

THE PICTURE OF THE TAOIST GENII PRINTED ON THE COVER of this book is part of a painted temple scroll, recent but traditional, given to Mr Brian Harland in Szechuan province (1946). Concerning these four divinities, of respectable rank in the Taoist bureaucracy, the following particulars have been handed down. The title of the first of the four signifies 'Heavenly Prince', that of the other three 'Mysterious Commander'.

At the top, on the left, is Liu *Thien Chün*, Comptroller-General of Crops and Weather. Before his deification (so it was said) he was a rain-making magician and weather forecaster named Liu Chün, born in the Chin dynasty about +340. Among his attributes may be seen the sun and moon, and a measuring-rod or carpenter's square. The two great luminaries imply the making of the calendar, so important for a primarily agricultural society, the efforts, ever renewed, to reconcile celestial periodicities. The carpenter's square is no ordinary tool, but the gnomon for measuring the lengths of the sun's solstitial shadows. The Comptroller-General also carries a bell because in ancient and medieval times there was thought to be a close connection between calendrical calculations and the arithmetical acoustics of bells and pitch-pipes.

At the top, on the right, is Wên *Yuan Shuai*, Intendant of the Spiritual Officials of the Sacred Mountain, Thai Shan. He was taken to be an incarnation of one of the Hour-Presidents (*Chia Shen*), i.e. tutelary deities of the twelve cyclical characters (see Vol. 4, pt. 2, p. 440). During his earthly pilgrimage his name was Huan Tzu-Yü and he was a scholar and astronomer in the Later Han (b. +142). He is seen holding an armillary ring.

Below, on the left, is Kou *Yuan Shuai*, Assistant Secretary of State in the Ministry of Thunder. He is therefore a late emanation of a very ancient god, Lei Kung. Before he became deified he was Hsin Hsing, a poor woodcutter, but no doubt an incarnation of the spirit of the constellation Kou-Chhen (the Angular Arranger), part of the group of stars which we know as Ursa Minor. He is equipped with hammer and chisel.

Below, on the right, is Pi *Yuan Shuai*, Commander of the Lightning, with his flashing sword, a deity with distinct alchemical and cosmological interests. According to tradition, in his early life he was a countryman whose name was Thien Hua. Together with the colleague on his right, he controlled the Spirits of the Five Directions.

Such is the legendary folklore of common men canonised by popular acclamation. An interesting scroll, of no great artistic merit, destined to decorate a temple wall, to be looked upon by humble people, it symbolises something which this book has to say. Chinese art and literature have been so profuse, Chinese mythological imagery so fertile, that the West has often missed other aspects, perhaps more important, of Chinese civilisation. Here the graduated scale of Liu Chün, at first sight unexpected in this setting, reminds us of the ever-present theme of quantitative measurement in Chinese culture; there were rain-gauges already in the Sung (+12th century) and sliding calipers in the Han (+1st). The armillary ring of Huan Tzu-Yü bears witness that Naburiannu and Hipparchus, al-Naqqāsh and Tycho, had worthy counterparts in China. The tools of Hsin Hsing symbolise that great empirical tradition which informed the work of Chinese artisans and technicians all through the ages.

SCIENCE AND CIVILISATION IN CHINA

A certain knowledge of Eastern religions and philosophies aids one's intellect and intuition in understanding the ideas (of inner alchemy), partly at least, just as one can fathom the paradoxes of primitive beliefs in terms of 'ethnology' or of the 'comparative history of religion'. But this is the Western way of hiding one's own heart under the cloak of so-called scientific understanding. We do it partly because of the 'misérable vanité des savants', which fears and rejects with horror any sign of living sympathy, and partly because an understanding that reaches the feelings might allow contact with the foreign spirit to become a serious experience. . . . Science only works harm when taken as an end in itself. Scientific method must serve; it errs when it usurps a throne.

C. G. Jung, in the introduction to his commentary on
Richard Wilhelm's translation of *Thai I Chin Hua Tsung Chih*

Entwächstest du dir selbst und aller Kreatur
So wird dir eingeimpft die göttliche Natur.

Angelus Silesius (Joh. Scheffler, +1624 to +1677). *Cherubinische Wandersmann*, II

The mystic does not deny the body, but uses it as a necessary instrument of salvation.

G. Tucci, in *Theory and Practice of the Mandala*

The essence of all things is in our bodies. When thou shalt know thine own body, thy own
foundation will be firm. *Amrita-ratnāvali*

Ever keep Ithaca in your mind,
Your return thither is your goal.
But do not hasten at all your voyage,
Better that it last for many years.
All full of years at length you anchor at your isle,
Rich with all you gained upon the way,
Do not expect Ithaca to give you riches.
Ithaca gave you your fair voyage
Without her you would not have ventured on the way.
But she has no more to give you.
And if you find Ithaca a poor place
She has not mocked you.
You have become so wise, so full of experience
That you should understand already what
These Ithacas mean.

C. V. Cavafy, 'Ithaca'

Turn back, O Man, forswear thy foolish ways,
Old now is Earth, and none may count her days,
Yet thou, her child, whose head is crowned with flame,
Still wilt not hear thine inner god proclaim –
'Turn back, O Man, forswear thy foolish ways'.

Clifford Bax

李約瑟著

中國科學技術史

莫朝鼎



SCIENCE AND CIVILISATION IN CHINA

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PART V: SPAGYRICAL DISCOVERY AND
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To
KUO PÊN-TAO

*formerly Professor of Comparative Religion at the Nanking
Theological Seminary*

a master in the Tao

—remembering our talks in the
tower of Hua-Hsi University—
at Chhêngtu
1943-1944

and in memory of

ROBERT van GULIK

*formerly Minister Plenipotentiary in the Netherlands
Foreign Service*

a master in the Tao

—remembering our talks from
Basra to Chungking—

this volume is dedicated

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LIST OF ABBREVIATIONS

The following abbreviations are used in the text and footnotes. For abbreviations used for journals and similar publications in the bibliographies, see pp.339 ff.

- | | |
|------|--|
| B | Bretschneider, E. (1), <i>Botanicon Sinicum</i> . |
| CC | Chia Tsu-Chang & Chia Tsu-Shan (1), <i>Chung-Kuo Chih Wu Thu Chien</i> (Illustrated Dictionary of Chinese Flora), 1958. |
| CCIF | Sun Ssu-Mo, <i>Chhien Chin I Fang</i> (Supplement to the Thousand Golden Remedies), between +660 and +680. |
| CCYF | Sun Ssu-Mo, <i>Chhien Chin Yao Fang</i> (Thousand Golden Remedies), between +650 and +659. |
| CHS | Pan Ku (and Pan Chao), <i>Chhien Han Shu</i> (History of the Former Han Dynasty), c. +100. |
| CJC | Juan Yuan, <i>Chhou Jen Chuan</i> (Biographies of Mathematicians and Astronomers), +1799. With continuations by Lo Shih-Lin, Chu Kho-Pao and Huang Chung-Chün. In <i>HCCC</i> , chs. 159ff. |
| CLPT | Thang Shen-Wei <i>et al.</i> (ed.), <i>Chêng Lei Pên Tshao</i> (Reorganised Pharmacopoeia), ed. of +1249. |
| CSHK | Yen Kho-Chün (ed.), <i>Chhüan Shang-Ku San-Tai Chhin Han San-Kuo Liu Chhao Wên</i> (Complete Collection of prose literature (including fragments) from remote antiquity through the Chhin and Han Dynasties, the Three Kingdoms, and the Six Dynasties), 1836. |
| CTPS | Fu Chin-Chhüan (ed.), <i>Chêng Tao Pi Shu Shih Chung</i> (Ten Types of Secret Books on the Verification of the Tao), early 19th cent. |
| EB | <i>Encyclopaedia Britannica</i> . |
| HCCC | Yen Chieh (ed.), <i>Huang Chhing Ching Chieh</i> (monographs by Chhing scholars on classical subjects), 1829, contd. 1860. |
| HCSS | <i>Hsiu Chen Shih Shu</i> (Ten Books on the Regeneration of the Primary Vitalities, physiological alchemy), c. +1250. |
| HFT | Han Fei, <i>Han Fei Tzu</i> (Book of Master Han Fei), early – 3rd cent. |
| HHPT | Su Ching <i>et al.</i> (ed.), <i>Hsin Hsiu Pên Tshao</i> (Newly Improved Pharmacopoeia), +659. |
| HHS | Fan Yeh & Ssuma Piao, <i>Hou Han Shu</i> (History of the Later Han Dynasty), +450. |
| HNT | Liu An <i>et al.</i> , <i>Huai Nan Tzu</i> (Book of the Prince of Huai-Nan), – 120. |
| ICK | Taki Mototane, <i>I Chi Khao</i> (<i>Iseki-kō</i>) (Comprehensive Annotated Bibliography of Chinese Medical Literature [Lost or Still Existing]), finished c. 1825, pr. 1831; repr. Tokyo 1933, Shanghai 1936. |

- ITCM* Wang Khên-Thang & Chu Wên-Chen (ed.), *I Thung Chêng Mo Chhüan* (Complete Collection of Works on Medicine and Sphygmology), +1601.
- K* Karlgren, B. (1), *Grammata Serica* (dictionary giving the ancient forms and phonetic values of Chinese characters).
- KCCY* Chhen Yuan-Lung, *Ko Chih Ching Yuan* (Mirror of Scientific and Technological Origins), an encyclopaedia of +1735.
- KHTT* Chang Yü-Shu (ed.), *Khang-Hsi Tzu Tien* (Imperial Dictionary of the Khang-Hsi reign-period), +1716.
- Kr* Kraus, P., *Le Corpus des Écrits Jâbiriens (Mémoires de l'Institut d'Égypte, 1943, vol. 44, pp. 1-214)*.
- LPC* Lung Po-Chien (1), *Hsien Tshun Pên Tshao Shu Lu* (Bibliographical Study of Extant Pharmacopoeias and Treatises on Natural History from all Periods).
- LS* Tsêng Tshao (ed.), *Lei Shuo* (Classified Commonplace-Book), +1136.
- MCPT* Shen Kua, *Mêng Chhi Pi Than* (Dream Pool Essays), +1089.
- N* Nanjio, B., *A Catalogue of the Chinese Translations of the Buddhist Tripitaka*, with index by Ross (3).
- NCCS* Hsü Kuang-Chhi, *Nung Chêng Chhüan Shu* (Complete Treatise on Agriculture), +1639.
- NCNA* New China News Agency.
- PPT/NP* Ko Hung, *Pao Phu Tzu (Nei Phien)* (Book of the Preservation-of-Solidarity Master; Inner Chapters), c. +320.
- PPT/WP* *Idem (Wai Phien)*, the Outer Chapters.
- PTKM* Li Shih-Chen, *Pên Tshao Kang Mu* (The Great Pharmacopoeia), +1596.
- PWYF* Chang Yü-Shu (ed.), *Phei Wên Yün Fu* (encyclopaedia), +1711.
- R* Read, Bernard E. *et al.*, Indexes, translations and précis of certain chapters of the *Pên Tshao Kang Mu* of Li Shih-Chen. If the reference is to a plant see Read (1); if to a mammal see Read (2); if to a bird see Read (3); if to a reptile see Read (4 or 5); if to a mollusc see Read (5); if to a fish see Read (6); if to an insect see Read (7).
- RBS* *Revue Bibliographique de Sinologie.*
- RP* Read & Pak (1), Index, translation and précis of the mineralogical chapters in the *Pên Tshao Kang Mu*.
- S/* Stein Collection of Tunhuang MSS, British Museum, London, catalogue number.
- SC* Ssuma Chhien, *Shih Chi* (Historical Records), c. -90.
- SF* Thao Tsung-I (ed.), *Shuo Fu* (Florilegium of (Unofficial) Literature), c. +1368.
- SHC* *Shan Hai Ching* (Classic of the Mountains and Rivers), Chou and C/Han.

- SIC** Okanishi Tameto, *Sung I-Chhien I Chi Khao* (Comprehensive Annotated Bibliography of Chinese Medical Literature in and before the Sung Period). Jen-min Wei-shêng, Peking, 1958.
- SKCS** *Ssu Khu Chhüan Shu* (Complete Library of the Four Categories), +1782; here the reference is to the *tshung-shu* collection printed as a selection from one of the seven imperially commissioned MSS.
- SKCS/TMTY** Chi Yün (ed.), *Ssu Khu Chhüan Shu Tsung Mu Thi Yao* (Analytical Catalogue of the *Complete Library of the Four Categories*), +1782; the great bibliographical catalogue of the imperial MS. collection ordered by the Chhien-Lung emperor in +1772.
- SNPTC** *Shen Nung Pên Tshao Ching* (Classical Pharmacopoeia of the Heavenly Husbandman), C/Han.
- SSIW** Toktaga (Tho-Tho) *et al.*; Huang Yü-Chi *et al.* & Hsü Sung *et al.* *Sung Shih I Wên Chih, Pu, Fu Phien* (A Conflation of the Bibliography and Appended Supplementary Bibliographies of the History of the Sung Dynasty). Com. Press, Shanghai, 1957.
- STTH** Wang Chhi, *San Tshai Thu Hui* (Universal Encyclopaedia), +1609.
- SYEY** Mei Piao, *Shih Yao Erh Ya* (The Literary Expositor of Chemical Physic; or, Synonymic Dictionary of Minerals and Drugs), +806.
- TCTC** Ssuma Kuang, *Tzu Chih Thung Chien* (Comprehensive Mirror (of History) for Aid in Government), +1084.
- TFYK** Wang Chhin-Jo & Yang I (eds.), *Tshé Fu Yuan Kuei* (Lessons of the Archives, encyclopaedia), +1013.
- TKKW** Sung Ying-Hsing, *Thien Kung Khai Wu* (The Exploitation of the Works of Nature), +1637.
- TMITC** Li Hsien (ed.), *Ta Ming I Thung Chih* (Comprehensive Geography of the Ming Empire), +1461.
- TPHMF** *Thai-Phing Hui Min Ho Chi Chü Fang* (Standard Formularies of the (Government) Great Peace People's Welfare Pharmacies), +1151.
- TPKC** Li Fang (ed.), *Thai-Phing Kuang Chi* (Copious Records collected in the Thai-Phing reign-period), +978.
- TPYL** Li Fang (ed.), *Thai-Phing Yü Lan* (the Thai-Phing reign-period (Sung) Imperial Encyclopaedia), +983.
- TSCC** Chhen Mêng-Lei *et al.* (ed.), *Thu Shu Chi Chhêng* (the Imperial Encyclopaedia of +1726). Index by Giles, L. (2).
References to 1884 ed. given by chapter (*chüan*) and page.
References to 1934 photolitho reproduction given by *tshé* (vol.) and page.
- TSCCIW** Liu Hsü *et al.* & Ouyang Hsiu *et al.*; *Thang Shu Ching Chi I Wên Ho Chih*. A conflation of the Bibliographies of the *Chiu Thang Shu* by Liu Hsü (H/Chin, +945) and the *Hsin Thang Shu* by Ouyang Hsiu & Sung Chhi (Sung, +1061). Com. Press, Shanghai, 1956.

- TSFY* Ku Tsu-Yu, *Tu Shih Fang Yü Chi Yao* (The Historian's Geographical Companion), begun before +1666, finished before +1692, but not printed till the end of the eighteenth century (1796 to 1821).
- TT* Wieger, L. (6), *Taoïsme*, vol. 1, Bibliographie Générale (catalogue of the works contained in the Taoist Patrology, *Tao Tsang*).
- TTC* *Tao Tê Ching* (Canon of the Tao and its Virtue).
- TTCY* Ho Lung-Hsiang & Phêng Han-Jan (ed.). *Tao Tsang Chi Yao* (Essentials of the Taoist Patrology), pr. 1906.
- TW* Takakusu, J. & Watanabe, K., *Tables du Taishō Issaikyō* (nouvelle édition (Japonaise) du Canon bouddhique chinoise), Index-catalogue of the Tripiṭaka.
- V* Verhaeren, H. (2) (ed.), Catalogue de la Bibliothèque du Pé-T'ang (the Pei Thang Jesuit Library in Peking).
- WCTY/CC* Tsêng Kung-Liang (ed.), *Wu Ching Tsung Yao (Chhien Chi)*, military encyclopaedia, first section, +1044.
- YCCC* Chang Chün-Fang (ed.), *Yün Chi Chhi Chhien* (Seven Bamboo Tablets of the Cloudy Satchel), Taoist collection, +1022.
- YHL* Thao Hung-Ching (attrib.), *Yao Hsing Lun* (Discourse on the Natures and Properties of Drugs).
- YHSF* Ma Kuo-Han (ed.), *Yü Han Shan Fang Chi I Shu* (Jade-Box Mountain Studio collection of (reconstituted and sometimes fragmentary) Lost Books), 1853.

AUTHOR'S NOTE

It is now some eighteen years since the preface for Vol. 4 of this series (Physics and Physical Technology) was written; since then much has been done towards the later volumes. We are now happy to be able to present a further part of Vol. 5 (Spagyric Discovery and Invention), i.e. alchemy and early chemistry, which go together with the arts of peace and war, including military and textile technology, mining, metallurgy and ceramics. The point of this arrangement was explained in the preface of Vol. 4 (e.g. pt. 3, p. 1). Exigencies not of logic but of collaboration are making it obligatory that these other topics should follow rather than precede the central theme of chemistry, which here is printed as Vol. 5, parts 2, 3, 4 and 5, leaving parts 1 and 6 to appear at a later date.

The number of physical volumes (parts) which we are now producing may give the impression that our work is enlarging according to some form of geometrical progression or along some exponential curve, but this would be largely an illusion, because in response to the reactions of many friends we are now making a real effort to publish in books of less thickness, more convenient for reading. At the same time it is true that over the years the space required for handling the history of the diverse sciences in Chinese culture has proved singularly unpredictable. One could (and did) at the outset arrange the sciences in a logical spectrum (mathematics – astronomy – geology and mineralogy – physics – chemistry – biology – psychology – sociology) leaving estimated room also for all the technologies associated with them; but to foresee exactly how much space each one would claim, that, in the words of the Jacobite blessing, was 'quite another thing'. We ourselves are aware that the disproportionate size of some of our Sections may give a mis-shapen impression to minds enamoured of classical uniformity, but our material is not easy to 'shape', perhaps not capable of it, and appropriately enough we are constrained to follow the Taoist natural irregularity and surprise of a romantic garden rather than to attempt any compression of our lush growths within the geometrical confines of a Cartesian parterre. The Taoists would have agreed with Richard Baxter that 'tis better to go to heaven disorderly than to be damned in due order'. By some strange chance our spectrum meant (though I thought at the time that the mathematics was particularly difficult) that the 'easier' sciences were going to come first, those where both the basic ideas and the available source-materials were relatively clear and precise. As we proceeded, two phenomena manifested themselves, first the technological achievements and amplifications proved far more formidable than expected (as was the case in Vol. 4, pts. 2 and 3), and secondly we found ourselves getting into ever deeper water, as the saying is,

intellectually (as will fully appear in the present part, and in the Sections on medicine in Vol. 6).

Alchemy and early chemistry, the central subjects of the present Volume, exemplified the second of these difficulties quite well enough, but they have had others of their own. At one time I almost despaired of ever finding our way successfully through the inchoate mass of ideas, and the facts so hard to establish, relating to alchemy, chemistry, metallurgy and chemical industry in ancient, medieval and traditional China. The facts indeed were much more difficult to ascertain, and also more perplexing to interpret, than anything encountered in subjects such as astronomy or civil engineering. And in the end, one must say, we did not get through without cutting great swathes of briars and bracken, as it were, through the muddled thinking and confused terminology of the traditional history of alchemy and early chemistry in the West. Here it was indispensable to distinguish alchemy from proto-chemistry, and to introduce words of art such as aurifiction, aurifaction and macrobiotics. It is also fair to say that the present subject has been far less well studied and understood, either by Westerners or Chinese scholars themselves, than fields like astronomy and mathematics, where already in the eighteenth century a Gaubil could do outstanding work, and nearer our own time a Chhen 'Tsun-Kuei¹, a de Saussure, and a Mikami Yoshio could set them largely in order. If the study of alchemy and early chemistry had advanced anything like so far, it would be much easier today than it actually is to differentiate with clarity between the many divergent schools of alchemists at the many periods, from the -3rd century to the +17th, with which we have to deal. More adequate understanding would also have been achieved with regard to that crucial Chinese distinction between inorganic laboratory alchemy (*wai tan*²) and physiological alchemy (*nei tan*³), the former concerned with elixir preparations of mineral origin, the latter rather with operations within the adept's own body; a distinction hardly realised in the West before the just passed decade. As we shall show in this present part, there was a synthesis of these two age-old trends when in iatro-chemistry from the Sung onwards laboratory methods were applied to physiological substances, producing what we can only call a proto-biochemistry.

Let us now, as an introduction to pt. 5, take a look backward over the way we have come. First, then, we had to write a very careful preamble (Sect. 33*b*, in Vol. 5, pt. 2, pp. 9 ff.) on concepts, terminology and definitions; because once one has obtained a clear idea of the distinctions between aurifiction, aurifaction and macrobiotics everything that one encounters in the proto-chemistry and alchemy of all the Old World civilisations falls into place. There is a parallel here with the history of time-keeping, for the radical gap between the clepsydra and the mechanical clock was only filled by half-a-dozen centuries of Chinese hydro-mechanical clockwork. So in the same way the radical gap between

¹ 陳遵媯 ² 外丹 ³ 內丹

Hellenistic aurifictive and aurifactive proto-chemistry at one end, and late Latin alchemy and iatro-chemistry at the other, could only be explained by a knowledge of Chinese chemical macrobotics.

After that beginning the argument developed in several directions, among which the reader might take his choice. How could belief in aurifaction ever have arisen when the cupellation test had been known almost since the dawn of the ancient empires? Look at Sect. 33*b*, 1-2, especially pp. 44 ff. in pt. 2. What was the position of China in this respect, and what were the ancient Chinese alchemists probably doing experimentally? Read 33*b*, 3-5; and *c*, 1-8 (pt. 2, pp. 47 ff., 188 ff.). Why were they so much more occupied with the perpetuation of life on earth, even in ethereal forms, than with the faking or making of gold? We tried to explain it in Sect. 33*b* (pt. 2, pp. 71 ff.). Such an induction of material immortality was indeed the specific characteristic of Chinese alchemy, and our conclusion was that the world-view of ancient China was the only milieu capable of crystallising belief in an elixir (*tan*¹), good against death, as the supreme achievement of the chemist (see especially pt. 2, pp. 78, 82, 114-15).

This was the nub of the argument, and in the last part (Sect. 33*i*, 2-3 in pt. 4, pp. 323 ff.) we followed the progress of that great creative dream through Arabic culture and Byzantium into the Latin Baconian and Paracelsian West. Differences of religion, theology and cosmology modified it but they could not stop its course. There can be no doubt that it was born within the bosom of the Taoist religion, and hence the reader was invited to participate in a speculation that the alchemist's furnace derived from the liturgical incense-burner no less than from the metallurgical hearth (Sect. 33*b*, 7, see pt. 2, pp. 128 ff., 154). Finally something was said on the physiological background of the ingestion of elixirs (Sect. 33*d*, 1, see pt. 2, p. 291); why were they so attractive to the consumer initially and why so lethal later? Here belongs also the conservation of the body of the adept after death, important in the Taoist mind in connection with material immortality (Sect. 33*d*, 2, see pt. 2, pp. 106 ff., 294 ff., 303-4).

In the sub-section giving the straight historical account of Chinese alchemy from beginning to end, *chi shih pên mo*² as the phrase was (Sect. 33*e*, 1-8) in pt. 3, no passage was really more significant than any other. Yet special interest did attach to the oldest firm records of aurifiction and macrobotics expounded in (1), pp. 12 ff. and to the study of the oldest alchemical books in (2) and (6, i), pp. 50 ff., 167 ff. Now and then the narrative was interrupted by passages of detail, especially in (1), (2), (3, iii) and (6, vii) which readers not avid for minutiae may have liked to pass over; such is the wealth of information not previously available in the West. The sub-sections in the next part on chemical laboratory apparatus and alchemical theory (Sects. 33*f*, *g*, *h* in pt. 4) explained themselves from the contents table, and again no passage stood out as crucial; though many matters of considerable importance for the history of chemistry revealed themselves on the way. One thinks of the earliest tubular cooling devices (pp. 26

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ff.), the radical differences between the Chinese, Hellenistic and Indian types of still (pp. 80 ff.), the fascinating story of the first appearance of 'ardent water' (strong alcohol) whether by freezing-out or by distillation (pp. 121 ff.), the many ramifications of the term 'nitre' (*hsiao*¹) in the history of the recognition and separation of soluble salts, leading to the isolation and use of saltpetre and copperas (pp. 167 ff.), and the industrial precipitation of metallic copper from its salts by iron (pp. 201 ff.).

Outstanding theoretically was the relation of the Chinese alchemist to time (33*h*, 3-4, pt. 4, pp. 221 ff., 242 ff.). His was indeed the science (or proto-science) of the Change and Decay Control Department as one might say, for he could (as he believed) accelerate enormously the natural change whereby gold was formed from other substances in the earth, and conversely he could decelerate asymptotically the rate of decay and dissolution to which human bodies, each with their ten 'souls' (*hun*² and *pho*³; cf. Fig. 1306 on p. 91 of pt. 2), were normally subject (cf. Fig. 1516 on p. 244 in pt. 4). Thus in the words of the ancient Chinese slogan (33*e*, 1, pt. 3, p. 27) 'gold *can* be made, and salvation *can* be attained'. And the macrobiogens were thus essentially time- and rate-controlling substances – a nobly optimistic concept for a nascent science of two thousand years ago.

The historical narrative in pt. 3 was drafted in the first place by our collaborator Prof. Ho Ping-Yü⁴ of Brisbane, who also had a large part to play in the epic of Chinese chemical and alchemical apparatus; and the study of the theory of Chinese elixir alchemy in pt. 4 was essentially the work of another collaborator, Prof. Nathan Sivin, then of the Massachusetts Institute of Technology, now of Philadelphia. All of us are agreed that the most important single source for Chinese alchemy, whether chemical or physiological, is the Taoist patrology, the *Tao Tsang*⁵. During the second world war I was instrumental in securing for the Cambridge University Library copies of the *Tao Tsang* and its Szechuanese version the *Tao Tsang Chi Yao*⁶, which is much more than the collection of excerpts suggested by its title. Most of the alchemical books and tractates in these vast compilations were then microfilmed for the East Asian History of Science Library, and somewhat later (1951-5) Dr Tshao Thien-Chhin⁷, then a Fellow of Caius, made a valuable study of them. After his return to the Biochemical Institute of Academia Sinica, Shanghai, of which he has been for a number of years past Vice-Director, these notes were of great help to Dr Ho and myself, forming the basis for the subsection in Vol. 5, pt. 4 on aqueous reactions (*g*). Still later, Prof. H.B. Collier of Edmonton, Alberta, who had taught chemistry for many years at the West China University at Chhêngtu in Szechuan, presented to our Library the alchemical books in the *Tao Tsang Chi Yao* which he had collected there, and these proved of great use to Dr Lu Gwei-Djen⁸ and myself since many of them deal with physiological rather than laboratory alchemy. Again, before he left

¹硝 ²魂 ³魄 ⁴何丙郁 ⁵道藏 ⁶道藏輯要 ⁷曹天欽 ⁸魯桂珍

Cambridge in 1958, Dr Wang Ling¹ accomplished a good work by making an analytical index of the names of chemical substances mentioned in the *Shih Yao Erh Ya*² (Literary Expositor of Chemical Physic; or, Synonymic Dictionary of Minerals and Drugs), written by Mei Piao³ in the Thang (+ 806), one of the most valuable alchemical books in the *Tao Tsang*. It still helped Dr Lu and myself even for the present part, because so many concepts of physiological alchemy were fond of hiding themselves under chemical nomenclature. Lastly, when we were facing the interesting but difficult study of the evolution of chemical apparatus in East and West (Sect. 33, *f*), Dr Dorothy Needham put in a considerable amount of work, including some drafting, in the intervals of her own work on the history of muscle biochemistry. And she has continued to read all our pages – perhaps the only person in the world who ever does so!

If there is one question more than any other raised by this present Section 33 on alchemy and early chemistry, now offered to the republic of learning in these volumes, it is that of human unity and continuity. In the light of what is here set forth, can we allow ourselves to visualise that some day before long we shall be able to write the history of man's enquiry into chemical phenomena as one single development throughout the Old World cultures? Granted that there were several different foci of ancient metallurgy and primitive chemical industry, how far was the gradual flowering of alchemy and chemistry a single endeavour, running contagiously from one civilisation to another?

It is a commonplace of thought that some forms of human experience seem to have progressed in a more obvious and palpable way than others. It might be difficult to say how Michael Angelo could be considered an improvement on Pheidias, or Dante on Homer, but it can hardly be questioned that Newton and Pasteur and Einstein did really know a great deal more about the natural universe than Aristotie or Chang Hêng⁴. This must tell us something about the differences between art and religion on one side and science on the other, though no one seems able to explain quite what, but in any case within the field of natural knowledge we cannot but recognise an evolutionary development, a real progress, over the ages. The cultures might be many, the languages diverse, but they all partook of the same quest.

Throughout this series of volumes it has been assumed all along that there is only one unitary science of Nature, approached more or less closely, built up more or less successfully and continuously, by various groups of mankind from time to time. This means that one can expect to trace an absolute continuity between the first beginnings of astronomy and medicine in Ancient Babylonia, through the advancing natural knowledge of medieval China, India, Islam and the classical Western world, to the break-through of late Renaissance Europe when, as has been said, the most effective method of discovery was itself discovered. Many people probably share this point of view, but there is another one which I may associate with the name of Oswald Spengler, the German

¹王鈴 ²石藥爾牙 ³梅彪 ⁴張衡

world-historian of the thirties whose works, especially *The Decline of the West* (1), achieved much popularity for a time. According to him, the sciences produced by different civilisations were like separate and irreconcilable works of art, valid only within their own frames of reference, and not subsumable into a single history and a single ever-growing structure.

Anyone who has felt the influence of Spengler retains, I think, some respect for the picture he drew of the rise and fall of particular civilisations and cultures, resembling the birth, flourishing and decay of individual biological organisms, in human or animal life-cycles. Certainly I could not refuse all sympathy for a point of view so like that of the Taoist philosophers, who always emphasised the cycles of life and death in Nature, a point of view that Chuang Chou¹ himself might well have shared. Yet while one can easily see that artistic styles and expressions, religious ceremonies and doctrines, or different kinds of music, have tended to be incommensurable; for mathematics, science and technology the case is altered – man has always lived in an environment essentially constant in its properties, and his knowledge of it, if true, must therefore tend towards a constant structure.

Nevertheless, in presenting to the world this part of Volume 5, we are conscious that it is rather different from those which have gone before it and from those which will follow it. In order to understand the physiological alchemy of China, one has to enter a world of natural philosophy entirely unlike that of Western tradition, and to attune oneself to a theology and a realm of religious feeling quite foreign to the common presuppositions of the 'Peoples of the Book'.^a The sheer un-European-ness of Chinese physiological alchemy deeply impresses. True, it had some connections with Indian thought and belief, yet it was very clearly itself and nothing else, essentially materialist in character because it conceived of the enchymoma of immortality as a real chemical substance formed from the juices and *pneumata* of the body, psychosomatic perhaps but certainly not psychological alone. In view of the deep contrasts between Western and Eastern spirituality, a leap of sympathetic understanding is required in approaching Chinese physiological alchemy, a readiness for new experience of the 'other', as was so well seen by C.G. Jung in the passage which we have quoted on our half-title page.

The techniques which the physiological alchemists believed they could use for their purpose will be described in due course, the control of respiration, the mastery of neuro-muscular coordination and the effects of particular forms of bodily rest and movement, the recognition of sexual activity as part of the Tao of the sage and the adept, the utilisation of bodily exposure to light, and the management of the mind in methods of meditation and mental concentration. Today the younger generation, the people in the 'counter-culture', are

^a A phrase used by Muslims to denote Jews and Christians as well as themselves, all those in fact deriving from ancient Hebrew monotheism.

¹ 莊周

rediscovering and re-exploring many of the ways of altered consciousness which the *nei tan* experts were seeking,⁸ so that the present time is appropriate enough for a pioneer survey of their systems as extensive as we have had time and space to make it, even though the subject is far from exhausted and there remains still much to be done.

Yet physiological alchemy was not wholly antithetical to modern science, as has sometimes been thought. It is but a truism to say that the Yang and Yin principles are present wherever there is positive and negative electricity today, and this means in the very foundations of the natural world, the sub-atomic elementary charged particles, the protons and electrons. The Five Elements can reasonably be taken to prefigure the states of matter recognised today, the solid, the liquid and the gaseous; and they served as a symbolic language for expressing subtle inter-relationships manifested in natural phenomena. There may be nothing in modern science exactly corresponding to the Taoist emphasis on reversion, counter-current flow, regeneration and return, but it does evoke the many and pressing mysteries of growth, differentiation, de-differentiation and re-differentiation, seen for example in insect metamorphosis, and well known in modern biological science. It is not impossible that with greater knowledge of enzymology, and especially physiological genetics, we may hope to arrest the ageing process and even retrace its steps; already rejuvenation is not an ostracised word, for the process can be seen to be real in tissue-cultures of plant and animal cells. The conservation of secretions seems strange to us at first, but we shall ultimately suggest that it meant the retention of many substances, from amylases to prostaglandins and other hormones, which might benefit the body. The three 'primary vitalities' of the Taoists are not precisely translatable into terms of modern science – no characteristically medieval formulations ever are – but *shen*¹ did some justice to the mental components of man, while *chhi*² denoted the dissolved gases in his body-fluids, and *ching*³ those fluids themselves; only the solid structures had little representation here. *Chhi* also included all those invisible processes like diffusion and the nervous impulse; and it was a penetrating insight to see that *shen* depended upon *chhi* and *ching*. A tripartite division of vital force came into Western physiological thought by the time of Paracelsus and Glisson; it was prominent in the Naturphilosophie movement, and even as late as Claude Bernard. We suspect that the three primary vitalities of China were not unconnected with it. Then long before Freud and Jung the Chinese physiological alchemists understood the importance of sexual health for the integrated personality, and made it a part of their macrobiotic programme. And there are many other physiological priorities to be assigned to China beyond what can appear in this book, for example the discovery of circadian rhythms in bodily

⁸ Neither dietary techniques nor psychotropic drugs were really part of physiological alchemy. On the former see pt. 3, pp. 9 ff.; on the latter see pt. 2, pp. 116 ff., 121 ff., 150 ff.

¹ 神 ² 氣 ³ 精

function, both normal and pathological; and the discovery and codification of the viscerocutaneous reflexes.^a

For all these reasons, we believe that most of physiological alchemy merits the name of proto-science rather than pseudo-science. Of particular interest here are the theoretical convictions voiced by so many of its practitioners, for example that 'man's fate is in his own hands, not those of Heaven'; and they speak also of 'robbing Nature's workshop to accomplish good for humanity'. Strangely Promethean words, these, from a culture which even some of its own interpreters have believed bound to the view that ethical self-discipline alone mattered. 'The Chinese philosophers', wrote Fêng Yu-Lan¹ long ago, 'had no need of scientific certainty because it was themselves that they wished to know; they had no need of the power of science, because it was themselves that they wished to conquer.'^b It is true, as we shall see, that some philosophers, such as the Neo-Confucians, were unhappy about the audacious proto-scientific programmes of the alchemists and other technologists, but death itself was what these men intended to conquer, and selfhood was only one obstacle on their way of certainty and power to the sagehood of the Holy Immortals.

The truly proto-scientific character of their endeavour appears moreover at the end in that *tour de force* of medieval achievement, the preparation of active hormones from urine, worked up in almost manufacturing quantities. ^c Here the synthesis of iatro-chemistry, starting several centuries before Paracelsus, transcended the *wai tan* elixirs and the *nei tan* enchymomas by applying *wai tan* methods to *nei tan* materials. In later volumes we expect to return to similar achievements of the iatro-chemists, but here this forms a fitting concrete conclusion to the description of a tradition which might at first sight seem to have been no more than wishful thinking.

Although the other parts of Vol. 5 are not yet ready for press we should like to make mention of those who are collaborating with us in them. Much of the Section on martial technology for Vol. 5, pt. 1 has been in draft for many years now,^d but it has been held up by delays in the preparation of the extremely important sub-section on the invention of the first chemical explosive known to man, gunpowder, even though all the notes and books and papers necessary for this have long been collected. ^e At last we can salute the advent of a relevant draft of substantial size from Dr Ho Ping-Yü at Brisbane, recently Visiting Professor at Keio University in Tokyo, aided by Dr Wang Ling (Wang Ching-Ning²) of the Institute of Advanced Studies at Canberra. Meanwhile Prof. Lo

^a On these subjects see Lu Gwei-Djen & Needham (5), as also in due course Vol. 6, pt. 3.

^b Quoted by Needham (47), p. 301. ^c Sect. 33k, 1-7.

^d Including an introduction on the literature, a study of close-combat weapons, the sub-sections on archery and ballistic machines, and a full account of iron and steel technology as the background of armament. The first draft of this last has been published as a Newcomen Society monograph; Needham (32), (60).

^e A preliminary treatment of the subject, still, we think, correct in outline, was given in our article in the *Legacy of China* eleven years ago; Needham (47). This has recently been re-issued in paperback form.

¹ 馮友蘭 ² 王靜寧

Jung-Pang¹, of the University of California at Davis, spent the winter of 1969-70 in Cambridge, accomplishing not only the sub-section on the history of armour and caparison in China but also the draft of the whole of Section 37 on the salt industry, including the epic development of deep borehole drilling (Vol. 5, pt. 6). Other military sub-sections, such as those on poliorcetics, cavalry practice and signalling, we have been able to place in the capable hands of Dr Korinna Hana of München. About the same time we persuaded Dr Tsien Tsuen-Hsüin (Chhien Tshun-Hsün²), the Regenstein Librarian at the University of Chicago, to undertake the writing of Section 32 on the great inventions of paper and printing and their development in China; this is now completed. For ceramic technology (Section 35) we have obtained the collaboration of Mr James Watt (Chhü Chih-Jen³), Curator of the Art Gallery at the Institute of Chinese Studies in the Chinese University of Hongkong. The story of these marvellous applications of science will be anticipated by many with great interest. Finally non-ferrous metallurgy and textile technology, for which abundant notes and documentation have been collected, found their organising genii in two other widely separated places. For the former we have Prof. Ursula Martins Franklin assisted by Dr Hsü Chin-Hsiung⁴ at Toronto; for the latter Dr Ohta Eizo⁵ at Kyoto and Dr Dieter Kuhn in Cambridge. When their work becomes available, Volume 5 will be substantially complete. This by no means exhausts the list of our invaluable collaborators, for many others are concerned with Volumes 6 and 7; but they will be introduced to readers in due time.

As has so long been customary, we offer our grateful thanks to those who try to keep us 'on the rails' in territory which is not our own; Prof. D.M. Dunlop for Arabic, Dr Sebastian Brock for Syriac, Prof. E.J. Wiesenberg for Hebrew, Dr Charles Sheldon for Japanese, Prof. G. Ledyard for Korean, and Prof. Shackleton Bailey for Sanskrit.⁶

Three or four years ago it became clear that our working library and its operations had grown so much in size and complexity that a full-time Amanuensis (*chêng chen shu tshao*⁶) or Librarian was needed. For this we first recruited a physical chemist, Dr Christine King (Ting Pai-Fu⁷), who gave us much assistance; being succeeded after some time by a valued former associate, the Japanologist Miss Philippa Hawking. Her organising abilities stood us in good stead during the moves of the library mentioned below. The best Librarians are born, not made, and she is of that company.

Next comes our high secretariat – Miss Muriel Moyle, who continues to give us impeccable indexes; Mrs Liang Chung Lien-Chu⁸ (wife of another Fellow of Caius, the physicist Dr Liang Wei-Yao⁹), who has inserted many a page of well-

⁶ For further advice on linguistic and cultural matters we are also indebted to Dr Edith Jachimowicz, Prof. R.B. Serjeant and Dr Felix Klein-Franke.

¹ 羅榮邦 ² 錢存訓 ³ 屈志仁 ⁴ 許進雄 ⁵ 太田英藏 ⁶ 正眞書曹
⁷ 丁百馥 ⁸ 梁鍾連杼 ⁹ 梁維耀

written characters and made out many a biographical reference card, as well as editing the typescripts of collaborators to conform with project conventions. And just as Mrs Liang keeps an eagle eye on the Chinese of the footnotes in proof, so we now welcome the collaboration of Major Frank Townson who has undertaken the press work formerly done by Mrs Margaret Anderson. We are also happy to acknowledge the skilled and accurate typing help of our Secretary, Mrs Diana Brodie, and Mrs Evelyn Beebe.

All that has been said in previous volumes (e.g. Vol. 4, pt. 3, p. lvi) about the University Press, our treasured medium of communication with the world, and Gonville and Caius College, that milieu in which we used to live and move and have our being, has become only truer as the years go by – their service and their encouragement continues unabated, and so does our heartfelt gratitude. If it were not for the devotion of the typographical – and typocritical – masters, and if one could not count on the understanding, kindness and appreciation of one's academic colleagues, nothing of what these volumes represent could ever have come into existence. We have taken pleasure on previous occasions in paying a tribute to our friend Mr Peter Burbidge of the University Press, and as we do so again we would like to associate with his name all those in that unique organisation who deal so faithfully, accurately and elegantly with our very difficult work.

Down to the summer of 1976 the library which constitutes the engine-room of the project was housed in Caius, but upon my retirement from the Mastership it was moved to a temporary building in Shaftesbury Road just outside the 'compound' (as one would say in Asia) of the University Printing House. Later we were installed in a spacious house in Brooklands Avenue. This building belongs to the Press, and is leased by the Syndics to the East Asian History of Science Trust (U.K.) *pro tem*. We acknowledge with warmest thanks a generous installation grant from the British Museum Library Ancillary Libraries Fund, and a special grant from the Sloane Foundation in America. Since that time there have been further liberal benefactions from the Ford and Mellon Foundations, and from the National Science Foundation, so much so as to assure, in all probability, the financial backing needed for the remaining eight or nine volumes of the series; and these funds are held in part by our East Asian History of Science Trust (U.S.A.). We should like to take this opportunity of offering our warmest gratitude to all those who serve as Trustees of these charitable organisations.

Particular continuing gratitude is due to the Wellcome Trust of London, whose generous support upheld us throughout the period of preparation of these chemical volumes. Since the history of medicine is touched upon at so many points in them – and especially now with regard to physiological alchemy – we are not without some sense of justification in accepting their unfailing aid. It can hardly be too much emphasised that in China proto-chemistry was elixir alchemy from the very beginning (as it was not in other civilisations of

comparable antiquity), and by the same token alchemists there were very often physicians too (much more so than they tended to be in other cultures). For the basic elixir and enchymoma notions were pharmaceutical and therapeutic ones, even though Chinese optimism regarding the conquest of death reached a height which modern medical science dare not as yet contemplate.

In recent times our project has received notable benefactions from the Coca-Cola Company of Atlanta, Georgia, through the kind intermediation of its then Senior Vice-President, the late Dr Clifford A. Shillinglaw, first Chairman of our American Trust; and for this and many other kindnesses our most grateful thanks are due. The support of the Company's benevolent fund met the expenses of Dr Li Li-Shêng¹ when he spent some time in Cambridge working on Section 34 (the chemical industries), a first draft of which had been made some years before by Prof. Ho Ping-Yü. To Thames Television Ltd we acknowledge a useful grant for the support of our amanuensis, and to the Lee Foundation of Singapore (founded in memory of the late Dato Lee Kong-Chian²) several most welcome grants for general project expenses. Help on a lesser scale has also been forthcoming from the American Philosophical Society. Certain private persons, too, have sent us truly notable donations from time to time; and here we cannot forbear from offering our warmest thanks to Mrs Carol Bernstein Ferry and Mr W.H. Ferry of Scarsdale, N.Y.; as also to Mr and Mrs P.L. Lam (Lin Ping-Liang³ and Lin Ma-Li⁴) of Hongkong.

So now at last, in this our part 5, we pass from the 'outer elixir' (*wai tan*) to the 'inner elixir' (*nei tan*), from proto-chemistry to proto-biochemistry, from reliance on mineral and inorganic remedies to a faith in the possibility of making a macrobiogen from the juices and substances of the living body. For this new concept we have had to coin a fourth new word, the enchymoma; its synthesis was in practice the training of mortality itself to put on immortality. The basic ideas of this 'physiological alchemy' will be found in two places, Sect. 33j (2) especially (i, ii), and (4). It was not primarily psychological, like the 'mystical alchemy' of the West, though it made much use of meditational techniques. Our conclusion is, at the end of (4) and in (8), that most of its procedures were highly conducive to the health, both mental and physical, of the follower of the Tao.

¹李勳生 ²李公健 ³林炳良 ⁴林瑪利

33. ALCHEMY AND CHEMISTRY

(j) THE OUTER AND THE INNER MACROBIOGENS; THE ELIXIR AND THE ENCHYMOMA

(1) ESOTERIC TRADITIONS IN EUROPEAN ALCHEMY

The science of alchemy (*ars alchimica*) [said Martin Luther in the middle of the +16th century],^a I like very well, and indeed it is truly the natural philosophy of the ancients. I like it not only for the many uses it has in melting and alloying metals, and in distilling and sublimating herbs and extracts (*in excoquendis metallis, item herbis et liquoribus distillandis ac sublimandis*), but also for the sake of the allegory and secret signification, which is exceedingly fine, touching the resurrection of the dead at the Last Day. For as in a furnace the fire extracts and separates from a substance the other portions, and carries upward the spirit, the life, the sap, the strength, while the unclean matter, the dregs, remain at the bottom, like a dead and worthless carcase...^b even so God, at the day of judgment, will separate all things through fire, the righteous from the ungodly.^c

And a similar thought was committed to paper about +1641, when Sir Thomas Browne wrote, in his *Religio Medici*:^d

The smattering I have of the Philosophers' Stone (which is something more than the perfect exaltation of gold), hath taught me a great deal of Divinity, and instructed my belief, how that immortal spirit and incorruptible substance of my Soul may lye obscure, and sleep awhile within this house of flesh. Those strange and mystical transmigrations that I have observed in Silk-worms, turned my Philosophy into Divinity. There is in these works of nature, which seem to puzzle reason, something Divine, and hath more in it than the eye of a common spectator can discover.

These interesting quotations may serve to remind us that beside the current of practical laboratory experimentation in Western proto-chemistry and alchemy there was, perhaps from the beginning, a parallel current of mystical, allegorical, symbolic, ethical, even psychological exegesis. At many places in the foregoing volumes the reader will have come across somewhat mystifying references to 'inner' or 'spiritual' alchemy within the Chinese story, and the question that now has to be faced at last is whether or not there was similarity between the distinctively

^a *Tischreden*, I, 1149, quoted by Montgomery (1), p. 79, who demonstrates, as others such as Hubicki (1) also do, the very favourable influence which Lutheranism had upon the development of alchemy and early chemistry. For other sciences see Miall (1); Pelseneer (3, 4, 5) and Mason (2, 3). On the general subject of the relations between Protestant theology and the natural sciences Dillenberger (1) is well worth reading. We have already referred (Vol. 2, p. 92) to the preponderance of scientific men on the side of the Reform at this time.

^b Here Luther illustrates further by speaking of the preparation of wine, cinnamon, nutmeg and the like.

^c Though Luther is in no way to be compared with the Gnostics of the early Christian centuries, one cannot help being reminded here of the close connections between Gnostic ideas and Hellenistic proto-chemical thought. This we duly emphasised in Vol. 5, pt. 4, pp. 376 ff., 385 ff., but we would have been justified in putting the case a good deal more strongly, as may be seen from the texts of Basilides, Ptolemaeus and the Sethians among others, translated in Foerster (1), vol. 1, pp. 64 ff., 135, 304-5 etc.

^d Macmillan ed. p. 64.

non-laboratory traditions in China and the West. As we know, practical laboratory alchemy tends to be described in Chinese texts as the search for the 'outer elixir' (*wai tan*¹), besides which there was, especially in T'hang times and later, later increasingly, a parallel search for an 'inner elixir' (*nei tan*²). The exact significance of this distinction has been a matter of much uncertainty among those few sinologists who have ever wandered near these fields,^a and indeed at the present time it would be impossible to point to any monograph or book which deals, even inadequately, with the *nei tan* complex. Was it basically allegorical, food for the soul of the adept on his difficult path towards perfection? Or was it something entirely different from the mystical psychology of the West? We are now fully assured that it was entirely different, and that a radical distinction must be made between the two kinds of 'alchemy' in the West and the two kinds of 'alchemy' in China. We shall find it necessary to introduce an entirely new word for the 'inner elixir', since it was a physiological rather than a psychological achievement. But first it is necessary to take a closer look at the spiritual alchemy of Europe.

As is well known, the eminent psycho-analytic philosopher C. G. Jung published in 1944 a book called 'Psychologie und Alchemie' (1) which has had a great deal of influence.^b He followed it up by other works such as 'Alchemical Studies' (3) and 'Mysterium Conjunctionis' (8), but in all these books the general idea is the same. Jung suggested that the practical chemical element in medieval and Renaissance European alchemy had been much over-rated, believing that a great deal, if not most, of the description in the alchemical writings was essentially mythology, consisting of allegories, metaphorical formulations, poetical analogies and symbolism. The alchemist achieved what Jung called the process of psychological individuation by meditating on the phenomena of chemical change;^c he freed himself from the inner contradictions, conflicts, etc. which lead to obsessions, anxieties, neuroses and psycho-somatic disorders—attaining psychological wholeness, balance and integration—by following chemical reactions or descriptions of them, and identifying these with universal 'archetypes'^d instead of his own inner world alone. Thus Western psychological alchemy was concerned not so much, if at all, with actual chemical operations as with states of mind, catharsis, sublimation, purification and the attainment of unity and equilibrium—almost like an auto-psycho-analysis before psycho-analysis had been invented.

Now evidently it could be but a short step from the multifarious poetical and secretive cover-names in which alchemy, both West and East, was so rich (for example in China the 'elegant girl by the riverside', *ho shang chha nü*³ for mercury,^e

^a One may refer, for example, to the recent eccentric but knowledgeable paper of Liu Tshun-Jen (1), based upon a range of literature somewhat different from that used by us herein. It will prove more understandable if read after the study of the present sub-section.

^b Much has been written on the life and thought of Jung; here we should like to refer only to the perceptive essay of Staude (1).

^c (1), pp. 3, 27.

^d See p. 7 below.

^e E.g. in *TT990*, ch. 2, p. 28a, *TT993*, ch. 2, p. 25a.

¹ 外丹

² 内丹

³ 河上姮女

and we have seen a thousand examples already) to all sorts of metaphorical formulations and symbols.^a One finds in Jung's expositions of the alchemical writings, therefore, a veritable farrago of imagery, parallelisms, patterns, visions, and symbolic formulations, drawn from Orphism, Gnosticism,^b the Hermetic Corpus,^c the Alexandrian proto-chemical philosophers,^d the Kabbalah,^e and many other sources, not excluding the apocryphal Gospels^f and similar quasi-Christian legendary material; where almost every possible statement seems to be made, however contradictory, valued indeed sometimes because of its very paradoxical contradiction. The method was uncomfortably Forkean or Granetian,^g statements of all kinds from all historical periods being inextricably mixed. Jung's defence against this was that human nature is everywhere the same, with human activities and the human condition at all times comparable, having an essential similarity of neurotic and psychotic content;^h but it is doubtful if this can justify the ignoring of historical

^a There is no lack of descriptions of the 'Great Work' as the later European alchemists conceived it, whether in the form of albums of their allegorical illustrations, such as those of Fabricius (1) or Alleau (1) or Ploss *et al.* (1); or as textual expositions such as that of Evola (4). Some are more overtly psycho-analytic than others; some make comparisons with the experience of persons under the influence of hallucinogenic drugs. For example, Fabricius finds a sexual *conjunctio* between each of the stages of descending and ascending colour-change, and has much to say on incest, birth trauma and primal anxiety. How much wiser the attentive reader will be after studying this material is a moot point.

^b Cf. pt. 4, pp. 376 ff. There was also a connection with later Manichaeism since it regarded matter as something essentially evil from which all spirits were trying to escape. A classical account of this religion, quite distinct from, and opposed to, Christianity, was given in +1707 by J. C. Wolf (1). But since his time there have been enormous advances in our knowledge of these world-views. Beginning with Burkitt (1, 2), one can now find reliable general accounts in Dorese (1); Rudolph (1) and Foerster (1). Puech (5) has a brilliant essay on the ideas of the Gnostics about time, and Bianchi (1) brings out other aspects of their thought. The Coptic Gnostic library of Nag Hammadi (Chenoboskion) has been edited in English by Robinson (1).

^c See the definitive editions of Scott (1) and Nock & Festugière (1), as also the expositions of Kroll (1) and Mead (1). This Corpus, which bears the name of the legendary Egyptian philosopher-god Hermes Trismegistus, consists of the theological writings of +3rd-century Graeco-Egyptian philosophers. One of the documents (*Asclepius Lat.* III) is datable to +270 almost exactly. It is only now becoming clear that the 'Christianisation' of these writings, with their emphasis on redeemed man's power over Nature, by the +15th-century Italian philosophers Marsilio Ficino and Pico della Mirandola, had a great deal to do with the appearance of the Renaissance magus and the birth of modern science (cf. Yates, 1).

^d All in Berthelot & Ruelle (1), cf. Berthelot (1, 2). Cit. as *Corpus Alchem. Gr.* (-1st to +7th cents).

^e Another Corpus, of Jewish mysticism and magic, systematised first in the +13th century, but with roots going back clearly to Gnosticism (see Blau (1); Scholem (3, 4); Yates (1), pp. 92 ff.; Waite (12), (2) pp. 377 ff.). We have already referred to the Kabbalah (or, as the Renaissance scholars called it, Cabala) in Vol. 2, pp. 297 ff., drawing attention to parallelisms between its system and that of the Chinese symbolic correlations. The datings of the two chief books there given are perhaps too early, for the *Sefer Yesirah* (Book of Creation), tr. Stenring (1), should be placed rather in the +11th-century, and the *Zohar* (Book of Splendour) towards the end of the +13th. But there had been a centuries-long development within the framework of oral tradition since the +3rd-century. The *Zohar* is attributed to a +2nd-century Palestinian writer, R. Simon ben Yochai, but its author was almost certainly Moses ben Shem Tob de Leon (d. +1305). The central doctrine could perhaps be called a system of creation by remote control, and the ten sephiroth (names of God) or emanations, remind one at times, by their independent status as creative forces, of the eight trigrams (*kua*) of the much earlier *I Ching* (Book of Changes). This parallelism has long been dimly realised, as by Waite (12), p. 68. The Kabbalah was another ancient system of mysticism 'Christianised' at the Renaissance, and it had a deep influence on some of the early figures in the scientific revolution. In particular its doctrine of the 'creative word' has been found relevant again in modern times by Rafter (1), who has brought it into relation both with the infinite possibilities of arrangements of atoms in the molecules of organic chemistry, and with the semantophore molecules of DNA base sequences in the genetic code.

^f See the collection of James (1), and the more recent and elaborate work of Hennecke & Schneemelcher (1), together with particular studies and translations such as that of Ménard (1).

^g Cf. Vol. 2, pp. 216 ff.

^h (8), p. xviii, e.g.

periods, because the same words could hardly always mean the same things. In fact, he drew his material largely from the +14th to the +18th centuries, from the texts of that great burgeoning of allegorical alchemy at the Renaissance when proto-chemical alchemy had come to an apparently dead check;^a yet it was not entirely so confined, for the Hellenistic aurifactors had been mystical enough, Zosimus more so, and Stephanus of Alexandria completely so.^b What first put Jung upon this trail constitutes a paradox of paradoxes, but that we shall see at the conclusion of this sub-section.

For those who are not learned in modern introspective psychology the conceptions which Jung applied to the explanation of alchemical allegory are difficult to grasp, but we must do our best.^c Processes of 'projection'^d took place in the psyche of the individual alchemist suggested to him by the peculiar behaviour of the chemical substances with which he carried on his operations, changes of colour and physical property, volatility, solidification, solution, precipitation, resistance to heat, and so on. He found, to his relief, that his own complexes (as we should say) were mirrored in them, and therefore acceptable as natural, no more demanding feelings of sin or guilt.

On psychological projection it is best to quote Jung's own words.

As we know from psycho-therapeutic experience, [he wrote^e] projection is an unconscious, automatic process, whereby a content that is unconscious to the subject (the person) transfers itself to an object, so that it seems to belong to that object. The projection ceases the moment it becomes conscious, that is to say, when it is seen as belonging to the subject.

Or, as his disciple Goldbrunner, put it:^f

Something external is held responsible while the real cause lies in the subject himself or herself. The effects of the complexes lying within the unconscious are projected outwards. What has to be done in such cases is to detach the projection from the object and make clear to the patient that the . . . imaginations and fears come only from the . . . forces in his or her own psyche.

Our task is not, said Jung,^g

to deny the archetype, but to dissolve the projection, in order to restore their contents to the individual who has involuntarily lost them by projecting them outside himself.

It is the mechanism of projection, as Goldbrunner says,^h which relates the picture-book of human traditions to the inner happenings of the psyche.

^a (1), p. 217.

^b Cf. Jung's account in (3), p. 206.

^c For a psychological commentary see Harding (1), pp. 377 ff., 414 ff.; Jacobi (1); Goldbrunner (1). There is also the book of Jung (12), an introduction to his own psychological philosophy.

^d It should be noted that this technical term in Jungian psychology has nothing whatever to do with the physical process of 'projection' descriptions of which are found in all alchemical and proto-chemical literature, namely the conversion of a mass of material into one of the precious metals by the throwing in of a very small quantity of a chemical substance (the philosopher's stone). This goes back at least as far in China as in the West, cf. Vol. 5, pt. 4, p. 7, and pts. 2 and 3, *passim*.

^e (13), pp. 59 ff.

^f (1), p. 33.

^g (13), p. 84.

^h (1), pp. 73 ff.

A process or content residing in the unconscious can confront us as a quality of objects, our fellow-men, or the environment. The influences of the unconscious seem foreign to the ego, they appear to come from outside, from the objects; they have been (in a word) projected.

Thus the powers of Nature were once personified as spirits or demons under whose despotic sway man was a helpless victim, gods of disease or of the passions of war or sex. That was the archaic identity of subject and object which has been called 'participation mystique' (Lévy-Bruhl). The magic rites and the myths of ancient and primitive peoples reflect this stage of 'psychological identity' with the outside world. But eventually there came a recognition and a resumption or 'introjection' of the psychic forces. As this withdrawal happened in human history, and whenever it happens in the life of the individual, the conscious ego takes in new contents, increases its domain, and can differentiate more and more between itself and the environment.^a The withdrawal can be intensely therapeutic, for frightening symbols, due for example to anxiety unacknowledged, are replaced by self-knowledge, relief and calm—yet new problems and efforts now face the conscious ego.^b

Alchemy was found by Jung to be a case in point, for in the ancient and medieval laboratories the adepts had certain psychological experiences which they attributed to the chemical processes, not realising that these had nothing to do with material elements and compounds as we know them today, but were projections from themselves. The alchemist, wrote Jung,^c 'experienced his projection as a property of matter, but what he was really experiencing was his own unconscious'. Again,^d

in order to explain the mystery of matter (the alchemist) projected yet another mystery—his own unconscious background—into what was to be elucidated . . . This was not of course intentional, it was involuntary. Projections are never made, they happen.

This process, at that stage, was also in its way therapeutic, so long as it was possible; because the images from the unconscious, with their affective tone for which the men of that time had no name, were transplanted into the contents of the alchemist's vessels, so externalised in fact that they could be seen as part of the natural world and therefore felt as not alarming. This was the 'scapegoat function' of natural objects,^e helpful in certain circumstances when applied to things, harmful always when applied to people. Moreover, 'during the practical work, certain events of a hallucinatory or visionary character were perceived, phenomena which cannot have been anything but projections of unconscious contents'.^f This one can easily imagine, for in the behaviour of substances undergoing physical and chemical change there are many happenings which nowadays we know how to neglect as subsidiary—solid or liquid surface-films, interference colours, clouds formed when immiscible liquids are brought together, or fortuitous shapes assumed by

^a Cf. Goldbrunner (1), p. 127.

^b Cf. Jacobi (1), p. 118.

^c (1), p. 234.

^d (1), p. 233.

^e Jacobi (1), p. 21.

^f Jung (1), p. 239.



Fig. 1539. Psychological projection in Western allegorical alchemy; the idea of parricide hypostatized into chemical reactions. From the *Margarita Pretiosa Novella* (+ 1546) of Petrus Bonus. Cf. Silberer (1), pp. 84-5; Jung (1), Eng. ed., p. 210.

vapours in evaporation or distillation, bubble masses that take strange forms, etc. Indeed the whole transition from alchemy to modern chemistry might be seen from the psychological point of view as fundamentally the withdrawal of a mass of projections. They had doubtless eased the spirits of the first chemical explorers from Zosimus and Ko Hung onwards, but if man was ever to see Nature clear and plain they had to be recognised in a higher therapy as a veil which he himself had created.

In the texts of spiritual alchemy there were also always admonitions that the adept should look within himself and follow the 'inner light', a light which would illumine, as we might say, the dark places in the subconscious mind normally hidden from introspection. Moreover there was the idea that 'meditation' (an internal dialogue with the unconscious self) and 'imagination' (the use of the Paracelsian *astrum*, or light that lighteth every man that cometh into the world) would actually set free forces which would enable the operator in the Great Work to impose alterations on matter.^a Above all the alchemist was engaged upon an 'individuation process', nothing less than his own liberation from the inner contradictions and conflicts which give rise to neuroses, obsessions and anxieties.^b In changing Nature, he was, more importantly, changing himself, and whether engaged in transmuting ignoble substances into the noblest of substances, gold, or whether following the voluminous writings of those who thought that they had done so, he was in fact walking along the path of an ennobling salvation of himself. Individual

^a Cf. p. 16 below on the ideas of Mary Atwood.

^b 'The alchemist projected what I would call the process of individuation into the phenomena of physical change', Jung (1), p. 462. Cf. the discussion of Jacobi (1), pp. 137 ff.



Fig. 1540. Psychological projection in Western allegorical alchemy; the idea of incest hypostatised into chemical reactions. Third woodcut of the *Rosarium Philosophorum*, + 1550 (Anon. 156). The scrolls name the two Sol and Luna, consenting to marriage, and over the dove is written: 'It is the Spirit which gives life'. Cf. Jung (16), pp. 450ff.

mental health, in psychological terms, was what he was really after,^a the integration of the personality, with freedom from fear, depression, oppression, and 'all evil thoughts which may assault and hurt the soul'.^b

The attainment of this, for Jung, was not dependent only on the overcoming of sexual or other traumata received in early youth or infancy, but also on the harmonising of the 'archetypes' of the collective unconscious. Archetypes might be said to be the idea-patterns that all people spontaneously have, occurring in variant forms in all civilisations and often repressed into the unconscious—for example, incest, castration, suicide, the virgin-mother, the father eating the son, parricide, impotence, the dragon or wild worm, the unicorn, death and resurrection, female and male, darkness and light, the Yin and the Yang (Figs. 1539, 1540). 'So long', wrote Jung, 'as the alchemist was working in his laboratory, he was in a favourable position, psychologically speaking, for he had no opportunity to identify himself with the archetypes as they appeared; they were all projected immediately into the chemical substances'.^c The disadvantage was that the ultimate incorruptible was a

^a Though not of course consciously.

^b *BCP*, Collect for Lent 2.

^c (1), p. 37.

chemical product and they could never get it, so the alchemical quest could never completely succeed,^a though both modern chemistry and modern psychology are in a real sense the inheritors of it.^b

Jung found in alchemy a veritable treasure-house of symbols the knowledge of which was extremely helpful for the understanding of neurotic and psychotic processes.^c Much of his work lay in analysing the dreams of his patients, and rightly or wrongly he was constantly reminded of alchemical symbolical terminology, probably because both were so often concerned with the problem of 'irreconcilable' opposites, naturally in archetypal form.^d

As the alchemists, with but few exceptions, did not know that they were bringing psychic structures to light, but thought they were explaining the transformations of matter, there were no psychological considerations to prevent them, for reasons of sensitiveness, from laying bare the background of the psyche, which a more conscious person would have been nervous of doing. It is because of this that alchemy is of such absorbing interest to the psychologist.^e

Archetypal images of the unconscious, related to motifs of folklore and mythology, arise in dreams, displace each other, overlap, interconnect and fuse in a bewildering manner, but the imagery of the alchemical writers shows hardly less waywardness.

This is what makes it so difficult for us to understand alchemy. Here the dominant factor is not logic but the play of archetypal motifs, and although this is 'illogical' in the formal sense, it nevertheless obeys natural laws which we are far from having explained. In this respect the Chinese are much in advance of us, as a thorough study of the *I Ching* (Book of Changes) will show. Called by short-sighted Westerners a 'collection of ancient magic spells' (an opinion echoed by modernised Chinese themselves), the *I Ching* is a formidable psychological system that endeavours to organise the play of archetypes, the 'wondrous operations of Nature' into a certain pattern, so that a 'reading' becomes possible.^f

We have already given our opinions on the *I Ching* at an earlier stage,^g and must not return to it here, but Jung's evaluation of that concept-repository is of much interest. In all this he probably did not wish to imply that the late European allegorical-mystical alchemists never engaged in any laboratory operations at all. The point is that while the proto-scientific character of such experiments is quite clear in the Hellenistic aurifactors and the Jābirian and Geberian alchemists, the later alchemist went on doing practical operations not so much with any aim of understanding the natural world in the scientific sense, as rather for the purpose of purifying, integrating and perfecting himself by the contemplation of the mechanisms of change in God's creation; in other words he saw for himself what kind of things happened in chemical transformations, and projected upon these the archetypes which welled up from his own unconscious—thus becoming an individuated, fully adjusted or balanced *totus homo*. The analogy with the *chen jen*^h or

^a (3), pp. 90, 91. Cf. pp. 223ff., 298ff.

^b One could say of the Hellenistic aurifactive writings that chemistry has inherited the *Physica* and psychology the *Mystica* (cf. p. 11). Jung (1), p. 218.

^c (8), p. xvii.

^e (8), pp. xviii, xix.

^f (8), pp. 293, 294.

^d (1), pp. 41ff., (2), p. xvii.

^g Vol. 2, pp. 322ff., 335ff.

^h 眞人

'realised man' of Taoism springs to the mind, but what follows will indicate the grave danger of all such identifications.^a

Since European allegorical-mystical alchemy developed within the bosom of Christendom it is natural to ask what relation it had with the ideas of that organised religion. Now alchemy was always recognised as the art of taking to pieces and putting together again. *Solve et coagula* was one of its great watchwords. Separation and analysis (the realm of Ares) was followed by synthesis and consolidation (the realm of Aphrodite).^b This is the origin of the seventeenth-century Latin word 'spagyric' for alchemical, for *σπάω, σπαράττειν, spao, sparattein*, means to rend, tear, separate or stretch out, while *ἀγείρειν, ageirein*, is to bring, unite or collect together.^c Conflict was thus subsumed in unity, melanosis followed by xanthosis, with the attainment of all the longed-for ends—permanence, incorruptibility, androgyny, spirituality yet corporeality, divinity, the beatific vision, and (last but not least) the Chinese-Arabic components of longevity and immortality. Hence the immense significance of the 'union of contraries' in alchemy, the *coincidentia oppositorum*, of which so much more will have to be said. And since 'uniting symbols' tend always to have a numinous character one is in no way surprised to find Christ continually identified with the philosophers' stone, whether in the context of the eucharistic liturgy or not.^d True, the latter was celebrated by those in need of redemption who gained the fruit of grace by the work done on their behalf (*ex opere operato*), while the alchemist laboured for the redeeming of the divine soul of the world slumbering in matter and yearning for redemption, gaining an elixir of life by his own activity (*ex opere operantis*).^e Many similar contrasts have been formulated by Jung and his expounders; 'the alchemists ran counter to the Church in preferring to seek through knowledge rather than to find through faith'.^f Alchemical allegory restored the bridge to Nature which the Church had cut when it alienated consciousness from its natural roots in the unconscious, for alchemy allowed the recognition of archetypes that could not be fitted into Christian theology.^g Alchemy was to Christianity as the undercurrent to the surface, or as the dream to the consciousness, compensating the conflicts of the waking mind.^h Besides, there was the great contrast that the Church was a collective while the adept's quest was solitary and individual; he would find out his own salvation. All the same, the imagery of alchemy did not fail to inspire some of the best religious poetry of the seventeenth century. The Anglican parish priest, George Herbert, wrote:ⁱ

^a There is no agreed or satisfactory translation for the important and widely used term *chen jen*, and we tend to say 'adept' instead of 'real man', 'true man' or 'perfected man', all of which have been used by others. The basic sense of it is given in ch. 1 of the *Huang Ti Nei Ching, Su Wen* as 'he who has understood the interaction of the Yin and the Yang in the workings of the universe, harmonising and nourishing the *ching* and *chi* of his body, and guarding his *shen* . . .' In other words, *chen* here is used in the sense of *hsiu chen*, 'restoring the primary vitalities' (cf. p. 46), and hence attaining longevity. Moreover, as mentioned above (pt. 2, p. 109), the term was originally applied chiefly to immortals of high grade, and only gradually came to signify an adept still in this mundane world. All this will be better understandable as the reader proceeds.

^b Jung (8), p. xiv.

^c *Loc. cit.* See also von Lippmann (12).

^d Cf. Jung (1), p. 343.

^e (1), p. 457.

^f (1), p. 35 *et seq.*

^g (1), p. 34.

^h (1), p. 23.

ⁱ Verses 4 and 6 of 'The Elixir', no. 156 in 'The Temple' (EH, 485). The Gibson edition contains also the 'Life of Mr G. H. [+ 1593 to + 1632]' by Izaak Walton.

All may of thee partake;
 Nothing can be so mean,
 Which with his Tincture (for thy sake)
 Will not grow bright and clean.

This is the famous Stone
 That turneth all to Gold;
 For that which God doth touch and own
 Cannot for less be told.

What then were the dominating themes or motifs in Western allegorical-mystical alchemy? One can distinguish two in chief, both arising quite naturally from meditation on the behaviour of chemical substances undergoing change. There was the theme of death and resurrection to eternal life, with its associated motifs of a descent into hell, and the liberation or redemption of the spirit imprisoned within base matter. And there was the sexual theme of the conjunction of opposites,^a the union which brings forth a higher product or state of equilibrium, so tending upwards step by step towards an absolute perfection.^b Associated with this was the employment of hermaphrodite beings as symbols,^c and the depiction of the unity of all things in cosmic diagrams analogised by Jung with the maṇḍalas of Indo-Tibetan religious art.^d It is easy to see how both themes arose naturally in the first place from the observation of laboratory phenomena, for the alchemist (from Alexandrian times onwards) often had to destroy the pleasing properties of one substance or metal in order to gain the still more pleasing properties of the other which he was preparing, while in every chemical reaction the properties of the two reacting substances disappear as those of the product or products take their place.

First, as to death and resurrection, it will be remembered that the Alexandrian aurifactors or proto-chemists conceived of chemical and metallurgical change as the withdrawal of certain 'forms' (in the Aristotelian sense) from 'matter as such', followed by the imposition of certain others.^e Since all matter as such was thought to be identical and homogeneous, one could, as it were, hope to be able to replace one coat of paint on a lump of it by a paint of an entirely different colour. Hence they (and many alchemists in subsequent centuries after them) thought in terms of a 'deprivation of forms' (*solutio, separatio, divisio, putrefactio*) of the *materia prima* (ὕλη, *hulē*), followed by a progressive 'addition of the forms' (*ablutio, baptisma*).^f The lowest stage, when matter as such, or something like it, was reached (*mortificatio, calcinatio*) was a blackening (Fig. 1541), the famous *μελάνωσις, melanōsis* (*nigredo*), but after this the ascent towards the golden, the purple, or the perfect

^a Cf. our discussion in Vol. 5, pt. 4, pp. 363 ff.

^b This was what Waite (5), p. xxix, called the 'alchemical doctrine of evolution', the 'processes of the development of inherent energies'.

^c Cf. Pagels (1).

^d The maṇḍala of Hindu and Buddhist tradition is a discoidal cosmic diagram or image of the universe, but also a theophany in so far as it could be the habitation, temporary or permanent, of the gods or Bodhisattvas themselves. It played an important part in Tantric initiation and other liturgies, and is particularly prominent in Tibetan Mahāyāna. See Eliade (6), pp. 223 ff., 392, and the monograph of Tucci (5).

^e Cf. Leicester (1), pp. 27, 41, 110.

^f Jung (1), p. 304.



Fig. 1541. Psychological projection in Western allegorical alchemy; calcination imaged as the breaking-up of the dried dead bones of the royal hermaphrodite. From *Margarita Pretiosa Novella* (+ 1546). Cf. Jung (1), pp. 506 ff.

state was begun, passing through that series of colour changes which the Alexandrians had first laid down.^a First came the whitening, *λευκωσις*, *leucōsis* (*albedo*), then the yellowing, *ξανθωσις*, *xanthōsis* (*citrinitas*) at which gold or a gold-like colour or substance was produced, and finally a rather mysterious final stage of purpling, *ῥωσις*, *iōsis* (*rubedo*).^b It lay near at hand to analogise this succession of stages with the renewal of the life of the soul just as the chemical substances passed through the 'torments of death and hell' of the reaction-vessel.^c

This thought was not at all foreign to the Alexandrians, as the visions of Zosimus and Stephanus bear witness,^d but in later Christian alchemical allegory the analogy of the lapis-Christus, the powerful reagent symbolising Him who had gone on before, conquering death and harrowing hell, fitted naturally into place.^e It was left for Jung to point out that these conceptions paralleled, adumbrated, or in fact represented, the descent into the snake-pit of the unconscious.^f The abysses, the 'depths of the sea', contain not only evil but also a great King who awaits redemption, and will at the end of the Work emerge in all glory and accomplished peace.^g

Allied with such symbolism was the idea of the liberation of the spirit slumbering or prisoned within matter.^h This was connected both with the archetype of the

^a Cf. pt. 2, p. 23 above, and Jung (1), pp. 218 ff. Cf. Leicester (1), p. 42; Sherwood Taylor (2), p. 135, (3), p. 49; Holmyard (1), p. 25 following Berthelot (1) pp. 242, 277, (2) pp. 263, 264. *Corpus Alchem. Gr.* IV, xx, 5; III, xxxviii, xl, in Berthelot & Ruelle (1), vol. 3, pp. 279 ff., 202, 204 respectively.

^b There is always doubt whether this meant 'purpling' or 'de-rusting' so as to gain a brilliant polished surface.

^c As we know (pt. 4, p. 76) the term 'Hades' was regularly used by the Hellenistic proto-chemists for the liquid at the bottom of the *kērotakis* reflux condenser vessel; see *Corpus Alchem. Gr.* IV, xx, 7 ff. (the book of Comarius and Cleopatra), text in Berthelot & Ruelle (1), vol. 2, pp. 292 ff. Fr. tr. vol. 3, pp. 281 ff.; Eng. tr. Sherwood Taylor (3), pp. 58 ff, cf. p. 47. Cf. also his descriptions in (2), p. 133, (7), p. 41.

^d Cf. Sherwood Taylor (8) and (9).

^e Jung (1), pp. 332 ff.

^f (1), p. 322.

^g (1), p. 313. Cf. Sheppard (5).

^h This was partly a Manichaean idea, based on Gnosticism; see the book of Wolf (1), and all the recent literature.

'lowly origin of the redeemer'^a and with the theology of the eucharistic liturgy in the West,^b especially the Latin doctrine of transubstantiation, which had an obvious connection with the medieval natural philosophy of forms and primary matter.^c The *salvator microcosmi* of the Church was paralleled by a *salvator macrocosmi* of the alchemists. There are many references to the presence of spirit in the 'vilest matter', *in stercore* indeed,^d and sulphur, with its evil-smelling compounds, was often taken as a Christ-symbol—paralleling, says Jung, the 'dirty unconscious', a realm which yet the spirit also pervades, as can be understood if sufficiently meditated upon and unravelled.^e All this was in a way a defence of the sooty character of the spagyric art, yet not devoid of deep philosophical truth. And one may note too how extremely European it was, since China made no such stark antithesis between spirit and matter, the lotus and the mud.^f

At various stages of the colour sequence (often called collectively or separately *cauda-pavonis*, the 'peacock's tail'), but especially before the depth or nadir of the *melanōsis*, the alchemist brought about, in actual practice or allegorically, a fusion of opposites in which male and female reactants gave rise to something new (*conjunctio, conjugio, matrimonium, coitus*). The importance of what the Chinese would have thought of as Yin and Yang throughout Western alchemy, and all that that involves, can hardly be over-estimated.^g In spite of the Manichaean element in Christianity, so inimical to sex, the sexual symbolism of alchemy was highly prominent,^h and the *ιερός γάμος* (*hieros gamos*), or consecrated union, often depicted extremely frankly (Fig. 1542). Essences in conflict were transcended in the *mysterium conjunctionis*,ⁱ opposites personified (*rex* and *regina*, Adam and Eve, fire and water, lead and mercury, above and below)^j were united in the 'chymical marriage'.^k All this was perfectly natural, not only because of the facts of chemical

^a (1), p. 28; (8), pp. 360, 366 ff.; 'the dominant subjected to transformation'.

^b So much so that more than one devout alchemist drafted a Hermetic Mass, with proper collect, epistle and gospel, special antiphons, introit, gradual and the like. Nicholas Melchior of Hermannstadt (d. + 1531) did this (Jung (1), pp. 380 ff.), as also Benedict Töpfer or Benedictus Figulus c. + 1608 (Waite (2), pp. 260, (9), p. 81; cf. Ferguson (1), vol. 1, p. 275); and there is a Requiem Mass for alchemists in one of the collections like the *Musaeum Hermeticum Reformatum et Amplificatum* of + 1678, translated by Waite (8).

^c (1), pp. 222, 283 ff., 293 ff., 295.

^d Jung (1), p. 300 (8), p. 554; and note the close parallel with *Chuang Tzu*, ch. 22, tr. Legge (5), vol. 2, p. 66, quoted in Vol. 2, p. 47.

^e (8), p. 122.

^f With his usual perspicacity Jung remarked (8), p. 536, that 'the alchemist's labours elevated the body into proximity with the spirit while at the same time drawing the spirit down into matter. By sublimating matter he concretised spirit'. Hence the synthesis gave a third thing, 'our Stone which is no stone' (*λίθος οὐ λίθος, lithos ou lithos*). In other words, the alchemists were searching for something characteristically Chinese, for in China the concept of *chhi* covered everything from the crassest matter to the most tenuous spirit. No desperate effort was required to join them.

^g Jung (1), pp. 21 ff. 31. Good and evil, he says, tended to be absolute in Christian thinking; alchemy relativised them (just as Chinese thought would have wanted to).

^h In Jung (1) see figs. 72, 78, 118, 159, 167, 218, 225, 226, 237, 268(2), fig. 7. In Jung (8) see pp. 3 ff. at length, and 6 ff.

ⁱ Jung (1), p. 103.

^j (8), pp. 258 ff., 382 ff., 457 ff.

^k (8), pp. 39 ff. One recalls that the 'Chymical Wedding, of Christian Rosencreutz' was published at Strasbourg in + 1616, at the beginning of the Rosicrucian furore in that century, and became the model for the second part of Goethe's 'Faust'. The context of it is well described in Yates (3). A new edition of the English translation by Ezechiel Foxcroft of King's, is projected by Mr S. I. Abrams.



Fig. 1542. Psychological projection in Western allegorical alchemy; sexual union as symbol of chemical reaction. Fifth woodcut of the *Rosarium Philosophorum* (+ 1550). Cf. Jung (1), p. 448.

observation, but because the alchemists, always more or less mystical, were seeking a sort of dialectical synthesis, the 'individuation' of ever new and more perfect equilibria, in fact 'a unity purified of all opposition and therefore incorruptible'.^a Moreover the sexual relationship resided not only in the objects of alchemical manipulation but also in the subjects themselves, the operators, who were often taught that the Work would not succeed unless the alchemist had a *soror mystica* to collaborate with him.^b Presently we shall see how extremely Chinese this was, though in an utterly different context. The effects were doubtless similar, for in Europe, in so far as the alchemical work was a pattern of the purification or individuation of the soul, the value of the progressive reconciliation of contradictions is psychologically manifest. The chemical reactions and the psychic adjustments were typified by hermaphrodite beings,^c and the final syntheses were symbolised by the mandala charts and pictures of Boehme and many others.^d

In order to be clear about the contribution of Jung to the history of alchemy and early chemistry in the West before proceeding to the Chinese parallels which we have to explore, it is necessary to look both at the criticism of him and at his antecedents. There can be no doubt that Jung himself under-estimated the extent to

^a (1), pp. 34, 37.

^b In Jung (1) see figs. 2, 124, 133, 143, 462. On this subject Waite (2), pp. 398ff. has an interesting excursus.

^c In Jung (1) see, e.g. fig. 125, but the symbolism is frequent.

^d Including Jung's own patients, (1), pp. 91 ff.; though it has to be admitted (from the orientalist point of view) that he was liable to describe almost any sort of symbolical picture or painting as a mandala.

which alchemy embodied primitive chemistry and later gave birth to the techniques of Renaissance and modern chemistry.^a In his *Elementa Chymiae* of +1732 the great Hermann Boerhaave wrote as follows:^b

To speak my mind freely, I have not met any writers on natural philosophy who treat of the nature of bodies, and the manner of changing them, so profoundly, or explain'd them so clearly, as those called alchemists. To be convinced of this, read carefully...Raymond Lully... you will find him with the utmost clearness and simplicity, relating experiments, which explain the nature and action of animals, vegetables and fossils... We are exceedingly obliged to them for the immense pains they have been at, in discovering and handing to us many difficult physical truths.

And in +1750 Albrecht von Haller, in his *Vorrede* to the German translation of Buffon's works, speaking of the value of hypotheses in science, even if wrong, remarked:

The alchemists conceived for themselves mirages, golden mountains, and metamorphoses passing those of Ovid, yet labouring to approach these visions they found on the way many valuable truths, knowledge indeed even more useful to man than the secret of turning lead into gold would have been; for that would have made us all poor in a very short time, though surrounded by heaps of the precious metal, and in order to carry on our economy we should have been obliged to replace it with diamond or any other thing, so long as it was scarce and durable enough.

While soon after +1600 John Donne employed the same idea in a charming if rather rueful analogy:^c

And as no chymique yet th'Elixir got
 But glorifies his pregnant pot
 If by the way to him befall
 Some odoriferous thing, or medicinal;
 So, lovers dream a rich and long delight
 But get a winter-seeming summers night.

The first of these passages was quoted by Pagel (11) in a critique which still best represents the views of historians of science on the work of Jung. Pagel agreed that Jung had placed alchemy in a quite new perspective relative to the history of chemistry, medicine, theology and general culture, and that he had given an illuminating psycho-analytical explanation of the elaborate traditional symbolism of the alchemists, previously very puzzling; but this was the *Nachtseite* of alchemy, not the whole. Alchemy contained a great deal more than psychology and symbolism, for there was real practical proto-chemistry and laboratory technique all the way from the Alexandrians onwards; nor could its philosophical foundations in Plato, Aristotle and Plotinus be overlooked. What Jung revealed, said Pagel, constitutes a monumental reminder of the part played by non-scientific motives in the history of

^a We have already quoted, in pt. 2, p. 32, the classical statement of Francis Bacon on this subject.

^b Eng. tr. by P. Shaw (+1753), vol. 1, pp. 200ff. Biography by Lindeboom (1).

^c 'Love's Alchymie', Nonesuch ed., p. 28.

science, and a salutary warning against the tendency to build 'stepladders of continuously progressive and "correct" results extricated and juxtaposed today regardless of the philosophical, psychological and historical background from which they sprang.' Nor did Jung's ideas themselves spring from nowhere. Their origins are worth a glance.

In the forties and fifties of the last century a certain regular officer of the American army might have been met with at frontier posts from Maryland to California and Oregon, taking command of garrisons, crossing the deserts of the South-west, or defending the interests of the Indians against rapacious traders.^a He was evidently a very strange man, for wherever he went he took with him trunkloads of old books, Spinoza and Basil Valentine, Plato, Paracelsus and Jacob Boehme. This was none other than Major-General Ethan Allen Hitchcock, who produced in 1855 and 1857 two memorable books on alchemy and the alchemists.^b He propounded the idea that the real subject of alchemy had been the improvement of man himself; Man had been the true *vas philosophorum*, and 'our mercury' his conscience. Hitchcock took the symbolism to conceal distinctively moral and ethical teachings, and believed that the medieval alchemists had resorted to concealment because they feared persecution for heretical ideas. 'The works of the alchemists', he wrote, 'may be regarded as treatises upon religious education . . . and under the words gold, silver, lead, salt, sulphur, antimony, arsenic, orpiment, sol, luna, wine, acid, alkali, and a thousand other words and expressions, infinitely varied, may be found the opinions of the several writers upon the great questions of God, Nature and man, all brought into or developed from one central point, which is Man, as the image of God'.^c *Aurum nostrum non est aurum vulgi*, 'our gold is not ordinary gold'.

Jung never mentions Hitchcock, but the latter's work was well known to Silberer (1), whose book on the symbols of mysticism, published at Vienna in 1914, was one of the seminal influences on Jung.^d From Hitchcock's diaries we know that the original stimulus for him was the strange book of Gabriel Rossetti (1), written in 1834, which held the *Inferno* of Dante to have been an anti-Catholic or at least anti-Roman allegory written in secret figurative language in the interest of some persisting underground Manichaeic sect or doctrine. Hermetic and Gnostic elements in Dante need not be denied, but Rossetti's conception of a secret sect has not been substantiated. Nevertheless, it was only one aspect of a general movement of 'euhemeristic' interpretation in the first half of the nineteenth century. Aroux (1), for example, pursued a connection between Dante and the Albigensians, Templars and Freemasons, seeking also (2) to show a Manichaeic allegorical symbolism in the Platonic 'courts of Love' and the Grail Corpus.^e Hitchcock in his

^a See the biography of Hitchcock by Croffut (1), based on lifelong diaries.

^b These and the rest of his work are considered in the illuminating monograph of Bernard Cohen (1).

^c (1), p. v.

^d It was also discussed by Craven (1) in 1910, who took the same judicious position as Waite (*cf.* p. 17) against the exaggerations of Hitchcock. Practical alchemy had always played a large part, yet Hitchcock was right that there had been an 'esoteric teaching' too. In later work (3) he studied the ideas of Emanuel Swedenborg, and sought to enrol his religious mysticism in the company of the hermetic philosophers.

^e To this last, Waite (3) devoted an interesting but long-winded and mystagogical book.

way was part of this, though we know that he was also influenced by many older writings, notably the +17th-century mystical and alchemical works of Thomas Vaughan (Eugenius Philalethes) and George Starkey (Eirenaeus Philaletha),^a and certainly Jacob Boehme.^b Very little notice was taken of Hitchcock until the following century, and he is not exactly well known even now, but in 1868 a scientific journalist in France, Landur (1), propounded similar ideas, though without mention of him. Reviewing a communication on alchemy to the Académie des Sciences by Chevreul, Landur wrote:

As for the doctrines of the old alchemists, I think I ought not to let pass what M. Chevreul says without making a fundamental observation, even though it is not the custom of the journal *l'Institut* to intervene with personal opinions in scientific discussions. I have studied the alchemists from a point of view quite different from that of M. Chevreul, and I soon arrived at the conviction that they were not chemists, but rather philosophers having a secret doctrine for which chemistry served only as a veil, just as expressions taken from the building trade served as a veil for freemasonry. When they speak of making gold, of solidifying mercury, etc., they are alluding to works of a purely moral character; and the materials on which they work, the 'metals of the philosophers', are not (as they constantly say) ordinary metals, but 'living metals', that is to say, men. Many of the most celebrated alchemists such as the Cosmopolite [Eirenaeus Philaletha], and [Eugenius] Philalethes, etc., were only chemists in order to mislead the vulgar, and made no chemical discoveries whatever; others, such as Basil Valentine (the most cabalistic of all) were in fact at the same time true chemists. Just like the cabalists from whom they derived, the true alchemists gave multiple meanings to their words; the text, often insignificant, sometimes inept, has also sometimes a chemical meaning, but the real sense is the hidden one.

So far we have been dealing with historical scholars,^c but there was also a strain leading to Jung which passed through certain writers who believed that some form of the classical alchemical transmutation of metals was, or had been, possible. In 1850 a young woman, Mary Anne Atwood, published a very peculiar book entitled 'A Suggestive Enquiry into the Hermetic Mystery . . .', one of the curiosities of literature, learned enough but exceedingly obscure and confusing. She readily admitted the practical experimentation of the early alchemists,^d and affirmed that gold could have been made by their methods,^e but nevertheless maintained that the greatest treasures in their writings were those of religious mysticism. 'This', she wrote, 'is the Grand Hermetic secret, that there is a Universal Subject in nature, and that Subject is susceptible of nourishment in Man; and this is the greatest Mystery—of all mysteries the most wonderful, that man should be able not only to find the Divine Nature but to effect it.'^f When one can disentangle her meaning from the speculations about 'Mesmerism' (then a novel discovery)^g and her pre-occupation with the elucidation of the Eleusinian Mysteries, it seems that Mary

^a Cohen (1), pp. 74, 108.

^b Ibid. p. 99. See p. 18 below.

^c The story has also been briefly told by Martin (1).

^d (1), pp. 62, 136.

^e So far as can be made out through the clouds of her style of writing, she supposed that they had exercised some kind of mental control or manipulation of chemical substances, a supra-normal influence suggested by the phenomena of hypnotism. See Waite (2), pp. 17ff., 30, 395ff., 397, perhaps the most thorough attempt to analyse her ideas.

^f (1), p. 516.

^g (1), p. 175 for example.

Atwood interpreted alchemical allegory in a more religious sense than Hitchcock and yet not of course psychologically like Jung.

There followed the work of A. E. Waite, also a curious character but one who worked at a higher scientific level. Waite, the translator of Paracelsus (6), was a substantial scholar, but liable to be discounted because of his self-confessed belief in theosophy, magic, theurgy and 'the occult'; if he has been less read than he deserved, the fault must partly be attributed to his copious, not to say wordy, style, which often appears designedly vague and mystifying. He is particularly interesting today because his criticism of Atwood and Hitchcock was essentially the same as that of Jung by Pagel, namely that they were carried away by their belief in allegorical alchemy and failed to do justice to their practical laboratory aspect of the search for the Stone and the Elixir, the 'Medicine both of metals and of man'. In 1888 he published a book of biographies of famous alchemists (1), now indeed totally outdated as history, but containing criticisms of Atwood and Hitchcock still valuable today. Here he upheld the work of the hands.

My object, [he wrote], in publishing this book is to establish the true nature of the Hermetic experiment by an account of those men who have undertaken it, and who are shown by the plain facts of their histories to have been in search of the transmutation of metals. There is no need for argument; the facts speak sufficiently. It is not to the blind followers of the alchemists that we owe the foundation of chemistry; it is to the adepts themselves, to the illustrious Geber, to that grand master Basilius Valentinus, to Raymond Lully, the supreme hierophant. What they discovered will be found in the following pages.^a

Nevertheless Waite in no way rejected the view that allegorical-mystical alchemy had at certain periods and in certain authors been paramount. In 1926, two years before Jung began his collaboration with Wilhelm,^b ten years before Jung's first publication on these subjects,^c and twenty-two years before Pagel's parallel criticism, he set out to try to discover 'whether we can trace from the beginning the presence of any spiritual intent in the (alchemical) literature at large'. This was his 'Secret Tradition in Alchemy' (2). After a very full review of Atwood and Hitchcock, in which he drew attention to the latter's wilful neglect of worthy historians of chemistry of the period such as Figuier (1), he passed in review the Alexandrians (by then well known through the work of Berthelot, 1, 2), the Arabs (still then very imperfectly understood), the early Latin technicians, the Latin Geber and his descendants, and many other alchemists of the + 16th century and later.^d In all these cases he concluded in favour of a practical chemical rather than an allegorical-mystical meaning. Among the Greek texts there are none 'which are to be understood solely in a spiritual and high mystical sense, and their symbolical language of physical alchemy was never transferred to veil a science of the soul'.^e

^a (1), p. 26.

^b Wilhelm & Jung (1), on which see p. 243 below.

^c Jung (9), associated with Bernoulh (1).

^d He also (2), pp. 55 ff. attempted to deal with the Chinese alchemical tradition, but as he had to depend on hardly anything more than the pioneer article of Martin (8) dating from 1868, and reprinted in 1879 and 1880, the results could not be very illuminating.

^e (2), pp. 85, 86. Here he was undoubtedly wrong, for the Hellenistic Corpus is impregnated through and through with Orphic, Gnostic, Hermetic, and perhaps even Manichaean, mystical and religious influences (cf. Festugière (1); and Sheppard's (1, 2, 4, 5) well-documented papers).

'Syriac and Arab alchemy was not a science of the soul in veils.'^a 'The early Latin literature is that of pure physicists, expounding the principles and practice of a purely physical work.'^b

Yet a turning-point there was, and Waite found it at the period of the Reformation, towards the end of the + 16th century. He took + 1608 as the threshold,^c the date of the death of John Dee,^d for it was just about this time that the man whom Waite regarded as the first of the truly mystical alchemists, Heinrich Khunrath (+ 1560 to + 1605) published his *Amphitheatrum Sapientiae Aeternae* (+ 1602 and many later editions). From this, he said, 'it emerges with complete certainty that Khunrath is concerned solely with an *itinerarium mentis in Deum*, and that because he was an alchemist he used things seen, imagined or reported in the process of the Stone to illustrate—as he understood them—the states and stages of the soul's ascent'.^e Thus alchemy had two aspects from the days of Khunrath onwards.^f Then in the next generation came Jacob Boehme (+ 1575 to + 1624)^g and Robert Fludd (+ 1574 to + 1637), a great contrast, the one a visionary German shoemaker, the other a polymathic Kentish gentleman.^h Fludd's chief work of this kind, the *Tractatus Theologo-Philosophicus*, was published in + 1617, while Boehme's 'Epistles' were in English by + 1649. The new direction was well recognised. For example the author of an anonymous 'Beytrag zur Geschichte der höhern Chemie' in + 1785 remarks that

it cannot have been with Mr Böhm's will that he has been transformed into a gold spyer. He was a dreamer and a spirit seer, but a gold maker—certainly not. His dark writings, like those of the cabalists and theosophists, turned the heads of the alchemists so that they dreamed their system into it.ⁱ

This general finding links up closely with the quotation from Martin Luther with which the present sub-section opened. Mystical and individualist religion was so obviously and profoundly a part of the Reformation that its massive penetration into the alchemical literature at this time should have no need to cause us any surprise; and there may well have been subsidiary factors also, such as the yearning for a liturgical beauty which the reformers had regrettably felt it their duty to cast away, now to express itself perhaps not only in the luxuriance of alchemical illustration but later in the actual rites and ceremonies of Rosicrucians and

^a Ibid., p. 102.

^b Ibid., p. 119.

^c Ibid., p. 236.

^d B. + 1527; see the biography by French (1) and in Holmyard (1), pp. 200ff. Dee was one of the foundation Fellows of Trinity College, Cambridge, and famous as a magician, albeit magic natural, like that of da Porta. The story of his collaboration with Edward Kelly has elements of interest for the role of sexual imagery and practice in Western alchemy. But he was also a genuine mathematician and astronomer, a man of many parts, almost the type of the Renaissance magus, on which see Yates (2).

^e Waite (2), p. 257. See also the long account in (9), pp. 61ff. Cf. the formulation in (5), p. xxix, referred to on p. 10 above.

^f Ibid. p. 287.

^g Boehme, the Teutonicus Philosophus, was not, says Ferguson (1), vol. 1, p. 111, an alchemist, but he employed alchemical phraseology and imagery to illustrate his religious views. There is a special monograph by von Harless (1) on Boehme's relations with the alchemists.

^h cf. Waite (2), pp. 5ff., 10ff.; Partington (7), vol. 2, pp. 324ff.

ⁱ Anon. (84), pp. 522, 642, 670.

Freemasons.^a Nevertheless we know today that the 'spiritual' tradition cannot be taken as beginning only with Heinrich Khunrath. Jung himself, in his well-documented work, based on the study of a wide range of Western alchemical manuscripts and treatises, discovered that the identification of the Philosopher's Stone with Christ is much older than Khunrath and Boehme. The mystical strain undoubtedly begins with the gnostic redemption visions of Zosimus (+ 3rd century) and continues with the Christian ones of Stephanus (+ 7th).^b The identification is present already in the treatise of Petrus Bonus of Ferrara, the *Margarita Pretiosa Novella*,^c written about + 1330, and the *Aurora Consurgens* from the first half of the + 14th century.^d

Thus Western alchemy may be said to have had two aspects from the time of the Alexandrian proto-chemists onwards, though its allegorical manifestation grew enormously and generated a popular literature in and after the Renaissance and the Reformation.^e Radically different though the two kinds of alchemy in Chinese culture were, as we shall duly see, it is rather striking that just in the same way, both strands were present almost from the beginning, and that the non-laboratory aspect also burgeoned and flourished at later rather than earlier dates.

It remains only to add that Waite was not so scientifically orthodox as to deny all credence to the possible success of medieval metallurgical transmutations. By his time nuclear physics was coming to birth, and he could appeal, though only rhetorically, to the transformation of chemical elements into one another. 'If cumulative evidence can be held to count for anything in such a subject, one would feel disposed to think that metallic transformations have taken place in the past . . .', he concluded,^f adding that 'all alchemy testifies to the fact that the so-called Philosopher's Stone was a physical object composed of certain material substances by those who had claims to adeptship, and certified as such by persons who had seen and handled it.'^g Thus in a way Waite stood rightly with Pagel against the Jungian over-emphasis, though prepared to believe what no contemporary scientist or scholar would admit. But here we must leave the curious story of allegorical and psychological alchemy in the West, and turn to examine what corresponded to it in Chinese culture. What in fact was the 'inner elixir'?

This the rest of the present volume will attempt to explain, but meanwhile it is fair to say that the tradition of 'inner alchemy' still interests philosophers of science.

^a Here see Waite's books (9, 10) and those of Arnold (1) and B. E. Jones (1). How far there really was a Rosicrucian secret society before the eighteenth century remains problematical; it may have been started by the followers of Giordano Bruno at Wittenberg—at any rate those who did not disdain the label were, like the polymathic Robert Fludd, Protestant and Paracelsian, Hermetic and iatro-chemical, mystical and numerological. See the discussion in Yates (1), pp. 312ff., 407ff., 446ff. There was also an Arabic flavour about the early Rosicrucian pronouncements which has not yet been explained; cf. Waite (9), p. 127.

^b Cf. Sherwood Taylor (8) and (9) respectively.

^c Cf. Leicester (1), p. 86, and the translation of Waite (7); with Crisciani (1, 2).

^d Anon. (85), in Anon. (86) and Morgenstern (1); but especially the version in Codex Paris Lat. 14,006 and Rhenanus (1).

^e Particularly during the century and a half between Libavius and Priestley, when the classical hopes of alchemy were being abandoned and modern chemistry had not yet come to birth, (+ 1600 to + 1750).

^f (2), p. 318; cf. (1), pp. 33ff., 36. They 'thought they succeeded, though the secret in now lost'.

^g (2), p. 332.

For example, it has inspired Goodwin (1) in a striking essay on the problem of providing modern science with an ethic of contemporary validity. Knowledge should be developed within a context of universal cosmic meaning, not simply for the purpose of domination and power over Nature. Knowledge and power have been too much separated from meaning and morality. But now the idea of man as the perfect observer, and hence the all-powerful controller, has broken down, because observation is known to imply perturbation, necessary paradigms are liable to be fundamentally incompatible, and science without ethics will clearly lead to self-destructive situations. The inner alchemical tradition, says Goodwin, 'attempted to fuse knowledge and meaning by combining *scientia*, the study of natural process, with morality, man's attempt to realise his own perfectibility and self-fulfilment, itself a continuous process'. The essence of the alchemical process was 'a two-way relationship between the adept and Nature, both undergoing transformation together, as occurs in a true dialogue'. If this view of things could be transmuted into an ethic appropriate to modern science, it might lead to a 'responsible creativity' in which the search for meaning would be paramount, and the application—or non-application—of assured knowledge would be under the sign of true human benefit rather than private profit or public dominance. How to combine wisdom with power is the great problem now before humanity. The medieval 'inner alchemists' were not faced with this as we are, but perhaps their ethos has still a message for us.

(2) CHINESE PHYSIOLOGICAL ALCHEMY; THE THEORY OF THE ENCHYMOMA (*NEI TAN*), AND THE THREE PRIMARY VITALITIES

The existence of two parallel traditions in Chinese alchemy has now been known or glimpsed in Europe for more than a century. In his pioneer paper of 1855 on Taoism Edkins (17) was perhaps the first to mention it.

The Taoists [he wrote] call the process of manipulating substances to obtain the elixir *lien wai tan*,¹ 'the obtaining by purification of the external elixir'. The corresponding process for rectifying the mind is denominated *lien nei tan*,² 'to obtain by purification the inner elixir'. By the former the rank of earthly genii is attained, *ti hsien*.³ But those who succeed in the latter become *thien hsien*⁴ or celestial genii,⁵ and instead of enjoying their immortality in a grotto on some legendary mountain, they fly upward to Yü Ching,⁶ the abode of Yü Ti⁶ [the Jade Emperor], or to Tzu Wei Kung,⁷ his lower residence.^b

Edkins could not explain very clearly however what the second process consisted in. He knew indeed of a Taoist 'mode of self-training called *lien-yang*⁸' which had been founded by Chih Sung Tzu⁹ and Wei Po-Yang¹⁰—refining and nourishing—but conceived that it 'consisted of a hermit life and sitting cross-legged in a mountain cave' while repressing the passions. He realised however that

^a This distinction has been studied already in pt. 2, pp. 106 ff. Cf. Fig. 1308.

^b It will be remembered that this is the astronomical name for the region of the circumpolar stars (cf. Vol. 3, pp. 259 ff.).

¹ 煉外丹

² 煉內丹

³ 地仙

⁴ 天仙

⁵ 玉京

⁶ 玉帝

⁷ 紫微宮

⁸ 煉養

⁹ 赤松子

¹⁰ 魏伯陽

'making the breath return in a circle' had something to do with it. He was aware, too, of another phrase, *yang hsing*,¹ but associated it only with late ethical Taoism deeply influenced by Confucianism. The double pattern was also brought out clearly by Martin (8) in his address to the American Oriental Society in 1868, often subsequently reprinted, and notable for the emphasis with which he supported Edkins' belief in a higher antiquity of alchemy in Chinese than in any other civilisation (cf. pt. 4, pp. 491, 504). Although Martin could not give any more precise account of the *nei tan* tradition than Edkins, he provided a slightly different formulation of it:

In the Chinese system [he wrote] there are two processes, the one inward and spiritual, the other outward and material. To obtain the greater elixir, involving the attainment of immortality, both must be combined; but the lesser elixir, which answers to the philosopher's stone, or a magical control over the powers of nature, might be procured with less pains. Both processes were pursued in seclusion; commonly in the recesses of the mountains—the term for adepts signifying 'mountain men' (*hsien*).^a

From what will appear in the following pages it is evident that Martin had been studying some *nei tan* texts, for he quotes (without precise reference) a sentence from Lü Tsu³ (the late + 8th-century Patriarch Lü, Lü Yen,⁴ Lü Tung-Pin⁵): 'You must kindle the fire that springs from water, and evolve the Yin contained within the Yang.' Those who read this, such as Waite,^b were duly baffled, and he wrote, quite understandably, 'We need to know much more than Dr Martin has told us about spiritual processes in China which passed under the name of alchemy before we can take them into consideration on a quest of their (possible) correspondences with the groups of European texts.'

Of the two Western-language books on Chinese alchemy in the early part of this century, Chikashige (1), as a plain blunt metallurgist, ignored the *nei tan* tradition altogether, but Johnson (1) devoted a chapter to it which constituted a slight further advance in understanding. He translated *nei tan* as 'esoteric drug' and *wai tan* as 'exoteric drug', associating the former purely with the attainment of longevity and immortality, and the latter purely with the transmutation of metals. Nevertheless he knew that the *nei tan* procedures involved 'a comprehensive regimen of mental and physical discipline', gymnastic techniques, a regulated and selective diet,^c and respiratory exercises including long holding of the breath. But he also thought that the 'esoteric drug' was a compound derived from minerals and metals.^d

Only two years after Johnson's book came the more scholarly contribution of Waley (14). After discussions of the Han material, the *Tshan Thung Chhi* and the *Pao Phu Tzu* book, which we have already taken into account (pt. 3, pp. 50ff.,

^a In (3), vol. 1, p. 246.

^b (2), pp. 57, 58, 61.

^c Including abstentions e.g. from cereals, and also the consumption of unusual plant substances.

^d (1), p. 64.

¹ 養性

² 仙

³ 呂祖

⁴ 呂晶

⁵ 呂洞賓

75ff.), he directed attention to the commentary of Phêng Hsiao¹ on the *Tshan Thung Chhi* written in +947 and entitled *Chou I Tshan Thung Chhi Fên Chang Thung Chen I²* (TT993), and to another work by him, the *Huan Tan Nei Hsiang Chin Yo Shih³* now but half a chapter in the *Yün Chi Chhi Chhien* collection.⁴ Here we meet, wrote Waley,

with the distinction between exoteric alchemy (*wai tan⁵*) which uses as its ingredients the tangible substances mercury, lead, cinnabar and so on, and esoteric alchemy (*nei tan⁶*), which uses only the 'souls' of these substances.⁷ These 'souls', called the 'true' or 'purified' mercury, etc., are in the same relation to common metals as is the Taoist Illuminate (*chen jen⁶*) to ordinary people. Presently a fresh step is made. These transcendental metals are identified with various parts of the human body, and alchemy comes to mean in China not an experimentation with chemicals, blow-pipes, furnaces, etc. (though these, of course survived in the popular alchemy of itinerant quacks), but a system of mental and physical re-education.

And he went on to quote one of the writings of Su Tung-Pho⁷ (ca. +1100), entitled *Lung Hu Chhien Hung Shuo⁸* (Discourse on the Dragon and the Tiger, or Lead and Mercury), as follows:⁹

The dragon is mercury. He is the semen and the blood. He issues from the kidneys^d and is stored in the liver. His sign is the trigram *Khan*.⁹ The tiger is lead. He is breath and bodily strength (*li¹⁰*). He issues from the mind (*hsin¹¹*) and the lungs bear him. His sign is the trigram *Li*.¹² When the mind is moved then the breath and strength act with it. When the kidneys are flushed then semen and blood flow with them.

Waley then pointed out how in later times Taoist *nei tan* alchemy was much influenced by Buddhism, especially of the Chhan or Zen school, as the case of Ko Chhang-Kêng,¹³ also known as Pai Yü Chhan,¹⁴ whose *Hsiu Hsien Pien Huo Lun¹⁵* (Resolution of Doubts concerning the Restoration to Immortality) written about +1218, shows explicitly. Thus Waley touched the very essence of the matter by

^a Ch. 70, pp. 1 aff.

^b This is Waley's formulation; we have hardly, if ever, noted in Chinese *nei tan* texts the statement that 'true mercury' or 'true lead' are the 'souls' of ordinary mercury and lead. Perhaps he was influenced by Western alchemical ideas in this.

^c It was addressed to his younger brother Su Tzu-Yu (cf. pt. 3, pp. 193-4), and is printed in *TSCC*, Shen I Tien, ch. 300, *ching kung pu, i wên* 1, p. 6b. We should not translate this passage exactly as Waley did, but it deserves to stand as one of the first pronouncements on physiological alchemy to appear in any Western language.

^d Here Waley translates the word *shen*,¹⁶ and here for the first time in this context we come upon a difficult anatomical term which will be of great importance in what follows. It can be translated 'urino-genital system' (if the importation of a fairly exact modern concept is not objectionable), for in medical literature *nei shen¹⁷* means the kidneys and *wai shen¹⁸* or *shen tsu¹⁹* the testes; but for our present medieval purpose a vaguer expression may be better, and we have one at hand in the old biblical word 'reins'. Dictionaries (such as Webster's, 1832) define this as the kidneys, the lower part of the back, the waist, the loins; this last another old and vague word embodying distinctively sexual significance, for besides 'girding up one's loins' they also say, 'kings shall come out of thy loins' (*Gen. 35. 11*) and 'he was yet in the loins of his father' (*Heb. 7. 10*). We shall therefore generally use the word reins for *shen*, remembering that its meaning is at least as much sexual as excretory.

¹ 彭曉

² 周易參同契分章通真義

³ 還丹內象金鑰匙

⁴ 外丹

⁵ 內丹

⁶ 真人

⁷ 蘇東坡

⁸ 龍虎鉛汞說

⁹ 坎

¹⁰ 力

¹¹ 心

¹² 離

¹³ 葛長庚

¹⁴ 白玉蟾

¹⁵ 修仙辯惑論

¹⁶ 腎

¹⁷ 內腎

¹⁸ 外腎

¹⁹ 腎子

demonstrating that alchemical terminology had been transferred from a specifically chemical-metallurgical context to a psycho-physiological one, *nei tan* 'elixirs' and their components not being in crucibles or retorts but in the actual organs and vessels of the human body. And then he spoilt it all by reverting to a purely mystical explanation.

The interest [he wrote] of this purely mystical phase of Chinese alchemy is that whereas in reading the works of Western alchemists one constantly suspects that the quest with which they are concerned is a purely spiritual one—that they are using the romantic phraseology of alchemy merely to poeticise religious experience—in China there is no disguise. Alchemy becomes there openly and avowedly what it almost seems to be in the works of Boehme or Thomas Vaughan.

Waley would certainly have known of the books of Waite, but it is interesting that he wrote this half a dozen years before Jung began to publish his psychological-allegorical interpretations of Western alchemy. Subsequent writers who followed Waley closely, notably Eliade (5), were able to profit by the fundamental monograph of Maspero (7) on which we have often drawn, and shall still draw; so they did not fall into the *non sequitur* of Waley, though always allowing ample room for psycho-mental techniques of meditation, etc. alongside the more important physiological exercises designed to prepare an 'elixir' of life within the organs of the human body itself. When Eliade pointed to a Yogic-Tantric connection he was really on the right track—but more of that later.

Thus if the Western companion of metallurgical-chemical alchemy was psychological, its Chinese companion (*nei tan*) was essentially physiological. The Chinese adept of the 'inner elixir' did not seek psycho-analytic peace and integration directly, he believed that by doing things with one's own body a physiological medicine of longevity and even immortality (material immortality, for no other was conceivable) could be prepared within it.^a Thus there opens out before us the whole field of Taoist physiology, a proto-science not exactly the same as the physiology of the physicians down through the centuries, but not very far different from it. No greater mistake could be made than to analogise *nei tan* with the 'spiritual alchemy' of the West; it was physiological through and through, and though certainly not without parallelisms or even connections with Indian Yoga, it was generally more moderate, with more emphasis on hygiene, and always infused with characteristically Chinese sanity, sobriety, empiricism and rationality.

As already adumbrated, one of the basic features of Chinese *wai tan* and *nei tan* alchemy was that many of their principles and technical expressions were held and

^a In recent years great advances have been made in our knowledge of the physiology and biochemistry of human ageing, and it is advantageous to have a knowledge of these at the back of one's mind in considering the prolongevity techniques of the Taoists. Excellent general accounts are to be found in Rosenfeld (1); Thorbecke (1) and Rockstein, Sussman & Chesky (1). The onset and continuance of cell impairment is discussed in collective works edited by Cristofalo & Holečková (1) and Goldman, Rockstein & Sussman (1). The gradual breakdown of molecular genetic mechanisms is traced in Rockstein & Baker (1). Neuro-physiology and neuro-chemistry is treated by the writers in Ordy & Brizzee (1) and Rockstein & Sussman (2). Endocrinological changes are the subject of Cristofalo, Roberts & Adelman (1); while the relation of longevity to nutritional factors is treated by the group in Rockstein & Sussman (1). To all this one may add another look at the references given on the gerontological page of Vol. 5, pt. 4, (p. 507).

used in common. While it is possible, therefore, to categorise without hesitation certain particular texts as *wai tan* and others as *nei tan*, there are a good many where it is sometimes very difficult to be sure whether the writer is talking about laboratory operations or physiological techniques. Some texts indeed give the impression of having been designedly written ambiguously so that readers of either persuasion could take their choice. At a later stage (p. 218 below) we shall take a closer look at this piquant situation. One has only to realise that chemical terms such as 'reaction-vessel' or 'distillation' or 'potable gold' were freely applied to physiological processes; as also to remember that the viscera and the metals were strictly associated together within the Five-Element symbolic correlation system,^a to see that interpretation may not always be easy. And here it dawns upon the investigator that nothing short of a dual translation system will ever cope with the problems presented by *nei tan* alchemy in China. In *wai tan* contexts *chin i*¹, literally 'gold juice', has often been translated 'potable gold' (cf. pt. 3, pp. 40, 82-3, 178-9 above), but study reveals that in the *nei tan* context the two words must be Englished in an entirely different way, even involving the creation of a new, or the use of an unfamiliar, word; so that here what we ought to say is 'metallous fluid', for it refers to the saliva,^b which was thought to be prepared by the lungs,^c which belong to the element Metal. Thus we need special adjectives, other than those in common use, for the five elements, and we must be prepared to have 'aquescent', or some such coinage, to convey the idea of something under the sign of Water. As for the overlap of terms, it could almost be said that the *nei tan* experts took pleasure in punning usages which could put the uninstructed totally off the trail.^d

Of course the *nei tan* texts can often be recognised because they give no clear instructions for manual chemical operations; it then becomes evident to the reader that they are using an abundance of chemical terms with purely physiological meanings. Here there is an interesting difference from Western writings. When a European alchemist speaks of 'true mercury' or 'our mercury' or 'philosophical mercury' we know that he is referring to some hypothetical entity or un-isolated constituent believed to exist invisibly behind the ordinary inorganic substances which he is handling in the laboratory. Just of this sort were the Tria Prima, the mercury, sulphur and salt, the 'three hypostatical principles' which Boyle combated in the 'Sceptical Chymist' as well as the four Aristotelian elements.^e But

^a See Table 12 in Vol. 2, p. 263. The correspondences shown there are not the same as those which the Taoist *nei tan* alchemists used, for more than one set existed at different times. What they followed was the system of the *Huang Ti Nei Ching, Su Wen*, i.e. the medical set of correspondences rather than that of the ancient philosophers. See on this Hsieh Kuan (1), vol. 1, p. 15b. Here the liver belongs to Wood, the heart to Fire, the spleen to Earth, the lungs to Metal and the kidneys (or urino-genital system) i.e. the reins, to Water.

^b As one of the bodily secretions or juices (汁) this was believed to contain pre-natal Yang *chi*. As we shall see, this was symbolised by the Yang lines (*yao*²) in the trigrams (*kuai*³) Chhien and Tui, both of which were associated with the Metal element (cf. Fig. 1550).

^c Or, more correctly, at a point along the Cheirotelic pulmonic Thai-Yin⁵ tract (cf. Vol. 6).

^d Indeed they were bound not to transmit their knowledge except to disciples under an oath of secrecy (cf. p. 39 below, cf. pt. 3, p. 74, and Ware (5) pp. 75, 302).

^e Cf. Leicester (1), pp. 97 ff., 110 ff.

¹ 金液

² 液

³ 爻

⁴ 卦

⁵ 手太陰肺經

when a Chinese writer speaks of 'true mercury' or 'true lead' he is likely to be speaking about the secretion, *chhi* or emanation of some physiological organ or tissue.^a Exactly what, we shall see as we go on.

Take for example the basic idea of reversion, regeneration and return. For the proto-chemical alchemist the term *huan tan*¹ meant an elixir or part of an elixir prepared by cyclical transformation, such as may be brought about by repeated separation and sublimatory re-combination of mercury and sulphur, reducing cinnabar and re-forming mercuric sulphide. If this were accomplished nine times it could be the *chiu chuan huan tan*² described in many of the books. On the other hand, the phrase *huan tan*¹ was applied by the 'physiological alchemists' as we may henceforward call them, to a *chhi* or substance generated by techniques purposefully within the human body which would bring about a reversion of the tissues from an ageing state to an infantile state. When presently we look at the history of these ideas we shall see that they go back far into Chinese antiquity; here it is necessary only to recall that pregnant phrase from the — 4th-century *Tao Tê Ching*: 'Returning to the state of infancy . . .'^b It was indeed one of the most ancient slogans of Taoism, and while the methods were more and more elaborated as the centuries went by, the fundamental idea probably changed but little, namely that there could be a reversion to youth, an attainment of longevity *because* of continued rejuvenation—*fan lao huan thung*³ in the proverbial phrase—worked for by means of hygienic and other physiological techniques.^c

There is no single key to physiological alchemy more important than the idea of retracing one's steps along the road of bodily decay. The old English political cry of 'retrenchment and reform' constantly recurs to the mind in reading *nei tan* texts, and the technical terms stand out like signals. *Huan* and *fan*, regeneration and reversion, we have just met with, but there is also (and very prominently) *hsiu*,⁴ restoration, or *hsiu pu*,⁵ repair, as well as *fu*,⁶ replenishment, and several more. Further, this concept gradually generated two others almost equal in importance, first a counter-current flow of some of the most important fluids of the body opposite to their normal directions, and secondly a thought-system which envisaged a frank reversal of the standard relationships of the five elements. The first idea, of flow in a direction opposite to the usual, is expressed by such terms as *ni liu*⁷ or *ni hsing*,⁸ and was applicable, as we shall see, particularly to the products of the salivary and testicular glands. The second concerned the power which the physiological alchemists believed that their techniques could attain over the natural processes of mutual generation of the five elements (*hsiang shêng*⁹) and of mutual conquest (*hsiang shêng*¹⁰ or *hsiang kho*¹¹).^d They dared to believe that by their efforts the

^a The terms do also occur from time to time, however, in theoretical discussions of *wai tan* alchemy. Then the most usual meanings are, respectively, mercury prepared from mercuric sulphide, and silver extracted from lead. Cf. pt. 4, pp. 254, 257-8.

^b Cf. Vol. 2, p. 58 above, and Waley (4), p. 178.

^c See again Vol. 2, p. 140.

^d See Vol. 2, pp. 255 ff.

¹ 還丹

² 九轉還丹

³ 返老還童

⁴ 修

⁵ 修補

⁶ 復

⁷ 逆流

⁸ 逆行

⁹ 相生

¹⁰ 相勝

¹¹ 相尅

normal course of events could be arrested and set moving backwards; this was called *tien tao*,¹ 'turning nature upside down'.^a Thus 'to become as little children' was the *nei tan* ideal, and though one must not minimise the undertone of holy innocence which all true Taoists would have wished to recapture, the physiological alchemists of medieval China had, in our view, far more in common with those who attempt to halt the ageing of tissues and bodies today by biochemical means,^b endocrinological treatments and hygienic exercises than with those who think in terms of a purely psychological 'return to the womb'.^c

How did the *nei tan* alchemists talk about the condition of vitality to which they wished to return? One just has to know the key, for the terms were ordinary words used as veils for a special meaning. Encountering *san yuan*² or *san chen*³ the uninitiated would write down immediately 'the three originals' or 'the three true things', but here in fact *yuan* and *chen* are synonymous and mean 'primary vitalities', the primary vitalities with which the young human organism, like that of all animals, is endowed. This endowment, in a common usage with many medical writers, was called *hsien thien*,⁴ a phrase which we have come across before in connection with one of the ancient alternative azimuthal arrangements of the eight trigrams,^d but here with a quite different sense, namely what was bestowed upon the embryonic organism before it came forth from womb or egg into the light of day. There were in all bodies three great vitalities, first the *yuan ching*⁵ or primary *ching*, which degenerates to the seminal essence of intercourse (*chiao kan ching*⁶), secondly the *yuan chhi*⁷ or primary *chhi*,^e which degenerates to the *hu hsi chhi*⁸ or respiratory pneumonia of exhalation and inhalation, and finally the *yuan shen*⁹ or primary *shen*, which degenerates to the *ssu li shen*¹⁰ or mental activity eaten up by anxiety and worry. The first of these vitalities was correlated with the peripheral parts of the body (*shen*¹¹) as a whole, the second with the heart (*hsin*¹²) or the thorax in which it centered, and the third with the mind (*i*¹³). The whole complex was called the *i ling chen hsing*,¹⁴ the 'numinous triune natural life endowment', or *thien chen*,¹⁵ 'original vitality' or simply *pin*, *ping*.^{16, 17} It is no good trying to find adequate English equivalents for *ching* and *shen*, they can only be left untranslated, like *chhi*, but in view of

^a There are echoes of this in Western alchemy, though they have originated quite independently. For example, the late medieval writer Salomon Trismosin speaks of a stage in the Great Work when the normal natural processes reverse themselves and flow in the opposite direction. His *Splendor Solis* of +1598, on which see Ferguson (1), vol. 2, pp. 469ff., has been re-translated by London (1). It may be significant that Trismosin was a particularly macrobiotic Paracelsian, believing in rejuvenescence as well as prolongevity, and for women as well as men.

^b Just take the first gerontological example that comes to mind. Nummular eczema tends to occur in the aged because the skin loses fats and lipins as it becomes older; this can be corrected by simple inunction.

^c There is much in the works of Jung and others on the *regressus ad utero* in psychology, but it has little or nothing to do with the Chinese attempt to reverse ageing.

^d See Vol. 4, pt. 1, p. 296.

^e On this untranslatable word, corresponding to *pneuma* nearer than anything else, we have had much to say in previous volumes (*v. sub voce*). The analysis of its meanings by Hiraoka Teikichi (1, 2) are worth careful study. Cf. also Kuroda Genji (1).

¹ 顛倒	² 三元	³ 三眞	⁴ 先天	⁵ 元精	⁶ 交感精
⁷ 元氣	⁸ 呼吸氣	⁹ 元神	¹⁰ 思慮神	¹¹ 身	¹² 心
¹³ 意	¹⁴ 一靈眞性	¹⁵ 天眞	¹⁶ 稟	¹⁷ 稟	

its wonderful generative properties (which no one understood before modern times) it seems not at all surprising that a 'semen-as-such' should have been raised to equal rank with the 'breath of life' and the pervading intellectual powers. Nor is it much good trying to situate *shen* in the context of the Aristotelian vegetative, sensitive and rational souls and their Chinese counterparts, a problem to which we gave some attention long ago;^a it can only be said to have included all of them. The *hun*¹ souls, upward-floating, were no doubt its Yang parts, and the *pho*² souls, downward-seeping, its Yin ones.^b Such was the complement of dazzling youthful vitalities at which the Taoist physiological alchemists set their sights.

After it was borne in upon us, therefore, that we were face to face with a physiological (indeed at bottom a biochemical) elixir, to be prepared by physiological, not chemical, methods, out of physiological constituents already in the body, it became clear that in order to do justice to the Chinese *nei tan* conceptions it would be desirable to introduce an entirely new word for 'the elixir within'. For this purpose we have settled upon the term 'enchymoma'. This is satisfactory in many ways; its prefix indicates at once that it is within the body, while its second and third syllables come from the Greek word *χυμός*, *chumos*, juice – connected obviously not only with the term chyme, still current in modern physiology, but also one of the possible origins of the very name of chemistry itself (cf. pt. 4, pp. 349ff. above).^c Enchymoma (= *egchymōma*, *ἐγχύμωμα*) would be a pouring in, and indeed the noun *enchymōsis* (= *egchymōsis*, *ἐγχύμωσις*) occurs already in Hippocrates,^d defined as 'the infusion of vital humours into the solid parts, such as takes place in anger, shame, joy, etc., also a sudden injection of blood into the cutaneous vessels, as in blushing'. Since the infusion of vital humour, the restoration of the primary infantile vitalities to ageing muscles, joints and organs, was just what the Taoist physiological alchemists were aiming at, the word seems eminently suitable to place beside 'elixir', which we can reserve for the external preparations, whether made from metallic and mineral substances or from plants.^e Furthermore it is interesting that a closely related word, 'enchyloma', in old pharmacy 'an inspissated juice' (from *chulos*, *χυλός*, also juice, hence the chyle of modern physiology) was actually used in the sense of elixir by the great iatro-chemist Nicholas Lemery

^a Vol. 2, p. 22. Cf. Fig. 1306.

^b See Vol. 2, p. 490. Jung (3), pp. 38ff. has a very peculiar discussion of the *hun* and *pho* souls in terms of *animus* and *anima*, conscious rationality and affective prejudice. I have no authority to criticise so great a philosophical psychologist, yet this instance does seem to me a good example of an attempted Chinese-European correspondence which carries no conviction whatever. We do ourselves use the two words in translation now and then, but with every reservation against further implications (cf. pt. 4, pp. 228, 238, 260).

^c It is interesting too to recall that 'enchyma' was the word used by J. E. Purkinje (Purkyně) in 1837 for the material or contents of living cells before coining two years later the term 'protoplasma', still in use today. See Teich (1), pp. 109ff, 115, (2).

^d *Epid.* 2. 1037 F.

^e One must be careful not to confuse in the mind the term *enchymoma* with the old medical expression *ecchymosis*, which physicians of my father's generation used to designate bruises, humours seeping beyond their vessels, livid swellings, or extravasations of blood; for it derives from *ekchymōma*, *ἐκχύμωμα*, a pouring out. This also has the authority of Hippocratic usage, both in the *-ōma* and the *-ōsis* forms (*Fract.*, 759, 760). Correspondingly, *ecchymoma arteriosum* was an old term for the false aneurism, and *ecchyloma*, in pharmacy, an extract.

(+ 1644 to + 1715).^a His 'Cours de Chymie', which first appeared in + 1675, was perhaps the most celebrated chemical treatise of its time, a time of transition, for though Lemery still thought in terms of the Tria Prima plus two passive principles (phlegm and caput mortuum, water and earth), he followed Descartes and Gassendi in using an early form of atomic theory. We shall perpetuate him therefore in our *enchymoma*. In the texts which concern the external elixir it is interesting that the theme of rejuvenation is relatively infrequently spelt out, though it certainly does occur there, but in the physiological *enchymoma* descriptions it seems always to be the essence of the matter, invariably present; so it is desirable to have an additional technical term at hand when special emphasis needs to be laid on the regenerative property. Accordingly 'anablastemic' will be useful as a term for the restoration of youth. *Anablastanein*, ἀναβλαστάνειν, means to burgeon again, to spring anew, to grow afresh, and if this evokes for us too vividly the marvellous totipotency of plant cells, how much the Taoists would have wished that animal organisms could escape from their determination into the same liberty. Anablastemic, then, has obvious connections with the blastema of regeneration and embryonic growth, and it will be useful for elixirs as well as *enchymomas* when the idea is present in such contexts. Lastly, what shall we call the class of elixirs and *enchymomas*? The answer springs to the mind from the Hippocratic adage quoted in the preface to Vol. 4—'The craft is long but life is short'.^b If we have in our time the less lovely carcinogens and hallucinogens why should not the Taoists of old be allowed their macrobiogens? Let us only hope that some day, but under reason and right judgment, we may have the substance of their shadow.

(1) *The quest for material immortality*

When we examine the principal component parts of the *nei tan* complex as it appears from the literature we see that it was essentially a development in certain particular directions from the classical Taoist techniques of ancient times for the attainment of individual material immortality or at least enduring longevity. Some traditional practices were excluded but other new ones were introduced, while at some particular periods some practices were dominant, then declined giving place to others.^c In Section 10, at a much earlier stage, a discussion of the classical Taoist techniques was preceded by a list,^d but here a new list is needed,^e partly because the types of technique had changed a good deal by the early Middle Ages, and partly

^a See Partington (7), vol. 3, pp. 28 ff.

^b Vol. 4, pt. 1, p. xxxi; Vol. 4, pt. 2, p. 11.

^c The classical descriptions are those of Maspero (7), reprinted in (32). A brief survey is that of Kaltenmark (5) which omits, mysteriously, only the sexual techniques.

^d See Vol. 2, pp. 143 ff. The reader is referred to this discussion for many detailed references, e.g. to the ancient literature, which cannot be repeated here.

^e The book of Huard & Huang Kuang-Ming (7) discusses some of these in considerable detail, adding however a miscellany of information on acupuncture, moxa, sphygmology, bodily hygiene, bathing and balneology, wrestling, the medical aspects of various sports, and even 'cosmetology'. It attempts, moreover, to cover not only Chinese civilisation, but also European, Japanese and Indian. Conceptions of physiological alchemy are touched upon only very briefly. This interesting work is unfortunately less helpful than it might have been because the text is not clearly distinguished from the translations (which seem often to be abridgments or paraphrases) and no Chinese characters are given, except in the illustrations (the origins of which are not always clearly stated).

because a novel nuance is present, the idea that what these practices do is to produce a physical enchymoma of salvation, as it were, within the body of the practitioner. Thus we may list the techniques designed to give rise to one or other form of anablastemic enchymoma as follows:^a

- (1) What one may call 'redemptive' mental and bodily hygiene (*chü chhu fa*¹) in all aspects. Here the keynote was to avoid excess in everything, to live the most healthy kind of life, to cultivate ataraxia and to banish all passions from the mind (*yang shêng*,² *yang hsing*,³ *shê shêng*,⁴ *shê yang*⁵). The physicians of ancient Greece in the Hippocratic tradition of $\mu\eta\delta\epsilon\nu\ \acute{\alpha}\gamma\alpha\nu$ would have comprehended this regimen perfectly,^b but one must understand that it included much which we would now regard as distinctively hygienic, such as cleanliness and sanitation.^c At the same time it assumed engagement in special practices intended to 'preserve and nourish the *ching*, the *chhi* and the *shen*' (*pao yang ching chhi shen*⁶). Such a life could theoretically have been lived anywhere, but it would have been much more convenient in the service of a Taoist temple remote in the mountains, and that is the setting which most of our adepts preferred. That is where one has to imagine them.
- (2) Respiratory exercises and techniques ('harmonising the *chhi*', *thiao chhi*⁷). These, as we saw in Sect. 10,^d were of great antiquity and became highly elaborated. Breathing in various rhythmic ways (*thun chhi*⁸), reducing expiration and inspiration (*hu hsi*⁹) to the utmost; or long holding of the breath (*pi chhi*¹⁰), accompanied by the counting of heart-beats, even till anoxaemia produced abnormal mental states; or chasing a theoretical inner *chhi* (*nei chhi*¹¹), not the same as the air of in- and out-breathing, around its believed circulatory course in the body—these were some of the methods at which we may look a little closer in due course.^e
- (3) Allied with the respiratory exercises were others intended to assist actively the circulation of the *chhi* and the fluids in the body (*pan yün*¹²). These were designed to bring about 'regeneration by internal transmutation' (*huan tan nei lien*¹³).
- (4) Passing to exercises requiring still greater muscular exertion, one reaches the large field of remedial gymnastics (*tao yin*¹⁴), in which the Chinese were great pioneers. Closely connected with this was what might be called gymnastics practised by one adept upon another, namely massage (*an mo*¹⁵). Together with the respiratory exercises, all these methods of encouraging the preparation of an enchymoma were called in later times *kung fu*¹⁶ and *nei kung*¹⁷ (interior achievement).
- (5) An exceptionally important role was played by the conservation of certain secretions, for example saliva, the swallowing of which (*thun thuo*^{18, 19}) was accomplished in ritualised ways which included the gnashing of the teeth (*khou chhih*²⁰).

^a Cf. Figs. 1552, 1553, 1591.

^b *Mēden agan*, 'do nothing to excess'.

^c Cf. Sect. 44 below, and meanwhile, Needham & Lu Gwei-Djen (1).

^d Vol. 2, pp. 143 ff.

^e P. 142 below.

¹ 居處法	² 養生	³ 養性	⁴ 攝生	⁵ 攝養	⁶ 保養精氣神
⁷ 調氣	⁸ 吞氣	⁹ 呼吸	¹⁰ 閉氣	¹¹ 內氣	¹² 搬運
¹³ 還丹內煉	¹⁴ 導引	¹⁵ 按摩	¹⁶ 功夫	¹⁷ 內功	¹⁸ 吞唾
¹⁹ 吞唾	²⁰ 叩齒				

The physiological alchemists were clearly of the opinion that the spitting out of saliva (probably a common usage in ancient and medieval China just as it was there until recently) involved a dangerous loss of vitality from the body, and they greatly emphasised therefore the necessity of its conservation—indeed, as we shall see, the Yang *chhi* within it formed one of the essential ingredients for the inner elaboration of the enchymoma.^a Moreover there was a certain parallelism between the conservation of the saliva and the long retention of the air which had been breathed into the lungs.

(6) Sexual techniques (*fang chung pu i*¹). In part these were concerned with another aspect of the conservation of secretions, the retention of the semen, but their general significance was much wider than this. It cannot be too often emphasised that sexual activity was highly important in the world-view of Taoism,^b and hence of the physiological alchemists. The place of a female component in the world of Nature, forming one of the two fundamental forces, the Yin being the equal and opposite partner of the Yang, was basic to Taoist naturalism.^c A sexual element was descried in the most intimate structure of the natural universe itself, and since men and women must behave in the closest accordance with their true natures in seeking rejuvenation by the enchymoma, techniques of sexual intercourse were a logical and reasonable part of the Taoist scheme.^d This was the mutual nourishment of Yin and Yang, but besides there was a further technique available to the male, namely 'making the semen return upwards to nourish the brain' (*huan ching pu nao*²).^e It is fully understandable as yet another instance of the emphasis on

^a Tears, ear wax, nasal mucus and sweat could also theoretically have been regarded as products the conservation of which should have been beneficial to the organism, but one encounters little about them in the literature, probably because they were so much more difficult to collect (cf. Chhen Kuo-Fu (1), vol. 2, p. 451). The first and the last, at least, would have been regarded as undesirable losses caused by excesses of grief or gaiety, and of physical labour. It is often enjoined that gymnastic exercises, for example, should stop at the onset of perspiration. Nasal mucus occurs therapeutically in the *Su Shen Liang Fang*, ch. 6, p. 13b, but there is no entry for it in *PTKM*, ch. 52.

^b Cf. Vol. 2, pp. 150-1.

^c See further Vol. 2, pp. 273ff. Cf. Figs. 1545, 1572-4, 1579 below.

^d This had nothing to do with sacrificial religious asceticism or reactions against it, charismatic celibacy, phallic worship, temple prostitution, or social promiscuity; it was simply that the moral valuations associated with various (often dominant) forms of Confucianism, Buddhism and Christianity were not recognised. Nor does it mean that all Taoist physiological alchemists were bound to engage in sexual activities; there were many possible ways towards salvation by the enchymoma, and some of these involved abstention from all sex, just as others involved abstention from cereals or other foods. It may be worth adding that in the Middle Ages, or at least the earlier Middle Ages before the influence of Buddhism became too strong, all Taoists were expected to marry (and in some of their sects they still do to this day), while there were always Taoist 'nuns', or feminine adepts, as well as the Taoist 'monks'. These terms are so wildly inappropriate that they should never be used, and one should speak rather of men and women Taoists, though often priests and priestesses would not be inappropriate. It is essential not to see all these phenomena through conventional Western eyes, and indeed the presence of sexual techniques among the means for achieving longevity will hardly be likely to be condemned by either the physiological or the psychological sciences of the present day.

^e See Vol. 2, p. 149. At the moment of ejaculation, pressure was exerted on the urethra between the scrotum and the anus, thus diverting the seminal secretion to the bladder, whence it was later lost with the urine upon excretion. This the Taoist physiological alchemists of course did not know; they thought that the seminal essence was raised actively up the spinal column so as to nourish the brain and to produce an enchymoma with the saliva somewhere in the abdomen.

reversion, restoration, regeneration, counter-current motion and cyclical transformation.^a

(7) Techniques of meditation, trance and ecstasy (*tso wang*¹). Here much remains to be investigated. It is certain that in late times Taoism was much influenced by Buddhism, and by the Sung period had taken over meditational practices of Indian origin, but something of the kind had always been there though perhaps less prominently than afterwards. There is also some reason for thinking that anciently use was made of hallucinogenic fungi and other plants to induce mystical or religious experiences.^b Indications of the use of techniques of hypnotism also demand a special study. But at the simplest estimate, periods of quiet recollection and mental concentration would have contributed to psycho-somatic calm, health and equilibrium.

All these were the *nei tan* procedures. A word must now be said about the other macrobiotic methods mentioned in Sect. 10 which could not have been numbered among them.

(1) First among these would come the dietary complex (*fu shih*²), ancient but very persistent.^c This included the prolonged consumption of all kinds of unusual plant, mineral and even animal substances, from pine needles to peach gum or *Eucommia* resin, and from mica powder to avian blood;^d but also specific abstention for prolonged periods from certain foods, notably cereals (*pi ku*³), or plants of the *Allium* genus. There were endless ramifications of the peculiar diet which the adept might find helpful (Figs. 1543, 1544), and we cannot go into them here,^e but diets were never part of *nei tan*.

(2) Nor, obviously, was the way of the alchemical elixirs (*wai tan*⁴) which gradually arose out of them as time went on.^f *Nei tan* adepts were never concerned with all the pharmaceutical complications which followed from the use of metallic and mineral substances as medicines of immortality.

(3) Lastly, there was what may be called the actino-therapeutic complex, the exposure of the body to the rays of the sun and moon. This was important in early times but gradually declined later; one may find indications of it, for instance, in a list of macrobiotic techniques given in the *Thai Phing Ching*⁵ (Canon of the Great Peace),^g the important, though incomplete, sacred book of a Taoist church, written about + 150. There the absorption of the sun rays is called *thun jih ching*,^h and the

^a If the secretions were to be so conserved, what of the excretions? Ideas about these form a separate chapter, but the drinking of urine was counselled from ancient times onwards, and did in fact lead to significant discoveries concerning hormones; see Lu Gwei-Djen & Needham (3); Needham & Lu (3) as also pp. 308 ff. below.

^b We shall have more to say of this in Sect. 45. Meanwhile, see pt. 2, pp. 116, 121, 150.

^c A classical account is given by Maspero (7), reprinted in (32), pp. 365 ff.

^d See the opening sub-sections of the historical description of the development of alchemy in Sect. 33, especially Vol. 5, pt. 3, p. 11.

^e Something more will be said of the nutritional aspects of them in Sect. 40, devoted to that subject.

^f See again in Sect. 33 how the search for the herb of immortality (*pu ssu chih yao*⁷) gradually changed into the golden elixir (*chin tan*⁸). Especially pt. 3, pp. 19, 29 ff., 45 ff., 48 ff.

^g The history of this work is rather complex; for the background of our bibliographical entry see Hsiung Tê-Chi (1); Wang Ming (5).

¹ 坐忘

² 服食

³ 辟穀

⁴ 外丹

⁵ 太平經

⁶ 存日經

⁷ 不死之藥

⁸ 金丹



Fig. 1543. Drawing of a plant often eaten by adepts seeking prolongevity or material immortality, the *shu* (in this case from Chhichow). The manuscript is the *Hsiang Yao Chhao* (*Kōyō-shō*, Memoir on Aromatic Plants and Incense), written by the monk Kuan-Yu (Ken-i) shortly before +1156. Ch. 2, p. 74a; cf, Vol. 5, pt. 2, p. 330. The plant is a composite, *Atractylodes* (*Atractylis*) *ovata*.

absorption of those of the moon is *fu yüeh hua*.^{1 a} It is possible that in some texts actinotherapy may have been included within *nei tan* procedures, because after all no obvious material substance was introduced into the body from outside. Men adepts 'absorbed' the rays of the sun, woman adepts those of the moon.

^a P. 8.

¹ 服月華



Fig. 1544. Drawing of a fungus often eaten by adepts seeking prolongevity or material immortality, the *fu ling* (in this case from Kunchow). The manuscript is the *Yao Chung Chhao* (*Yakushi-shō*, Memoir on Several Varieties of Drug Plants), written by the monk Kuan-Yu (Ken-i) shortly before +1156. P. 6a, cf. Vol. 5, pt. 2, p. 361. The fungus, *Polyporus* (= *Poria*, *Pachyma*) *cocos*, parasitises the roots of pine trees. Here it is called *fu shen*. Cf. Burkill (1), vol. 2, p. 1618.

It is interesting to note that the basic technical terms given in the preceding paragraphs have been derived from sources of widely differing dates in Chinese Taoist and medical history. To show the continuity of the tradition, it may suffice to say that one can find essentially the same headings in the *Chhien Chin Yao Fang*¹

¹ 千金要方

(Thousand Golden Remedies) written by Sun Ssu-Mo¹ in the neighbourhood of +652, and in the *Tongüi Pogam*² (Precious Mirror of Eastern Medicine),^a written by the Korean physician Hō Chun³ about +1600.^b

Nevertheless, the impression of unity and simplicity which one might gain from this statement alone would be illusory. The *nei tan* palace was in fact a house of many mansions, and over the two millennia of its existence there grew up a multiplicity of teachers, schools and sects, embodying the traditions of a number of Taoist centres. Each of these had a favourite terminology of its own, and specialised in particular techniques. In all the discussions which follow, the reader must understand that we have taken our exemplifying texts from writers of many different persuasions, and that if some of them had actually met, they would no doubt have disagreed quite strongly with one another. Contradictions of this kind can in fact be found within the bounds of single collections of tractates of physiological alchemy.^c Even so, there was a consensus of opinion on the basic beliefs, both in time and space, and it is this that we have tried to delineate in the present Section.

(ii) *Rejuvenation by the union of opposites; an in vivo reaction*

In order to give a properly rounded idea of *nei tan* physiological alchemy we shall have to draw upon many interesting texts as examples, some strange, some surprising, some poetical and some of striking interest for the history of science. Let us begin with three passages, very short, from texts which define the *nei tan* and the *wai tan*. The *Tao Tsang* contains a work of the Thang period entitled *Thung Yu Chüeh*⁴ (Lectures on the Understanding of the Obscurity of Nature),^d which says: 'The (primary) *chhi* can preserve (the invisible) life, hence it is called the enchymoma (*chhi nêng tshun shêng, nei tan yeh*⁵). The chemical substances can strengthen the visible body, hence (their combination) is called the elixir (*yao nêng ku hsing, wai tan yeh*⁶)'. Some centuries later a Sung adept, Wu Wu,⁷ wrote another book of the same kind entitled *Chih Kuei Chü*⁸ (Pointing the Way Home to Life Eternal; a Collection),^e and also preserved in the *Tao Tsang*. The preface, written about +1165, says:

The theory of the *Nei Tan* (enchymoma) is nothing more than the mutual conjunction of the heart and the reins (*hsin shen chiao hui*⁹), the circulation of the *ching* (seminal essence) and the *chhi* (*ching chhi pan yün*¹⁰), the preservation of the *shen* and the retention of the air (*tshun shen pi chhi*¹¹), exhaling the old and breathing in the new (*thu ku na hsin*¹²). Besides this, one may practise the special arts of the bedchamber (*huo chuan fang chung chih shu*¹³),

^a We always quote this title, and others by Korean authors, with the Korean pronunciation, though it will be understood that they wrote their books in classical Chinese.

^b And indeed in Japanese medicine and hygiene also, as witness the *Yōjōkun*,¹⁴ written by the famous Kaibara Ekiken¹⁵ about +1700.

^c E.g. the *Hsin Chen Shih Shu*, on which see pp. 79 ff. below.

^d *TT906*, p. 18b. Cf. Chhen Kuo-Fu (1), Vol. 2, p. 370.

^e *TT914*. We had occasion to refer to this book already at an earlier stage, in pt. 4, p. 233.

¹ 孫思邈 ² 東醫寶鑑 ³ 許浚 ⁴ 通幽訣 ⁵ 氣能存生內丹也
⁶ 藥能固形外丹也 ⁷ 吳愷 ⁸ 指歸集 ⁹ 心腎交會 ¹⁰ 精氣般運
¹¹ 存神閉氣 ¹² 吐故納新 ¹³ 或專房中之術 ¹⁴ 養生訓 ¹⁵ 貝原益軒

or take the rays and emanations of the sun and moon (*huo tshai jih yüeh ching hua*^a), or consume particular vegetable substances (*huo fu erh tshao mu*^b), or again, it may be, abstain from cereal grains, or practise celibacy (*huo pi ku hsiu chhi*^c).³

Here some of the additional alternatives are not strictly *nei tan*, but were included as facultative helps to the practice of it.^b The formulations in this passage occur over and over again in the *nei tan* texts, so that it becomes fairly easy to recognise what procedures the adepts are recommending.

It must of course be understood that the activities of elixir-making and enchymoma-making generally ran parallel, and most of the Chinese alchemists, at any rate before the Yuan period, pursued both objectives at the same time, believing them to be essential to each other. Presently (p. 209) we shall quote from the *Pao Phu Tzu* book passages which indicate this mutual dependence; sometimes the enchymoma procedures were considered ancillary in the sense that they would give sufficient longevity for the mastery of the immensely complex and time-consuming elixir procedures. This viewpoint was rather characteristic of the earlier periods, Han, Chin, Liu Chhao and Thang; later disillusion with the results of proto-chemistry took physiological alchemy to a position of superiority and independence, as we shall see. Broadly speaking, one may say that the search for the elixir predominated during the earlier times, perhaps down to the end of the golden period of laboratory alchemy in the Thang, before + 800, while the search for the enchymoma became dominant during subsequent times, e.g. the later Sung and Yuan periods, continuing through Ming and Chhing, and still faintly alive within living memory.^c Of course there always remained also a few of the traditional *wai tan* practical alchemists (not at all confined to Waley's 'itinerant quacks', but sometimes learned scholars). And now we are beginning to perceive a third period or current which was in a sense the synthesis of all that had gone before, namely the iatro-chemical development, from the Sung onwards, but we must reserve for a while yet the discussion of this application of *wai tan* techniques to *nei tan* materials.

Besides the commonplace ordinary usage of the term *wai tan* for laboratory elixir alchemy and *nei tan* for physiological enchymoma alchemy there grew up, certainly by the end of the Thang, a sophisticated usage, even more esoteric and confusing, of distinguishing between a *wai* and a *nei tan* within the *nei tan* realm. We can illustrate this by a passage from a book called *Hsiu Chen Pi Chüeh*⁴ (Esoteric Instruction on the Regeneration of the Primary Vitalities). The writer of this text is unknown, but it can be dated without fear before + 1136, because parts of it were

^a Tr. auct.

^b Cf. the remarks of Chhen Kuo-Fu (*t*), vol. 2, pp. 389, 390.

^c Cf. p. 179 below. Naturally the expression *nei tan* did not always mean exactly the same group of practices. In the Sui period it referred mainly to the circulation of the *chhi* and the gymnastic techniques, in Thang and Sung 'embryonic respiration' replaced the *chhi* circulation; and by the Southern Sung there was a broader spectrum of methods including the swallowing of saliva and the retention of semen. Cf. Chhen Kuo-Fu (*t*), vol. 2, p. 389.

¹ 或採日月精華

² 或服餌草木

³ 或辟穀休妻

⁴ 修真秘訣



Fig. 1545. Knowledge of Nature as a way of salvation; a Buddhist *arhat*, one of the 500 Lohan, at the temple of Pao-Kuang Ssu, near Hsintu in Szechuan (orig. photo. 1972). He holds a scroll with a version of the Yin-Yang symbol. On the history of this device see Needham (76).

incorporated into the *Lei Shuo* florilegium compiled in that year. It runs as follows:^a

The Inner and the Outer Macrobiogens.

Lao Chün (Lao Tzu) says that the changes in the atmological realm of the heavens and the earth are very difficult to fathom. There are two *chhi*, one Yang, represented by the dragon, by the element Wood, and by secretions (*lung, mu, i*); the other Yin, represented by the tiger, by the element Metal, and by essences (*hu, chin, ching*).^b When these two *chhi*^c are brought into conjunction and made to react with transformation—then what results is called the outer macrobiogen (*wai tan*).^d

But (the practices of) conserving and harmonising (the secretions), working alchemical transformations within the viscera (*han ho lien tsang*), exhaling the old and breathing in the new, transmitting upwards to the brain (*ni wan*), then showering downwards to the regions of vital heat (*tan thien*), restoring and transforming in endless cycles, passing through the heart (*chiang kung*) and there collecting the five *chhi* (of the viscera) in order to nourish all the vitalities of the body (lit. the hundred *archaei, pai shen*)^e—this is called the inner macrobiogen (*nei tan*).

For those who follow the Tao, the inner enchymoma can lengthen one's life, but the outer enchymoma can make one ascend to become an immortal. If the inner enchymoma succeeds, the outer enchymoma will necessarily be accomplished (lit. must respond to it, *pi ying*), and this being so, the inner enchymoma will necessarily be strengthened. But even so, the inner one alone will never succeed in effecting ascension.

The *nei tan* system of ideas was a complex one, and it must be allowed to unfold itself gradually; this it will do as we proceed. But in the quotation just given there are several points worth retaining in the mind. The first paragraph means that the outer enchymoma, derived from the two primordial *chhi* of the respiratory exercises, is formed by the chymical marriage of the elements Metal (*Chhien chin*) and Wood. The inner enchymoma, on the other hand, is produced by the conjunction and transmutation of the *chhi*, fluids and secretions within the body.^f 'Transmitting upwards' and 'showering downwards' are phrases referring to the important 'counter-current' and circulatory procedures of the physiological alchemists which

^a *Lei Shuo*, ch. 49, pp. 5b, 6a (vol. 5, p. 3212), tr. auct. The same passage occurs, in a slightly abridged form, in the *Thi Kho Ko*¹² (Song of the Bodily Husk), collected in *Hsiu Chen Shih Shu*¹³ (TT260), ch. 18, p. 7a.

^b This refers to the association of elements and trigrams in the Wên Wang arrangement of the *kua* (cf. Vol. 4, pt. 1, p. 296). Metal corresponds to Chhien¹⁴ and Wood to Sun¹⁵ (cf. Fig. 1550). In these *kua* there is little or no Yin within the Yang; this is why the outer macrobiogen is here depicted as so powerful in raising the adept to the heavens.

^c Cf. Fig. 1574.

^d The imagery of dragon and tiger here goes far to show that the whole passage is concerned with two enchymomas and not with an elixir and an enchymoma. The motif is quite absent from the *Pao Phu Tzu* book, but characteristic of early *nei tan* writings. The attribution to Lao Tzu is of course fictitious.

^e More will be said about the internal *archaei* or body-spirits on p. 79 below.

^f Saliva, semen and other secretions enter in here, as well as *chhi*. The chymical marriage involved is that of Water and Fire, because of the *kua* Khan and Li, on which see pp. 42, 60, below. We have already encountered the importance of these *kua* in other alchemical contexts in pt. 4, p. 271.

¹ 龍木液

² 虎金精

³ 外丹

⁴ 含和煉藏

⁵ 泥丸

⁶ 丹田

⁷ 絳宮

⁸ 百神

⁹ 內丹

¹⁰ 必應

¹¹ 乾金

¹² 體殼歌

¹³ 修真十書

¹⁴ 乾

¹⁵ 巽

we encounter again and again. Then there are two other technical terms in the *Hsiu Chen Pi Chüeh* passage demanding each a paragraph of explanation.

Since it is here that we meet for the first time in the present context with the technical term *ni wan*,¹ so important in Taoist anatomy and physiology, a few words must be said about the 'ball of mud', the human brain. As Maspero pointed out,^a all Taoist texts write the characters as here given, while those of Buddhist authors and translators write *ni huan*,² which is the same as the standard transcription of *nirvāna*.^b Buddhist quotations of Taoist texts in anti-Taoist writings always change *ni wan*, taking *ni huan* as the orthography. Maspero suggested that the Taoist name was not older than the +3rd or 4th-century, and that it had been adopted from the Buddhist concept, further that the written form *ni wan* was perhaps stabilised by the Taoists only in and after the +7th-century, to differentiate their ideas from those of the Buddhists. We feel doubt about the cogency of these conclusions. Why should the Taoist term not have been a descriptive one from the beginning? Brain tissue is in fact of a whitish grey colour, and elsewhere we shall come upon several Chinese parallels to the old Greek idea that 'the father sows the white, the mother the red'.^c In any case the brain was always an organ of cardinal importance in Taoist anatomy and physiology.^d

The so-called 'cinnabar fields' (a translation which we ourselves eschew) or regions of vital heat, *tan thien*,³ were another important element in Taoist physiology. Three were universally recognised, the upper one in the head, the middle one in the thorax, and the lower one in the abdomen. Here *tan* should be taken in its meaning of red (*hung*⁴), signifying Fire (*huo*⁵), and vital internal warmth.^e Hence one could think of the *tan thien* as centres of production of 'animal heat'. They were considered the areas from which the *chhi* set out on its circulatory paths through the body, and to which it returned,^f a process which itself came to denominate the 'cycled enchymoma' (*huan tan*⁶)—very different from the cycled repetitions of chemical changes meant by *wai tan* practitioners. Moreover the Taoists envisaged a considerable anatomical complexity in these three calorific power-houses, as Maspero so well elucidated.^g Each region consisted of nine cavities or spaces, arranged in two rows of four and five each, the cephalic set horizontally, the thoracic and abdominal sets vertically. We have the full details of nomenclature of the cephalic cavities in a +4th-century text called *Ta Yu Miao Ching*⁷ (Book of the Great

^a (7), p. 194.

^b Though later *ni wan*¹ is also found for this among the Buddhists, and *wan* in *ni wan* can be read *huan*. *Ni Wan* was also the *hao* name of the archæus of the brain (*Nao Shen*⁸).

^c Cf. p. 207.

^d Exactly what its functions were considered to be is not so easy to say. We shall return to all these matters in Sect. 43 on physiology, in Vol. 6, and must not too greatly anticipate here what belongs to that discussion.

^e But in physiological alchemy the word regained its meaning of elixir, since the enchymoma when formed radiated its life-giving warmth in the neighbourhood of the (lower) *tan thien*. This was certainly connected with subjective sensations experienced by the adepts.

^f On microcosmic circulations in *wai tan* alchemy see pt. 4, pp. 281 ff.

^g (7), pp. 192 ff., (13), pp. 92 ff.

¹ 泥丸

² 泥洹

³ 丹田

⁴ 紅

⁵ 火

⁶ 還丹

⁷ 大有妙經

⁸ 腦神

Mystery of Existence)^a by an unknown Chin author, explained by Thao Hung-Ching¹ himself in his *Têng Chen Yin Chüeh*² (Confidential Instructions for the Ascent to Perfected Immortality)^b of the late + 5th or early + 6th-century. But the description and full names of the other two sets of cavities, thoracic and abdominal, have not come down to us.^c In general the system was by no means without objective anatomical basis, for almost certainly the horizontal cephalic set was based on the ventricles of the brain, while the vertical thoracic set originated from the auricles and ventricles of the heart (perhaps also the pericardial and pleural cavities); lastly the vertical abdominal set would have arisen from early observations of the many obvious cavities among the viscera.^d

The *tan thien* system undoubtedly grew up during the Later Han and San Kuo periods, for a locus classicus about it can be found in the *Pao Phu Tzu* book, about + 300. There Ko Hung says:^e

Thus it is that we read in the manuals of the immortals (*hsien ching*³):

'He who wishes to obtain longevity and immortality
Must hold fast to the (Great) Unity.^f
Meditating on it and reaching comprehension of it,
It will be food enough to satisfy all hunger
It will be drink enough to satisfy all thirst.^g

Now this (Great) Unity has a material manifestation (lit. name, dress and colour). In men it is nine-tenths of an inch long, in women six-tenths. One of its locations is two and four-tenths of an inch below the navel; this is the lower region of vital heat. Another is in the crimson palace (*chiang kung*⁴)^h or the metallous gateway (*chin chüeh*⁵) below the heart; this is the central region of vital heat. The third is in the space between the eyebrows; one inch behind this is the cosmic palace (*ming thang*⁶), two inches behind it is the arcane chamber (*tung fang*⁷), and three inches behind it is the upper region of vital heat. Such things have been emphasised by the Taoists generation after generation, transmitting the technical terms (lit. names) orally only, to disciples bound by a blood seal of secrecy.

Here the terms given are exactly the same as we find in the later *Ta Yu Miao Ching*.

Of course, this brief discussion is far from exhausting the subject of the *tan thien*; they figure considerably, for example, in later medical literature, partly because they were sometimes identified with the 'three coctive regions' (*san chiao*⁸).^h But the idea may well go back as far as the Warring States, for in the bronze figures of dancers from the Shih-chai Shan culture in Yunnan, and from its derivative culture of Han times, one sees very prominently discoidal 'breastplates' worn on the

^a TT1295.

^b TT418.

^c Except part of the thoracic set in YCCC, ch. 12, p. 18a.

^d For further information on this subject Sect. 43 on anatomy may be consulted, in Vol. 6 below.

^e Ch. 18, p. 1b, tr. auct., adjuv. Ware (5), p. 302; Schipper (5). Another, passing, mention occurs in ch. 5, p. 2b, cf. Ware (5), p. 100.

^f Here this is a collective term for the calorigenic centres in the body, as the Taoists conceived them.

^g This term is normally one of the most prominent names for the heart itself in the literature of physiological alchemy.

^h Cf. Sections 43 and 44 below.

¹ 陶弘景

² 登真隱訣

³ 仙經

⁴ 絳宮

⁵ 金闕

⁶ 明堂

⁷ 洞房

⁸ 三焦

abdomen.^a Archaeologists call them 'heart protectors' (*hu hsün ching*¹), but may they not have had something to do with the lowest *tan thien*?

Let us now examine another statement of the doctrine of the inner and outer macrobiogens, all within the enchymoma realm. It is found in Chhen Chih-Hsü's *Chin Tan Ta Yao* of +1331.^b

Shang Yang Tzu says that ever since the days of old the great sages and immortals have not been willing to indicate clearly (the exact identification of) even a single medicinal entity in their enchymoma manuals. The Metal, Wood, Water, Fire and Earth elements, together with lead, mercury, cinnabar and silver, as mentioned therein, were all used as metaphors (*pi yü*²). Nevertheless ordinary people, thinking that they were directly referring to the operations of forging and transmuting, processing and refining (*tuán lién*³), used ordinary mercury, cinnabar and sulphur as medicinal substances. This was even worse than the blind leading the blind. But I shall now clarify this and reveal the secret to the world.

What are (the true) medicinal entities? One should first understand that they all come forth from the invisible (*wu chung*⁴); they are not ordinary physical things of the metal, mineral, plant and vegetable categories. They also lack the categories of form (*hsing*⁵) and substance (*chih*⁶), yet they are derived from things with form, resembling Metal but not ordinary metal, resembling Water but not ordinary water. Moreover, (among them) there is an interior medicinal entity (*nei yao*⁷) and also an exterior medicinal entity (*wai yao*⁸).

For the exterior medicinal entity the Water of the primordial unity of the pre-natal endowment (*hsien thien chen i chih shui*⁹) is sought from within the *kua* Khan.¹⁰ From this Water the undeteriorated lead of the pre-natal endowment is taken, and from this lead the *chhi* (primary vitality) of the great unity of the pre-natal endowment is obtained. This *chhi* is thus the white within the black and the Yang within the Yin. This is what the *Wu Chen Phien* means when it says that the solid (line) within the *kua* Khan is to be taken, since the Water of the primordial unity is the *ching* and *chhi* of the primary vitality. This *chhi* is the very Mother of Heaven and Earth, the Root of Yin and Yang, the Source of Water and Fire (elements), the Ancestor of the Sun and Moon, and the Forefather of the Myriad Things. The *Chhi Pi Thu*¹¹ ^c says that Khan *kua* represents the Water (element) and the moon. In man it refers to the reins, and there the *ching* (semen or seminal essence) is produced. Within this seminal essence is the *chhi* of the Principal Yang (*chêng Yang*¹²), which rises up and heats what is above.^d This is the Yang *chhi* generated within an accumulation of Yin. Hence lead is pliable and silver is hard. By nature the tiger belongs to the Metal (element), and this element can produce water.^e But in the process of inversion (*tien tao*¹³)^f the mother conceals her own male offspring, and therefore (we say that) the tiger is born from (the element) Water. Thus the tiger is equated with lead, and is called the Yang within the Yin. All this refers to the exterior medicinal entity.

^a We had the opportunity of examining many of these in the Museum at Kunming during the summer of 1972; the full-size ones do not exceed 1 ft in diameter. We are glad to offer our best thanks to the Curators, Mr Chang Tshêng-Chhi and Mr Hu Chen-Tung for their many kindnesses.

^b Ch. 1, pp. 31 bff., tr. auct.

^c There is a *Ta Huan Tan Chhi Pi Thu* in YCCC, ch. 72, but these passages are not in it.

^d One appreciates the parallel with the laboratory alchemy where the reactants are heated from below. *Chêng Yang* is of course a synonym of *chen yang*.¹⁴

^e Cf. Vol. 2, p. 257.

^f The *nei tan* theory of the reversal of the normal relationships between the elements. See p. 60 below.

¹ 護心鏡 ² 譬喻 ³ 煅煉 ⁴ 無中 ⁵ 形 ⁶ 質 ⁷ 內藥
⁸ 外藥 ⁹ 先天眞一之水 ¹⁰ 坎 ¹¹ 契秘圖 ¹² 正陽 ¹³ 顛倒 ¹⁴ 眞陽

As for the interior medicinal entity, we search for the secretion (*i'*) of the pre-natal endowment within the *kua* Li.² Within the secretion moves (or circulates) the long-accumulated cinnabar (*sha*³) of the pre-natal endowment, while the cinnabar carries with it the most real mercury of that endowment. This mercury is the black within the white, the Yin within the Yang. This corresponds to what the *Wu Chen Phien* calls the transmutation of the Yin within the belly of the *Li kua*. The *Chhi Pi Thu* says that *Li kua* represents the Fire (element) and the sun. In man it refers to the heart. The heart viscus produces blood, within which is the secretion of the primordial unity (*chen i chih i'*). This secretion flows downwards. Now blood is a Yang substance and the secretion is Yin. Hence cinnabar is Yang and mercury Yin. The dragon by nature belongs to the Wood (element), and this produces fire.⁴ But in the process of inversion the mother conceals her own male offspring, and therefore (we say that) the dragon is born from (the element) Fire. Thus the dragon is equated with mercury, and is called the Yin within the Yang. All this refers to the interior medicinal entity.

Ying Chhan Tzu⁵ says:^b "Those who learn the Tao must first begin with the exterior medicinal entity before coming to the interior medicinal entity. The advanced adept understands (the Tao) because of the innate virtue which he possesses, and therefore without having to transmute the exterior medicinal entity he can restore himself by the use of the interior medicinal entity alone. The interior one is inactive (*tau wei*⁶) because there is nothing it can use for its action;^c the exterior one is active because there are things on which it can act. The interior one is without form (*hsing*⁷) and substance (*chih*⁸) and yet it fully exists. The exterior one has matter (*thi*⁹) and function (*yung*¹⁰) and yet it is full of non-existence. The exterior one is concerned with the affairs of the material body (*sê shen*¹¹), while the interior one concerns the affairs of the ethereal body (*fa shen*¹²). The former is the Tao of the earthly immortals, the latter is the Tao of the heavenly immortals. The first improves the life of the Yin parts of the organism (*ming*¹³), the second advances the vitality of the Yang parts of the organism (*hsing*¹⁴). It is because the Tao embraces both Yin and Yang that the medicinal entity is of two kinds, the interior and the exterior.

The foregoing passages, embodying doctrines current over some five hundred years, from the + 10th to the + 15th-centuries, will be enough to show something of the complexities of the two kinds of enchymoma. They can only be understood in the light of explanations which will follow a little later in this Section; here for the moment it must suffice to say that the writers were talking about processes which were symbolised by the exchange of lines (*yao*¹⁵) between the trigrams (*kua*¹⁶) of the *I Ching*¹⁷ (Book of Changes),^d the object being to disentangle the Yang from within the Yin, and the Yin from within the Yang. A delicate analytical separation indeed.

^a Again cf. Vol. 2, p. 257.

^b This was Li Tao-Shun¹⁸ (fl. + 1290 to + 1320), author of *Chhüan-Chen Chi Hsüan Pi Yao*¹⁹ (TT248) and *Ying Chhan Tzu Yü Lu*²⁰ (TT1047).

^c Emending *pu*²¹ to *i*²² here, to conform with his other statements, esp. e.g. p. 17b. The mistake would have been very easily made by a copyist because of the inverted echo of *Tao Tê Ching*, ch. 37.

^d See Sect. 13 in Vol. 2.

¹ 液	² 離	³ 砂	⁴ 眞一之液	⁵ 瑩蟾子	⁶ 無爲
⁷ 形	⁸ 質	⁹ 體	¹⁰ 用	¹¹ 色身	¹² 法身
¹³ 命	¹⁴ 性	¹⁵ 爻	¹⁶ 卦	¹⁷ 易經	
¹⁸ 李道純	¹⁹ 全眞集立秘要	²⁰ 瑩蟾子語錄	²¹ 不	²² 以	

In general the idea was to re-create the pure Yang of the primordial pre-natal endowment, i.e. to rebuild the *kua* Chhien,¹ recapturing the Yang lines which had escaped to Khun² with the formation of other (mixed) *kua* trigrams during the wear and tear of life. By the same token Khun would be restored to its original purity.³

But the expositions of the schools were, it can be seen, at some variance with one another. In the *Hsiu Chen Pi Chüeh* passage the mutationist emphasis is on the conjunction of the *mu i*,³ the *chhi* of the secretions pertaining to the element Wood (and the *kua* Sun⁴)^b with the *Chin ching*,⁵ the *chhi* of the essences pertaining to the element Metal (and the *kua* Chhien¹); cf. Fig. 1550. The result it calls the outer macrobiogen (*wai tan*); this is a *chhi* or Yang thing. What it calls the inner one (*nei tan*) is a macrobiogen formed of internal body fluids, and therefore a Yin thing. On the other hand the *Chin Tan Ta Yao*'s 'exterior medicinal entity' (*wai yao*) is mutationally the Yang line of the *kua* Khan⁶ (corresponding to Water), i.e. a *chhi*; and its 'interior' one is the Yin line of the *kua* Li⁷ (corresponding to Fire), i.e. a secretion. The former is thus the Yang within the Yin, the latter is the Yin within the Yang. Meanwhile the *Chhi Pi Thu* correlates Khan *kua* with the reins and Li *kua* with the heart, emphasising the principle of inversion (on which see pp. 60 ff.). And Ying Chhan Tzu goes over the same ground, using technical terms less Taoist, more Buddhist and Neo-Confucian.

The last sentence of Chhen Chih-Hsü's text explains brilliantly why there had to be a *nei* and a *wai tan* within the enchymoma realm itself (of. Fig. 1546). But the descriptions of them varied. The *Hsiu Chen Pi Chüeh* passage has an inner and an outer enchymoma (*nei tan*, *wai tan*), the former leading only to earthly immortality, the latter giving ascension to the status of heavenly immortal.^c But in *Chin Tan Ta Yao* there are two medicinal entities, an inner and an outer (*nei yao*, *wai yao*; called in a just subsequent passage *Yin tan*⁸ and *Yang tan*⁹ respectively)^d only the former, according to Ying Chhan Tzu, giving ascension, while the latter just preserves the material body. How should one understand this seeming discrepancy? What the *Hsiu Chen Pi Chüeh* writer had in mind was the universally admitted correlation of Yang with externality, and indeed in the Chhien – Sun *kua* pair the outer Yin line had to be got rid of. In the *Chin Tan Ta Yao* Chhen Chih-Hsü followed exactly the

^a The fullness of time has brought us vastly deeper insight into the real processes of biochemistry, but the most recent concepts of ageing sometimes strangely recall these intuitive medieval formulations. On the Orgel theory, for example, ageing is an irreversible breakdown in the accuracy with which proteins are formed by the genetic coding mechanism of the nuclear system. Protein anabolism continues but as the organism ages it loses its efficiency and the wrong types of protein are made. If this is true, and if this 'error catastrophe' pattern could ever be reversed, it would be like restoring Chhien and Khun to their pristine perfection, and abrogating the mixed *kua*, symbols of degeneration and inefficiency. The Taoists believed that this could actually be done; we do but dare to live in hope.

^b 'Lignic secretion' is also often associated in *nei tan* texts with Chen¹⁰ *kua*. The reason for this can be seen from Fig. 1551 below, which shows their own characteristic systems of relating the *kua* to the five elements.

^c Cf. Vol. 5, pt. 2, pp. 106 ff.

^d P. 33a.

¹ 乾

² 坤

³ 木液

⁴ 巽

⁵ 金精

⁶ 坎

⁷ 離

⁸ 陰丹

⁹ 陽丹

¹⁰ 震

內 外 二 藥 圖

上藥三品神與氣精其體則一
 其用則二何謂體本來三寶一
 體是也何謂用內外兩般作用
 是也故悟真篇云內藥還同外
 藥內通外亦通通丹頭火熟白
 然紅溫養兩作用此漸教也
 權法也接中根及下根人

大藥雖分神氣精三般原是
 一根生凡夫生死如輪轉只
 因迷却本來心心即性也故
 朗然子曰本來真性號金丹
 四大為爐煉作圖此頓教也
 實法也接上根人及上上根人



Fig. 1546. A scholarly adept meditating on the inner and the outer enchymomas. From *Hsing Ming Kuei Chih* (+ 1615), ch. 1, p. 28b. In the explanations above there is reference to the three primary vitalities, *shen*, *chi* and *ching* (see text).

same idea, only with regard to the different *kua* Khan and Li, where the two key lines were both 'inside', yet one, the Yang, was 'external' in the fundamental correlation sense, and the other, the Yin, 'internal' in that sense. Thirdly, Ying Chhan Tzu also had in mind mainly the Yang line in Khan *kua*, but for him its most important feature was its 'internality' in the *kua*, hence his emphasis on the 'interior medicinal entity' as the more important of the two, conferring ascension. All three writers were deeply intent on restoring the Yang force of the organism, but they spoke about it in different ways. Ying Chhan Tzu was of course more than half Buddhist, and therefore committed to a primacy of *nei* ideas, as in meditation (*nei kuan*¹), hence his ways of talking.

A passage echoing the words of the *Chhi Pi Thu* just quoted is found in the *Chou I Tshan Thung Chhi Chu* by an anonymous Sung commentator. In this he says:^a

As for the meaning of the two terms 'superior virtue' (*shang tē*²) and 'inferior virtue' (*hsia tē*²),^b (we know that) the *kua* Li represents the heart, and occupies an upper position (in the body). Inside it is found a 'jade fluid' (*yü i*³) which can be made into an anablastemic enchyroma beneficial to man. Hence it is referred to as the 'superior virtue'. On the other hand the *kua* Khan represents the reins, which occupy a lower position (in the body). Within them is found a 'golden fluid' (*chin i*³)^c which can also be used for making an anablastemic enchyroma beneficial to man. Hence the name 'inferior virtue'.

Here the terms 'upper virtue' and 'lower virtue' refer both to the anatomical position of the relevant organs in the body, and to the *nei yao* and *wai yao* of Chhen Chih-Hsü respectively.^d

One more quotation from the *Hsiu Chen Pi Chüeh*. It takes the form of a typical Chinese sorites.^e

Whoever wishes to nourish the *shen*⁶ must first nourish the *chhi*,⁷ but in order to nourish the *chhi* one must first nourish the brain (*nao*⁸), and in order to nourish the brain one must first nourish the seminal essence (*ching*⁹), and in order to nourish the *ching* one must first nourish the blood (*hsüeh*¹⁰), and in order to nourish the blood one must first nourish the saliva (*thuo*¹¹), and in order to nourish the saliva one must first nourish the element Water.^f These are what are called the Nine Regenerations (*chiu huan*¹²). But if one talks about the Seven Reversions (*chhi fan*¹³), the greatest takes place in an annual cycle and the least in a diurnal cycle. Within the diurnal cycle, under the turning of the heavens and the earth, from the *yin* double-hour^g to the *shen* double-hour,^h these are the seven reversions. Or if you go backwards to the *tzu* double-hour,ⁱ you have the nine regenerations.^j

^a *TT*991, ch. 1, pp. 14b, 15a, tr. auct.

^b Cf. *Tao Tê Ching*, ch. 38.

^c Here we do not translate 'metallous fluid', for that meaning is more usually applied to the saliva, connected as it was in Taoist physiology with the organ of the Metal element, the lungs.

^d For more Buddhist interpretations of *shang tē* and *hsia tē* see *Chin Tan Ta Yao*, ch. 2, p. 31b.

^e A similar chain connecting *ching*, *chhi* and *shen*, occurs in *TT*275, ch. 1, p. 3a,b, which may be a Thang text. Variations on the theme are naturally common in these writings.

^f I.e. the reins or urino-genital system, which provided the semen.

^g Beginning at 3 a.m.

^h Ending at 5 p.m.

ⁱ Centred on midnight.

^j In *Lei Shuo*, ch. 49, p. 6a,b, tr. auct.

¹ 內觀

² 上德

³ 下德

⁴ 玉液

⁵ 金液

⁶ 神

⁷ 氣

⁸ 腦

⁹ 精

¹⁰ 血

¹¹ 唾

¹² 九還

¹³ 七返



Fig. 1547. Portrait of the physician Sun I-Khwei, prefixed to his *Chih Shui Hsüan Chu* of +1596.

From this one can see that the Taoists were paying great attention to carrying out their physiological exercises at different particular hours of the day and night. This constant vigilance calls to mind the complicated cycles of heating (the 'fire-times',

*huo hou*¹) which were so prominent in *wai tan* laboratory alchemy.^a And indeed, we may see that this expression was in fact used metaphorically by the *nei tan* physiological alchemists, who even went so far as to use directions about weights of ingredients as part of their hidden language (p. 58). How prominent the conception of 'regenerating, restoring or repairing the primary vitalities' (*hsiu chen*²) was, can be gauged by the large number of books which have this phrase as part of the title. A good deal needs saying about these and their content, but first we should like to conclude this introduction by giving a translation of a fundamental passage on *nei tan* alchemy by a medical writer of the late +16th-century. It was this passage which first enlightened us about the basic meaning of rebuilding, or reverting to, the primary vitalities.

It occurs in a work called *Chhieh Shui Hsüan Chu*³ ('The Mysterious Pearl recovered near the Red River'), a system of medicine and iatro-chemistry by the eminent Ming physician Sun I-Khuei⁴ (Fig. 1547). This was finished in +1596, the same year that saw the publication of the great *Pên Tshao Kang Mu* of Li Shih-Chen, so often quoted in these volumes. Towards the end of Sun I-Khuei's book, in chapter 10, he has an important section entitled *Fang Wai Huan Tan*⁵ (Regenerative Enchymomas beyond all ordinary Prescriptions), and he tells us that he had been searching these out for the previous fifty years. The passage which we shall here give forms a prelude to a longish section on sexual practices and related iatro-chemical preparations. It is prefaced by a long paragraph on the principles of redemptive hygiene (*yang shêng*⁶). Here Sun contrasts the Buddhist acceptance of fate (*thien ming*⁷) and the idea that chance and prayer alone determine whether death occurs a little earlier or a little later, with the Taoist attitude, to which he himself inclines, that people can do something actively and successfully about their life-span. Only usually they do not start taking care soon enough. 'One cannot entirely attribute events to fate' wrote Sun I-Khuei, 'on the contrary man can act in such a way as to conquer Nature'.^b Accordingly he counsels moderation in everything, and gives detailed instructions on diet and regimen; only after this are plant drugs any good at all, let alone the elixirs, even the most precious. The passage is entitled *Huan Tan Pi Yao Lun*^{8, c}

A Discussion of the Mysterious Principle of the Anablastemic Enchymoma.

What can one say about the anablastemic enchymoma (*huan tan*)? It is the Tao of reversion to the original state, the Tao of regeneration of the primary vitality (*fan pên, huan yuan*⁹).^d All human life has an endowment coming from the semen of the father and the blood of the mother.^e The child at the time of its birth (possesses) the primary *ching*, the primary *chi* and the primary *shen*—all in a state of perfect purity (*shun chhüan*¹⁰). But as it gradually

^a Cf. Vol. 5, pt. 4, pp. 266 ff.

^b *Pu kho chin wei chih thien ming; kai jen ting i kho-i shêng thien yeh.*¹¹

^c Ch. 10, pp. 20b, 21a, tr. auct. ^d Cf. Vol. 2, p. 76.

^e An Aristotelian doctrine also; see Needham (2), p. 42 ff.

¹ 火候 ² 修真 ³ 赤水玄珠 ⁴ 孫一奎 ⁵ 方外還丹 ⁶ 養生

⁷ 天命 ⁸ 還丹秘要論 ⁹ 反本還原 ¹⁰ 純全

¹¹ 不可盡委之天命蓋人定亦可以勝天也

grows up, this numinous triune natural life-endowment (*i ling chen hsing*¹) is attacked and corrupted by the temptations of the four senses caused by colours, sounds, perfumes and tastes, acting continually day by day and year by year. The primary *ching* deteriorates into the seminal essence of sexual intercourse (*chiao kan ching*²); the primary *chhi* changes into respiratory pneuma (*hu hsi chhi*³); and the primary *shen* is 'sicklied o'er by the pale cast of thought' (*ssu lü shen*⁴). These three primary endowments being thus dribbled away, it is exceedingly hard to regenerate the original innocence (*thien chen*⁵).^a

Therefore the teachers of old handed down their words in formulated doctrines, explaining in the various elixir and enchymoma manuals (*tan ching*⁶) the methods of repair (for this damage). Where the *ching* is deficient it must be restored with (primary) *ching*, where the *chhi* is deficient it must be restored with (primary) *chhi*, and where the *shen* is deficient it must be restored with (primary) *shen*. This is applying the principle of 'reverting to the origin and regenerating the primary vitality'.

Such is replenishment (*fu*⁷), but what really is replenishment? To bring back the *ching* to perfection is like providing (a plant with) deep roots, to bring back the *chhi* to perfection is like giving it a firm stalk, and to bring back the *shen* to perfection is like the bestowal of a marvellous harmony. To be able to perfect (*chhüan*⁸) (once again) these three (endowments), this is indeed (to use) the primary medicinal substances (i.e. the enchymoma) existing within the body itself. For example, many people have spoken of heaven and earth as 'furnace and reaction-vessel', of sun and moon as 'fire and water', of crow and rabbit as 'medicines and substances',^b of Yin and Yang as the 'mechanisms of change' (*hua chi*⁹), of dragon and tiger as the 'mysterious application of techniques', of *tzu* and *wu* as 'the two solstices',^c of *mao* and *yu* as 'the two equinoxes',^d—all this is symbolism and parables, but in truth it does not go beyond the body, the heart and the mind (*shen hsin i*¹⁰). Of these three things the body is correlated with the *ching*, the heart with the *chhi* and the mind with the *shen*.

Now what is this reversion (*fan*¹¹)? It is a renovation of these three things, contrary (*ni hsing*¹²) to the normal course (of ageing). What is regeneration (*huan*¹³)? It is to bring about a replenishment (*fu*¹⁴) of the three primary endowments. To make these three vitalities perfect and primary (as they were at the beginning of life)—that is what is meant by the anablastemic enchymoma.

Thus what the physiological alchemists were talking about essentially was rejuvenation, and they believed that by their techniques they could 'make all things new' (Fig. 1548). However we may judge their physiological theories now, there is no reason for doubting that under appropriate conditions they could perform miracles of restoring physical and mental health.

Before taking a survey of the Hsiu Chen books, and other parts of the *nei tan* literature, it may facilitate understanding of its fundamental ideas if we explain them in tabulated form. Table 121 A,B,C shows the main reagents of physiological

^a *Chen* and *yuan*¹⁵ are always equivalent in these domains.

^b A reference to the legendary animals in the sun and moon respectively, hence to the Yang and the Yin, and the organs in the body corresponding to them; but especially to the Yang within the Yin and the Yin within the Yang (cf. p. 40 and Fig. 1574).

^c I.e. the two double-hours centering on midnight and midday.

^d I.e. the two double-hours centering on 6 a.m. and 6 p.m.

¹ 一靈眞性	² 交感精	³ 呼吸氣	⁴ 思慮神	⁵ 天真
⁶ 丹經	⁷ 復	⁸ 全	⁹ 化機	¹⁰ 身心意
¹¹ 反	¹² 逆行	¹³ 還	¹⁴ 復	¹⁵ 元

三家相見圖

性命圭旨

身心意是誰分作三家

大道玄微見此圖分明有象不模糊
先將一二爲之用三四中當共一都

肝青爲父
肺白爲母
心赤爲女
脾黃爲祖
腎黑爲子
于五行始
三物一家
都歸戊己

不用五金併八石只求三品共一室
煉成一顆如意珠軟似兜羅紅似日

精氣神由我合成一箇



Fig. 1548. Emblematical illustration showing an adept holding the three interlinked primary vitalities, *shen*, *chi* and *ching* (see text). From *Hsing Ming Kuei Chih* (+ 1615), ch. 1, p. 36b. The left-hand verses adjure the alchemist to have nothing to do with the five metals and the eight minerals, but rather to transmute his own interior, and so to produce the enchymoma of immortality which will be soft like a ball of willow-floss or tree-cotton, and flaming, brilliant like the sun.

alchemy, including the *chhi*¹ and secretions (*i'*) of the body, such as saliva and semen. It was out of all these things that the primary or vital Yang (*Chen Yang*³) and the primary of vital Yin (*Chen Yin*⁴) had to be regenerated, and these two were the entities which the physiological alchemists designated as 'true mercury' (*chen hung*⁵) and 'true lead' (*chen chhien*⁶).^a The union of these produced the enchymoma of immortality.

In all the formulations there was much synonymy, so that every term could be explained by another on the same or a different level of analysis, but unless the existence of the different levels had been fully understood by the disciple beforehand in the course of oral instruction, complete confusion could easily result. The physiological alchemists certainly had a subtle and elaborate system of natural philosophy, but in those days the scientific and the technological were not yet wholly differentiated from the aesthetic and the religious, so that there developed a great abundance of terms and cover-names, often very poetical. This meant that they could preach, as it were, without undue repetition, but it makes the system seem sometimes more complex than it really was.^b

The table has been drawn up from statements in many of the texts which we name in this sub-section, but certain books in particular deserve mention, for example the *Thien Yuan Ju Yao Ching*⁷ (Mirror of the All-Penetrating Medicine (i.e. the Enchymoma restoring the Endowment) of the Primary Vitalities), written by Tshui Hsi-Fan⁸ in +940. This is a prose text without commentary,^c quite different from his more famous and much commented production in verse, which has as its title the last three characters alone, *Ju Yao Ching*.^d Another book with relatively clear explanations is the *Tho Yo Tzu*⁹ (Book of the Bellows-and-Tuyère Master) very deceptively chemical in its title, written by some unknown author of the Sung or Yuan period.^e It concludes with a useful appendix entitled *Yin Tan Nei Phien*¹⁰ (Esoteric Essay on the Yin Enchymoma). And one must not forget the catechetical questions and answers in the *Chin Tan Ta Chheng*¹¹ (Compendium of the Metallous Enchymoma),^f composed by Hsiao Thing-Chih¹² just before +1250. Finally, much profit is to be gained from the tradition which culminated in Shang Yang Tzu,¹³ Chhen Chih-Hsü,¹⁴ whose *Chin Tan Ta Yao Thu*¹⁵ (Illustrations for the Main Essentials of the Metallous Enchymoma; the true Gold Elixir)^g of +1333 incorporated many diagrams and succinct explanations derived from a

^a It is interesting to note how the basic imagery for *nei tan* was taken from the making of lead amalgam, not from the combination or decomposition of mercury and sulphur. We may return to this point later on.

^b This links with a point which will arise presently; cf. pp. 228, 291 below.

^c In *Hsiu Chen Shih Shu* (TT260), ch. 21, pp. 6b ff.

^d TT132 and TTCY, *hsü chi* 5. Also in *Hsiu Chen Shih Shu*, ch. 13, pp. 1a ff., and in *Tao Hai Chin Liang*, pp. 35a ff.

^e TT1174 and TTCY, *hsia mao chi* 5. It describes physiological alchemy in particularly mutationist terms.

^f In *Hsiu Chen Shih Shu*, (TT260), chs. 9 to 13 incl.; TTCY, *mao chi* 4, pp. 10a ff.

^g TT1054, and in TTCY as ch. 3, pp. 26 ff. of *Chin Tan Ta Yao*. Cf. Figs. 1581, 1582.

¹ 氣

² 液

³ 眞陽

⁴ 眞陰

⁵ 眞汞

⁶ 眞鉛

⁷ 天元入藥鏡

⁸ 崔希範

⁹ 橐籥子

¹⁰ 陰丹內篇

¹¹ 金丹大成

¹² 蕭廷芝

¹³ 上陽子

¹⁴ 陳致虛

¹⁵ 金丹大要圖



Fig. 1549. The eight trigrams in the Fu-Hsi arrangement, from Chang Chieh-Pin's *Lei Ching Fu I* (+1624), ch. 1, p. 2b. The text at the bottom is a quotation from the Great Appendix of the *I Ching* (Book of Changes).

succession of predecessors, going back through Chang Po-Tuan^{1 a} and Lin Shen-Fêng^{2 b} to Phêng Hsiao³ in the middle of the +10th-century. Phêng's most important work in the present context was his *Chou I Tshan Thung Chhi Ting Chhi Ko Ming Ching Thu*⁴ (An Illuminating Chart for the Mnemonic Rhymes about Reaction-Vessels in the 'Kinship of the Three and the Book of Changes')^c finished in +947 and commenting extensively on the rhymes, which themselves might be placed c. +140. Chhen's *Chin Tan Ta Yao*⁵ itself^d is also indispensable.

^a Cf. pp. 89, 92.

^b Cf. Fig. 1582.

^c *TT*994, cf. Fig. 1551.

^d *TT*1053, and in *TTCY*, *mao chi*, 1-3.

¹ 張伯端

² 林神鳳

³ 彭曉

⁴ 周易參同契鼎器歌明鏡圖

⁵ 金丹大要



Fig. 1550. The eight trigrams in the Wên Wang arrangement, from the *Lei Ching Fu I* (+ 1624), ch. 1, p. 4b. This is the Hou Thien system, that in the preceding Figure the Hsien Thien system (see text).

N. <i>Khun</i>				N. Khan			
W. Khan	Kên	Chen	Li E.	W. Tui	<i>Chhien</i>	Kên	Chen E.
	Sun	Tui		<i>Khun</i>	Sun		
	<i>Chhien</i>			Li	S.		
	S.						
The 'Fu-Hsi' system				The 'Wên Wang' system			

The first thing which must be said about the fundamental ideas of *nei tan* alchemy is that without giving serious attention to the ideology of the *I Ching* (Book of Changes)^a there is no hope of understanding them. It has been necessary accordingly to divide Table 121 into three separate parts. In Part A we have placed the normally expected natural symbolic correlations of the *kua* trigrams arranged according to the Fu-Hsi system.

This, we recall, was one of the two classical patterns in which the trigrams were ordered relative to the four directions of space, with all that that implied for the symbolic correlations.^b We show a typical illustration of it in Fig. 1549.^c To make the two patterns clear we reproduce also the diagrams already given in Vol. 4, pt. 1, p. 296; and in comparing this with Figs. 1549 and 1550^d it is only necessary to remember that while in the Chinese illustrations the south is always at the top we show it in the diagrams at the bottom, in accordance with universal modern usage. Summarising the conclusions to which we came in the Sections on natural philosophy and on magnetism (13 and 26), one could say that though the trigrams themselves, derived no doubt from the long and short sticks used anciently in divination, may well be as old as the time of Confucius (— 6th century) if not earlier, their two azimuthal patterns can hardly have crystallised much before the Han, and may not be older than the — 1st century, the time of the diviners Chiao Kan¹ and Ching Fang,² when the relevant part of the *I Ching* called the *Shuo Kua*³ was written. The attributions of that in Fig. 1549 to the legendary sage Fu-Hsi, and that in Fig. 1550 to the semi-legendary emperor Wên Wang, are frankly much later, probably connected with the Taoist-Confucian philosophers Chhen Thuan⁴ in the + 10th and Shao Yung⁵ in the + 11th centuries. The Fu-Hsi pattern, traditionally the older, was in fact very likely the later (though in a way more logical), because the diviner's board (*shih*^{6, 7}),^e ancestor of all magnetic compasses, was marked on the Wên Wang pattern,^f and early geomantic discussions indicate that this came to be thought unsatisfactory.^g Both patterns were associated with the ancient magic squares,^h Fu-Hsi's with the Ho Thu and Wên Wang's with the Lo Shu; but what is much more significant for us here is that Fu-Hsi's was always called the Hsien Thien⁸ system and Wên Wang's the Hou Thien⁹ one. The conventional translations of these two phrases as 'Former Heaven' or 'prior to heaven' and 'Latter

^a See Vol. 2, pp. 304 ff.

^b Vol. 2, pp. 261 ff.

^c Taken conveniently from the *Lei Ching Fu I*¹⁰ (Supplement to the 'Classics Classified'; the Institutes of Medicine), written by Chang Chieh-Pin¹¹ in + 1624.

^d Also from *Lei Ching Fu I*.

^e See Vol. 4, pt. 1, pp. 262 ff.

^f *Ibid.*, Fig. 326.

^g The eventual geomantic compass (*lo phan*¹²) generally showed both arrangements, retaining the Wên Wang (Hou Thien) system for the written names of the *kua*, and adopting the Fu-Hsi (Hsien Thien) system for the *kua* as depicted with their long and short lines. Fig. 333 in Vol. 4, pt. 1, however, shows a mariner's compass with the depicted *kua* in the Wên Wang pattern.

^h See Vol. 3, pp. 56 ff.

¹ 焦贛

² 京房

³ 說卦

⁴ 陳搏

⁵ 邵雍

⁶ 式

⁷ 栻

⁸ 先天

⁹ 後天

¹⁰ 類經附翼

¹¹ 張介賓

¹² 羅盤

Table 121 A. *Natural Symbolic Correlations according to the Fu-Hsi (Hsien Thien) kua pattern*

Yang			Yin		
	乾	Chhien <i>kua</i> (south)		坤	Khun <i>kua</i> (north)
<i>thien</i>	天	heaven	<i>ti</i>	地	earth
<i>shang</i>	上	upper, ascending	<i>hsia</i>	下	lower, descending
<i>jih</i>	日	sun	<i>yüeh</i>	月	moon
<i>nan</i>	南	south	<i>pei</i>	北	north
<i>huo</i>	火	fire	<i>shui</i>	水	water
<i>chiu, i</i>	九一	nine, one	<i>liu, pa</i>	六八	six, eight
<i>kang</i>	剛	hard	<i>jou</i>	柔	soft, pliable
<i>tung</i>	動	activity, movement	<i>ching</i>	靜	rest, immobility
<i>chün</i>	君	prince	<i>chhen</i>	臣	minister
<i>fu</i>	父	father	<i>mu</i>	母	mother
<i>fu</i>	夫	husband	<i>fu</i>	婦	wife
<i>nan</i>	男	male	<i>nü</i>	女	female
<i>lu</i>	爐	furnace	<i>ting</i>	鼎	reaction-vessel
<i>wai</i>	外	outer	<i>nei</i>	內	inner
<i>piao</i>	表	superficial	<i>li</i>	裡	deep-seated
	離	Li <i>kua</i> (east)		坎	Khan <i>kua</i> (west)

Heaven' or 'posterior to heaven' are practically meaningless, and have come down to us from the pioneer or dead-pan period of Western sinology; what matters now is that both in medicine and in physiological alchemy the former always refers to the 'pre-natal endowment' or hereditary constitution full of health, the latter to the psycho-somatic organism during and after ageing.

Here we come close to the significance of Table 121 A and Figs 1549, 1550 for the physiological alchemists. Their essential aim was symbolised by, or verbalised as, the reconstitution of the two *kua* Chhien and Khun (Yang and Yin of pristine purity) on their south-north axis, but with positions inverted to be in the north and south respectively; and this was to be effected by the exchange of Yin and Yang lines between Khan (here in the west) and Li (here in the east), as already adum-

brated above (pp. 22, 41). Such was the way in which it was possible for the *nei tan* adepts to talk about the separation and restoration of pure Yang and pure Yin—transforming, as it were, the greybeard to the zygote.

With our eyes thus opened, it is worth while to read again the passage quoted in Vol. 2, pp. 332–3 from Chhen Hsien-Wei's¹ commentary of +1254 on the *Fu*² (cauldrons or reaction-vessels) chapter of the *Kuan Yin Tzu*³ book,^a written by some unknown Taoist of the Thang. There is the intercourse between Khan and Li, the boy and girl within them, the antagonism of Water and Fire, the transformation of dragon and tiger within one's own viscera, and other similar images, mixed however (as was the wont of so many alchemists) with descriptions which would recall the phenomena to be seen in proto-chemical laboratories.^b

Every natural object and entity was, for the Taoists, in the last analysis, a mixture of Yin and Yang. All manifestations of varying qualities and shapes were the results of the different quantitative proportions of these two 'components' existing within them;^c for example, the sun has within it more Yang than Yin (like *Li kua*), but the reverse is true of the moon (resembling *Khan kua*). A more precise or sophisticated expression of this quantitative doctrine, enriching the realm of *nei tan* theory, was found in the extension of these considerations so as to include not only the trigrams but also the whole system of the hexagrams.^d We shall see something more of this presently.

We turn now to the second classical arrangement of the trigrams (Fig. 1550), the Wên Wang (Hou Thien) system; here *Li kua* is situated at the south and *Khan kua* occupies the north. *Nei tan* alchemy was primarily concerned with the attempt to recast one's own body to a state like that of the *Hsien Thien Chen I chih Shui*,⁴ the 'Water of the Primordial Unity of the Pre-Natal Endowment'. *Nei tan* training also aimed at converting the degenerating 'worldly' *chhi* which circulated round the body through all the viscera into the essential *Hsien Thien Chen I chih Chhi*,⁵ the 'Chhi of the Primordial Unity of the Pre-Natal Endowment'.^e Why the Wên Wang arrangement of the *kua* was so important for physiological alchemy was because the

^a *Wên Shih Chen Ching*, ch. 3, p. 1 b, (ch. 7).

^b We noted at the time that the passage was at least as much *nei tan* as *wai tan*, but in those days we thought of the former as mystical, spiritual or psychological rather than physiological.

^c This is irresistibly reminiscent of the 9th-century Jābirian 'Books of the Balances', which we have discussed already in pt. 4, pp. 393, 459 ff., and raises again the question of Chinese influence on Arabic alchemy.

^d Every one of these, it will be remembered (cf. Fig. 41, opp. p. 276 in Vol. 2) was predominantly either Yin or Yang. How deep the insight of the mutationists went in visualising an infinite regress of Yin–Yang compositions, positive and negative being inseparable even in the smallest natural things, could hardly have been appreciated before modern nuclear physics. Of course they knew about the poles of magnets.

^e This was the condition of the embryo at conception, rejoicing in the pure Yang and pure Yin of the paternal and maternal contributions. So far the thought was truly Taoist. But beyond this again, in later syncretistic formulations, one could remount to the *Thai Chi*⁶ realm of primordial unity before the differentiation of Yin and Yang, and be absorbed into the Tao, the Mother of the Myriad Things (*Wan Wu chih Mu*); cf. Vol. 2, pp. 460 ff. This idea might look Neo-Confucian, but was evidently influenced also by the Buddhist conception of extinction in *nirvāna*.

As for the paternal and maternal contributions, it is not surprising, when one thinks of them in this way, that the iatro-chemists later on applied themselves to processes starting with semen and menstrual blood. Cf. pp. 301 ff.

¹ 陳顯微

² 釜

³ 關尹子

⁴ 先天眞一之水

⁵ 先天眞一之氣

⁶ 太極

⁷ 萬物之母

Table 121 B. *Natural Symbolic Correlations according to the Wên Wang (Hou Thien) kua pattern*

Yang			Yin		
	離	Li kua (south)		坎	Khan kua (north)
<i>hung</i>	汞	mercury	<i>chhien</i>	鉛	lead
<i>shang</i>	上	upper, ascending	<i>hsia</i>	下	lower, descending
<i>jih</i>	日	sun	<i>yüeh</i>	月	moon
<i>nan</i>	南	south	<i>pei</i>	北	north
<i>huo</i>	火	Fire (element)	<i>shui</i>	水	Water (element)
	乾	Chhien kua (NW)		坤	Khun kua (SW)
<i>nan</i>	男	male	<i>nü</i>	女	female
<i>hsin</i>	心	heart	<i>shen</i>	腎	reins
<i>chhi</i>	氣	pneuma	<i>thuo</i>	唾	saliva
<i>hsüeh</i>	血	blood	<i>ching</i>	精	semen
<i>hung</i>	紅	red	<i>hei</i>	黑	black
<i>shang tê</i>	上德	superior virtue	<i>hsia tê</i>	下德	inferior virtue
<i>fou</i>	浮	floating, volatilising	<i>chhen</i>	沉	sinking, seeping
<i>chu</i>	主	host	<i>pin</i>	賓	guest
<i>wo</i>	我	self	<i>pi</i>	彼	other
<i>shêng</i>	升	rising, transmitting upwards	<i>chiang</i>	降	descending, showering down
<i>chhing lung</i>	青龍	caerulean dragon (east)	<i>pai hu</i>	白虎	white tiger (west)

Five Elements came to be incorporated in it (Fig. 1551), and their participation was obviously a *sine qua non* for any natural (or counter-natural) process. In Table 121 Part B we have placed the normally expected natural symbolic correlations of the *kua* trigrams according to the Wên Wang system. Furthermore, a special chart designed to elucidate *nei tan* theory was drawn up in +947 by Phêng Hsiao¹ and captioned *Ming Ching Thu*² (Bright Mirror of Physiological Alchemy).³ This table and the discoidal chart we must now examine.

³ *TT*994, p. 8a,b; reproduced in the *TCY* ed. of *Chin Tan Ta Yao*, ch. 3, pp. 33b, 34a.

¹ 彭曉 ² 明鏡圖

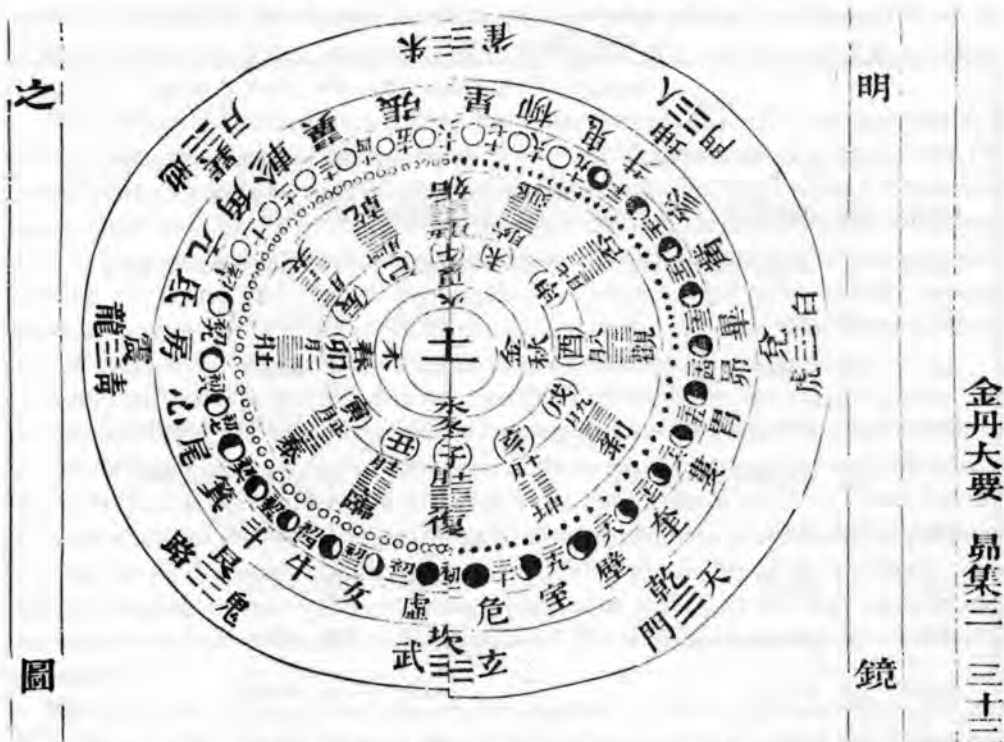


Fig. 1551. The chart called *Ming Ching chih Thu* (Bright Mirror of Physiological Alchemy) drawn up by Phêng Hsiao in +947. From the *Chin Tan Ta Yao Thu* (Illustrations for the Main Essentials of the Metallous Enchymoma, the true Gold Elixir), completed by Chhen Chih-Hsü in +1333. In *TTCY*, *mao chi* 3, p. 33a,b (TT1054).

Any distribution of the five elements among eight trigrams necessarily resulted in three duplications. These were as follows: Metal was distributed both to Chhien and Tui, Water both to Khan and Chen, and Earth both to Kên and Khun. This left Li with Fire and Sun with Wood. It will be remembered that in the *Hsiu Chen Pi Chüeh* passage quoted above (p. 37) we encountered the expression *mu i*¹ (lignic secretion) and *chin ching*² (metallous essence). The *chhi* of these two gave rise to an 'outer macrobiogen' (*wai tan*) which was superior to its companion 'inner macrobiogen' (*nei tan*) because only the former could affect ascension. This is now explained by Fig. 1551. The 'lignic secretion' was represented by the Yin line in the *kua* Sun, and the 'metallous essence' by the corresponding Yang line of the *kua* Chhien. Exchange generated a new Chhien, filling the bodily secretions with the Yang force required for the ascension of the immortal into the heavens.

In the *Ming Ching Thu*, however, the number of directional element places was reduced to four. The innermost circle of Fig. 1551 (i.e. the first ring) shows Water below with Fire above, Wood to the east and Metal to the west, Earth being situated at the centre of all.^a The function of Earth is to facilitate the interaction and the

^a This was an extremely classical correlation, the same as that in Table 12 in Vol. 2, p. 262.

¹ 木液 ² 金精

union of the opposites—Fire and Water, or Wood and Metal.^a The new relationship of elements and *kua* can now be seen by comparing the first ring with the eighth. The Wood element of Sun *kua* in the south-east (on the Wên Wang pattern) has been moved to the east under Chen *kua*, while the Chhien Metal of the north-west has been combined with Tui Metal and stands in the west. Similarly the Chen Water of the east has been combined with Khan's Water and occupies a purely north position.^b Continuing outwards from the centre, the further rings are concerned with the passage of time; the second one shows the four seasons of the annual cycle and the third the twelve double-hours of the diurnal cycle.^c Next comes, in the fourth ring, the round of months, each with its corresponding hexagram both depicted and named in writing. Inspection of these immediately shows that at the north direction (*tzu*¹) stands the first *kua*, Fu² (no. 24),^d in a clockwise series of steadily increasing Yang content; this becomes maximal at the sixth position thereafter (inclusive) where the hexagram Chhien (no. 1) is reached. After that follows Kou³ *kua* (no. 44) with one Yin line, and so the process goes on till the fully Yin hexagram Khun (no. 2) is reached, again in the sixth position forwards. Thus is delineated in other terms the sine curve of rising and falling Yang and Yin forces;^e the advancing phase being called *chin Yang huo*,⁴ the retiring phase *thui Yin fu*.⁵ One complete revolution was termed in parable a 'firing-' or 'heating-time' (*huo hou*⁶). Continuing outwards, the fifth ring shows the hundred quarter-hours of day and night (distinguished as white and black respectively),^f while the sixth gives a graphic representation of the waxing and waning of the moon, one picture for each day of the lunar month, and all in phase with the advance and retirement of the Yang. From the new moon onwards the waxing period was called 'rising crescent' (*shang hsien*⁷), while the waning in the third and fourth quarters was called 'falling crescent' (*hsia hsien*⁸); these two terms are often met with in the texts of physiological alchemy^g—and for a good reason, because the triumphant Yang on one side came forth from within the Yin, and the prospering Yin on the other still contains some of the Yang of the full moon. Hence the expressions *hu chih hsien chhi*,⁹ 'the (rising) crescent *chhi* of the Tiger', i.e. the Yang coming forth from within the Yin, and the *lung chih hsien chhi*,¹⁰ 'the (falling) crescent *chhi* of the Dragon', i.e. the Yin coming forth from within the Yang. Hence the veiled usage of 'two eight-ounce amounts of lead and mercury (*erh pa liang*¹¹)'; a secret way of referring to the lunar

^a Cf. pp. 82, 92 for other names of this central arena of the hierogamy.

^b We reproduce in Fig. 1552 an illustration from the *Hsing Ming Kwei Chih* of +1615 (on which see p. 224 below) showing the four symbolic animals of the azimuth directions, dragon, tiger, tortoise and bird, surrounding the reaction-vessel in which the enchymoma is being prepared.

^c See Needham, Wang & Price (1), *passim*.

^d Cf. Table 14 in Vol. 2.

^e Cf. Fig. 277 on p. 9 in Vol. 4, pt. 1.

^f See Needham, Wang & Price (1).

^g E.g. *Chin Tan Ta Yao*, ch. 3, pp. 36a to 37a.

¹ 子 ² 復 ³ 姤 ⁴ 進陽火 ⁵ 退陰符 ⁶ 火候
⁷ 上弦 ⁸ 下弦 ⁹ 虎之弦氣 ¹⁰ 龍之弦氣 ¹¹ 二八兩



Fig. 1552. An illustration from *Hsing Ming Kuei Chih* (ch. 1, p. 37b) showing the symbolical animals of the four directions surrounding and influencing the bodily reaction-vessel in which the enchymoma is being prepared. The tortoise of the North is at the bottom, and the red bird of the South at the top; the dragon of the East and the tiger of the West are inverted—like so much else in physiological alchemy. The four beasts mirror the four organs: liver, reins, heart and lungs, which participate in the achievement of the enchymoma. On the background of the expression *wu lou* at the top of the right-hand inscription, see p. 252.

quarters (two eight-day intervals) already mentioned.^a Then the seventh ring shows the 28 lunar mansions (*hsiu*¹) around the celestial equator.^b Lastly, the eighth ring shows the eight trigram *kua*, both depicted and named, in the Wên Wang arrangement. Thus Phêng Hsiao, as his title indicates, revealed in this diagram the basic theory of physiological alchemy.

As for Table 121 B, most of the first eight entries have already figured in Part A. But mercury and lead now make their appearance, together with a number of physiological organs, fluids and processes. How these were dealt with by the *nei tan* adepts brings us to the third part of the Table.

All the correlations discussed so far were compatible with the assumption that processes were following (*shun*²) the ordinary course of Nature; and in elixir alchemy this idea almost always prevailed. But in enchymoma alchemy the adept was vowed to a 'way of upside-downness' (*tien tao*³). Both in practice and in theory he applied a counter-natural or widdershins principle in physiology, seeking to go against (*ni*⁴) the normal course. The arrest and reversal of the ageing process with its ultimate end in death was after all something apparently contrary to Nature. So in counter-current style he not only retained and conserved secretions usually lost from the body, but obliged the Yang within the Yin of saliva-lead to go downwards,^c and raised up the Yin within the Yang of semen-mercury.^d These are just two examples of the expressions 'showering down' upon the central and lower regions, and 'nourishing' the upper regions. Where the vital pre-natal Yin and Yang (true mercury and true lead)^e met and reacted, in the centre of the body (*chung thu*⁵) corresponding to Earth, close by the spleen, there would the anablastic enchymoma (*huan tan*⁶) be formed (Fig. 1553).^f Inversion would bring reversion—to eternal youth.

In Part C of Table 121 we have assembled the chief terms and symbols of the counter-natural inverted correlation system. It will be noted that the columns are no longer headed by Yang and Yin, but by Chen Yang and Chen Yin, the vital pre-natal 'prelapsarian' Yang and Yin. It is now significant that the *kua* Khan and Li have crossed over and changed their places. This is because their inner lines represent Chen Yang and Chen Yin respectively, and if these could be made to return to

^a Note also the two and eight in the fourth circle.

^b See Vol. 3, pp. 231 ff. Although it is not shown here, the Great Bear constellation (*Pei tou*²) is found in many *nei tan* diagrams, often at their centre, on account of the regularity of its apparent diurnal and annual revolutions. Paralleling the circulation of the *chi*, this double movement was taken as an earnest of the possible compression of a year's physiological work into the twelve double-hours of one day and night. On such accelerations in *wai tan*, cf. pt. 4, pp. 242 ff.

^c Which Yang normally should not do.

^d Which Yin normally should not do.

^e Many synonyms and poetical cover-names for these are listed in *Chin Tan Ta Yao*, ch. 3, pp. 36a, 37a, respectively, following *Wu Chen Phien* (in HCSS, TT260, ch. 26, pp. 5b, 6a).

^f There was a wealth of synonyms for this too; see *Chin Tan Ta Yao*, ch. 3, p. 36a, b, following *Wu Chen Phien* (in HCSS, TT260, ch. 26, p. 6a). Some are particularly tricky. The terms 'baby boy' (*ying erh*⁸) and 'current-driven water-raising machine' (*ho chhê*⁹) were used both for true lead and for the enchymoma itself. Another enchymoma synonym again was 'autumn mineral' (*chhiu shih*¹⁰), on which much more will have to be said in due course (pp. 311 ff.).

宿 順 顛倒 逆 中土
 還丹 北斗 嬰兒 河車 秋石

Table 121 C. Counter-natural Inverted Nei Tan Correlations

Chen Yang ☷ 坎 Khan kua			Chen Yin ☲ 離 Li kua		
<i>Yin chung chih Yang</i> (the Yang within the Yin) 陰中之陽			<i>Yang chung chih Yin</i> (the Yin within the Yang) 陽中之陰		
<i>chen chhien</i>	真鉛	true lead	<i>chen hung</i>	真汞	true mercury
<i>shang</i>	上	above	<i>hsia</i>	下	below
<i>Khan nan</i>	坎男	the 'Lad of Khan' (in the moon)	<i>Li nü</i>	離女	the 'Maiden of Li' (in the sun)
<i>ying erh</i>	嬰兒	the 'Baby Boy'	<i>chha nü</i>	姘女	the 'Lovely Girl'
<i>nan</i>	南	south	<i>pei</i>	北	north
<i>shui</i>	水	Water	<i>huo</i>	火	Fire
<i>chin ching</i>	金精	metallous essence	<i>mu i</i>	木液	lignic secretion
<i>chin i</i>	金液	metallous fluid	<i>yü i</i>	玉液	jade fluid
<i>(Hsi Shan)</i> <i>pai hu</i>	西山白虎	White Tiger (of the Western Mountains)	<i>(Tung Hai)</i> <i>chhing lung</i>	東海青龍	Caerulean Dragon (of the Eastern Ocean)
<i>hu chih</i> <i>hsien chhi</i>	虎之弦氣	(rising) crescent <i>chhi</i> of the tiger	<i>lung</i> <i>chih hsien chhi</i>	龍之弦氣	(falling) crescent <i>chhi</i> of the dragon
<i>chhen</i>	沉	sinking, seeping	<i>fou</i>	浮	floating, volatilising
<i>chu</i>	主	host	<i>pin</i>	賓	guest
<i>pi</i>	彼	other	<i>wo</i>	我	self
<i>chiang</i>	降	descending, circulating downwards	<i>shêng</i>	升	rising, circulating upwards
<i>chin lu</i>	金爐	metallous furnace	<i>yü ting</i>	玉鼎	jade reaction-vessel
<i>shang</i> <i>hsien chin pa liang</i>	上弦金八兩	'eight ounces of rising-crescent gold	<i>hsia</i> <i>hsien yin pa liang</i>	下弦銀八兩	'eight ounces of falling-crescent silver'
<i>ti pho</i>	地魄	earthly anima	<i>thien hun</i>	天魂	celestial animus
<i>wu thu</i>	戊土	<i>wu</i> Earth	<i>chi thu</i>	己土	<i>chi</i> Earth
<i>wai tan</i>	外丹	outer enchymoma	<i>nei tan</i>	內丹	inner enchymoma
<i>Yang tan</i>	陽丹	Yang enchymoma	<i>Yin tan</i>	陰丹	Yin enchymoma
<i>huo chhê</i>	河車	'current-driven water-raising machine'	<i>niu chhê</i>	牛車	'ox-driven water- raising machine'

their original homes (as it were by an exchange between Khan and Li), then the pristine purity of Chhien and Khun *kua* could be reconstituted, as in the pre-natal endowment. To express the process in mutationist terms the first operation in the *tien tao* inversion system was to bring the *kua* Khan to the south and to take the *kua* Li to the north (cf. Fig. 1551).^a Next came the movement of the central lines, Yang and Yin, the Yin one from Li being made to go up anti-clockwise, and counter-current (*ni hsing*⁴), via the West, and along the *hsia hsien*² half-circuit; the Yang one from Khan being made to come down similarly via the East and along the *shang hsien*³ half-circuit. Thus Chhien is finally reconstituted, but in the north, while Khun is also reconstituted, but in the south. As Chhen Chih-Hsü said: 'Following the course of Nature leads to common birth and death, but going against it leads to immortality (*shun tsê fan, ni tsê hsien*)'^b—a crystalline epigram indeed. And how profound a truth lay hid in this exaltation of the feminine qualities and virtues to the highest place, perhaps nothing less than the key to all human social evolution in its sublimation of intra-specific aggressiveness, can be sensed if we see in the enthronement of Khun an echo of the Magnificat—'He hath put down the mighty from their seat, and hath exalted the humble and meek.' And in the individual life-span it must certainly have contributed to serene longevity, even if it did not lead to the immortality that the Taoists visualised.

As for the specifically alchemical aspects of *nei tan*, it was necessary, we know, to extract the Chen Yin from within the Yang, and the Chen Yang from within the Yin.^c For the physiological alchemists the Yin line of Li represented the 'true, or vital, mercury' (*chen hung*⁵), and the Yang line of Khan represented the 'true, or vital, lead' (*chen chhien*⁶). 'Our' mercury and 'our' lead were thus the vital *chhi* and essences extracted by internal work from juices, *chhi* or secretions of the opposite sign. And true mercury and true lead were the two precursors or proximate components of the anablastemic enchymoma.

This meant, as we have seen, that Khan and Li had to be, as it were, operated on, and their central lines drawn out and despatched in directions opposite to their natural tendencies. The Yang central line in Khan would of itself tend to rise, the Yin central line of Li would of itself tend to sink, but just the opposite was to be effected. Take another look at the Ming Ching Thu in Fig. 1551. If no inversion of Khan and Li's positions had taken place Chhien would be re-formed in its natural locus, the south, as in the Fu-Hsi pattern (Fig. 1549). But 'naturalness' was not what was wanted. Chhien was to be kept under and brought into subjection so that Khun might spread its beneficent influence. Just the same thing was borne out

^a This was just the opposite of the arrangement in the Wên Wang pattern.

^b *Chin Tan Ta Yao*, ch. 1, p. 47a.

^c One cannot help feeling that this whole idea was the result of a true intuition, that there is female in what seems male, and male in what seems female. Not only has modern psychology come to appreciate the truth of this, but also in human anatomy we know that all the sexual organs and structures of the opposite sex are present in each body, though in reduced and vestigial form. And to a large extent, sometimes indeed a paradoxical extent, the same is true of the sex hormone molecules themselves, though not necessarily the competence to react to them.



Fig. 1553. Image of Mei-Thau Tsang Wang, one of the 500 Lohan at the temple of Pao-Kuang Ssu, near Hsintu in Szechuan (orig. photo. 1972). The enchymoma is personified as the 'divine embryo' or 'baby boy' (*ying erh* or *chih tzu*), formed in the lower area of vital heat (*tan thien*) or central 'Yellow Court' (*huang thing*).

when one looked at the hexagrams formed by the combinations of Khan, Li, Chhien and Khun. Li upon Khan gives the hexagram Wei Chi (no. 64); if Li's centre were allowed to sink and Khan's to rise, as they would according to 'Nature', the result would be Phi (no. 12), i.e. Chhien upon Khun:



This manifestation, with maleness so much in the ascendant, is not auspicious, for Phi stands for evil and decay, the beginning of autumn, stagnation and even retrogression, 'the way to dusty death'. Try the alternative. Khan upon Li forms the hexagram Chi Chi (no. 63); now if Li's centre is made to rise and Khan's centre is made to sink (according to counter-nature) the result will be Thai (no. 11), i.e. Khun upon Chhien:



a hexagram full of the promise which the physiological alchemists wanted. Female-ness was now in the ascendant, as in Taoist thought it should be. This *kua* betokens prosperity and springtime, peace and upward progress, growth and youthfulness, bearing even in its character-structure evidence of the fertilising living waters flowing down from the sacred mountain Thai Shan (Fig. 1554). It only remains to mention that Chi Chi and Wei Chi themselves, respectively definable as consummation or perfect order, and disorder potentially capable of consummation, perfection and order, are terms important in quite different but related departments of alchemy, as we can see elsewhere (pt. 4, pp. 70ff.).

How exactly the physiological alchemists visualised their interior work with the forces which were symbolised in the *kua* and the mutations it is now extremely difficult to say. The movement of the *kua* and their lines was used as a language^a for talking about those inner chemical operations by means of which vital Yang (Chen Yang¹) and vital Yin (Chen Yin²), under the names of the two sets of entities in Table 121 C above, could be made to react to give a new birth, just as they once had done in conception and development. Moreover it is important to realise that whether a writer speaks of a 'true' chemical substance, or a *kua*, or a representative animal, or one of the symbolic correlations,^b what he has in mind is the extraction of vital Yang from seemingly Yin things and vital Yin from seemingly Yang things,

^a From sources such as Shang Yang Tzu's commentary on *Wu Chen Phien*, ch. 2, p. 3b, and *Chin Tan Ta Chéng* (in *TT260*, ch. 9, pp. 1 aff.) we know that the *kua* were regarded as images or symbols (*hsiang*³) of the Yin and Yang and the four spatial directions, while 'sun' and 'moon' were equally images of Khan and Li. Similarly 'true lead' and 'true mercury' were called the 'substance-names' (*thi*⁴) of Chen Yang and Chen Yin. The many synonyms in Table 121 A, B, C, were considered metaphors (*phi yü*⁵), while some other terms such as *nan* and *nü*, male and female, were called 'vague expressions' (*hsü ming*⁶). See further on p. 223 below. Hsiao Thing-Chih ends up by saying (ch. 9, p. 12b) that all the terms of art in physiological alchemy apply to things invisible, not capable of use like material substances.

^b Cf. Vol. 2, pp. 261 ff.

¹ 眞陽 ² 眞陰

³ 上陽子 ⁴ 象 ⁵ 體 ⁶ 譬喻 ⁷ 虛名



Fig. 1554. An adept meditates upon the inversion of the trigrams Khan and Li (see text). From *Hsing Ming Kuei Chih* (ch. 1, p. 38b). It is entitled 'Bringing the (feminine lines of the) *kua* Khan to fill up the *kua* Li'. The verses above describe elegantly the re-formation of the *kua* Chien (and Khun), just as the enchymoma involves a regeneration of the primary vitalities dominant in infancy.

more especially both from our own body-fluids, then and only then to react with the formation of the enchymoma, the primal unity (*chen i*¹) of immortal life. Thus would the last dispensation of death be reversed to regain the original endowment (*hsien thien*²)^a in its perfection. And finally it should be noted that all this led to the iatro-chemical movement (see pp. 301 ff.) which attempted to extract vital materials from human secretions, fluids and tissues, using the methods of chemical alchemy.

There does also seem something interesting in the insistence, for such it reveals itself to be, on the pre-eminence of the feminine and the regulation of the masculine characteristics. Perhaps we need do no more here than ask the reader to take a glance once again at what was said in Sect. 10 about the stand the Taoists took against male domination, rationality, intolerance and aggressiveness, and in favour of female receptivity, gentleness, affection and intuition.^b Hence their favourite symbols of Water and the Feminine, the 'Valley Spirit that never dies'. If then they were on the side of meekness against wrath, of Aphrodite against Ares, was not that a prescription for longevity in itself? And may it not be that the triumph of feminine peace within the body and soul (for they would have made no distinction) was somehow involved in the meditations with which they accompanied their physiological practices?

Turn back, O Man, forswear thy foolish ways,
Old now is earth, and none may count her days,
Yet thou, her child, whose head is crowned with flame,
Still wilt not hear thine inner god proclaim—
'Turn back, O Man, forswear thy foolish ways'.^c

Perhaps in other contexts it is a programme for our time as well as theirs.

In the light of the foregoing explanations many statements which might otherwise seem incomprehensible or even contradictory become relatively easy to understand. For example, Shih Thai in the *Huan Yuan Phien* (cf. p. 102)^d about + 1140, takes 'true, or vital, lead' as *pai hu chih*,³ the fat of the white tiger, and calls 'true, or vital, mercury' *chhing lung sui*,⁴ the marrow of the caerulean dragon. This is obviously reasonable from Part c of Table 121, fat and marrow representing in parable the inner or central lines. So also Hsiao Thing-Chih in the *Chin Tan Ta Chhêng* (see p. 120)^e says about + 1250, in the Song of the Bellows and Tuyère (*Tho Yo Ko*), that this lead-dragon must go up and this mercury-tiger must come down (*chhien lung shêng hsi, hung hu chiang*)⁵.^f And again: 'the lead rises and the

^a Much more will have to be said on this important term and its antithesis in Vol. 6; meanwhile one may turn to Vol. 4, pt. 1, p. 296.

^b Vol. 2, pp. 57 ff.

^c Clifford Bax, set to music by Gustav Holst, in 'Songs of Praise', no. 197.

^d In *TT260*, ch. 2, pp. 1 b, 2 a.

^e In *TT260*, ch. 9, p. 7 a.

^f This is a good example of the double way of talking so often met with. Hsiao is here referring to Khan and Li *kua* before their positional inversion and the extraction and despatch of their central lines.

¹ 眞一 ² 先天 ³ 白虎脂 ⁴ 青龍髓 ⁵ 鉛龍升兮汞虎降

(quick-)silver sinks' (*chhien fou erh yin chhen yeh*).^a This refers to the counter-natural (*tien tao*²) process explained above (Table 121, Part C). The same association is also very clear in the +14th-century *Chin Tan Ta Yao*,^b as may be seen in the long quotation already given (p. 40). An earlier statement can be found in the *Huan Tan Nei Hsiang Chin Yo Shih* (cf. p. 22), which goes back to +950, here already 'true' lead is associated with *ching*.^c And as we shall note in due course (p. 225), various commentators on the *Tshan Thung Chhi* indicate that it is 'our lead' which has to be conveyed up the vertebral axis to the cephalic end of the body.

The 'biochemical' reaction between the essential enchymoma components was thought of as a *conjunctio oppositorum* and expressed in sexual imagery without reserve. For example, the *Thien Yuan Ju Yao Ching* gives a diagram including the *kua* Khan and Li, entitling it *Khan Li chiao kou chih thu*,^d 'chart of the intercourse between the *kua* Khan and Li', and embodying two lines of verse which say:^d

The Yin tiger shall revert to the position it had before Khan,^e
And the Yang dragon claim its original home at the centre of Li.^f

And the *Ju Yao Ching* says in one place:^g

If the water is true water, and the fire is true fire,
And if you can bring them to bed together,
Then you will never see old age.

Here is a reference to the 'true mercury' and 'true lead' of the two great ingredients, and the reaction which produces the enchymoma.^h And in another:ⁱ

Bearing is in the sign of Khun⁵
Sowing the seed is in the sign of Chhien,⁶
If you can work in the purest sincerity
You will be following the way of Nature itself.^j

Always one finds the two processes mentioned thus in parallel, as in another book of the Thang or Sung, the *Shang-Tung Hsin Tan Ching Chüeh*⁷ (An Explanation of the Heart Elixir and Enchymoma Canon; a Shang-Tung Scripture).^k This text

^a TT260, ch. 10, p. 7b.

^b Ch. 1, pp. 31bff.

^c *Chin ching*⁸ in Table 121 c. Also *chen i chih ching*,⁹ an expression quite often found equivalent to *Hsien-Thien Chen I chih Shui* and *Hsien-Thien Chen I chih Chhi* (cf. p. 54 above). This same character, *ching*, means of course also the actual semen itself, as in the expression 'making the semen return upwards to nourish the brain' (p. 30). But it would be a great mistake to read *ching* as always referring only to the material secretion itself.

^d TT260, ch. 21, p. 9b.

^e I.e. before Khan *kua* was born from Khun *kua*.

^f Li *kua*, thus restoring Chhien *kua*.

^g P. 16b. *Shui chen shui, huo chen huo, shui huo chiao, yung pu lao*.¹⁰

^h On p. 8a the writer says that *nei tan* adepts regard their own bodies as the reaction-vessel (*ting*¹¹); they represent the *ching* and the *chhi* as lead and mercury, and Khan and Li *kua* as water and fire.

ⁱ P. 12b. *Chhan tshai Khun, chung tshai Chhien, tan chih chheng, fa tsu jan*.¹²

^j We shall quote some further verses from this book on p. 203 below.

^k TT943, ch. 2, p. 8b, quoted by Chhen Kuo-Fu (r), vol. 2, p. 435.

¹ 鉛浮而銀沈也

² 顛倒

³ 精

⁴ 坎離交媾之圖

⁵ 坤

⁶ 乾

⁷ 上洞心丹經訣

⁸ 金精

⁹ 眞一之精

¹⁰ 水眞水火眞火水火交永不老

¹¹ 產在坤種在乾但至誠法自然

¹² 鼎

contains an important section entitled *Hsiu Nei Tan Fa Pi Chüeh*.¹ After describing the embryonic respiration (see on, p. 145), the gnashing of the teeth, and the exercises for the circulation of the *chhi*, it goes on to say that 'one feels a happy harmony in the muscular system, limber and light-footed, like the feeling of bodily well-being after sexual satisfaction—this is a proof (that the *nei tan* practices are being done rightly)'.

(iii) *The Hsiu Chen books and the Huang Thing canons*

How prominent the conception of 'regenerating, restoring or repairing the primary vitalities' (*hsiu chen*²) was, can be gauged by the fact that no less than nineteen books in the *Tao Tsang* have (or had) this phrase in their titles, mostly as the first two words. Eight of them are lost from the Patrology as we have it now, but of the others several contain interesting and elaborate diagrams of physiological alchemy, indicating the role of the enchymoma within the interplay of mutual influences among the viscera and the glands. Curiously, the book with the nearest title to that from which we have been quoting, the *Hsiu Chen Nei Lien Pi Miao Chu Chüeh*³ (Collected Instructions on the Esoteric Mysteries of Regenerating the Primary (Vitalities) by Internal Transmutation) is not in the *Tao Tsang* but is listed in the bibliography of the *Sung Shih*. It also occurs in the *Thung Chih Lüeh* bibliography,⁴ a work of about + 1150, which thus confirms our earlier dating; so that on the whole the book is not likely to be much earlier than the Wu Tai period or the beginning of the Sung, c. +960. Most of the books with similar titles in these bibliographies appear to be of Wu Tai or Sung date, but there is (or was) one, the *Hsiu Chen Chün Wu Ching Lun*⁵ (Discourse on the Five Ching Essences (of the Viscera) by the Adept of the Regeneration of the Primary Vitalities) which is attributed to the Later Han and ascribed to Yin Chhang-Shêng⁶ already mentioned.⁷ Whether or not we may be disposed to accept this, there is no reason to think that the conception of the regeneration of the primary vitalities was not already beginning at that time.

There is no better way to gain familiarity with the ideas of the physiological alchemists than to look through the Hsiu Chen books in the *Tao Tsang*, some of which are abundantly illustrated with diagrams. These are clear enough once the basic technical terminology has been understood. Take the *Hsiu Chen Thai Chi Hun Yuan Thu*⁸ (Illustrated Treatise on the (Analogy of the) Regeneration of the Primary (Vitalities) (with the Cosmogony of) the Supreme Pole and Primitive Chaos)⁹ composed by Hsiao Tao-Tshun⁷ about + 1100, and evidently influenced, as its title implies, by the Neo-Confucian philosophy that had arisen during the

¹ Ch. 43, pp. 21 a, b, 22 a, the *Nei Tan* section. It is interesting to note that this has 40 titles, while the *Wai Tan* section (pp. 22 a ff.) has 203 titles.

² Cf. pt. 3, p. 77 above. This is also in *Thung Chih Lüeh* and was recorded by Yao Chen-Tsung (1) in his Hou Han bibliography (*Erh-shih-tsu Shih Pu Pien*, vol. 2, p. 2443).

³ TT 146. The writer's philosophical name was Hun 1 Tzu.⁸

⁴ 修內丹法秘訣

⁵ 修真

⁶ 修真內煉秘妙諸訣

⁷ 修真君五精論

⁸ 陰長生

⁹ 修真太極混元圖

¹⁰ 蕭道存

¹¹ 混一子

靈寶真一經云天如覆盆陽到難昇積陽生
 陰所以生陰者以陽自地中暗負真陰而上
 升故也地如盤石陰到難入積陰生陽所以
 生陽者以陰自天暗包真陽而下降故也陰
 極陽生陽極陰生陰陽逆生而天地之道反

圖之降昇陽陰地天

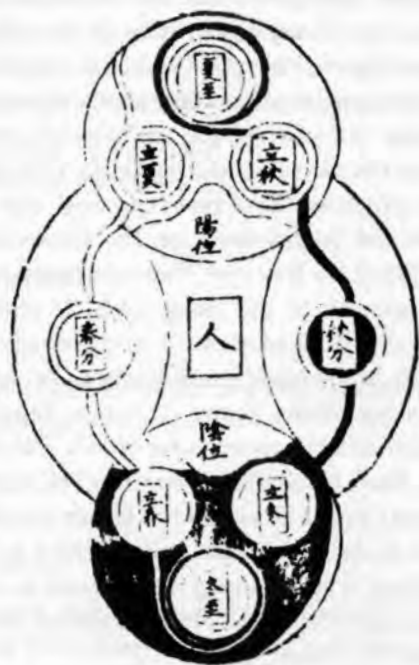


Fig. 1555. An illustration from the *Hsiu Chen Tai Chi Hun Yuan Thu* ('Treatise on the Analogy of the Regeneration of the Primary Vitalities with the Cosmogony of the Supreme Pole and Primitive Chaos'), written by Hsiao Tao-Tshun about +1100 (TT146), p. 3b. It analogises the circulation of *ch'i* in the body with the annual cycle of solstices and equinoxes (see text).

previous century.^a The preface has a stirring phrase: the practice of *nei tan*, says Hsiao, 'can rob the power of the natural order of things (*nêng to thien ti tsao hua*).^b The opening part of the work is concerned with macrocosm-microcosm doctrine in its universe form,^c the three heavens and persons of the Taoist Trinity being

^a Cf. Vol. 2, pp. 460ff.

^b P. 2a. Or, 'can act like the Shaping Forces of Nature themselves'. Cf. pt. 4, p. 234.

^c Cf. Vol. 2, pp. 294ff.

^d 能奪天地造化

analysed or even identified with the three regions of vital heat (*tan thien*) in the human body, and the five layers of the sublunary world with the five elements operating within the human viscera.^a Next comes an interesting diagram analogising the *chhi* and other cycles in the human body (Fig. 1555) with the annual cycle of fortnightly periods,^b solstices and equinoxes.^c In this representation, captioned *Thien Ti Yin Yang Shêng Chiang chih Thu*¹ (The rise and descent of the Yin and Yang within the microcosm), 'heaven' above stands for the heart and 'earth' below for the reins; on the left we see a white channel through which the Yang *chhi* ascends, and on the right a black channel through which the Yin *chhi* descends. The accompanying passage of text is worth giving in translation.^d

The *Ling-Pao Chen I Ching*² says:^e 'Heaven is like a covering basin. It is hard for the Yang to rise further, so it piles up and generates Yin. How can this be? It is because the Yang of the earth bears a true Yin hidden (within it); this is why (a Yin) can rise upwards.^f The earth is like a flat base of rock. It is hard for the Yin to descend into it, so it piles up and generates Yang. How can this be? It is because the Yin of the heavens hides and envelops a true Yang; this is why (a Yang) can come downwards.^g When Yin is at its maximum Yang is born, when Yang is at its maximum Yin is born—but Yin and Yang can be generated in a manner contrary to normal Nature; this is why the reversion (*fan*³) of the Tao of heaven and earth can be brought about (i.e. the arrest and reversal of the ageing process). If a man understands the pattern-principle of the rise and descent of Yin and Yang, knowing that he can practise the Tao of reversion within (his own body's) heaven and earth, then he can himself repair (*hsiu*⁴) and recast (*lien*⁵) (the *chhi*). If the *chhi* is recast, the primary *ching* can be formed; within the *ching* arises the *chhi*, his own (primary) *chhi*, and within the *chhi* arises the *shen*, his own (primary) *shen*.⁷

Liu I^{6 h} says that the heart corresponds to heaven and the reins to earth, the *chhi* is like the Yang and the fluid (*i*⁷) is like the Yin. If the *chhi* and the *i* do not come into conjunction there can be no union. When the *ching* (seminal essence) enters into the womb of a woman, then there occurs what is called the generation of a human being. But when the *ching* enters the Yellow Courts (*huang thing*,⁸ a region near the spleen)¹ of a man, there occurs what is called the generation of the (primary) *shen*. When this *shen* is collected, the (primary) *chhi* brought

^a P. 1b. Here we find references to the ancient theory of centrifugal cosmogony (p. 2b), on which see Vol. 2, pp. 371 ff. By this time, however, nine heavens (*hsiao*⁹) are being balanced by nine underworlds (*chhuan*¹⁰), possibly owing to Buddhist influence.

^b Cf. Table 35 in Vol. 3, p. 405.

^c Cf. pt. 4, pp. 264 ff. on temporal correspondences in *wai tan*.

^d Pp. 3b, 4a, tr. auct.

^e This 'Canon of the Primal Unity, a Ling-Pao Scripture' is not easily identifiable. There is a *Chen I Ching* in one of the parts of the *Thai-Shang San-shih-liu Pu Tsun Ching*¹¹ (Canon of the Thirty-six Scriptures revealed by the Three Pure Ones) TT8, but this may not have been part of it. There was also a *Tung Hsüan Ling Pao Chen I Pao Ên Ching*,¹² but this has been lost from the *Tao Tsang*. A *Thai-Shang Chen I Pao Fu Mu Ên Chhung Ching*¹³ exists, but is a still less likely source.

^f One would expect it to sink from the empyrean to its appropriate lower regions.

^g One would expect it to ascend to its appropriate celestial regions. But both these mysteries have been explained in terms of the lines of the *kua* (p. 61 above).

^h A little later (p. 5a) this adept is referred to as the twelfth patriarch of the Hsi Shan¹⁴ school.

¹ On the Yellow Courts, see further, pp. 82 ff. below.

¹ 天地陰陽升降之圖

² 靈寶真一經

³ 反

⁴ 修

⁵ 鍊

⁶ 劉謨

⁷ 液

⁸ 黃庭

⁹ 霄

¹⁰ 泉

¹¹ 太上三十六部尊經

¹² 洞玄靈寶真一報恩經

¹³ 太上真一報父母恩重經

¹⁴ 西山

第四 圖元混極太真修

太上隱書曰日月之形周圍各八百里日者
太陽之精而行乾策月者太陰之精而行坤
策東西出沒以分晝夜南往北來以定寒暑
日得月魄而清月得日魂而明清明者日月
之氣也精華者日月之質也陰陽者日月之



立故也若人識陰陽升降之理悟天地及立
之道自可修鍊鍊氣而結真精精中生氣我
氣也氣中生神我神也
劉謙曰心如天而腎如地氣如陽而液如陰
氣不相交而不合精在婦人之子宮即曰生
人精在男子之黃庭即曰生神神集氣聚而
胎氣出殼而昇仙矣
日月弦望圖

Fig. 1556. Another diagram from the same work (p. 4a,b) in which the *chhi* circulation cycle is paralleled by the diurnal rotation of day and night, and with the lunation. At the centre is the crow representing the sun, at the top the constellation of the Great Bear, representing the night. Below, the birth of the *hun* and *pho* souls at dawn and dusk is marked, as also the rising crescent side on the left and the falling crescent side on the right (cf. Fig. 1551 and the explanation on p. 57).

together, and the embryonic *chhi* released from its husk (the shell, *kho*,¹ of the physical body), (a man can) ascend (to the heavens) as an immortal.

This is a good example of + 11th-century theorising. It emphasises that when the Yang and Yin reach their extreme points they undergo a change of sign, Yang beginning to generate Yin, and Yin beginning to generate Yang. This was seen already in Fig. 1551, the *tsu*² and *wu*³ points marking these moments of instability and change-over.³ Only by realising that each of the two great forces carries within it the other, and by remembering the inversion principle, was the way of reversion possible.

Hsiao Tao-Tshun continues with a macrocosmic-microcosmic diagram (Fig. 1556) in which the *chhi* cycle is analogised with the diurnal cycle and the waxing and waning of the lunation; this is reminiscent of the Ming Ching Thu in Fig. 1551.

³ Compare Fig. 277 on p. 9 of Vol. 4, pt. 1. In strict accordance with the wave conception, when one influence attains its maximum it must inevitably begin to decline, and at the same time its opposite begins to increase. This has elsewhere been called by Nathan Sivin 'the First Law of Chinese natural philosophy', cf. Vol. 5, pt. 4, pp. 225 ff.

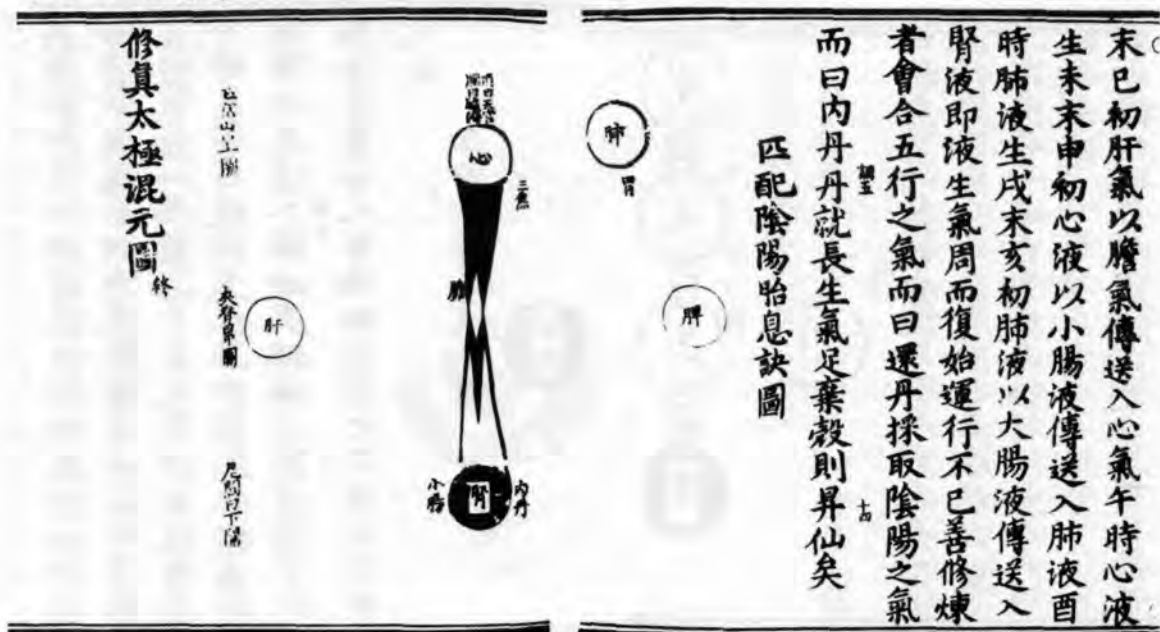


Fig. 1558. 'Eclipse' diagram from the *Hsiu Chen Thai Chi Hun Yuan Thu* (pp. 15b, 16a), illustrating the key process of physiological alchemy in the +11th century; 'transmitting upwards' from the reins, and 'showering down' from the brain and heart. The semen has to be sent up, and the saliva has to be sent down, to meet at the Yellow Court and form—with other constituents—the enchymoma. On the extreme left are marked the three 'bottlenecks' (*kuan*); and round about are the participating organs—lungs, liver, spleen, gall-bladder, etc.

The last diagram in the book (Fig. 1558) is also of particular interest.^a At first it looks like a representation of an astronomical eclipse, but in fact what it illustrates to perfection is the phrase 'transmitting upwards to the brain and showering downwards to the regions of vital heat' which we read on p. 59 above. Lungs, stomach and spleen are shown on the right, and liver on the left. The reins, shown in black, are shooting what looks like a white ray upwards; this whiteness signifies the ascent of the Chen Yang. So also the heart, shown in white, is sending what looks like a dark ray downwards; this blackness signifies the descent of the Chen Yin.^b At the centre where the 'rays' meet (on the level of the spleen) there is a white diamond representing the enchymoma itself, and it is so drawn as to show very clearly the principle of the Yang within the Yin (and vice versa). Above the heart a legend explains that the top of the head is called *thien kung*,¹ celestial palace, and the brain within it *sui hai*,² the sea of marrow. Right at the bottom, on the right of the reins, are the words *nei tan*, which in this case must mean 'inner macrobiogen'. The title

^a Pp. 15b, 16a. A similar diagram is to be seen in the *Kuei Chung Chih Nan*³ of late Sung or Yuan date (p. 3a). Cf. also the +12th-century *Wu Hsüan Phien*.⁴

^b Cf. what has been said above on Fig. 1551 and p. 69.

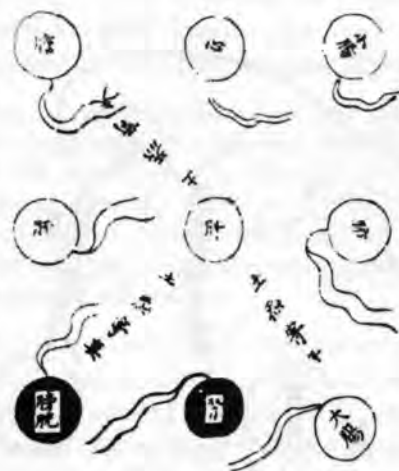
¹ 天宮

² 髓海

³ 規中指南

⁴ 悟玄篇

天元正曆日五帝傳一氣而天地之道不差
五臟傳一氣而人物之道不差故知人之真
氣大運隨天地春在肝而夏在心秋在肺而
冬在腎人之元氣子時而腎氣主丑未寅初
腎氣以膀胱氣傳送入肝氣卯時肝氣生辰



陰虎之象也心火也火中生水水內自有正
陽之氣而曰恍惚惚陽龍之象也世人若
悟此理自可長生不死以下田反上田以上
田反中田非止五行顛倒而此三田反復三
田反復自可棄殼昇仙故先師訣曰五行不
顛倒龍虎不交媾三田不反覆胎仙不氣足
真五行交合傳送圖

Fig. 1559. The circulation of pneumata (*chhi*) and juices (*i*) through the nine organs (from top left: gall-bladder, heart, small intestine, liver, spleen, lungs, bladder, reins and large intestine). It is interesting that the alchemists felt tied neither to the ten viscera of the natural philosophers nor the orthodox twelve of the physicians. Pp. 14*b*, 15*a*.

of the diagram is *Phi Phei Yin Yang Thai Hsi Chüeh Thu*¹ (Diagram of oral instructions for the simple mating of Yin and Yang by means of embryonic respiration).² It thus illustrates one of the great *nei tan* systems, that of 'foetal breathing' (on which see pp. 145 ff.), but its doctrine of the 'conjunction of heart and reins' (*hsin shen chiao hui*)³ was applied by other schools both to sexual practices (cf. p. 184) and to techniques primarily meditational.⁴

All the viscera drawn or marked round about, including the gall-bladder, the small intestine, and the three coctive regions (*san chiao*)⁵ have reference to more complicated systems of circulation of the *chhi* and *i* through the organs and channels of the body which are described earlier in the same tractate and in the following one. On the extreme left of the diagram three great gates or bottlenecks in the *chhi* circulation through the spinal column are indicated, the upper one called *yü ching shan*,⁶ the middle one *chia chi*,⁷ and the lower one *wei lü*,⁸ this last in the neighbourhood of the coccyx.⁹ These are not involved in the present procedure, but we

¹ Unfortunately this diagram seems to have lost (perhaps designedly) its explanation. It is called simple because it does not involve the circulation of the *chhi* through the viscera or the spinal column.

² Cf. pp. 116 and 179. Exponents of this last-named *tao* often substituted the term *shen*⁷ for *shen*.⁸

³ It will be remembered from Vol. 4, pt. 3, pp. 548ff. that this term also had a cosmological, almost geographical, significance, as the 'world cloaca' in the Eastern Ocean. The other two could be translated 'jade mountain-height (pass)' and 'vertebral strait-gate' respectively.

⁴ 匹配陰陽胎息訣圖

⁵ 心腎交會

⁶ 三焦

⁷ 玉京山

⁸ 夾脊

⁹ 尾閭



Fig. 1560. A diagram from the *Hsiu Chen Thai Chi Hun Yuan Chih Hsüan Thu* (TT147) written by Chin Chhüan Tzu about +830 (p. 1b). It shows the head and trunk of the body as if in sagittal section, depicting the several organs concerned in the formation of the enchymoma. Explanation in text.

shall shortly meet with them again; they can be seen more graphically in Fig. 1563.

The preceding passage has the title *Chen Wu Hsing Chiao Ho Chhuan Sung Thu*¹ (Diagram of the true interaction and union of the five elements (i.e. the viscera) and what they give and transmit). The text for Fig. 1559 is a discussion of the organ *chhi* and *i* continuously circulating, and states the situation corresponding to each double-hour of day and night. The standard circulation was thought of as a microcosmic clock dial (cf. Fig. 1551), the reins corresponding to the *tsu* point and the heart to the *wu* point, i.e. to the decisive moments of change-over as between *chhi* and *i*, Yang and Yin. The *yuan chhi*² started from the reins and passed through the

¹ 眞五行交合傳送圖 ² 元氣

bladder, liver and gall-bladder to the heart. Here it turned into *yuan i*¹ and passed through the small intestine, lungs and large intestine back to the reins. During each one of the intermediate periods each of the viscera in question generated and contributed its own *chhi* or *i* to the circulation, and passed all on to the next member of the series. These viscera, either drawn symbolically, or marked as names, will be found constantly present in Figs. 1557 to 1564. The passage ends:^a

Success in repairing and recasting (*hsiu lien*²) (the *chhi*, so as to re-create the primary vitalities), is achieved by combining the *chhi* of the Five Elements (corresponding to the five viscera, for rejuvenation)—that is what is called the reverted or anablastemic enchymoma (*huan tan*³). Selecting and collecting the (primary) *chhi* of Yin and Yang—that is what is called the enchymoma (*nei tan*⁴). When this is completed longevity will be achieved. When the (primary pre-natal) *chhi* has been sufficiently collected then the husk can be cast off, and ascension as an immortal will ensue.

Many pictures are to be found which show the enchymoma forming in the midst of the body. A closely similar tractate, the *Hsiu Chen Thai Chi Hun Yuan Chih Hsüan Thu*⁵ (TT147) has several of these.^b Fig. 1560, for example, interestingly shows the Yellow Courts (*huang thing*⁶)^c in the centre of the abdomen, flanked by the small and large intestines. The diagram is captioned *Chen Lung Hu Chiao Kou Nei Tan Chüeh Thu*⁷ (Diagram of oral instructions concerning the (formation of the) enchymoma by the intercourse of the vital dragon and the vital tiger),^d and the accompanying text describes seven different macrobiogens made by selecting and extracting the vital Yang and Yin *chhi* from one or another of the viscera and their juices. There are two legends on the left; the upper one says: 'the fluid (*i*) of the heart embodies the *chhi* of Chen Yang, so it is called the Yang dragon'; the lower: 'the *chhi* of the reins embodies the water of the primordial unity of the pre-natal endowment, so it is called the Yin tiger'. A legend to the right of the heart in the 'cephalic' region says that the union of dragon and tiger gives indeed the metallous enchymoma (*chin tan*⁸). Beneath the heart we read: 'the fluid (*i*) of the heart is called the 'lovely girl''; and alongside the reins: 'the *chhi* of the reins is called the 'baby boy''.^e These are just synonyms of Chen Yin and Chen Yang respectively (cf. Table 121 c). Thus one sees that just as the reins were a complex of urino-genital

^a P. 15b, tr. auct.

^b Cf. on this the discussion of Chhen Kuo-Fu (*i*), vol. 2, pp. 447ff.

^c See pp. 82ff. below.

^d P. 1b.

^e These two cover-names belong to a set of four which constantly recur, the 'Four Images' (*ssu hsiang*⁹), paralleling the Five Elements (*wu hsiang*¹⁰) as applied to the five viscera (cf. Fig. 1552). *Chin ong*,¹¹ the Metallous Grey-beard, stands for the *ching chhi*¹² of the lungs (hence pertaining also to the saliva); *chha nü*,¹³ the Lovely Girl, symbolises the cavities and *chhi* or fluids of the heart; *ying erh*,¹⁴ the Baby Boy, refers to the *ching chhi* in the reins (or testes, as we should say); and *huang pho*,¹⁵ the Yellow Dame, images the *ching chhi* of the most central organ, the spleen. For further discussion see Chou Wu-So's + 12th-century *Chin Tan Chih Chih* (TT1058), referred to on p. 219 below; and Chhen Kuo-Fu (*i*), vol. 2, p. 451.

In *wai tan* proto-chemical alchemy the 'Four Images' seem to be more usually the elements, with the exception of Earth (cf. TT230, pref., p. 1b).

¹ 元液 ² 修煉 ³ 還丹 ⁴ 內丹 ⁵ 修真太極混元指玄圖 ⁶ 黃庭
⁷ 眞龍虎交媾內丹訣圖 ⁸ 金丹 ⁹ 四象 ¹⁰ 五行 ¹¹ 金翁 ¹² 精氣
¹³ 姹女 ¹⁴ 嬰兒 ¹⁵ 黃婆

五第



Fig. 1561. A similar diagram (p. 5b) of rejuvenation, i.e. the re-casting and re-creating of the bodily form (*lien hsing*). Explanation in text.

organs and structures, so also the thoracic group which produced the saliva and other fluids was also complex, involving heart, lungs and salivary glands. It was precisely out of this background, and in the conviction that every organ contributed something valuable to the circulation, that the later iatro-chemists devoted such efforts to working up urine, semen, blood, placenta, and other secretions and products. To this we shall return (pp. 301 ff. below).

Other diagrams are equally interesting. Fig. 1561 shows the *Lien Hsing Pi Chüeh Thu*¹ (Diagram of secret instructions for recasting the bodily form). The accompanying text describes four different macrobiogens capable of improving health

四第 圖玄指元混極太真修



Fig. 1562. Another diagram (p. 4a,b) showing the successful formation of a greater and a lesser anablastemic enchymoma. Explanation in text.

and giving physical perfection. The legend at the top on the right says in effect: 'Recasting the bodily form is what happens when the (Chen Yang of the reins) in the jade juice (*yü i*'), circulating up through the viscera to the lungs, is allowed to go on upwards (and outwards, to the limbs, to make blood to nourish the body, etc.), instead of going downwards and completing its circuit to form the anablastemic enchymoma.' This is shown at the centre and right of the diagram. Similarly, on the left, the Chen Yang of the reins is driven up through the three gates of the spinal column, but stops in the brain and goes no further.

In contrast with this, Fig. 1562 shows the successful formation of a greater and a lesser enchymoma. It is called *Huan Tan Chüeh Thu*² (Diagram of the reverted, or anablastemic, enchymoma). Here the *chhi* of the reins is made to rise through the viscera (liver, heart and lungs) as in the previous case, only now it is decisively sent downwards to the middle region of vital heat at the level of the spleen where the macrobiogen is formed;³ this is called the Lesser Anablastemic Enchymoma. Similarly in a larger circuit the Chen Yang of the reins is made to rise up the spinal column through the three gates to the brain, where it combines with the *shen shui*³

² The spleen was not one of the organs through which the visceral *chhi* and *i* normally circulated; it corresponded to Earth element, as we know (cf. Fig. 1557), and played an essential part in the formation of the enchymoma, appearing under many synonyms (*chung thu*,⁴ *huang thing*,⁵ etc.; cf. p. 59 above). Was it not because the spleen contains neither duct nor cavity that the ancient Chinese anatomists set it aside from the other thoracic and abdominal organs?

¹ 玉液

² 還丹訣圖

³ 神水

⁴ 中土

⁵ 黃庭



Fig. 1563. An 'eclipse' diagram from the same work (p. 6b) expounding the theory of perfected equalisation in enchymoma formation. Explanation in text.

and is made to descend to the same central regions; this is called the Greater Anablastemic Enchymoma. The thickened black line in this outer circle at the top indicates the change-over from *chhi* to *i* as the Yin appears when the *wu* point is reached by the Yang.⁸

From Fig. 1563, entitled *San Thien Chi Chi Chieh Thu*¹ (Diagram of the oral instructions for perfected equalisation in the regions of vital heat) we have a further expression for the development of the enchymoma, here to be accomplished purely by imaginative meditation. We see again the three gates in the spinal column, the enchymoma in the centre among the viscera, and a 'mutual irradiation' pattern

⁸ Cf. Chhen Kuo-Fu (1), vol. 2, p. 450.

¹ 三田既濟訣圖

above. This last is not unlike the one we have seen in Fig. 1558, but it differs in three ways; it connects the brain with the central region of vital heat (not the heart with the reins), its Yin-Yang characteristics are inverted (white pointing down and black pointing up), and it is associated with the ascent through the spinal column. The *chhi* of the viscera is circulating as usual from the reins (the *tsu* point) round its course; but now the meditational effort is directed to the special use of the *chen chhi*¹ of the lungs (marked in symbol as an organ on the right). This is to be carried down (in thought),^a along with the *chhi* of the reins, to the reins, whence it must circulate up the spinal column through the three gates to reach the brain, joining there with the *shen shui*² to give a pure Yang *chhi*; and this it is which is made to 'shower down upon' the central region of vital heat. At the same time, this *chhi*—which has suddenly turned into Yin, according to a principle which should by now be obvious—is 'transmitted upwards'. Where the streams meet, a legend just to the right says: 'When Water is above and Fire below, this is called 'perfected equalisation' (*chi chi*).'^b 'Water' here stands for the *shen shui*, and 'Fire' for the heat of the heart region beside the *chung tan thien*.

Finally, in Fig. 1564 we see the enchymoma in all its glory surrounded by little human figures representing the archaevi (*shen*^c) of the five viscera, complete with all their names and cognomina.^c Once some of the enchymoma has been formed the adept can use its Chen (Yang) *chhi* to transmute the *chhi* of the viscera into *shen*^d with all their ascensory power. Meeting in the brain with the *yuan chhi*,^e as if in audience with the emperor, they will descend again and manufacture more of the reverted anablastemic enchymoma (*huan tan*). Ordinarily the visceral *chhi* go round perpetually in their circuit (cf. Fig. 1559 and p. 73), but in this case each one is converted into a *shen*, and so shunted upwards out of the cycle to the brain—liberated, 'as the sparks fly upwards', as it were—to that ouranic region, whence, fortified by the *shen shui*, they will return to accomplish their mission in the spleen or the central region of vital heat.

A whole chunk of writings on physiological alchemy is embodied in the *Tao Tsang* under a single title, the *Hsiu Chen Shih Shu*⁶ (Collection of Ten Tractates and Treatises on the Regeneration of the Primary Vitalities).^d Comparable in importance to the *Yün Chi Chhi Chhien* itself, this was put together by an unknown

^a It is noteworthy that some of these *nei tan* actions could have been envisaged as effected by mental concentration alone. Perhaps it indicates the growing influence of Buddhism, though the phenomena of hypnotism could always have induced ideas of this kind.

^b This is of course one of the hexagrams, no. 63, see Vol. 2, p. 320. It was also an important technical term for certain types of alchemical laboratory apparatus (especially those for distillation and sublimation). Cf. pt. 4, pp. 70-1, 284.

^c P. 7a. There is now a special study by Homann (1) of these 'body-spirits' or archaevi in the *Huang Thing* canons (p. 86 below). See also Schipper (5) on the 'Taoist body'. Not only could these *spiritus rectores* be seen by adepts in visions or meditation; the microcosm also possessed its starry lights and constellations visible to the inner eye of faith. These are described in the *Thien Lao Shen Kuang Ching*⁷ (The Celestial Elder's Canon of Spirit Lights, *TT859*) newly translated by Sivin (16). It constitutes a veritable physiological astrology. The tractate is attributed to a Taoist general of the Thang, Li Ching⁸ (fl. +618 to +649).

^d *TT260*, cf. Maspero (7), pp. 239, 357. It actually contains many more than ten.

¹ 眞氣

² 神水

³ 既濟

⁴ 神

⁵ 元氣

⁶ 修真十書

⁷ 天老神光經

⁸ 李靖

圖玄指元混極太真修



Fig. 1564. The enchymoma in all its glory (p. 7a) surrounded by the archaevi of the organs. Explanation in text.

editor about + 1250. It includes material of great value from the Sui to the southern Sung in date, and much of it calls saliently for closer investigation; here it will be worthwhile to describe briefly its contents, moving in roughly chronological order.

One of the oldest components is a work derivative from the *Huang Thing Ching* tradition, to which reference will shortly be made, and this will conveniently afford an opportunity for explaining it. In the *Hsiu Chen Shih Shu*, then, we find a *Huang Thing Nei Ching Wu Tsang Liu Fu Thu*¹ (Diagrams of the Five Yin-viscera and the Six Yang-viscera (in accordance with) the ('Jade Manual of the) Internal Radiance of the Yellow Courts'), written in the Thang period (+ 848)^a by a Taoist anatomist and physiologist, Hu An,² whose fame was to have been taught by Su Nü (the

^a On the dating see Watanabe Kozo (1), pp. 112 ff.

¹ 黃庭內景五臟六府圖

² 胡愔



Fig. 1565. One of the 500 Lohan at the Pao-Kuang Ssu temple near Hsintu in Szechuan (orig. photo. 1972). He points to the anablastemic enchymoma forming in the Yellow Court of the abdominal region, symbolised by a roundel on his gown. He holds a toad on his knee, emblem of the moon (which it shares with the drug-pounding rabbit) and therefore of the Yin force, so vital for the making of the enchymoma. The flesh of the toad, moreover, was valued as an aid to prolongevity and immortality by some ancient Taoists, and could cause a man to escape invisibly from captivity (R78, under *chhan-chhu*).

Immaculate Girl) on Thai-pai Shan,^a or somewhere in the Wei Valley near the capital, Chhang-an. Unfortunately the illustrations have been lost,^b but the book is full of therapy and pharmacy, throwing valuable light on the borderline between medicine and Taoist physiological alchemy. Hu An speaks of the application of respiratory techniques (*thu na*¹) for healing, and understanding the principles of the use of drugs (*thung yao li*²), gymnastic postures and exercises (*tao yin chhü shen*³), diagnostic inspection (*chha sê hsün chêng*⁴) and dietary abstentions (*shih chî*⁵).

According to the title of the book one would expect that it originally contained diagrams and discussions of each one of the five Yin viscera (*tsang*⁶) and the six Yang viscera (*fu*⁷).^c The text as we have it now still contains all the sections for the *tsang*, but only one for a *fu*, the gall-bladder; we do not know whether the remaining five were excluded or accidentally lost. There is much on the anatomy of the viscera, including weights and measurements.^d Each of the existing descriptions is followed by an account of how *nei tan* practices (*hsiu hsing*,⁸ *hsiu yang*⁹) relate to that particular organ, an account of the pathology and aetiology of its disorders (*ping yuan*¹⁰), then in most cases the therapeutic action of breathing exercises, the best prescriptions, appropriate massage, regimen of food and drink, etc. The intimate connection between *nei tan* and clinical medicine clearly appears in this book, expounding as it does the significance of each organ for medical physiology as well as for physiological alchemy.^e It has not so far received the attention it deserves.^f

But what were the Yellow Courts? By now it should be evident that the term was often used in an abstract generalised way for the central theatre of enchymoma formation (Figs. 1560, 1565, 1567, 1571).^g Physiologically however they were certainly three in number, one for each of the three anatomical regions, cephalic, thoracic and abdominal; and by their colour clearly thought of as central, hence undoubtedly the region of the spleen below, and that of the eyes above.^h This

^a From Vol. 2, p. 147, the significance of his title Thai Pai Shan Chien Su Nü¹¹ will not be lost upon us. And cf. pp. 187 ff. below.

^b Except some which are preserved in MS. at a temple in Japan; cf. Watanabe, *loc. cit.* These must have been copied before +985.

^c These we shall discuss further in Sect. 43 (Vol. 6). In medical tradition the *tsang* comprised heart, liver, spleen, lungs and reins, together with a sixth entity which has been approximated to the pericardium and of which we shall say no more here. In Taoist physiology, as we have noted, the spleen occupied a special position on its own. In medical tradition the *fu* comprised large and small intestines, stomach, bladder and gall-bladder, while the three coctive regions made the sixth. Here the classical five all had large and obvious internal spaces, evoking the concept of storage. The least important in Taoist physiology seems to have been the stomach.

^d This was a very old feature of Chinese anatomy. Again see Sect. 43 below.

^e The *Tao Tsang* contains another book by Hu An, entitled *Huang Thing Nei Ching*. . . *Pu Hsieh Thu*¹² (TT429). To this we expect to return in Sects. 43 and 44.

^f And any information on the biography and background of Hu An (or Yin) would be of great interest.

^g The *Huang Thing Nei Ching Yü Ching*, in HCSS (TT260), ch. 55, p. 1*b*, emphasises the microcosmic character of the Huang Thing, its outer aspect representing the cosmos and its inner aspect representing the human body.

^h The middle Yellow Court was the region of the heart, judging from YCCC, ch. 11, p. 9*b*.

¹ 吐納

² 通藥理

³ 導引屈伸

⁴ 察色尋證

⁵ 食忌

⁶ 藏 ⁷ 府

⁸ 修行

⁹ 修養

¹⁰ 病源

¹¹ 太白山見素女 ¹² 補瀉圖



Fig. 1566. A fresco of Lohan at the Fo-Kuang Ssu temple in the foothills of Wu-thai Shan in Shansi (orig. photo. 1964). Here the main hall is one of the oldest extant wooden buildings in China, dating from +857. The frescoes are in the north hall dedicated to Manjusri (Wên-Shu T'ien), and the picture shows 14 out of the 300 or more Lohan. Third from the right in the bottom row, one of them draws aside his abdominal wall to show the enchymoma of immortality in the form of a twice-born face within; he is squinting in one of the *ekāgratā* methods of mental concentration (cf. p. 269 below). This hall is of the J/Chin period, dating from +1113, but the frescoes are considerably later.

optical connection has to do with an element of light-mysticism in ancient Taoism,^a explaining in its turn the important word *ching*,¹ regarded by all these texts as equivalent to *kuang*,² brilliant, luminous, and therefore translated in what follows as 'radiance'.^b The oldest surviving text on this subject is the *Huang Thing Wai Ching Yü Ching*³ (Jade Manual of the External Radiance of the Yellow Courts),^c a work in verses which must go back to the Later Han, San Kuo or Chin periods, i.e. the +2nd or +3rd-centuries.^d It was current before +300 because Ko Hung lists it in his alchemical bibliography,^e and it is mentioned in the life of Chu Huang⁴ in the *Lieh Hsien Chuan*;^f but no author's name has come down to us.

^a Cf. pp. 181 ff., 249.

^b There were eight of these *ching* or radiances, but the commentators differ in their enumerations; cf. Maspero (7), pp. 195 ff., 428 ff.

^c *TT*329.

^d This is vouched for by the internal evidence of the rhymes and style.

^e *PPT/NP*, ch. 19, p. 5a (Ware (5), p. 380). Ko Hung used an abridged title.

^f Ch. 2, p. 8b (Kaltenmark (2), p. 177. Here *Lao Chün* precedes the rest of the title.

¹ 景 ² 光 ³ 黃庭外景玉經 ⁴ 朱璜



Fig. 1567. The 'divine embryo' or enchymoma seen again in an image of one of the 500 Lohan at the Pao-Kuang Ssu temple near Hsintu in Szechuan (orig. photo. 1972). The Lohan's name is 'Ta-Hsiang, and a label says: 'opening the heart and revealing a buddha' (*khai hsin chien fo*).

Whoever he was, his work is now the oldest text which describes in detail the various practices of the *nei tan* school which developed from the older Taoist techniques for obtaining material immortality; the circulation of the *chhi*, the swallowing of saliva, the method of 'making the *ching* return', the ways of increasing the amounts of *chhi* and *ching*, the uses of diet and drugs, and the formation of the 'divine embryo' (Fig. 1567), in a word, the preparation of the anablastemic enchy-moma.^a The seven-character verses are however designedly obscure, and the later commentators therefore particularly important; of these there were chiefly two, one in the Sui or early Thang, (+ 7th-cent.) who adopted the pseudonym Wu Chhêng Tzu,¹ and the other later in the Thang (+ 8th or 9th-cent.), also pseudonymous, Liang Chhiu Tzu.² Unfortunately their interpretations often disagree. Examples of these stanzas, not only ancient, but also extremely poetic, esoteric and allusive, require annotation for almost every phrase, and we could not in any way improve upon the pieces already translated by Maspero,^b so we shall be content to refer to those here. Probably it was because of the obscurity of the *Wai Ching* text that some unknown Taoist in the + 5th or + 6th-century was moved to compose a new version, also in seven-character lines, under the title *Huang Thing Nei Ching Yü Ching*³ (Jade Manual of the Internal Radiance of the Yellow Courts).^c This also was commented on by the two Taoists just mentioned (Fig. 1568), but most of the explanations of Wu Chhêng Tzu have failed to survive.^d Still, we do have elucidations for the whole series of new poetical cover-names which occur in this work.^e

^a We may here recall what was said in pt. 3, p. 167, about the predilection of Koreans for physiological alchemy, in contrast to the Veitnamese (p. 75), and the Japanese (pp. 174 ff.), who seem rather to have favoured *wai tan* chemistry and its elixirs. So for example Yun Kunphyông⁴ in the + 16th-century became a noted expert in the *Huang Thing Ching* tradition (Chôn Sangûn (1), p. 264). Already in the Thang period Kim Kagi⁵ (fl. c. + 850), and the scholar-astronomer Chhoe Chhiwôn⁶ (+ 858 to + 910), had ended as eminent Taoist adepts in China (ibid., p. 258); while the *Ishinhô* of + 982 ascribed to the masters of the Korean State of Silla two secret pharmaco-sexual techniques of physiological alchemy; ch. 28 (p. 655). By the time of the *Tongü Pogam*⁷ (Precious Mirror of Eastern Medicine), finished in + 1610, we find Hô Chun's⁸ first chapter full of explanations of physiological alchemy, including the three primary vitalities, and the means of regaining them.

^b (7), pp. 240 ff., 388 ff.

^c TT328. This is the generally accepted view, but Wang Ming (4) sought to prove that the *Nei Ching* was the older text, and that the *Wai Ching* appeared only about + 335. The matter is not yet finally settled. The oldest parts of the *Nei Ching* go back, it seems, to the Mao Shan school of Taoism, c. + 365. Cf. Watanabe Kozo (1), p. 114; Strickmann (6), p. 333.

^d Cf. Maspero (7), p. 239. The commentary of Liang Chhiu Tzu in HCSS, ch. 55, pp. 4a to 5b, contains some queer little symbolic diagrams which the text does not explain. See further on p. 126 below.

^e A valuable concordance to both Yellow Court manuals has been prepared by Schipper (6). Here it is necessary to allude to the intimate connections between the Yellow Court tradition and liturgical Taoism, especially in the Ling-Pao rituals. For example, Saso (5) describes the fourth phase in the Chiao (or Renewal) liturgy as one in which the celebrant carries out an alchemical meditation refining the Five Elements into the three primary vitalities, *shen*, *chhi* and *ching*. Meanwhile the four other sacred ministers are engaged in different activities, sending off petitions and orders, chanting prayers, or offering food, wine, flowers and incense to the Trinity and the lesser spirits; cf. Vol. 5, pt. 2, pp. 129 ff. It is precisely in the distinction between liturgy as an expression of the meditations of internal alchemy, and ritual as a means of exorcism, healing, curse and blessing, that the difference between orthodox and heterodox Taoism lies. Great advances are now being made in the elucidation of Taoist liturgiology, as in the interesting work of Schipper (7, 8), and Saso in other studies, e.g. (6, 7, 8, 10).

¹ 務成子 ² 梁丘子 ³ 黃庭內景玉經 ⁴ 尹君平 ⁵ 金可紀 ⁶ 崔致遠
⁷ 東醫寶鑑 ⁸ 許俊

太上黃庭內景玉經 太帝內書 藏湯谷陰
 上清紫霞金皇前友上大道玉宸君閑居紫珠作
 七言散化五形變萬神是為黃庭曰內篇琴瑟
 疊舞胎仙九氣映明出霄間神蓋童子生紫煙是
 曰黃庭可精研詠之萬過昇三天千災以消百病瘥
 不憚虎狼之凶殘亦却老延年永延上有魂靈下關

Fig. 1568. A rubbing from a stele inscription of the *Huang Ting Nei Ching Yü Ching*. This was cut in +1591 from earlier copies the calligraphy of which was so exquisite as to suggest to experts of the Sung and Yuan that it was due to the pens of Wang Hsi-Chih or Yang Hsi, in the +4th century. Though this would hardly be possible, it could well be the work of some calligrapher of the +5th or the +6th.



Fig. 1569. One of the frescoes of the Taoist temple, Yung-Lo Kung, in Shansi, showing Chungli Chhüan in conversation about the Tao with Lü Tung-Pin. Têng Pai (*1*), pl. 17.

We may have occasion to quote both of these manuals in specific contexts from time to time below.^a

The next oldest part of the *Hsiu Chen Shih Shu* collection is perhaps the material relating to Lü Yen¹ (Lü Tung-Pin²) and his putative teacher Chungli Chhüan,³ belonging to the last half of the +8th-century and the early years of the +9th (Fig. 1569). Thus we find a substantial work called *Chung Lü Chhuan Tao Chi*,⁴ a dialogue between these two on the transmission of the Tao and the art of longevity by rejuvenation.^b Here the differences between *wai tan* and *nei tan* alchemy are trenchantly discussed, and this is a good place to look for Thang *nei tan* meanings of *wai tan* terms.^c The collection also contains one of the classical works on Taoist gymnastics, that associated with the name of Chungli Chhüan, the *Chungli Pa Tuan Chin Fa*⁵ (cf. p. 158 below). This will also be of the late +8th-century. Then comes an important work of the Wu Tai period, the *Thien Yuan Ju Yao Ching*⁶ (Mirror of the All-Penetrating Medicine restoring the Endowment of the Primary Vitalities), written by Tshui Hsi-Fan⁷ and dated +940; we shall discuss it more fully later on in connection with the sexual techniques (p. 196). It is a prose text without commentary, not the same as Tshui's *Ju Yao Ching*, a more famous work in rhyming verses, on which several commentaries were written.^d

All the rest of the material in the *Hsiu Chen Shih Shu* is of the Sung, beginning with certain celebrated poems and treatises of the +11th-century. There is first the *Chin Tan Ssu Pai Tzu*⁸ (The Four-Hundred Word Epitome of the Metallous Enchymoma),^e twenty verses from the brush of the eminent adept Chang Po-Tuan⁹ (Fig. 1570), of whom so much has already been said in earlier sub-sections (pt. 3, *passim*). This is considered datable in the close neighbourhood of +1065. The collection also contains his much longer work in 99 stanzas, the *Wu Chen Phien*¹⁰ (Poetical Essay on Realising (the Necessity of Regenerating the) Primary Vitalities), written about ten years later.^f There can now be no doubt at all that these were primarily concerned with physiological alchemy. Translations of both were made some thirty years ago by Davis & Chao Yün-Tshung (2, 7 respectively),

^a This group of writings was completed by a work of the Sui period, the *Huang Thing Chung Ching Ching*¹¹ (Manual of the Middle Radiance of the Yellow Courts), by Li Chhien-Chhêng;¹² TT1382. It has been less studied than the others, and needs further investigation.

^b This was edited before the end of the Thang by Shih Chien-Wu.¹³ Another version of the dialogue, the *Pai Wên Phien*¹⁴ (Account of the Hundred Questions), is to be found in ch. 5 of the *Tao Shu*¹⁵ (Axial Principles of the Tao, TT1005), a collection made by Tsêng Tshao¹⁶ before +1145. A translation of the dialogue into German has been essayed by Homann (2), who has added a quite useful glossary of *nei tan* technical terms.

^c The sexual element seems to be rather played down in this text, either because of later bowdlerisation (which certainly took place as Buddhist influence grew in Yuan, Ming and Chhing), or perhaps more likely because these practices were from a quite early time a matter of oral instruction.

^d TT132. This physiological alchemist is not to be confused with another Taoist of the same name belonging to the late +12th-century, a physician who wrote an important book on sphygmology. Our Tshui's sobriquet was Chih I Chen-Jen,¹⁷ the other's Tzu Hsü Chen Jen.¹⁸

^e TT1067.

^f TT138, with many commentaries in succeeding items. Western Zen adepts will not need reminding that the character *wu* here is the same as the Japanese *satori*.

¹ 呂岳

² 呂洞賓

³ 鍾離權

⁴ 鍾呂傳道集

⁵ 鍾離八段錦法

⁶ 天元入藥鏡

⁷ 崔希範

⁸ 金丹四百字

⁹ 張伯端

¹⁰ 悟真篇

¹¹ 黃庭中景經

¹² 李千乘

¹³ 施肩吾

¹⁴ 百問篇

¹⁵ 道樞

¹⁶ 曾慥

¹⁷ 至一真人

¹⁸ 紫虛真人



Fig. 1570. Drawing of Chang Po-Tuan, from *Lieh Hsien Chhuan Chuan*, ch. 7, p. 23 a.



Fig. 1571. Sculptured Lohan in one of the caves at Nan-fêng Shan, near Hangchow in Chekiang (orig. photo. 1964). The enchymoma is again depicted as a twice-born face peering out from the monk's robe.

but as they were firmly under the impression that Chang was talking about practical laboratory alchemy, their versions are now classical examples of what happens when translations are 'not on the same wave-length' as the original author, and have almost no idea of what he was really trying to talk about.^a If the quotations which we shall now give are compared with the parallel passages in Davis & Chao the differences will be clearly seen. We select at random half a dozen verses from the *Chin Tan Ssu Pai Tzu*.

v.1 The (*chhi* of) vital Earth can capture the true lead; and true lead can control the true mercury. When (true) lead and (true) mercury return into the vital Earth, the body and the heart gain rest and move no more (towards decay and death).^b

v.6 The 'chemicals' (the *chhi* and fluids of the organs) come forth from the mysterious orifice (*hsüan chhiao*);^c the 'fire-times' (periods of their circulation) ignite the furnace of (pure) Yang.^d When the dragon and the tiger accomplish their mutual conjunction, the precious reaction-vessel produces the mysterious dark pearl (the enchymoma).

v.7 This orifice is no ordinary opening; it is formed by the union of the *kua* Chhien and Khun. It is called the cavity of the *shen*^e and the *chhi*, and within it are the *ching*^f (essences, i.e. inner Yang and Yin) of Khan and Li.

v.8 One drop of Lignic mercury (gives rise to) what is red,^g
But Metallous lead's four catties all are black;^f
This lead and this mercury, combining, form a pearl,
Shining and glittering with the hue of purple gold.^g

v.16 Heaven and earth unite the true fluids (*i'*) together; sun and moon harbour the true *ching*.^h When the fundamental powers of Khan and Li meet, then the 'three worlds' (*san chieh*)^h return into a single body (and rejuvenate it).

v.20 When a man and a woman engage in the clouds and rain of the bedchamber a child will be born each year, and every one of them will be able to soar into the heavens on the wings of a crane.ⁱ

^a This is no great criticism of Davis & Chao in view of the rudimentary state of knowledge of Chinese alchemy at that time. Besides, we are all much indebted to them for useful biographical and bibliographical material.

^b In other words, the preservative enchymoma is formed in the 'central earth', the Yellow Court region in the neighbourhood of the spleen.

^c Commentators refer this to the 'gate of the mysterious feminine' (*hsüan phin chih mên*) of the *Tao Tê Ching*, ch. 6. ^d Cf. p. 221 and Fig. 1551.

^e Lignic mercury has within it the *ching* of the primordial pre-natal unity (*hsien thien chen i chih ching*), hence the number one in 'one' drop. It gives rise to what is red because Wood produces Fire in the five-element system, hence the reference to the colour. This has nothing to do with cinnabar, but it might well have put those acquainted with *wai tan* alchemy off the scent, let alone modern historians thinking in terms of elixirs. Besides, 'cinnabar' does occur in other verses, though not with its plain meaning. This whole verse is a fairly good example of *nei tan* ideas being veiled in *wai tan* terms.

^f 'Four' catties, because four is the number assigned to Metal in the symbolic correlation system. Black, because Water goes with the colour black, and Metal produces Water in the five-element system.

^g The enchymoma, of course. On 'purple gold' cf. pt. 2, pp. 257 ff. For the essential theory behind this verse one may re-read the passage from the *Chhi Pi Thu* on p. 40 above.

^h I.e. the three primary vitalities, *ching*, *chhi*, *shen* (cf. p. 46 above). There would be an undertone here of antithesis to the three factors of death (*san shih*, 'three corpses'), in each living being.

ⁱ This verse is essentially an allegory of the *mysterium conjunctionis* of Yang and Yin. 'Clouds-and-rain' is the well-known poetical phrase for sexual intercourse. Naturally there is also an oblique reference to the 'baby boy' (*ying erh*), the enchymoma, thought of as a 'divine embryo' to be produced in the body by the procedures of physiological alchemy. But for the exponents of sexual techniques the verse could also be taken more literally as saying that no children of this world will be born from the commerce between the Taoist man and woman adepts, but both will attain longevity and immortality. It is often said that the normal flow (*shun*) produces children, while the counter-current flow (*ni*) produces immortals; cf. pp. 59, 118, 247.

¹ 玄竅 ² 神 ³ 精 ⁴ 液 ⁵ 三界 ⁶ 玄牝之門 ⁷ 先天眞一之精
⁸ 精氣神 ⁹ 三尸 ¹⁰ 嬰兒 ¹¹ 順 ¹² 逆

Once one has found the clue to the system of ideas of the physiological alchemists, everything falls into place and becomes understandable, even though various fluctuations and divergences remain (after all, the tradition was evolving through a millennium and a half). But there is nothing here concerning the minerals, metals and plants of the practical *wai tan* alchemists.

The same general conclusion holds of the *Wu Chen Phien*, which formerly puzzled us as it has so many others. Our quotations open with a clarion call to abandon the chemical alchemy in favour of the physiological.

- st.8 Desist from compounding and transmuting the Three Yellow Substances (*san huang*¹)^a and the Four Wonderful Materials (*ssu shen*²)!^b The common (medicines) of plant origin are even more different from the true primary (vitalities). Yin and Yang, when of the same category,^c will respond to each other and come into conjunction. 'Two' and 'eight' (i.e. the Yin and the Yang meeting under appropriate conditions) will spontaneously unite in kinship and affection. Just when the Yin is strangely (and seemingly) destroyed, a red sun will appear at the bottom of the lake,^d and the sprouts of the new medicine (the enchymoma) will appear like the white moon rising over the mountains. It is essential that people should recognise what is true lead and true mercury; they are nothing to do with common cinnabar and common mercury.
- st.13 Those who do not understand the mysterious principle of the inversion of the natural order (*tien tao*³) deny that one can plant lotuses in a sea of fire.^e Let the white tiger (the *chen Yang*) be brought home (to the centre of the body), then a glittering pearl round like the moon will be produced (the enchymoma). Let the 'chemical furnace' (the body) be watched with every care, and the 'fire-times' (periods of circulation of the *chhi*)^f strictly kept; calm in the mind, look to the maintenance of the respiratory rhythm, (and refrain from worldly anxieties)—thus Nature will be able to take its course. When all the Yin has been completely eliminated (and pure Yang formed), then will be achieved the enchymoma which enables a man to escape from the cage of the commonplace to a longevity of ten thousand years.
- st.18 First set up Chhien and Khun as the reaction-vessel and the apparatus, then heat together in it the crow (of the sun) and the rabbit (of the moon) as the chemical substances. When these two things are driven into the Yellow Way (*huang tao*⁴),^g the metallous enchymoma will be formed, and you need fear dissolution no more.

^a Sulphur, orpiment and realgar (according to Shang Yang Tzu, and *TT911*, ch. 6, p. 13a).

^b Cinnabar, mercury, lead and alum (according to Shang Yang Tzu). But *TT874* gives two lists, including variously malachite, magnetite, stalactitic calcium carbonate, and quartz, with orpiment and realgar. *TT911* adds cinnabar and resublimed mercuric sulphide to the 'three yellows'. As Sivin (1), p. 152, says, this only shows the variability in content of numerical categories even within the same book. The two expressions are older than Sun Ssu-Mo but were not used by Ko Hung.

^c On the category conception cf. pt. 4, pp. 305 ff.

^d Here of course the reference is to the bringing out of the Yang within the Yin (cf. p. 69 above).

^e This graphic phrase is yet one more example of the paradoxes of Yang-Yin theory, equivalent to saying that a male adept can produce a baby boy within himself (Fig. 1567).

^f Cf. p. 46 above.

^g Not of course here the ecliptic (cf. Vol. 3, p. 179), but the central region in the neighbourhood of the spleen.



Fig. 1572. One of the 500 Lohan at Pao-Kuang Ssu, Hsintu, stretching out his arm to bring down the Yang from the heavens (or rather, the Yin within the Yang). A label says: 'reaching heaven with one's own hand' (*chih shou ching thien*). Orig. photo. 1972.



Fig. 1573. One of the 500 Lohan at Pao-Kuang Ssu, Hsintu, stretching out his arm to fish up the Yin from the depths of the sea (or rather, the Yang within the Yin). A label says: 'searching for the moon at the bottom of the ocean' (*hai ti lao yüeh*). Orig. photo. 1972.

To swallow saliva and to inhale *chhi* are well-known practices, but without the (right) reagents nothing truly vital can be brought into being. If the true seeds are not put into the reaction-vessel, the operation will be as useless as having water and fire yet heating an empty kettle.^a

st.30 Khan's lightning (vividly flashes),^b with seething and rumbling in the (northern and western) regions^c of Metal (the lungs) and Water (the reins); (Li's) fire breaks forth at the top of the Khun-Lun mountain (the head),^d bringing Yin and Yang into confrontation. When these two things have accomplished their reverted and re-generative union, the enchymoma will spontaneously ripen and fill the whole body with perfume.^e

st.32 The sun, in the Li *kua* position (the south) turns over to femininity; the moon (lit. the Toad Palace), matched with Khan *kua*, becomes masculine. Whoever does not understand the principle of inversion of the natural order (*tien tao*) is like a man scanning (the broad heavens through a narrow) sighting-tube,^f and should cease to talk learnedly (about physiological alchemy).^g

From all this language, once understood, it is clear that the 'Poetical Essay' on awakening men and women to the necessity of cultivating their bodies and synthesising in them, as it were, the remedies for delaying old age indefinitely, even indeed for overcoming death, can never have been intended, however obscurely, as instructions for laboratory alchemists.^h

Among the prefaces and other preliminary materials at the beginning of the *Wu Chen Phien* we find a series of pictures and tables entitled *Tan Fang Pao Chien chih Thu*,² i.e. 'Precious Mirror of the Enchymoma Laboratory'. From the reproduction of the first picture, in Fig. 1575, one can see that the Yang dragon stands opposite to the Yin tiger,¹ Li opposite to Khan *kua*, each having a list of synonyms

^a This refers to the Yang and Yin of the inner lines of the *kua* Khan and Li (cf. pp. 61 ff. above).

^b I.e. the Yang within the Yin, the Fire within the Water. One expression for this was *Yin fu*;¹ another was *hu chih hsien chhi* (cf. p. 57 above).

^c Cf. Fig. 1551 above.

^d This is the obvious converse, the Yin within the Yang, set free by the former activity.

^e As the Shang Yang Tzu commentary shows, this is a poetical expression for the sense of perfect well-being which the Taoist adept attained by the practice of all the psycho-physiological and hygienic exercises and regimen. He also explains that the Water-Fire relationship denotes further the antithesis of the 'other' and the 'self' (cf. Table 121 C), especially of 'her' and 'me'. When 'her' *chen chhi* is generated, 'my' *chen Yang* is quickly liberated to form the enchymoma.

^f Cf. Vol. 3, pp. 332 ff. The analogy was a literary commonplace based on a useful astronomical technique.

^g Here we reproduce two striking illustration (Figs. 1572, 1573) of temple images depicting the snatching of the Yang from the heavenly height and the Yin from the depths of the sea. Also (Fig. 1574) the picture from *Hsing Ming Kuei Chih* (+ 1615) showing the triumphant adept with the sun in one hand and the moon in the other, Yin and Yang united in the enchymoma.

^h Our interpretations of the *Wu Chen Phien* are closely similar to those of some other modern students of it, for example Imai Usaburō (?);

¹ The dragon and tiger symbolism runs like a thread throughout the present volume, but one must find room somewhere to mention the many amulets which circulated in China formerly, depicting these two symbols of the Yang and Yin. See for example *Ku Chhuan Hui*, tsê 15, p. 40. There is now a superbly illustrated monograph by Hou Chin-Lang (1) on Taoist religious currency, both paper and metal.



Fig. 1574. The adept holding the moon (Yin) in his right hand, and the sun (Yang) in his left. An illustration from *Hsing Ming Kuei Chih* (+ 1615) entitled 'Universal Radiance' (Phu Chao Thu). Note the reaction-vessel for the enchymoma in the lower abdomen. Ch. 1, p. 20b.

五第六十二卷 篇真悟書十真修



篇真悟書十真修



Fig. 1575. The celebrated graphic tabulation of reagents in physiological alchemy given in the Wu Chen Phien (Poetical Essay on Realising the Necessity of Regenerating the Primary Vitalities), composed by Chang Po-Tuan about +1075 (TT260, ch. 26, p. 5a,b). For the elucidation see Table 122. The chart is entitled Tan Fang Pao Chien chih Thu, i.e. 'Precious Mirror of the Enchymoma Laboratory'. Below, the following pages tabulate the synonyms or cover-names respectively for (true) mercury on the right, (true) lead on the left, and the enchymoma in the centre.

Table 122. *Chang Po-Tuan's 'Precious Mirror of the Enchymoma Laboratory (i.e. the Body)'*.

YIN						YANG					
Khun <i>kua</i>						Chhien <i>kua</i>					
Feminine Portal						Mysterious Gate					
blood			<i>chhi</i>			<i>shen</i>			<i>ching</i>		
Khan <i>kua</i>						Li <i>kua</i>					
hardness	deep-seated	moon's anima	<i>Chhü-chiang</i> (small intestine)	tiger of Tui <i>kua</i>	white tin (tin)	malachite (copper carbonate)	dragon of Chen <i>kua</i>	Mt. Khun-Lun (head)	sun's animus	superficial	softness
number 1	<i>wu</i> Earth	rabbit's marrow	completed number 6	Metal	completed number 9	completed number 8	Wood	completed number 7	crow's liver	<i>chi</i> Earth	number 2
north	Sombre Warrior (northern sky palace)	black tin (lead)		wind	mountains and marshes	thunder and lightning	rain		cinnabar	Red Bird (southern sky palace)	south
black	jade rabbit (in the moon)	pre-natal Yin (poetical term)		white			caerulean		pre-natal Yang (poetical term)	golden crow (in the sun)	red
Moon	Metallous tiger			west			east			Pyrial dragon	Sun
Water				number 4			number 3				Fire
cyclical character <i>tsu</i>				cyclical character <i>keng</i>			cyclical character <i>chia</i>				cyclical character <i>wu</i>

N.B. The columns on the Yang side have been interchanged so as to bring out the originally intended mirror-image pattern; in the Chinese they occur in the order 4, 3, 2, 1, 6, 5.

corresponding with it.^a The principle of the arrangement is just the same as that of our Table 121 A,B,C above. Chang Po-Tuan's terms are translated in Table 122.^b Here one can see at once that among them there are some which could be mistaken for those of laboratory elixir alchemy, yet there can be no doubt that the whole plan is essentially psycho-physiological. Between the two sides there is a poetical epigram on the 'true (or vital) Earth', the enchymoma in its central place of formation: '(This) Earth has no fixed form, but if you marshal the Four Images^c in the right way, the true (or vital) Earth will be generated, that is to say, the Metallous Fluid and the Great Anablastemic Enchymoma.' Underneath, its manifestations (*chuang*^d) are described: 'Like bright window-dust,^d like a grain of millet, like a mysterious dark pearl.'^e

After this come three further charts (Fig. 1576), the first explaining a 'suspended womb reaction-vessel' (*hsüan thai ting*²), with details of its exact dimensions, and the third describing a 'crescent moon furnace' (*yen yüeh lu*³), again with specifications for its size and shape.^f These captions have already been translated in pt. 4 on pp. 17, 12, in the context of elixir laboratory apparatus, but by now it will be clear that they had a completely double meaning, and that just as cinnabar, lead and mercury could be names applied to physiological entities, so the dimensions and shapes here given made sense—but quite a different sense—in physiological alchemy. Furnace (*lu*) represented the Yang, reaction-vessel (*ting*) the Yin (cf. Table 121 A, C). 'Suspended womb' recalled the elaboration of the divine embryo, 'crescent moon' the cycles of the *chhi* (cf. Fig. 1577). Of course there was no reason why *wai tan* alchemists could not make and use apparatus with the given dimensions; and the double meaning doubtless also applied to the oldest extant description of all, the *Ting Chhi Ko*⁴ in Wei Po-Yang's +2nd-century *Tshan Thung Chhi* (cf. pt. 4, p. 16). In between the two pictures just discussed comes an 'iron ox' (*thieh niu*⁵), symbol in popular Buddhism of the subduing of evil passions, but also of the Taoist 'water-raising machines' involved in the circulation of *chhi* and *i* in the body (cf. Table 121 C, and pp. 115–6).

Although this pictorial section is thus to be understood primarily in terms of physiological alchemy, some of the tabulated terms, especially 'dragon' and 'tiger', are to be found also in later proto-chemical texts. The process of borrowing worked in both directions, for we have seen how some proto-chemical terms had been

^a TT260, ch. 26, p. 5a, b. These pictures have come down to us only in the *Hsiu Chen Shih Shu* edition of the *Wu Chen Phien*.

^b The array was also studied and translated by Davis & Chhen Kuo-Fu (2), but many of their pioneer interpretations cannot now stand. The version of this table reproduced in the *Chin Tan Ta Yao Thu* (+1333), TT1054, containing slight rearrangements of the names and terms, will be found reproduced in Ho Ping-Yü & Needham (2), but they too discussed it in a context only of elixir alchemy and category theory.

^c Cf. p. 58. But here they refer to the four directions of space, and all the symbolic correlates that those imply.

^d Cf. Vol. 5, pt. 3, pp. 73, 149ff.

^e Hereafter there follow (ch. 26, pp. 5b, 6a) the three lists of synonyms referred to on p. 97 above, i.e. of true mercury, then (in the middle) of the enchymoma, lastly (on the left), of true lead.

^f Ch. 26, pp. 6b, 7a.

東方青龍西白虎南朱雀北玄武四獸爭
 搏不可當定計將軍能作主兩手擒來合戰
 時正見中秋月當午殺氣驚天動鬼神用盡
 周星震區宇須臾戰罷兵器收產穎明珠號

挨排四象生真土詩

偃月鐘



鐘面周圍約一尺二寸明心機有
 一尺立唇環匝二寸唇厚二寸
 鐘口偃開鍋釜又如仰月狀故
 名偃月鐘也張隨注云又名威
 光鼎也

鐵牛



真鐵牛兒形容惡性剛偏好爭馳人人皆
 有那箇解牽騎種就黃芽滿院更須用
 神水洗之中宮裏若無此獸安得似嬰
 兒 乾坤真動靜生成家活總賴於伊
 虎隨渴飲水銀池皮牛牽車進火霞光進海
 底陰輝飲重天華池雲龍果節月明輝

懸胎鼎



鼎周圍一尺五寸中虛五寸長一尺二
 寸狀似蓬壺亦如人之身形分三層應
 三才鼎身腹通直令上中下等均勻
 入鐘八寸懸於竈中不着地懸胎
 是也又謂之朱砂鼎張隨注云又名
 太一神鐘

滿庭芳

Fig. 1576a,b,c. The three explanations of the *Wu Chen Phien* (TT260, ch. 26, pp. 6b 7a). On the right (a) the 'suspended womb aludel', in the middle (b) the 'iron ox', and on the left (c) the 'crescent moon furnace'. The captions on the right and left have already been translated in Vol. 5, pt. 4, pp. 17, 12 in the context of real laboratory apparatus, and that is their superficial meaning; but they also carry esoteric meanings relating to the *kua* of the *I Ching* and to the several respiratory, gymnastic, heliotherapeutic and sexual techniques (cf. pt. 3, p. 201). The central caption takes the ox extrinsically in the Buddhist sense as the beast of evil desire which has to be ridden and controlled by Everyman; only if this is done will the alchemical 'yellow sprouts' appear and the 'baby boy' be formed. This parallels the emphasis placed both in East and West upon the high moral character required of alchemists (cf. pt. 3, p. 101 and *passim*, as also p. 15 above). Intrinsically the ox is the motive power for the circulation of *chhi* and *i* in the body which permits the Yin tiger to drink from the pool of 'true' mercury and to approach the Yang dragon in the fiery clouds. Then the herdsboy, rejoicing, smiles with pleasure, and the enchymoma of immortality is achieved. There is deep psychological truth lurking somewhere in all this, expressed today perhaps by saying that the power generated by the id can appear as libido or else as mortido, according to the organising success of the ego, guided by the superego. The three explanations also appear in the *Chin Tan Ta Yao Thu* of + 1333 (TT1054), TTC Yed., *mao chi*, 3, ch. 3, pp. 34b to 35b.

adopted by the physiological alchemists, and indeed here we have had mention of 'white tin', 'copper carbonate' and the like, brought in as cover-names for the colours associated with directions, elements, organs, etc.

Over the years a number of other illustrations accreted round Chang Po-Tuan's original set of about + 1070. The words *Tzu-Yang*¹ were added to his Yang-Yin diagram to show that it had been due to the Adept of the Purple Yang (Tzu-Yang Chen Jen,² Chang's sobriquet), and it was incorporated (Fig. 1578) in the set of illustrations called *Chin Tan Ta Yao Thu*³ (TT1054) which Chhen Chih-Hsü⁴ (Shang Yang Tzu⁵) put together in + 1333 for the *Chin Tan Ta Yao* (Main Essentials of the Metallous Enchymoma, the true Gold Elixir)^a written by him in

^a TT1053.

¹ 紫陽

² 紫陽真人

³ 金丹大要圖

⁴ 陳致虛

⁵ 上陽子



Fig. 1577. The 'crescent moon furnace' in *Hsing Ming Kuei Chih* (+1615), ch. 1, p. 27b. The title refers to reaction-vessel and furnace as the 'greater' and the 'lesser', i.e. the body itself, and the real apparatus fanned by the boy. The poems speak of the forging and re-casting of the primary vitalities.

紫陽丹房寶鑑之圖

陰三牝血



三五兔金虎月魄
恍惚曲江成數六
兌虎金
風白西四庚
白錫成數九

真土無正形
挨排四象
生真土金
液大還丹

狀若明牕塵
若黍米
若玄珠

剛一北黑月
水子裏 戊土 亥武

陽三牡神精



三雨青成數八
窮冥崑崙成數七
金烏火龍口魂 烏肝朱砂

火午表 巳土 朱雀
柔二南赤日

三 甲
震龍木

首誠詳要

金丹大要

昇集三

Fig. 1578. Another version of the graphic tabulation of Chang Po-Tuan, from the *Chin Tan Ta Yao Thu*, ch. 3, p. 34a. Elucidation in Table 122. The title was now (+ 1333) prefaced by the words 'Tzu Yang, to indicate that it had indeed been drawn up by the Adept of the Purple Yang (Tzu-Yang Chen-Jen). From *TTCY*, *mao chi* 3.

+ 1331. Here we find, among many other matters, including adapted versions of the Neo-Confucian *Thai Chi Thu*,^a the famous 'Diagram of the Mutual Stimuli (and Responses) of Forms and Things' (*Hsing Wu Hsiang Kan chih Thu*) reproduced in Fig. 1579, where the masculine dragon of Yang confronts in love the feminine tiger of Yin between the flames of the red south and the 'sombre warrior' (the snake and tortoise) of the black north.^b Shih 'Thai's² verse is apposite:

^a *TTCY* ed., p. 28a. Cf. Vol. 2, p. 461.

^b A later version of this is given in Fig. 1580.

¹ 形物相感之圖 ² 石泰



Fig. 1579. Diagram of the Mutual Stimuli and Responses of Forms and Things (Hsing Wu Hsiang Kan chih Thu), from *Chün Tan Ta Yao Thu*, ch. 3 p. 32 a (TTCY, mao chi 3). In this *conjunctio oppositorum* or *matrimonium alchymicum* the man with the dragon faces the girl with the tiger, Yang in love with Yin, between the flames of the South and the tortoise-serpent of the North. Clouds and rain in the right-hand top corner add their symbolism.

The Elegant Girl rides upon the tiger of lead,
And the Master of Metal bestrides the dragon of mercury.^a

Other striking illustrations accompany this, for example, a portrayal of physiological alchemy (Fig. 1581) in which the body is seen as a mountain (*Yuan Chhi Thi Hsiang Thu*¹) up and down which the *chhi* circulates.^b Khan is in command at the

^a *Huan Yuan Phien*,² in TT260, ch. 2, p. 2 a. Cf. p. 65 above.

^b P. 28b.

¹ 元氣體象圖

² 還源篇



Fig. 1580. A later representation of the same pattern, from *Hsing Ming Kuei Chih* (+ 1615), ch. 2, p. 33b. But this is more sophisticated, for it is the girl who rides upon the dragon (the Yin within the Yang), while the young man is mounted on the tiger (the Yang within the Yin). Both animals exert their influence on the enchymoma developing within the reaction-vessel. The picture is entitled 'The Love-Making of Dragon and Tiger'; the surrounding poems amplify the theme.

base, with 'Thai Hsüan'¹ at the top, where we see the head as Khun-Lun mountain containing the 'ball of mud', the brain. Towards the lower part the important Yellow Court (*huang thing*)² can be seen, with paths that evidently meet there, as one would expect. Some of the *kuan*,³ or gates, in the circulation of the *chhi* are also

¹ 太玄² 黃庭³ 關

easily made out.^a Another curious picture (Fig. 1582) is due to Lin Shen-Fêng,¹ some late Sung or early Yuan Taoist, who fancifully likens the *nei tan* exercises to a set of arrows in the pitch-pot game.^b In this *Chin Tan Fa Hsiang Thou Hu Thu*^c each of twelve arrows (*mu chien*²) is marked like a tablet or *phai tzu*⁴ with the name of a particular exercise, and he would be the winner, presumably, who could combine them all to the best advantage. However, it is clear from the accompanying oral instructions that Lin was a syncretistic Buddhist-Taoist, and that all the exercises were conceived of in purely meditational terms. For example, on the right we see an arrow marked *kuan pi thiao hsi*,⁵ i.e. 'gazing at the tip of one's nose and harmonising the respiration'. And on the left there is another marked *ching ting wu wei*,⁶ i.e. 'setting one's mind at rest and refraining from worldly activity'. Some others are designated *phang mên*,⁷ ancillary disciplines, while at the centre there is a label marked *chung kung*,⁸ or, as we should say, 'royal road'. Here are two arrows, one labelled *yü i huan tan*,⁹ 'the regenerative enchyroma of the jade fluid', and the other *chin i huan tan*,¹⁰ 'the regenerative enchyroma of the metallous juice'. Finally we note another marked *jih yüeh kao pên*,¹¹ 'the rapid circulation of (the body's) sun and moon'. This then is as much as we need say for the present about the work of Chang Po-Tuan and Chhen Shih-Hsü.^c We must now return to our consideration of the *Hsiu Chen Shih Shu*.

We have skipped into the +14th-century, but must now return to the +13th, since all the rest of the works in the collection date, so far as we can see, from the first half of that century. Pai Yü-Chhan¹² (whose other, probably secular, name was Ko Chhang-Kêng¹³) was active between +1205 and +1226, and many chapters consist of his prose and poetry on physiological alchemy;^d but we need not enlarge upon it here. Much more interesting for us is a work called *Thi Kho Ko*¹⁴ (The Song of the Bodily Husk)^e and the deliverance from its ageing, by a Taoist whose pseudonym was Yen Lo Tzu¹⁵ (the Smoky-Vine Master).^f This contains a number of interesting anatomical diagrams. For example, Fig. 1583a shows the head

^a It should be noted that the picture contains a number of Buddhist terms.

^b P. 38b. Cf. Vol. 4, pt. 1, p. 328. The term was later used figuratively for a symposium or supper at which elevated topics were discussed.

^c As we may not have the opportunity of mentioning them again, it may be recorded that Chhen Chih-Hsü appended to his book two interesting tracts on the history of the schools of adepts and immortals (TT1055, 1056). The titles and details of these will be found in the bibliography. There has been no adequate study so far of this liturgical and hagiographic material.

^d Notably *Shang Chhing Chi*¹⁶ and *Wu I Chi*¹⁷ (see bibliography).

^e HCSS, ch. 18.

^f The 'Burning-Bush Master' comes to mind as a translation, but the idea was not exactly that. The second word applies to vines like *Metaplexis*, but also to *Wistaria*, the blossoms of which could look like a cloud of blue smoke in the distance. The same sobriquet was also borne by a philosopher or artist of the early Chhing, Kao Shu-Chheng,¹⁸ but we have not been able to find out much about him.

¹ 林神鳳	⁵ 金丹法象投壺圖	⁷ 木箭	⁹ 牌子	¹¹ 觀鼻調息
⁴ 靜定無爲	² 旁門	⁸ 中宮	⁶ 玉液還丹	¹⁰ 金液還丹
¹¹ 日月高奔	¹² 白玉蟾	¹³ 葛長庚	¹⁴ 體殼歌	¹⁵ 煙蘿子
¹⁶ 上清集	¹⁷ 武夷集	¹⁸ 高樹程		

圖真朝子籙煙 圖部首子籙煙



養生息命詩
 捉得金精養命基
 日華東畔月華西
 壺中自有長生藥
 返老還童天地齊
 勸君勤學守三一
 中有長生不死術
 能存玄真萬事畢
 一身精神不妄失

Fig. 1583a,b. Yen Lo Tzu's drawings of the head region; that on the right gives the names and synonyms recognised in physiological alchemy, that on the left shows the relevant spirits and animals, favourable and unfavourable. From *Thi Kho Ko*, in *Hsiu Chen Shih Shu* (TT260), ch. 18, p. 2a,b.

region, with many names and synonyms for the structures and functions recognised by Taoist physiological alchemy there. It is followed by a *Chhao Chen Thu*¹ (Fig. 1583b) reminiscent of the picture already given in Fig. 1564. Then Fig. 1584a,b shows the thorax and abdomen in sagittal section, seen from the right (a) and from the left (b), with the dragon and tiger meeting to form the 'baby boy', the enchymoma, near the spleen region, and the routes which connect the reins with the heart for the *chhi* circulation. Furthermore, the two lower centres of vital heat (*tan thien*²) are shown, and at the top above the lungs the trachea, marked by its famous names *shih-erh chung lou*³ and *shih-erh huan*,⁴ the 'twelve-storied tower' or the 'twelve rings'. On the dorsal side the vertebral column (*chia chi ku*⁵) appears, along with the spinal cord (*sui tao*⁶), a 'marrow path' along which the *chhi* circulates up, as in the Ta Huan Tan procedure (cf. Fig. 1562, p. 77). The mechanisms for the raising of the *chhi* are shown along the backbone on the left, the *niu chhê*,⁷ 'ox-driven machine', at the top, the *lu chhê*,⁸ 'deer-driven machine', below it, and right at the bottom a third which is indistinctly labelled *yang chhê*,⁹ 'goat-driven machine'. Lastly, Fig. 1585a,b shows the same regions from the front (a) and from the back

¹ 朝真圖² 丹田³ 十二重樓⁴ 十二環⁵ 夾脊骨⁶ 髓道⁷ 牛車⁸ 鹿車⁹ 羊車

圖之側右境內 圖之側左境內



Fig. 1584*a, b*. Yen Lo Tzu's sagittal sections of the thorax and abdomen, giving the names of many structures recognised in physiological alchemy. On the right the dragon and tiger are seen near the Yellow Court, and on the left the 'baby boy' (the enchymoma) which is born there. From *Thi Kho Ko*, in *Hsiu Chen Shih Shu* (TT260), ch. 18, pp. 2*b*, 3*a*.

(*b*), giving the names of the viscera. The principal organs of the body are discussed systematically,^a and the tractate ends with a few talismans in *Pao Phu Tzu* style.^a

In these anatomical drawings and discussions there is much more than meets the eye. They stand, so to say, in an intermediate position, linked on the one hand with the scientific anatomy of the age, indeed with the revival of dissection in the Sung period;^b and on the other with a kind of mystical microcosmography which served

^a As usual in medieval Chinese anatomical works, and as we shall show in Sect. 43, the scientific level in the text is better than that of the illustrations.

^b The Han and the Sung were the two great ages of anatomy in ancient and medieval China.

圖之內背境內 圖之內正境內

人有咽有喉咽則嚥物喉則通氣二竅各不相離喉在前咽在後喉主出納咽則吞之而已喉字從侯自內出者喉達之于外自外入者喉達之于內所謂呼者因陽出吸者隨陰

朱提點內境論

李四



Fig. 1585 a, b. Yen Lo Tzu's drawings of the front aspect (right) and dorsal aspect (left) of the viscera of the thorax and abdomen, about +1000 if not earlier. The names of the organs are all given. From *Thi Kho Ko*, in *Hsiu Chen Shih Shu* (TT260), ch. 18, p. 3a, b.

the Taoist *nei tan* alchemists well enough to continue in a traditional form down to our own time. Let us consider the former aspect first; it will incidentally help us to date Yen Lo Tzu's book.

Without anticipating here too much the historical account of anatomical dissection and illustration in China which must necessarily come in Section 43, it may be said that the +10th to the +13th-centuries constituted a time of great activity in these fields. Much is now known of this, and in the light of it, Yen Lo Tzu's pictures of thorax and abdomen are clearly Wu Tai or Sung in date (if not indeed possibly earlier). A very similar drawing, in which the head of Fig. 1583 has been united, as it were, with the trunk of Fig. 1584, appears in the *Shih Lin Kuang Chi*¹ encyclopaedia; this we illustrate in Fig. 1586 from the unique copy of the +1478 edition preserved in the Cambridge University Library. From that work itself one can learn little more, since the picture is not accompanied by any explanatory text, nor can we tell when it was incorporated in the encyclopaedia, because the early editions, from c. +1130 onwards, are of extreme rarity, perhaps not now extant anywhere. The picture is identical, however, with one in the book of Li Kung,² *Huang Ti Pa-shih-i Nan Ching Tsuan Thu Chü Chieh*³ (Diagrams and a Running

¹ 事林廣記

² 李綱

³ 黃帝八十一難經纂圖句解

Commentary for the Manual of Explanations concerning Eighty-one Difficult Passages in the Yellow Emperor's Manual of Corporeal Medicine).^a The preface of this is dated +1270, so either one of the later encyclopaedia editors copied from him, or he copied from some common source. Quite probably he constructed the picture from Yen Lo Tzu's diagrams, because his drawings of the viscera from the ventral and dorsal aspects are practically identical with those in the *Thi Kho Ko*. Li Kung's late Sung book is a medical work of conspicuous value, and we shall speak of it further in Vol. 6. Meanwhile this is as much as we can say here of the intermediate tradition in which scientific anatomical knowledge, so far as it went at that time, was blended with the ideas of Taoist physiological alchemy.

What exactly was the background of this movement or upsurge of anatomy in the Sung? Its full circumstances must be left for the appropriate Section;^b at present it may perhaps suffice to report that between the years +1041 and +1048 a civil official, Wu Chien,¹ ordered the dissection of the body of a famous rebel leader Ou Hsi-Fan,² and of those of many of his companions, draughtsmen (*hua kung*)³ being commissioned to make drawings of all the viscera and other parts.⁴ This was the time at which there arose the mistaken belief that at the base of the throat there were three passages, one for the *chhi* or air (trachea and bronchi), one for solid food (oesophagus), and a third for liquids. Earlier Chinese anatomists had not fallen into this error.

Then, between +1102 and +1106, in good emperor Hui Tsung's golden days, and those of his learned court of virtuosi,^d a governor named Li I-Hsing⁴ arranged for further dissections; and not long afterwards, probably partly as a result of this, the physician Yang Chieh⁵ produced in +1113 what is now the oldest extant illustrated anatomical treatise in Chinese, the *Tshun Chen Huan Chung Thu*⁶ (Illustrations of the True Form of the Body). We do not have the text now in its original version, but only incorporated in other books and MSS, notably in the Japanese works compiled by the priest-physician Kajiwara Shozen,⁷ the *Ton-Ishō*⁸ (Medical Excerpts Urgently Copied) of +1304, and the *Man-Anpō*⁹ (Myriad Healing Prescriptions) of +1315.^e The illustrations also occur, however, in a number of Chinese books, as we shall see. Now according to the preface which Chia Wei-Chieh¹⁰ wrote for Yang Chieh's treatise, all earlier anatomical texts and illustrations were carefully studied by him, including those of Yen Lo Tzu;^f and to the pictures of the viscera he added diagrams of the twelve tracts of circulation of the *chhi*; hence the words *Huan Chung* in the title. Thus Yen Lo Tzu was clearly the older writer, and

^a *TT*1012. The illustration is found in a preliminary tractate entitled *Huang Ti...Nan Ching Chu I Thu*,¹¹ p. 4a,b.

^b In the meantime there are excellent papers by Hou Pao-Chang (1); Ma Chi-Hsing (2); Watanabe Kozo (1); and Miyashita Saburō (1).

^c The names of the prosectors have not been preserved, but the Chief Illustrator was Sung Ching.¹²

^d Cf. Vol. 4, pt. 2, pp. 501-2.

^e Cf. Sugimoto & Swain (1), pp. 143ff., 379.

^f *ICK*, p. 235.

¹ 吳簡 ² 歐希範 ³ 畫工 ⁴ 李夷行 ⁵ 楊介 ⁶ 存真環中圖
⁷ 梶原性全 ⁸ 頓醫抄 ⁹ 萬安方 ¹⁰ 賈偉節 ¹¹ 註義圖 ¹² 宋景



Fig. 1586. The diagram of Taoist anatomy and physiology in the *Shih Lin Kuang Chi* encyclopaedia, from the edition of +1478. The picture is probably of the early +13th century. Several wheels of water-raising machinery for circulating the *chi* are seen, with the co-operation of Yang dragon and Yin tiger to produce the 'baby boy' enchymoma. The upward passage of the *ching* to nourish the brain is drawn in a railway-line convention, and at the top on the right the 'three corpses (or worms)' of death and decay are seen leaving the regenerated body.

he must have worked before the Ou Hsi-Fan dissections in the mid +11th-century because at one point in his book as we now have it there is a statement saying:^a

Recently there have been dissections of criminals, the reports of which maintain that the throat has three passages; this is very wrong . . . And they say therefore that Yen Lo Tzu's *Chhao Chen Thu*^b is in error—but that is not so.

This occurs in a piece entitled *Chu Thi Tien Nei Ching Lun*.^{1 c} Perhaps this was written by the eminent physician Chu Hung,² whose *Nei Wai Erh Ching Thu*³ (Illustrations of Internal and Superficial Anatomy)^d appeared in +1118, very shortly after the book of Yang Chieh.

So much for the borderline with scientific anatomy. The lesson is that the physiological alchemists were not entirely (as one might sometimes be tempted to think) withdrawn into the practice of strange ritual and magico-liturgical observances, the management of peculiar physiological exercises, and an absorption in meditational quiescence—they were extremely interested in the most advanced anatomy of their day. But we cannot conclude without the briefest of references to the possible relation of this with the history of anatomy in Europe. In Section 7 (Vol. 1) we had something to say of the *Tanksuq-nāmah-i İlkhān dar funūn-i 'ulūm-i Khitāi* (Treasures of the Ilkhan on the Sciences of Cathay),^e that remarkable encyclopaedia prepared at Tabriz in Persia under the auspices of Rashīd al-Dīn al-Hamdanī about the year +1313; and we even reproduced a drawing of the viscera very obviously Chinese in character.^f More recently Miyashita Saburo (1) has compared all the illustrations of thoracic and abdominal anatomy in this encyclopaedia with those of the possible Chinese sources, and convincingly concludes that they were based on the drawings of Yang Chieh in the *Tshun Chen Huan Chung Thu*, though probably not copied directly from that book. Besides the Japanese texts above mentioned which have preserved Yang's text and illustrations, the latter were incorporated not only in Chu Hung's *Nei Wai Erh Ching Thu* (of which we have also spoken), but furthermore in the Yuan edition (+1273) of the *Hsüan Mên Mo Chüeh Nei Chao Thu*⁴ (Illustrations of Visceral Anatomy for the Taoist Sphygmological Instructions; sometimes called *Hua Tho Nei Chao Thu*⁵)^g edited by Sun Huan;⁶ and thirdly in the *I Yin Thang I Chung Ching Kuang Wei Ta Fa*⁷ (The Great Tradition of Internal Medicine . . .; sometimes called *I Chia Ta Fa*⁸),^h compiled by the famous physician Wang Hao-Ku⁹ in +1294. These, especially

^a *Thi Kho Ko*, p. 5b.

^b Cf. Fig. 1583a above.

^c *Ibid.*, pp. 4aff.

^d *ICK*, pp. 236, 497. The piece would have been inserted by some later editor of Yen Lo Tzu's *Thi Kho Ko*.

^e Cf. Vol. 1, pp. 218-9. See also Adnan Adivar (1); Süheyl Ünver (1, 2).

^f Fig. 34 (b).

^g This book had originally been written by Shen Chu¹⁰ in +1095, i.e. after the first wave of dissections and before the second. It had nothing to do with the famous physician of the +3rd-century whose name some versions of it bore.

^h *ICK*, p. 863. The title commemorates the legendary minister I Yin, patron of potions, and the historical Han physician Chang Chung-Ching.

¹ 朱提點內境論 ² 朱肱 ³ 內外二景圖 ⁴ 玄門脈訣內照圖 ⁵ 華陀內照圖

⁶ 孫煥 ⁷ 伊尹湯液仲景廣爲大法 ⁸ 醫家大法 ⁹ 王好古 ¹⁰ 沈銖

perhaps Sun Huan's book, would have been the sources for the Persian encyclopaedia.

Miyashita does not fail to note that the revival of anatomy in Europe began with Mondino de Luzzi and his *Anothomia* of + 1316, after a few earlier autopsies such as that at Cremona in + 1286. Mundinus had read widely among the Arabian anatomists, says Singer,^a and naturally borrowed from them. In pondering such stimuli and transmissions one cannot fail to be struck by the fact that the beginning of the European + 14th-century had been preceded by at least three centuries of intensive anatomical work in China, and that just at the critical period there is clear evidence of a deep influence of this on Persian and Arabic medical culture. Though there had been no Chinese Galen, and the anatomy of Wang Mang's time could not compare, as far as we know, with that of the Hellenistic age, what was done in the Sung was something else again, and its time-relations give food for thought. But we must resume our account of physiological alchemy.

We turn now to the microcosmography. Visitors to the White Clouds Taoist temple (Pai Yün Kuan¹) at Peking have long been accustomed to admire an engraved stone stele entitled *Nei Ching Thu*;² we reproduce a rubbing of it in Fig. 1587.^b This 'Diagram of the Internal Texture of Man' was made in 1886, as the inscription says, by a Taoist named Liu Chhêng-Yin³ (Su Yün Tao Jen⁴), who found it on a beautiful old silk scroll in the library of a temple at Kao-sung Shan,⁵ together with explanations of anatomical names of joints, tracts, viscera, etc. Realising the importance of this for physiological alchemy (*chin tan ta tao*,⁶ as he calls it), he had the picture carved in stone.

The general scheme is obviously very reminiscent of diagrams that we have already studied (Figs. 1584, 1586); it represents a sagittal section of the human body seen from the left, but it is much more fanciful and poetical than any of them. The body is again pictured as a mountain with crags projecting from the spinal column and the skull. Without going into too much detail, we can easily distinguish a greater and a lesser circulation of the *Chen chhi*,⁷ forming reverted regenerative enchymomas. Most of the viscera appear only as inscriptions below and around the heart, which is represented as a ring of seething blood with the Herdboy (Niu-lang⁸) in the quiet centre of it; underneath and to the right the reins are symbolised by the Weaving Girl (Chih-nü⁹) working at her spinning-wheel, and sending up the *chhi* to the throat and trachea (the twelve-storied tower, *shih-erh lou thai*¹⁰) and the brain (*ni wan kung*¹¹) where the *shen shui*¹² is added to it before it is sent down to

^a (25), pp. 74 ff. Cf. Choulant (1), pp. 79 ff.

^b We are greatly indebted to Mr Rewi Alley of Peking for our copy, done in yellow and red. This diagram, together with a closely similar coloured scroll-painting, was reproduced and discussed in several publications by Rousselle (1, 4a, b, 5). His account is well worth reading, but much influenced by Buddhism and Indian yoga, so that in accordance with the doctrines of a syncretistic group which accepted him as an initiate in Peking in the twenties his interpretation is almost entirely in meditational terms. This hardly does justice to the whole range of the tradition of physiological alchemy.

^c On these two stars, Vega and Altair, cf. Vol. 3, p. 282 and *passim*.

¹ 白雲觀

² 內經圖

³ 劉成印

⁴ 素雲道人

⁵ 高松山

⁶ 金丹大道

⁷ 真氣

⁸ 牛郎

⁹ 織女

¹⁰ 十二樓臺

¹¹ 泥丸宮

¹² 神水



Fig. 1587. The *Nei Ching Thu* (Diagram of the Internal Texture of Man), a rubbing from a stone stele preserved at the Pai-Yün Kuan Taoist temple at Peking. The stone was carved in 1886 following an old silk scroll found in a temple at Kao-sung Shan. It represents the culmination of the traditions of Taoist anatomy and physiology, and shows a fanciful poetical rendering of a sagittal section of the head, thorax and abdomen seen from the left-hand side. For a brief explanation of the details see text. Our copy of the scroll is a valued gift from Mr Rewi Alley.

the central region of vital heat. This corresponds to the 'conjunction of heart and reins' (*hsin shen chiao hui*¹) discussed on p. 73 above.

The greater circulation, on the other hand, involves the spinal column. At its base in Fig. 1587 we see the treadmill water-raising machine (*Yin Yang hsüan cha chhê*²) which has to work to send the *ching chhi*³ upwards—*Khan shui ni liu*,⁴ as the neighbouring inscription says. At this point, flames seen bursting forth from a *ting*⁵ symbolise the unveiling of the Yang within the Yin of the seminal fluid and its *chhi*. Just alongside we see the lowest of the three gates (*san kuan*⁶) of the spinal cord or column, more prominently depicted than the other two, one of which is visible at the level of the heart, the other just above that of the trachea-pagoda. Once the *ching chhi* has been made to circulate thus upwards it again joins with the *shen shui* and finds its way down to the Yellow Courts where the enchymoma forms, this being symbolised by a glory emanating from a pack of four Yin–Yang symbols, emblems which represent, together with the 'vital Earth' (*chung thu*⁷) at the centre, the five elements and the four directions of space (cf. Fig. 1552). Near by a ploughboy and an ox working hard ground symbolise the skill and strength needed for the conduct and timing of the exercises. A caption says: 'the iron ox ploughs the field where coins of gold are sown', another reference to the 'golden', or more strictly Metal-ous, enchymoma of immortality.

If space permitted, many other allegories in the design could be expounded. For example, in the head sits Lao Tzu, and beneath him stands the 'blue-eyed barbarian monk', supposedly Bodhidharma.⁸ More interesting for us is the fact that two of the tracts are represented. Here we cannot properly discuss the dorsal median tract (*tu mo*⁸) and the ventral median tract (*jen mo*⁹), two of the eight auxiliary tracts or routes of circulation of the *chhi* important in medical physiology, because they must be dealt with in their place in Sect. 44 under acupuncture. But they appear very clearly in the picture as the two curving lines at the position of the 'face', the *tu mo* coming down over the top of the head as far as the central point of the maxillary junction above the teeth of the upper jaw, the *jen mo* coming up to its last point on the chin,¹⁰ and having at its origin a pool of *chhi* depicted.^c

To conclude this subject we present a wood-block broadsheet printed at Ch-hêngtu in Szechuan by one Tuan Fu¹⁰ in 1922.^d Again we see the bodily microcosm, but now not exactly sagittal or frontal, rather in the sitting lotus position^e yet

^a On all these matters we must be content to refer to Rousselle, *op. cit.* Cf. the comments of Schipper (5).

^b For details of these tracts see Chu-Lien (*r*), *opp.* p. 339, with pictures copied from a Ming book; and Soulié de Morant (2), pp. 185 ff.

^c These tracts figure considerably in Rousselle's exposition as routes of the 'circulation of the light'. This is late meditational terminology. The classical doctrine is in Lu Gwei-Djin & Needham (5), pp. 48 ff.

^d It was presented to us by my friend Mr Fan Wu in 1943. For an exposition of the living tradition in the form in which it continues to be expounded today, see the translation of Chao Pi-Chhen's¹¹ *Hsing Ming Fa Chüeh Ming Chih*¹² (printed in Taipei in 1963) by Lu Khuan-Yü (4).

^e Cf. p. 266 below.

¹ 心腎交會

² 陰陽玄踏車

³ 精氣

⁴ 坎水逆流

⁵ 鼎

⁶ 三關

⁷ 中土

⁸ 督脈

⁹ 任脈

¹⁰ 端甫

¹¹ 趙避塵

¹² 性命法訣明指

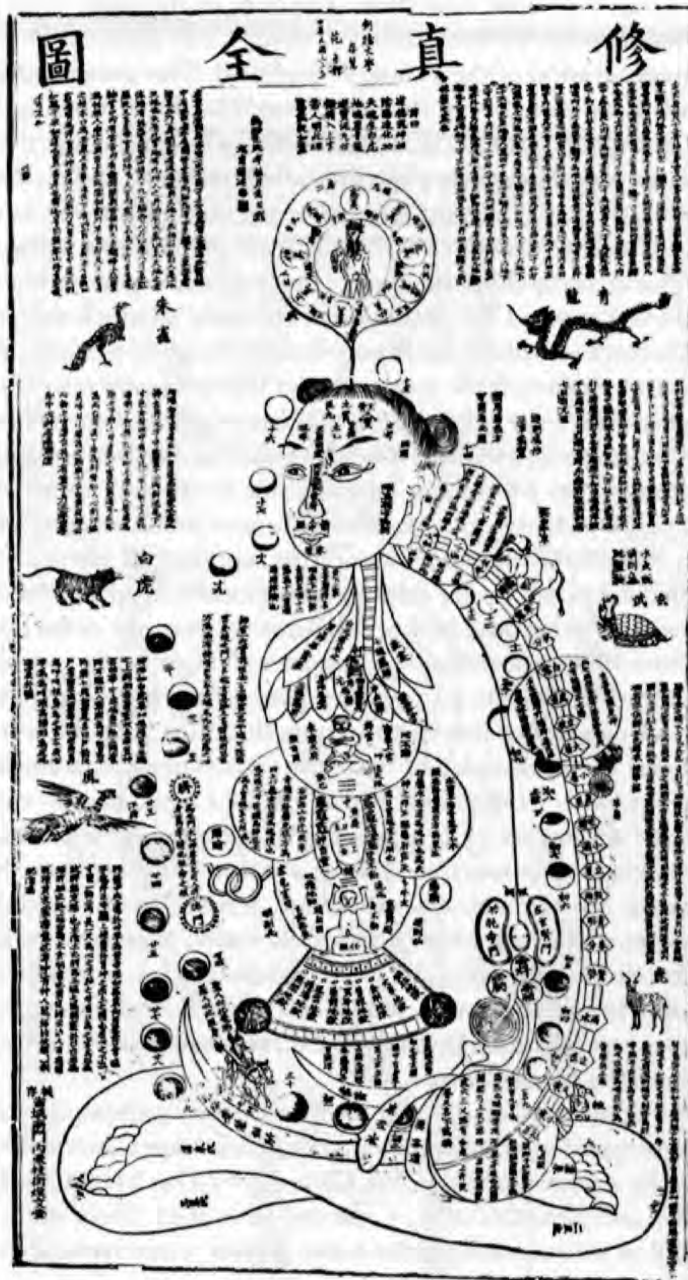


Fig. 1588. The *Hsiu Chen Chhuan Thu* (Complete Chart of the Regeneration of the Primary Vitalities), a Chhêngtu wood-block broadsheet of the twenties. It combines the macrocosmic elements of the + 10th-century *Ming Ching Thu* (Fig. 1551) with the Taoist physiology of the *Nei Ching Thu* (Fig. 1587). For a brief explanation of the details see text. Our copy of the broadsheet is a valued gift from Mr Fan Wu thirty-five years ago.

what might be called *passant regardant*. The title of the chart (Fig. 1588) is especially significant in the present context—*Hsiu Chen Chhüan Thu*¹ (Complete Chart of the Regeneration of the Primary Vitalities). The general idea of the diagram is much the same as that of the *Nei Ching Thu*, but cruder and even more influenced by Buddhism. One notes immediately the tracheal rings, the pulmonary lobes Buddhicised into a lotus flower surmounting the heart, and on the right at the bottom the two kidneys. The great interest of the chart, however, is that it combines the *Nei Ching Thu* system with macrocosmic elements as in the *Ming Ching Thu* (Fig. 1551), especially the succession of lunar phases representing the constant cyclical changes of Yang and Yin *chhi* and *i* in the body, so much so indeed that the spinal column is marked with all the twenty-four fortnightly periods (*chieh chhi*²) of the year.^a A very old feature is the appearance of the *ching-chhi* raising mechanisms (cf. p. 108), the *lu chhê*, *yang chhê* and *niu chhê* being situated approximately at the places of the 'three gates' (*san kuan*). The symbolical animals of the four directions of space (*ssu hsiang*³) are prominent on each side at the top, in accordance with Taoist physiological alchemy. But elsewhere there is much imagery of a Buddhist character. The base of the body, for example, is represented as a sharp blade, near which is a horse and rider; we are told that fools ride to their deaths on this steed while sages mount it to become immortals—this is mirrored in the famous adage, marked just above, that proceeding accordance to Nature leads to death while following counter-Nature leads to immortality (*shun tsê ssu, ni tsê hsien*⁴).^b Just beside this is an open fan containing the names of nine Buddhist hells. Upwards again the reins and the heart are represented by two boys each marked with a suitable *kua*, as one would expect, with *Chhien kua* in the Yellow Court; but on each side (and elsewhere in the diagram) we find complicated and unusual characters, the printed forms of the exorcistic talismans (*fu*⁵). Lastly, a feature differing from the *Nei Ching Thu* is the greater use of medical terminology, a number of acupuncture points being indicated as well as the *tu mo* and *jen mo* tracts. Moreover in the panels of print at the sides there are relics of the older anatomical descriptions in which even standard weights of organs can be found mentioned. And although the *nei tan* microcosmos has been so much Buddhicised these panels still contain and expound several texts from the *Huang Thing Ching*.

To show the continuity of the macro-microcosmic pattern through the centuries, and as a pendant to this discussion of the *Hsiu Chen Chhüan Thu*, we reproduce in Fig. 1589 a page from the *Nei Chin Tan*⁶ (The Metallous Enchymoma Within),^c partly completed in +1615, printed in +1622. Here again the body of man is depicted as surrounded by the lunar phases, participating in the endless

^a See Table 35 in Vol. 3, and pp. 404-5.

^b This is a perspicuous reminiscence of the ancient practice of 'sending the semen upwards to nourish the brain' (cf. pp. 30, 197 ff.); or at least a meditational recall of it, conceived entirely in terms of *chhi*, and taking its place within a context of Buddhist *vinaya* celibacy.

^c We shall have occasion to refer again to this book shortly (p. 124 below).

¹ 修真全圖

² 節氣

³ 四象

⁴ 順則死逆則仙

⁵ 符

⁶ 內金丹

circulation of Yang and Yin. It may serve to link in date the *Chin Tan Ta Yao Thu* and the *Hsiu Chen Chhüan Thu*.

Another writer whom we may put at the beginning of the +13th-century was Teacher Tou of the Western sacred mountain (Hua Shan), who wrote a short piece in dialogue form entitled *Hsi Yo Tou hsien-sêng Hsiu Chen Chih Nan*¹ (Teacher Tou's South-Pointer for the Restoration of the Primary Vitalities).² This is particularly interesting for the theories of generation which it contains,³ reminiscent of the Aristotelian conception of the roles of semen and menstrual blood, though without the philosophy of form and matter connected with it.⁴ Tou says that these two are the creative substances; if the semen advances first to the blood it will be enveloped by it and a male child will result, but if the blood advances first to the semen the reverse will happen and a female child will develop. He then gives a detailed account of the order in which the organs and structures of the body form during the ten months of development in both male and female embryos, each one presiding over the formation of the next. He goes on to list the 'seven precious things' (*chhi pao*²) necessary for the 'seven reversions' (*chhi fan*³), i.e. *shen*, *chhi*, *mo* (vessels and nerves), *ching*, *hsüeh* (blood), *thuo* (saliva), and *shui* (juices of organs). And he says that 'if the juices are abundant they can generate saliva, if the saliva is abundant it can change into blood, if the blood is abundant it can be transmuted the *ching* (seminal essence), if the *ching* is abundant it can (be sent up to) nourish the brain, if the brain is nourished it can strengthen the *chhi*, and if the *chhi* is copious it can complete and perfect the *shen*'. Finally he adds some measures of physiological spaces and times, and ends with a summary of the *nei tan* respiratory techniques.

Two components remain, and not the least important. At a date which we think was not much before +1250 Hsiao Thing-Chih⁴ produced a valuable work entitled *Chin Tan Ta Chhêng*⁵ (Compendium of the Metallous Enchymoma). This occupies five chapters in the *Hsiu Chen Shih Shu*,⁶ and it might not be a bad guess that he himself was the editor of the whole.⁷ Opening with a 'Thai Chi diagram, some glyphomantic constructions and a magic square, the book goes on to give a 'Tho Yo Ko,'⁸ 'Song of the Bellows and the Tuyère', illustrated by an interesting emblem reproduced in Fig. 1590a, b. Here we see the body represented by a bellows bag, with the dragon of true mercury ascending on the left, and the tiger of true lead descending on the right.⁹ Sun and moon are marked, but in inverted

¹ *TT260*, ch. 21, pp. 1 aff.

² We may have an opportunity of returning to this in the Section on embryology in Vol. 6. It begins with an exposition of the relation of viscera to elements, and a detailed microcosm-macrocosm parallel.

³ See Needham (2).

⁴ *TT260*, chs. 9 to 13 incl.

⁵ Hsiao Thing-Chih's position is particularly interesting because although himself so clearly a physiological alchemist, he was the direct pupil of Phêng Ssu,⁷ the part author of an outstanding book on chemical laboratory apparatus in +1225 (cf. Chhen Kuo-Fu (1), vol. 2, p. 441). And Phêng Ssu in his turn derived from P'ai Yü-Chhan, again a *nei tan* adept. We have drawn attention to this situation already (pt. 3, p. 203, pt. 4, p. 275 above); it surely implies that the same Taoists practised both *nei* and *wai tan* simultaneously or at least in different phases of their lives.

⁶ Cf. pp. 29, 30, 66.

⁷ 西嶽竇先生修真指南

⁸ 七寶

⁹ 七返

¹⁰ 蕭廷芝

¹¹ 金丹大成

¹² 囊籥歌

¹³ 彭紹

金 丹 索 籥

修 真 十 書 金 丹 大 成 集

乾坤索籥鼓有數離坎刀圭採有時鉛龍升
 兮汞虎降龜蛇上下兩相持天上日頭地下
 轉海底蟬娟天上飛乾坤日月本不運皆因
 斗柄轉其機人心若與天心合顛倒陰陽止

索籥歌

金 丹 索 籥 圖



有體有用夫鍾離傳道集日進火有數



Fig. 1590a, b. A page from the *Chin Tan Ta Chheng* (Compendium of the Metallous Enchymoma), written by Hsiao Thing-Chih early in the +13th century, and soon after included in the *Hsiu Chen Shih Shu* (TT260), ch. 9, p. 7a. It gives the 'Song of the Bellows and Tuyère' (Tho Yo Ko), alongside which is an emblem depicting the body as a bellows bag. For a brief explanation of the symbolism see text. (a) From the *Tao Tsang* itself; (b) from the *Tao Tsang Chi Yai*, *mao chi* 4, p. 8b.

position, with the enchymoma in the centre, and two personified figures, male and female, above it.¹⁸ But perhaps the most useful part of Hsiao's book is what follows; a systematic glossary in catechism form of the principal technical terms and cover-names used in physiological alchemy, reminiscent indeed of the *Shih Yao Erh Ya* which Mei Piao compiled mainly for laboratory alchemy (pt. 3, p. 152 above.) The rest is mostly poetry, expounding the theory and practice, especially the importance of the 'fire-times' in enchymoma technology. There is also an interesting essay on reading the *Tshan Thung Chhi*, and the work concludes with a commentary on Tshui Hsi-Fan's +10th-century *Ju Yao Ching*. Finally, to bring full circle our description of the *Hsiu Chen Shih Shu*, we can finish it by mentioning a work written in the Yuan period by Lun Chih-Huan¹⁹ following the instruction of Wang

¹⁸ The whole picture is rather like that of Chang Po-Tuan reproduced in Fig. 1579; both include the tortoise and serpent, symbols here of Yin and Yang.

Chih-Chin,¹ and concerned mainly with the psychology of Taoist aspirants. This is the *Phan Shan Yü Lu*² (Records of Discussions at Phan Mountain).³ Although rather Buddhist in character they throw some light on late *nei tan* meditational disciplines, including examples of tests of attainment, and the level of psychological understanding is quite penetrating.

Thus we have now surveyed a mass of Hsiu Chen literature for the light that it throws on the *nei tan* system. There are only a few additions to make before we can take up the question of its historical origins, and then briefly scrutinise in turn the various particular practices more closely.

It will be understood that all this was not without the backing of a great deal of classical philosophy, from which further developments, in cosmogony and microcosm-macrocosm doctrine^b for example, had proceeded. A treatise of this kind fundamental for the *nei tan* system occurs in the *Yün Chi Chhi Chhien* though lost as a separate entity from the *Tao Tsang* itself; this is the *Yuan Chhi Lun*³ (Discourse on the Primary Vitality and the Cosmogonic Chhi) by an unknown writer of the second half of the +8th-century.^c Maspero laid it under contribution for some interesting statements about the cosmic egg and the parallelism between the primary *chhi* of man and the cosmogonic *chhi* which formed the world,^d so that here it will suffice to add a few further quotations. The style of the text is shown by the following passage:

The primary (cosmogonic) *chhi* (*yuan chhi*³) has no appellation, but when change brought things to birth there arose names (*ming*⁵). The primary *chhi* doubly embodied change and generation into the differentiated categories (*i lei*⁶) (of things). Of this double embodiment there was no sign, for the *chhi* was unitary, and yet it may be considered the home of all original differences. When forms (*hsing*⁷) arose, then the myriad names were given, and their external characteristics were recognised; so that one can say that 'namelessness' was the Beginning of Heaven and Earth,⁸ while 'naming' was the Mother of the Ten Thousand Things. He who is for ever without desires can penetrate with vision the Mystery, but he who harbours preconceived prejudices can see only superficialities. These are only the externals, but the Mystery lies within, and the Within is the foundation of all. The externals correspond to the beginnings; these can be called 'the Father', but the Mystery can be called 'the Mother'.^f Such is the Tao.^g

The writer presently describes how the natural endowment of pure cosmic *chhi* in

^a TT260, ch. 53.

^b The most elaborate working-out of this in the *nei tan* context known to us is contained in the *Tao Fa Hsin Chhuan*,⁴ written by Wang Wei-I⁵ and dated +1294. It includes much meteorological speculation and explanation in terms of Yin, Yang and *chhi* (TT1235 and TTCY). This Taoist is not to be confused with the better-known +11th-century physician of the same name.

^c YCCC, ch. 56.

^d (7), p. 207.

^e Reminiscent of the 'nothingness' (*wu*¹⁰) of some Buddhist philosophical schools, which is full of all things in potentiality.

^f Note the typical Taoist priority for the feminine.

^g P. 3a, tr. auct.

¹ 王志謹

² 盤山語錄

³ 元氣論

⁴ 元氣

⁵ 名

⁶ 異類

⁷ 形

⁸ 道法心傳

⁹ 王惟一

¹⁰ 無

each human being, almost like a 'light that lighteth every man that cometh into the world' is dimmed and darkened by time and ageing, the 'shades of the prison-house' that begin to close.^a

The *Shang Chhing Tung Chen Phin* says:^b 'Man at his birth incarnates the primary *chhi* of Heaven and Earth as his mind and body (*shen hsing*²), and receives the *chhi* of the primary unity (*yuan i chih chhi*³) in his Yin secretions and Yang essences (*i ching*⁴). When the *chhi* of Heaven wastes and decays the *shen* becomes dispersed. When the *chhi* of Earth wanes and declines the *hsing* falls prey to diseases. When the primary *chhi* ebbs and degenerates the life-span becomes exhausted. Thus the (wise) emperors used the 'technique of the returning wind' (*hui feng chih tao*⁵),^c they opposed the natural directions of flow in the body; upwards they nourished the brain (*pu ni-wan*⁶), downwards they strengthened the primary *chhi*. The brain being replete the *shen* was perfected, the *shen* being perfected the *chhi* was at the full, the *chhi* being at the full the *hsing*⁷ was made an integral whole, and the *hsing* being made an integral whole the hundred gates (*kuan*⁸) were harmonised within and the eight malign influences (*hsieh*⁹) diminished outside. When the primary *chhi* was fully present (in the body), then the marrow solidified to make the bones, and the intestines (supplied the means of) change for the muscles and nerves. Thus all was purified (and restored), the true *ching*, the primary *shen* and the primary *chhi* were not lost from the mind and body. Therefore it was possible for (those wise emperors) to attain longevity (and immortality).'^d

Further on, the writer becomes more precise about some of the techniques involved.

The manuals of the immortals say: 'One's life-span depends upon oneself. If one can conserve the seminal essence (*ching*⁴) and obtain the *chhi*, one may attain longevity without end.' And they also say: 'Maintain the form (*hsing*⁷) without (harmful) exertion, conserve the seminal essence (*ching*⁴) without (harmful) agitation, restore the mind (*hsin*¹⁰) to ataraxy and peace. That is how longevity can be obtained.' The fundamental root of the life-force and life-span is set in this Tao. Although a man practices respiratory exercises (*hu hsi*¹¹), gymnastic techniques (*tao yin*¹²), charitable acts (*hsiu fu*¹³), initiating or assisting works of public benefit (*hsiu yeh*¹⁴) and a thousand other techniques of experienced knowledge, and even though he manages to consume exalted medicines (elixirs), it will profit him nothing if he does not know the Tao of the primary unity (*yuan chhi chih tao*¹⁵). He will be like a tree with fine branches and luxuriant foliage which yet has no proper roots, and so cannot endure. Is he not like a man who enjoys the pleasures of music and dancing-girls the whole night through, as well as all imaginable gastronomic joys? They will profit him nothing.^e

This is evidently a criticism of those who practise many ancillary techniques while ignoring the principles of counter-current flow, the enchymoma produced from secretions made to follow courses opposite to the normal. A little later we read more of this.

^a As we have seen (p. 47), this natural endowment was considered to be tripartite.

^b There is nothing with exactly this title in the *Tao Tsang* now, though eight books have titles beginning with the first four characters.

^c Another way of talking about *huan tan*. Cf. Chhen Kuo-Fu (1), vol. 2, p. 436.

^d P. 8b, tr. auct.

^e P. 11b, tr. auct.

¹ 上清洞真品

² 神形

³ 元一之氣

⁴ 液精

⁵ 回風之道

⁶ 補泥丸

⁷ 形

⁸ 關

⁹ 邪

¹⁰ 心

¹¹ 呼吸

¹² 導引

¹³ 修福

¹⁴ 修業

¹⁵ 元氣之道

The primary *chhi* (*yuan chhi*¹) is (the main factor of) life and death; life and death depend on the art of the bedchamber. One must follow the method of the Tao of retention, so that the *ching*² can be changed into something wonderful; one must make this *chhi* flow and circulate incessantly without hindrance or obstruction. As the proverb says: 'Running water doesn't rot, and a door often used is not eaten by woodworms.'^a Those who understand the mystery within the mystery know that a man and a woman can together restore (their vitality), and both can become immortals; this is truly what may be called a marvel of the Tao. The manuals of the immortals say: 'One Yin and one Yang constitute the Tao; the three primary (vitalities) and the union of the two components; that is the enchymoma (*san yuan erh ho wei chih tan*³)'. When the flow goes up against the stream to nourish the brain, this is called 'making the ching return' (*huan ching*⁴). When the *ching* changes into the primary *chhi*, this is called a *chuan*⁵ (a turn in a cyclical transformation), and one *chuan* is the same as one *î*⁶ (change) and one *î* (benefit).^b Every *chuan* means a longevity of one *chi*.⁸ Every nine *chuan* means a longevity of 108 years.^d

Thus the manuals of the immortals say: 'The Tao of Yin and Yang is the prizing of the Yang essences (*ching*,² as from semen) and the Yin secretions (*i*,⁹ as from saliva). If these are well and truly guarded, then longevity will be obtained.' And they also say: 'If you want to attain longevity you must pay attention to the gate of life, to wander and to dwell therein, to advance and retreat, in motion and in rest, by the way of leaving and remaining, all this in measure will bring length of days, and heal all diseases.'^e

We can illustrate this by the picture of a *nei tan* adept in the *Hsing Ming Kuei Chih* (Fig. 1591).

Here at the end of our introduction we may draw attention to a singular circumstance, namely that it was the *nei tan* tradition, not the *wai tan* one, which developed a symbolism in its texts.^f On p. 85 above mention was made of certain curious little signs which occur in the late +8th-century commentary of Liang Chhiu Tzu on the *Huang Thing Nei Ching Yü Ching*; these are not explained but we illustrate them in Fig. 1592. Then very much later another system of symbols was used by Chhen Ni-Wan¹⁰ in his *Nei Chin Tan*¹¹ of +1622, part of which is dated +1615, and we reproduce a couple of pages of this in Fig. 1593.

This book is a late one, belonging to a school much influenced by Buddhism, and probably confining its practices accordingly to meditation and some respiratory techniques. But its phraseology remains extremely Taoist. The author (or authors) make use of a set of some twenty or thirty symbols incorporated in the text, using them as a kind of notation to recall the fundamental ideas to the disciples. They are

^a An early occurrence of this is in *Lü shih Chhun Chhiu* (c. -240), ch. 12 (vol. 1, p. 25).

^b These terms are explained in an immediately following passage as referring to the advantages of the respiratory exercises.

^c I.e. one Jupiter cycle; see Vol. 3, p. 402.

^d P. 12b, tr. auct.

^e P. 13a, tr. auct.

^f On the development of symbols in Western proto-chemistry, alchemy and chemistry from Hellenistic times onwards see Berthelot (2), pp. 104 ff.; Zuretti (1); Partington (7), vol. 2, p. 769, (6); Sherwood Taylor (11); McKie (2); Walden (2); Gessman (1); Cordier (1); Ruska (11), pts. 2, 3 and 4; Poisson (1); Lüdy-Tenger (1).

⁸ Also called Wu Chhung-Hsü¹², both names obviously assumed.

¹ 元氣	² 精	³ 三元二合謂之丹	⁴ 還精	⁵ 轉	⁶ 易
⁷ 益	⁸ 紀	⁹ 液	¹⁰ 陳泥丸	¹¹ 內金丹	¹² 伍冲虛



Fig. 1591. A *nei tan* adept in *Hsing Ming Kuei Chih* (+ 1615), ch. 2, p. 14b. The five poems are on the general principles of Taoist anatomy and physiology. Note the spinal channel through which the *ching* goes up, and the reaction-vessel in the abdomen where the enchymoma of longevity and immortality is formed. The title is 'Washing the Heart and Storing Inwardly (the secretions)', (Hsi Hsin Thui Tsang).

書十真修

散化五形變萬神

謂能變化點聰明離形去智同於大道先
本後迹故假神托用神者隨應也散有五

形變萬神

是為黃庭曰內篇

因中而得名也

琴心三疊舞胎仙

琴和也疊積也存三丹田使和積如一則
胎仙猶胎息之仙猶胎在腹有氣但無息
也



四第五十五卷

九氣映明出霄間

三田之中有九氣炳煥而無不燭大洞經
云三丹田三元及三洞房合為九宮宮中
有天皇九氣變為九氣化為九神也

神蓋童子生紫煙

觀照存思假目為事下文云眉號華蓋覆
明珠神蓋眉也明珠目瞳也紫煙精妙氣
也

是曰玉書可精研

文因迹始專則之通



Fig. 1592. Possible beginnings of symbolic notation in physiological alchemy; the small drawings on pp. 4a, b and 5a, b of the *Huang Ting Nei Ching Yü Ching Chu* (Liang Chhiu Tzu's Commentary on the Jade Manual of the Internal Radiance of the Yellow Courts), a text of the +5th or +6th century, with commentary of the +8th or +9th. This is contained in the *Hsiu Chen Shih Shu* (TT260). The text gives no clue to the meaning of the drawings.

五第五十五卷

上魂天分也下關地分也魂靈無形關元
有質人法天地形象

左為少陽右太陰

左東右西卯生酉殺

後有密戶前生門

前南後北密戶後二竅言隱密也生門前

七竅言藉以生也為九竅

出日入月呼吸存

日月者陰陽之精也左出右入身有陰陽
之氣法象天地之氣出為呼氣入為吸氣



書十真修

詠之萬遍昇三天

精備神充名上三清

千災以消百病痊

精神俱故也

不憚虎狼之凶殘

無餘傷也

第十一

亦以却老年永延

唯此一章都說黃庭之道也

上有章第二

上有魂靈下關元



四



Fig. 1592. (contd.)



Fig. 1593. Symbolic notation in physiological alchemy; a couple of pages from the *Nei Chin Tan* (The Metallous Enchymoma Within the Body) of +1622, pp. 5b, 6a. The chapter discusses the differences between the pre-natal endowment and the changes and chances which affect the psycho-somatic unit post-natally. The passage is couched in terms very similar to the passage by Sun I-Khwei translated on p. 46 above, telling how the primary *chhi* is changed into ordinary respiratory breath, the primary *ching* into the secretions of sexual generation, and the primary *shen* 'sicklied o'er by the pale cast of thought'. The symbols are not ornaments because they do not always come at the breaks in punctuation. The first one at the top on the right seems to indicate the primary *shen* and *ching* since it occurs immediately after these are mentioned; but we have not found any part of the text where the meaning of the symbols is explained. On the left-hand page the original pre-natal *chhi*, which the adept must try to recapture, is called the ancestor of the metallous enchymoma (*chin tan chih tsu*). In the next column the *wei lou* principle (cf. p. 252), of not letting the semen and the saliva escape, is termed the mother of the metallous enchymoma (*chin tan chih mu*); but by this time, early in the +17th century, 'not leaking out' may well have come to mean the 'hermetically sealed personality' sunk in meditation or asceticism and dead to this world.

notational signs because they occur many times repeated. The piece of text in Fig. 1593, ch. 1, is headed: 'a discussion of pre-natal endowment and its degeneration during life (*hsien hou erh thien lun*)'. In general it seems that in these signs white blobs stand for the Yang and black ones for the Yin.

Starting from the top of the second column after the title on the right-hand page we see a symbol which is said to indicate the primary *chhi* of the pre-natal endowment (*hsien thien yuan chhi*²) while the blobs at its base mean the primary *shen*, *yuan shen*³ (Yang), on the left, and the primary *ching*, *yuan ching*⁴ (Yin), on the right. Lower down in the penultimate column (moving left) we have a symbol for the

¹ 先後二天論

² 先天元氣

³ 元神

⁴ 元精

hsien thien yuan chhi alone, and in the last column we find two signs. The one at the top is explained as signifying the degenerated *chhi* of respiration (*hou thien hu hsi chih chhi*¹) with its Yang and Yin components; while the bottom one represents the *yuan chhi* not able by itself to form an enchymoma but needing the *chhi* of the respiratory exercises to 'make it rise' and do so. On the opposite (left) page, we see first (in the third column) another symbol—somewhat like the £ in shape—this is described as in use for the success-bringing combination of *hsien thien* and *hou thien chhi* in the exercises; the radiating lines in the symbol perhaps refer to the *chhi* and *i* of the organs (cf. p. 49), or to the number of 'reversions' practised (cf. p. 124). Half-way down the fifth column there is a sign symbolising something of those circulations already so much discussed, the collection in fact by the practitioners of the *yuan chhi* to make the foundation of the enchymoma (*chin tan chih tsu*²)—the *chhi* of the reins being made to go up in order that it may in due course descend to the Yellow Courts, etc. (cf. pp. 72, 82). Finally in the last column a spiral symbol denotes the pre-natal endowment before any corruption has set in (*hsien thien chen i chih chhi*³). How widespread was the use of notations such as this it would be interesting to know, and the whole subject deserves closer study than it has yet received.

(3) THE HISTORICAL DEVELOPMENT OF PHYSIOLOGICAL ALCHEMY

What was the beginning of the *nei tan* system, the search for the inner elixir? To this question there can be no definite answer, for as has often been said, its roots were in the miscellaneous longevity and immortality practices of the pre-Han Taoists. At an earlier stage in our survey^a we referred to the work of Wilhelm (6) on a Chou inscription of perhaps the mid-6th-century, written on pieces of jade which may have formed part of the knob of a staff; it deals with respiratory exercises and the circulation of the *chhi*.^b It therefore testifies to the beginning of *nei tan* techniques long before there was any clear idea of alchemy, either external or internal.

Again, in the *Chuang Tzu* book of about -290 there is, in ch. 7, the parable of the lethal effect of 'boring holes in Primitivity'. We previously suggested an interpretation of this as a social criticism of the process of class-differentiation and the institution of private property;^c but the 'uncarved block' could also obviously mean the withdrawn adept practising ataraxy^d and conserving the life-force, as indeed most commentators and translators have so taken it.^e Primitivity was a translation of *hun-tun*,⁴ primaeva chaos, a term with very fluctuating orthography, and we meet with it also at another interesting place in the *Chuang Tzu* book (ch. 12). Roaming in the south in Chhu, the disciple of Confucius, Tzu-Kung, met with the

^a Vol. 2, p. 143.

^b We mention it again shortly below, p. 142.

^c Vol. 2, p. 112.

^d Cf. Vol. 2, pp. 63ff.

^e E.g. Legge (5), vol. 1, pp. 266-7; Waley (4), pp. 43ff., 116ff.; Fêng Yu-Lan (5), p. 141; Watson (4), p. 95.

¹ 後天呼吸之氣

² 金丹之祖

³ 先天眞一之氣

⁴ 渾沌

old farmer who refused to use the swape for watering his plants, insisting on carrying water from the well laboriously in buckets. This Taoist anti-technology complex we explored rather fully at an earlier point,^a but what is interesting here is the comment of his master when Tzu-Kung returned.

When he came back to (the State of) Lu, he told Confucius about the interview and the conversation. Confucius said: 'Ah, that man pretends to cultivate the Arts of Mr Hun-Tun! (*Hun-tun shih chih shu*). He knows the one but does not know the many. He can control the inner world but not the outer. He understands (only) what is simple, and how to avoid acting contrary to Nature; he can return to primitive undifferentiatedness—with body and spirit unperturbed he wanders through the world of common men. You may well be alarmed at his heterodoxy! Anyway, what should you or I find worth knowing in the Arts of Mr Hun-Tun?'.^b

Such was the Confucian sociological administrative point of view, but it is quite open to us to see the beginnings of *nei tan* also in the 'Arts of Mr Primal-chaos'.^c For they can have been nothing other than the embryonic form of those measures for reversion and return 'to the origin' which form so much of the essence of the present sub-section.^d Presently (p. 154 below) we shall quote Chuang Chou again to show that he knew quite a lot about the techniques of respiration control and gymnastic exercise.

The central father-figure of Taoism was of course Lao Tzu, about whom we long ago had much to say;^e rallying-point of the philosophers, and in later religion the second person of the Taoist Holy Trinity (Fig. 1594). So it is interesting to see what can be got out of the greatest of all Taoist scriptures, the *Tao Tê Ching*, which belongs to the – 4th-century. We can learn a good deal by seeing what certain parts of it meant to the earliest of its commentators,^f Ho Shang Kung² (the Old Gentleman by the Riverside), a writer who can be placed with fair certainty in the neighbourhood of + 150, since his work was known, for example, to the great commentator of the *Huai Nan Tzu* book, Kao Yu.³ Already (p. 25 above) we spontaneously quoted the phrase 'returning to the state of infancy', and indeed the following extracts will show beyond doubt that the ideas of restoration and rejuvenation, of the importance of the *yuan chhi* and the *ching*, 'breath' and semen, were prominent in the minds (and practices) of those ancient Taoists. Some were quoted in Sect. 10 but certain phrases will acquire a different nuance in the light of what we are learning in the present context. Let us interleave the lines of the Canon with the commentaries, mostly due to the Old Gentleman by the Riverside.⁸

^a Vol. 2, pp. 124 ff.

^b Tr. auct., adjuv. Legge (5), vol. 1, p. 322; Elorduy (1), p. 86; Jabłoński, Chmielewski *et al.* (1), pp. 149–50. A fuller exegesis of the passage is given above in Vol. 2, p. 114.

^c An elaborate and interesting examination of this has been carried out by Girardot (1).

^d See especially pp. 46–7, 59, 69.

^e See Vol. 2, pp. 35 ff.

^f That is to say, the earliest whose work has come down to us.

⁸ We base our version on the translation by Erkes (4). HSK means Ho Shang Kung, WP Wang Pi* (+ 226 to + 249). Cf. Vol. 2, p. 432. The text is complete so far as quoted, but the commentaries are sometimes abridged.

¹ 渾沌氏之術

² 河上公

³ 高誘

⁴ 王弼



Fig. 1594. Stone statue of Lao Tzu self-dated by inscription at +719, in the Provincial Historical Museum at Taiyuan, Shansi (orig. photo. 1964). This was formerly a Taoist temple, the Shun-Yang Kung, founded in the Thang and dedicated to Lü Tung-Pin, hence its other name Lü Tsu Miao. At the back of the plinth there are the names and portraits of four principal disciples and nine benefactors of Taoism.

Ch. 28

He who knows the male, yet cleaves to what is female

Becomes like a ravine, receiving all things under heaven.

HSK: Masculinity is considered the exalted, femininity the subordinate. Though men may attain exaltation, they can only retain it by subordination. Fly from the strength of masculinity, adopt the weakness of femininity; whoever can do this will find the whole empire throwing itself into his arms, like water gushing into a deep ravine.

WP: So the sage keeps in the background, yet is ever being brought to the front.

(Thence) the eternal virtue never leaks away.^a

This is returning to the state of infancy. . .

HSK: One must always have the intention of becoming like a little child, (seemingly)^b so stupid, and without (worldly) knowledge.

Ch. 55

He who possesses abundant virtue may be likened to a babe;

HSK: A man harbouring the fullness of *tê*^c in his mouth and bosom is protected by the spirits as if they were protecting a child.^c

Poisonous insects will not sting it,

Fierce birds will not seize it,

Clawing birds will not attack it.

HSK: An infant does no hurt to any creature, nor does any creature hurt it. In a generation entirely peaceful, men are neither esteemed nor despised; all have humane hearts. Stinging creatures therefore then reverse their nature,^d and poisonous snakes do no harm to man.

WP: A babe has no objectives, no desires, no aggression towards other living things, therefore dangerous animals show no aggression towards it.^e

Its bones are weak,

Its sinews tender,

Yet its grasp is strong;

It has known nothing of the union of male and female

Yet its penis is sometimes erect

Showing that its vitality is perfected;^f

HSK: It tightly grips things because its (unconscious) intention is bent on them, and it does not change its mind. The excitement is caused by the abundance of the semen.^g

WP: It is like the possessor of abundant virtue, nothing on earth can diminish this virtue, or change its primary softness and weakness (*yü chhi chen jou jō*²). It does not contend, and nothing can snap or break it.

^a The mental image of the ever-full reservoir is surely connected with the later *nei tan idée fixe* about the maximal conservation of vital juices.

^b Waley (4), p. 178; Erkes (4), pp. 57ff. Cf. Vol. 2, p. 58, where the whole chapter is quoted.

^c This relates also to the theme of quasi-magical invulnerability so prominent in early Taoism; cf. Vol. 2, p. 140.

^d Perhaps we may see here one of the origins of the theme of reversibility and inversion in physiological alchemy.

^e One is reminded of the great vision of Isaiah: 'The wolf shall dwell with the lamb and the leopard shall lie down with the kid . . . They shall not hurt nor destroy in all my holy mountain . . .' (11.6).

^f *Ching chih chih yeh*.³ The word which Waley translated as vital force or vitality here is of course our familiar *ching*, semen or seminal essence.

^g Note already the insistence on the treasuring of precious juices.

It may cry all day long without growing hoarse,
Showing that its harmony is accomplished;

HSK: This is caused by the abundance of harmonious breath (*chhi*^a).

WP: There is no contentious desire in its heart, that it is why it can scream without getting tired.

To understand this harmony is (to understand) the unfailing (vital force) (*chhang*²)
To understand the unfailing is to be enlightened.

HSK: If a man is able to know the tenderness of the harmonious *chhi*, this will be of use to him.^a If a man can know the unfailing circulation of the Tao, he will daily grow in enlightenment and will penetrate the dark mystery.^b

WP: Neither dazzling white nor jetty black, neither too cool nor too warm, that is the unfailing.^c The formless cannot be laid hold of, but to be able to perceive it is enlightenment.^d

By succouring the vital force (*i shêng*³) one (can) become daily happier

HSK: An enduring happiness. Succouring the vital force means daily increasing the will for longevity.^e

The heart (can) cause the breath to become daily stronger.

HSK: The heart especially must harmonise tenderness, then the *chhi* will really dwell in it, and the body will become daily gentler. But if on the contrary wrong and violent things are done, then the harmonious *chhi* will disappear from the interior, and the body will become daily more ruthless.

Everything first becomes robust and then dwindles to decay

This is called 'being without the Tao'

And whatever is without the Tao soon comes to an end.^f

HSK: When living things have reached the height of their growth, then they begin to wither and become old. That which is withered and old has not attained the Tao. Whatever does not attain the Tao soon dies.^g

Ch. 10

Can you sustain the *hun*⁴ and *pho*⁴ souls,^h

Hold fast to the unity and never know separation?ⁱ

HSK: By sustaining the souls man makes life possible. Joy and anger drive out the *hun*, sudden fright injures the *pho*. *Hun* live in the liver, *pho* in the lungs.^j Therefore overmuch indulgence in wine and delicious foods is dangerous, as it harms these organs. To quieten the *hun* one must maintain

^a Here are clear references to the importance of the *chhi* and to the respiratory exercises.

^b A reference probably to the circulation of the *chhi* in the body, later so highly developed and systematised.

^c We might see in this a brilliant intuitive appreciation of what modern physiology has revealed of the homeostasis of the internal environment, and of homoeothermy (cf. Vol. 4, pt. 2, p. 301).

^d From this point onwards the translation diverges from Vol. 2, p. 140, because Ho Shang Kung was commenting on a text slightly different from that used by Waley and other modern scholars.

^e Here again is one of the roots of physiological alchemy.

^f This is a clear statement that there were or could be Taoist techniques of defeating old age and death.

^g Waley (4), p. 209; Erkes (4), pp. 97 ff. Cf. Vol. 2, p. 140.

^h *Pho* originally meant the semen, *ching*.⁶ *Hun* was more related to *chhi*.⁷ Thus we have here two of the three *nei tan* primary vitalities in their most ancient form.

ⁱ On the separation of the 'souls' and parts of the body in ancient Chinese thought and its relation to the conception of material immortality, see the discussion in Vol. 2, p. 153, and, more particularly, Vol. 5, pt. 2, pp. 85 ff.

^j Note this early appearance of Taoist anatomy and physiology.

calm and strive for the Tao, to leave the *pho* in peace is to lengthen one's years and attain longevity. He who embraces unity and can conserve it in the body will exist for ever.

Can you, when concentrating the *chhi*, make it soft
And tender like that of a little child?^a

HSK: If one can hold the breath without allowing oneself to become confused, then the body will follow in tenderness and pliancy. If one can be like a little child, *innocent and fearless within, free from violent action without*, then the spirits will not flee away.

Can you purify (the mind) and reduce its flux
(Sitting with) the dark look^b and free from all blemish?

Can you love the people and rule the land, yet remain unknown?

HSK: He who counsels the techniques should conserve his *chhi*, then the body will be perfected. He ought to inhale and exhale the *chhi* without allowing the ears to hear it. He who governs a country ought to love the people so that the land is pacified. He ought to diffuse virtue and spread compassion without letting anyone know about it.

Can you in opening and shutting the heavenly gates
Play always the feminine part?

HSK: In the techniques, the gate of heaven means the nostrils; to open means to breathe hard, to shut means to inhale and exhale. In the techniques one *must be like a female bird, quiet and still, soft and tender*.

Can you in thought penetrate all parts of the land
Yet never take action contrary to nature?

HSK: The Tao is resplendent like the sun and moon, it penetrates the four quarters and fills the world beyond the eight poles.^c Therefore it is said: 'If you look for it you will see nothing, and if you listen for it there is nothing to hear.'^d

(Therefore) of the ten thousand things I say:
Rear them and feed them,
Rear them but not lay claim to them,
Control them but never lean upon them,
Be chief among them, but not lord it over them;
This is called the invisible Virtue.^e

HSK: The Tao generates all things and nourishes them; if it bequeaths something it expects no recompense. It causes all things to grow but does not rule them; therefore they become tools in its hands. Tao and Tê are mysterious and invisible. The heart of the man who strives for Tê resembles that of the Tao.

^a The expression used in the text is *ying erh*,¹ one of the most typical *nei tan* technical terms later on.

^b *Hsüan lan*,² a technical term for the abstracted appearance of the face in meditational trance.

^c One suspects here an implicit macrocosm-microcosm reference.

^d This is a quotation from ch. 14.

^e This wonderful passage is quoted in ch. 51, whence Vol. 2, p. 37. It must surely be the origin of Bertrand Russell's epitome of Taoism: 'production without possession, action without self-assertion, development without domination,' (Vol. 2, p. 164).

Ch. 59

When governing the people, and making use of Nature,
There is nothing like frugality (*sé^a*).

HSK: One must make use of the ways of Heaven and comply with the four seasons. He who governs with love, must cherish the wealth of the people; he must not be prodigal. He who practises the techniques must cherish the semen and the breath (*ching chhi^b*); he must not let them escape.

Now frugality means acquiring in good time,
And acquiring in time means doubling garnered virtue,
And doubling garnered virtue means becoming invincible,
And becoming invincible means knowing no bounds,
And only what knows no bounds can manage a whole kingdom—
And even that, not long, unless he reveres^a the Mother.

HSK: When the riches of the people are sparingly used, then men are peaceful. When semen and breath are sparingly used, then the Tao of heaven may be acquired in good time . . . The country is identical with the body, and the Mother is the Tao. When a man is able to protect the Tao within his body, he can keep his breath light and the five spirits (of his viscera) untroubled. Then he is able to last long.

This is called the deep root and the firm tree-trunk
It is the Tao of longevity and perpetual perception.^b

HSK: One may regard the breath as the root and the semen as the trunk. If the roots of a tree do not reach deeply down, it will be uprooted; if the trunk is not firm, it will fall. This means that one should hide one's breath deeply and conserve the semen firmly, letting neither of them leak out.^c

The foregoing quotations surely speak for themselves. They clearly show that by the + 2nd-century much in the *Tao Tê Ching* was interpreted in a manner foreshadowing the later *nei tan* system, and the beginnings of this will have been older still.^d Notes that we can now unfailingly recognise are struck again and again. There is of course the exaltation of feminine receptiveness and yieldingness about which there was so much to say in Sect. 10, and unforgettable words on the immense power of him or her who desires no power or dominance, has no possessiveness, no self-assertion. But for us here the most striking thing is the emphasis on *returning*, the return of the physical freshness and perfect vital force of infancy, childhood, and even foetal life; also to its innocence, with all that that implies. In this the text is not without undertones of religious belief, the favour of the spirits, the responses of wild animals, the coming and going of souls; but it shows also considerable intuitive appreciation of what constitutes bodily health and harmony in the physiological realm. Already there is much about the *pneuma* or breath (*chhi*)

^a Lit. 'has'.

^b The last words are *chiu shih*.¹ Erkes translated 'the permanent view' without explanation, while Waley put 'fixed staring', having some evidence that this was a technical term for a method of inducing meditational trance. We have preferred to see in it a reference to the perpetual perception which was implied in the terrestrial material immortality of the *hsien*.

^c Erkes (4), pp. 220ff., diverging much from Waley (4), p. 213.

^d Occasional earlier Han references are not at all difficult to find. For example, Huan Than's *Wang Hsien Fu* (Ode on Contemplating the Immortals) of -13, discussed on pt. 2, p. 111 above, has clear references to the respiratory and gymnastic techniques. See the translation and discussion by Pokora (3).

and the semen or seminal essence (*ching*), rather less about the third of the *san yuan*, the *shen*—apart from the *hun* 'souls' of ch. 10. The conviction of the importance for the individual of conserving carefully these breaths and juices is very clear, and references to the physiology of the viscera are beginning to come in. Moreover we find a clear belief in the 'geriatric' possibility of retracing the steps of ageing in a veritable rejuvenation, for techniques are frankly spoken of, and with complete optimism and assurance. Lastly there is much on the macrocosm-microcosm parallel, the text generally tending (or purporting) to be talking about the ruling of human society and the management of a State, while the Old Gentleman of the Riverside calmly interprets it as having to do with the individual human body—at least as one of its meanings. This is especially striking in the last of the quotations, ch. 59. In the light of all this it is interesting, and important, to recall that Wei Po-Yang may very probably have been an exact contemporary of Ho Shang Kung, so that there is no reason to be drawn from historical development why the *Tshan Thung Chhi* (cf. pt. 3, pp. 50ff.) should not have been the first book on physiological as well as proto-chemical alchemy. And indeed this was already our conclusion regarding it.

Ho Shang Kung was living about +150, but in the centuries which intervened between his time and that of the *Tao Tê Ching* text itself we can find, if we look, further evidence of the beginnings of physiological alchemy. For example, during the past seven years the Han tombs at Ma-wang-tui near Chhangsha have become world-famous because of the uncorrupt body of the Lady of Tai, who died about -166 and was buried, with rich grave-goods, in tomb no. 1.^a More recently the sepulchre of one of her sons (d. -168) has become almost equally renowned, on account of the wealth of manuscripts which his tomb (no. 3) contained.^b These included three times as much of the text of the *Chan Kuo Tshê*^c (Records of the Warring States) as had previously come down to us, together with many technical texts hitherto completely unknown. Some were on bamboo and wooden slips, including passages from a treatise on prolonging life, not previously recorded,^e but the greater part were written as scrolls on silk, and packed in a lacquer box.^d Among these were two un-titled and formerly lost essays on the natural philosophy of Yin-Yang and the Five Elements, another on the physiognomy of horses, a lost treatise on astronomy and astrology,^e several versions of the *Tao Tê Ching* and Taoist-Legalist writings, and some texts identical in content with the *I Ching*. There were also maps which have revolutionised the history of geography in China by providing evidence of great cartographic skill in the Han.^f

^a See Vol. 5, pt. 2, pp. 303-4.

^b See Riegel (1). Loewe (10) reviews the same literature, but includes Han manuscripts from other places also.

^c Anon. (204); Riegel (1).

^d Apart from the well-known Chhu decorated MS. on cosmology and religion, they are the oldest manuscripts on silk yet discovered in China.

^e Devoted largely to planetary cycles (rather accurately stated) and planetary influences. It gives their positions between -246 and -177.

^f See Anon. (205); Hsü Mei-Ling (1); Riegel (2); Bulling (16).

Here for us the most interesting books, hitherto unknown, are the medical ones.^a There are three on the conduits for *chhi* and blood (*mo*¹), representing an earlier phase of the physio-pathological system later expounded in the *Huang Ti Nei Ching, Ling Shu*;^b and three, some very extensive, on the diagnosis and therapy of syndromes and traumas.^c But besides these there is one on prolongevity dietetics, and one on therapeutic or hygienic calisthenics.^d We must postpone a description of the latter until its proper place in the history of *nei tan* gymnastics (p. 156–7 below), but since diet was never strictly a part of inner alchemy,^e we may glance briefly at it here.^f Though it, too, has no title, it deals with ‘abstaining from cereals and imbibing the *chhi*’ (*chhio ku shih chhi*²);^g it thus belongs to that Taoist alchemical ascesis which we noted in detail earlier on.^h Thus the roots of physiological alchemy make an unequivocal appearance in this wonderful manuscript library of the – 2nd-century.

There followed, in the + 1st, the Sextus Empiricus of China, Wang Chhung³ (+ 27 to + 97). Although so great a sceptic in most matters,ⁱ Wang Chhung considered that one hundred years was the proper length of human life, and said so several times in his *Lun Hêng*⁴ (Discourses Weighed in the Balance).^j This was about + 82. And later, in + 91, when he was in his sixties, he wrote a special treatise entitled *Yang Hsing Shu*⁵ (Book of Macrobiotics); unfortunately it did not survive.^k This was not because he believed that life could be prolonged beyond the span allotted by fate, but because he accepted the power of rational medicine, and some of the techniques of physiological alchemy, to moderate the afflictions of old age and ameliorate declining days. Accordingly:

to protect himself he nourished the *chhi* (*yang chhi tzu shou*⁶), drank wine to help the appetite (*shih shih tsê chiu*⁷), closed the eyes and ears (against all extraneous agitations, *pi ming sai tshung*⁸), cherished the seminal essence to guard his life-force (*ai ching tzu pao*⁹), and took medicines to help to keep the body on the right track (*shih fu fu yao yin tao*¹⁰);^l wishing by these means to attain fully his length of days.^m

Thus here in the Later Han there is direct mention of two of the primary vitalities, *chhi* and *ching*, while *shen* appears implicitly in the third clause. Evidently at this

^a There is a good survey by Harper (1).

^b These are transcribed in Anon. (196, 197).

^c See Anon. (199) for transcription, and Chung I-Yen & Ling Hsiang (1) for exposition.

^d Reproduced in Anon. (198, 204) and Wang Chia-Fu (1), all with illustrations; cf. Figs. 1596, 1597 below.

^e Cf. p. 31 above.

^f Transcription and discussion in Anon. (197) and Thang Lan (3).

^g Reading *ku*¹ of course.

^h Vol. 5, pt. 3, pp. 9ff. and *passim*.

ⁱ A full account has been given in Vol. 2, pp. 368ff.

^j Chs. 4 and 56 e.g., tr. Forke (4), vol. 1, pp. 314, 472.

^k We know about it from Wang Chhung's own autobiographical chapter in the *Lun Hêng*, ch. 85, tr. Forke (4), vol. 1, pp. 63, 82.

^l It would be tempting to transpose the last two words here, and see in them a reference to health-giving physical exercises, but unless the text was corrupted grammar does not allow.

^m Tr. auct., adjuv. Forke (4), vol. 1, p. 82.

¹ 脉

² 却谷食氣

³ 王充

⁴ 論衡

⁵ 養生書

⁶ 養氣自守

⁷ 適食則酒

⁸ 閉明塞聽

⁹ 愛精自保

¹⁰ 適輔服藥引導

¹¹ 殺

time doctrines were brewing which would come to definitive *nei tan* formulation a few hundred years later.

It is pleasant to think of the great iconoclastic philosopher 'taking a little wine for the stomach's sake' in his old age—

The Grape, that can with logic absolute
The two-and-seventy jarring sects confute,
The subtle alchemist that in a trice
Can life's lead metal into gold transmute.^a

A short while ago we had another occasion to mention the *Tshan Thung Chhi* of + 142. Another book of about the same date is that strange scripture of a Taoist church, the *Thai Phing Ching*,¹ mentioned already^b because traces of *nei tan* practices can be distinctly found in it, as well as early proto-chemical alchemy. So also we find in a fragment of the *Chhang Yen*² (Auspicious Affirmations), written about + 200 by Chungchhang Thung,³ an enthusiastic statement of belief in the value of the circulation of the *chhi* for avoiding hunger, averting disease and bringing about longevity.^c Soon afterwards, probably well before + 300, comes the great versified treatise on Taoist physiology and rejuvenation, the *Huang Thing Wai Ching Yü Ching*, a discussion of which has been given on p. 83 above, with the companion *Huang Ti Nei Ching Yü Ching* following it in the + 5th or + 6th-century.

But before that we have a turning-point not to be overlooked, the vision which came to Khou Chhien-Chih,⁴ the first 'Taoist Pope'^d in + 415. As reported in the *Wei Shu*,^e it marks a stage in the desexualisation^f of the *nei tan* practices and greater emphasis on respiratory and dietary exercises in them. In the course of a vision of the heavenly host, Thai Shang Lao Chün⁵ (Fig. 1595) said (*inter alia*):

'You must proclaim my new discipline for the purifying and reformation of the Taoist religion. You must banish the false systems of the Three Chang,⁶ Levies of rice^h and taxes in money, with the techniques for the union of the *chhi* of men and women (*nan nü ho chhi*)^g—what could such things have to do with the Great Tao, ineffable and incorporeal? Above all you must take the rules of personal behaviour in society as the corner-stone (of the Faith) (*i li tu wei shou*)⁷, with in addition the private techniques of absorbing the *chhi* for nourishment, enclosing it and recasting it (*fu shih pi lien*)⁸.¹

Then Thai Shang Lao Chün ordered the Jade Girl (a goddess), with Chhang Jung-Chih⁹ and eleven other (adepts) of Chiu-i Shan, to teach (Khou) Chhien-Chih personally the

^a Fitzgerald's translation (1) of the *Rubayât* of the mathematician and astronomer 'Umar ibn Ibrâhîm al-Khayyâmî (+ 1040 to + 1131), 1st ed, stanza 43.

^b Cf. pt. 4, p. 558 and pt. 2, s.v.

^c In *CSHK* (Hou Han sect.), ch. 89, p. 8b, assembled from *PPT/NP*, ch. 5, pp. 6b, 7a, tr. Ware (5), p. 107.

^d Cf. Vol. 2, p. 158.

^e Ch. 114, p. 35b, tr. auct., adjuv. Ware (1), pp. 229 ff.

^f Perhaps rather more, however, in relation to the liturgical hierogamies and unions of the participants (see Vol. 2, p. 150) than in relation to the private practices of adepts.

^g The theocrats Chang Tao-Ling, Chang Hêng and Chang Lu. See Vol. 2, pp. 155 ff.

^h As we know now, these were at least as much liturgical as fiscal.

¹ Cf. Maspero (7), p. 232.

¹ 太平經

² 昌言

³ 仲長統

⁴ 寇謙之

⁵ 太上老君

⁶ 男女合氣

⁷ 以禮度爲首

⁸ 服食閉練

⁹ 長容之



Fig. 1595. Stone monument self-dated by inscription at + 517, in the century following the activities of Khou Chhien-Chih. It is already syncretistic, for the stately bearded figure of Lao Tzu on this side is backed by a niche with a sculptured Buddha on the other. From Fu-phing Tung-yuan (orig. photo. 1964), now in the Pei Lin at Sian. The lower parts of the monument are covered with small carvings of Taoists and benevolent donors, among whom many names can still be made out, including that of a Taoist *Li Chhou-Nu* and a governor *Li Yuan-An*. Place-names of origin are always given, and the family names of Chang, Lü and Liu are frequent as well as Li.

techniques of absorbing the *chhi* (*fu chhi*¹) and practising gymnastic exercises (*tao yin*²). Thus he obtained the ability to dispense with cereals (*pi ku*³), to increase his vital *chhi* (*chhi shêng*⁴), to etherealise his body (*thi chhing*⁵) and to attain perfection of bodily health and colour (*yen sê shu li*⁶). Some ten of his disciples acquired these arts at the same time.

Thus we see here at one and the same time a Confucianisation of ancient Taoism, a tendency towards its organisation as a preaching church rather than a revolutionary movement, and a surrender to anti-sexual influences;^a yet also a reaffirmation of the traditional longevity and immortality techniques which were giving rise to physiological alchemy. And in the following century the actual phrase *nei tan* first appears.

It was Waley who noticed this, in a somewhat unexpected place, the Buddhist Tripitaka (*Ta Tsang*).^b Reading over the *Nan Yo Ssu Ta Chhan Shih Li Shih Yuan Wên*^c (Text of the Vows (of Aranyaka Austerities) taken by the Great Chhan Master (Hui-)Ssu of the Southern Sacred Mountain)^c he came upon the following passage:

I am now going into the mountains to meditate and practise austerities, repenting of the numerous sins and infractions of the Law which have been so many obstructions to the Tao, both in my present and previous incarnations. I am seeking for longevity in order to defend the Faith, not in order to enjoy worldly happiness. I pray that all the saints and sages will come to my help, so that I may get some good magic mushrooms (*chih*⁸) and numinous elixirs (*shen tan*⁹), enabling me to cure all illnesses and to stop both hunger and thirst. In this way I shall be able to practise continually the way of the Sūtras and to engage in the several forms of meditation. I shall hope to find a peaceful dwelling in the depths of the mountains, with enough of the numinous elixirs and medicines to carry out my plans. Thus by the aid of external elixirs (*wai tan*¹⁰) I shall be able to cultivate the elixir within (*nei tan*¹¹). For in order to bring peace to others I must first bring peace to myself; in order to undo the bonds of others one must first undo one's own.

This text is of much interest for several reasons. Though the first (c. +565) in which the internal elixir (the *enchymoma*) appears, it reads almost as if the expression were a literary trope; if so, as we have already seen, it was soon being taken very seriously indeed. Another noteworthy point is the parallelism with many Taoist alchemists' statements that the physiological techniques were but a means to a lengthened life, within the span of which they could master the complications and repetitions of the making of the proto-chemical elixir, prime instrument of immortality.^d Only Hui-Ssu's objectives were different. Hui-Ssu¹² (+517 to +577) was the teacher of Chhen Tê-An,¹³ who as Chih-I¹⁴ (+538 to +597) was the actual founder of the Thien-Thai¹⁵ school of Buddhism.

^a The trend towards celibacy under the domination of Buddhism from this time onwards has been traced by Eichhorn (6). On the general significance of Khou Chhien-Chih's 'reform' of Taoism see Thang Yung-Thung & Thang I-Chieh (7).

^b (14), p. 14.

^c *Taishō Shinshū Daizōkyō*, vol. 46, p. 791. 3. TW1933; N1576.

^d Cf. pp. 209, 218.

¹ 服氣

² 導引

³ 辟穀

⁴ 氣盛

⁵ 體輕

⁶ 顏色殊麗

⁷ 南嶽思大禪師立誓願文

⁸ 芝

⁹ 神丹

¹⁰ 外丹

¹¹ 內丹

¹² 慧思

¹³ 陳德安

¹⁴ 智顛

¹⁵ 天台

An alternative view is that the first appearance of the term *nei tan* for physiological alchemy occurs in the *Chih Tao Phien*¹ (A Demonstration of the Tao), now a lost book except in quotations, attributed to Su Yuan-Ming² (or -Lang³). If the *floruit* of this elusive figure (cf. pt. 2, p. 273, pt. 3, p. 130) was really, as Chhen Kuo-Fu was inclined to believe,⁴ the decades between +570 and +600, then his usage might have been even earlier than that of the Buddhist monk.⁵ At all events the approximate date would seem to be the Sui time or the period immediately preceding it.

As a pendant to this brief historical account we may refer to two texts of the same and a little later date. The *Han Wu Ti Nei Chuan*⁶ (Inside Story of Emperor Wu of the Han),⁷ is a Taoist romance, written at some time between +300 and +600, describing a visit of the goddess Hsi Wang Mu to the court of that great ruler and patron of Taoism (r. -140 to -87). In it there are lists of drugs and elixirs which have usually been taken in a pharmaceutical and protochemical sense,⁸ but some of them could very easily be *nei tan* names. For example *chiu tan chin i*,⁹ instead of 'ninefold cinnabar and juice of gold', could be 'the ninefold enchymoma of the metallous fluid (saliva)'. *Thai chhing chiu chuan*⁶ could not in any case be 'nine times distilled cinnabar of the Grand Purity' but it could be a 'nine times circulated enchymoma', while *thai hsü huan tan*⁷ could readily refer to an anablastemic enchymoma restoring the vitality of youth. Of course such fanciful terms are very ambiguous. Later, probably early in the +7th century, a *Han Wu Ti Wai Chuan*⁸ was added as a kind of appendix to the other book; it consists mainly of biographies of the magician-technicians at Han Wu Ti's court, and has some resemblance to medieval occidental 'lives of the saints'. One of these saints was a queer character named Wang Chen.⁹ Collecting firewood, he was heard to sing this song:

Put on the Metallous Headcloth
Make (the *chhi*) enter the Gate of Heaven,
Exhale slowly and very gently,
Absorb the waters of the Dark Fountain,
Sound the Celestial Drum
And nourish the Ball of Mud above.

Here are clear references to the nourishing of the brain by the *chhi* of the lungs and the *ching* made to ascend from the reins (first, fourth and last lines), to the respiratory techniques (second and third lines), and to the gymnastic exercises (the fifth).¹⁰ 'Nobody could understand what he said, except one of the minor officials of the court, who remarked: "This is a man from the Country of the Living, his words are indeed recondite"!'

¹ (1), vol. 2, pp. 389, 435.

² All the more so if the more traditional dating is followed, which would place him somewhere between +250 and +500.

³ TT289.

⁴ Pp. 6b ff., cf. Schipper (1), pp. 87, 88.

⁵ See further on this text Maspero (7), pp. 234 ff., where additional translated material is given.

⁶ 旨道篇

⁷ 蘇元明

⁸ 朗

⁹ 漢武帝內傳

¹⁰ 九丹金液

¹¹ 太清九轉

¹² 太虛還丹

¹³ 漢武帝外傳

¹⁴ 王眞

(4) THE TECHNIQUES OF MACROBIOGENESIS

(i) *Respiration control, aerophagy, salivary deglutition and the circulation of the chhi*

We are now to have a closer look at some of the chief *nei tan* processes hitherto only mentioned. About the antiquity of the respiratory techniques^a there is no need to say more, as some details have already been given demonstrating that they must go back to the –6th-century at least in rudimentary form.^b The inscription on jade translated by Wilhelm (6) runs as follows:

In breathing one must proceed (as follows). One holds (the breath) and it is collected together. If it is collected it expands. When it expands it goes down. When it goes down it becomes quiet. When it becomes quiet it will solidify. When it becomes solidified it will begin to sprout. After it has sprouted it will grow. As it grows it will be pulled back again (to the upper regions). When it has been pulled back it will reach the crown of the head. Above, it will press against this. Below, it will press downwards.

Whoever follows this will live; whoever acts contrary to it will die.

Some connection has also been surmised with the craft and training of divers for pearls, sponges and other sea ware, itself of age-old antiquity.^c The techniques doubtless began with the primary observation of the necessity of the circumambient air for life, and perhaps the idea that the more closely one could hug it to oneself the more it would contribute to life—thought of in our terms, it was as if by long retention of the inhaled air one could store an infinite abundance of oxygen. Air was clearly a highly vivifying agent for the mortal body—therefore (by ancient logic) it followed that if only one knew what to do with it the body could be made immortal. After all, before modern physiology, this was not so illogical. We can take up the story again in the middle of the +2nd-century, when a Taoist neophyte asks:

'What do they eat, those (immortals) of the higher, middle and lower grades, who have obtained the Tao and achieved deliverance from this world?'

[Reply] 'The highest live on the breaths of the air (*fêng chhi*'), the middle ones live on the sapidities of drug substances, and the lowest consume very little of anything, reducing to the minimum that which passes through the stomach and intestines'.^d

Real people could be found in the mountains following this as closely as they could. From the +4th-century or somewhat earlier we have the biography of a Taoist adept named Chou I-Shan,² which says:

^a The most elaborate accounts are those of Maspero (7), (32), pp. 373 ff., 497 ff.

^b Vol. 2, p. 143.

^c Vol. 4, pt. 3, p. 674. What may well be an interesting echo of this occurs in Ko Hung's description of his uncle Ko Hsüan retiring to the bottom of a deep pool for the afternoon when drunk on a hot summer's day. 'My ancestral uncle (Ko Hsüan), whenever he was overcome by wine in the heat of the summer would incontinently retire to the bottom of a deep pool and stay there till the evening—this was because he could retain his breath and respire like a foetus in the womb' (*PPT/NP*, ch. 8, p. 3b, tr. auct., adjuv. Ware (5), p. 140).

^d *Thai Ping Ching*, Wang Ming ed. p. 716, a fragment of ch. 145, preserved in *San Tung Chu Nang*,¹ ch. 4, p. 3a. Tr. auct., adjuv. Maspero (7), p. 201.

¹ 風氣 ² 周義山 ³ 三洞珠囊

Every morning after dawn, when the sun was rising, he stood up straight facing due east, and having rinsed out his mouth, swallowed (much) saliva, then he absorbed the *chhi* (*fu chhi*)^a more than a hundred times. This being done he turned towards the sun and saluted it twice. And every morning he repeated these procedures.^b

One inspiration (*hsi*^{2,3}) and one expiration (*hu*⁴) make one respiratory cycle (*hsi*⁵), say the Taoist books over and over again,^c but the question was not only just how these intakings and outbreathings should be made,^d but how much time should elapse between them. Generally speaking the air was to be inhaled through the nose, retained as long as possible and then exhaled through the mouth.^e This was the technique already several times referred to as *pi chhi*,^f and it certainly presents an obvious parallel with the conviction that there was vitality in certain secretions of the body so that all losses of them should be avoided. Some scientific interest attaches to the ways in which the medieval Taoist adepts measured the duration of their breath-holdings. In the +9th or +10th-century Huang Yuan-Chün⁷ recommended that the best measure was the normal respiration rate of a colleague or disciple sitting beside the practiser,^g i.e. a particular number of standard *hsi*;⁵ but there were also ways which could be used by one person alone. The most obvious, though not perhaps as independent as was thought, would be the heartbeats, and indeed the counting of these was described by Ko Hung himself towards the end of the +3rd-century.^h In *Pao Phu Tzu* we read:^h

By practising the circulation of the *chhi* (*hsing chhi*⁸) one can cure the hundred diseases, one can walk through the midst of plagues and epidemics, one can ward off snakes and tigers, stop bleeding from wounds, stay under water¹ or walk across it, free oneself from hunger and thirst, and protract one's years. The most important thing is simply to (know how to) breathe like an embryo. He who can breathe like a foetus will respire (*hsü hsi*⁹) as if still in the womb, without using nose or mouth; thus will the Tao be achieved.

When one first begins to learn how to circulate the *chhi*, one must inhale through the nose and then close up that breath. While it is thus hidden within, one counts up to 120 heart-

^a There is an ambiguity about this expression, on which see p. 149 below, but here we may assume that it means inspiration into the lungs.

^b *Tzu-Yang Chen Jen Nei Chuan*¹⁰ (Biography of the Adept of the Purple Yang), by an unknown writer. Chou I-Shan's sobriquet was afterwards adopted also by Chang Po-Tuan, but they are not to be confused. Tr. auct., adjuv. Maspero (7), p. 203.

^c For example, *TT260*, ch. 21, p. 6a (Mr Tou's +13th-cent. *Hsiu Chen Chih Nan*).

^d Cf. pp. 146-7 below on the six forms of exhalation.

^e The authorities here are numerous. For example, the *Shē Yang Chen Chung Chi*¹¹ (Pillow-Book on Assisting the Nourishment of the Life-Force), dating from the early +7th-century, and attributed to Sun Ssu-Mo.¹² *TT830*, p. 10b; also in *YCCC*, ch. 33, p. 10a. Or again, the *Thai-Chhing Thiao Chhi Ching*¹³ (Manual of the Harmonising of the Chhi), a +9th or +10th-century work. *TT813*, pp. 12b ff.

^f In his commentary on the *Chung Shan Yü Kuei Fu Chhi Ching*¹⁴ (Manual of the Absorption of the Chhi, found in the Jade Casket on Mt. Chung-Shan), *YCCC*, ch. 60, p. 9a.

^g Presumably by taking the pulse as one sat.

^h *PPT/NP*, ch. 8, pp. 2b, 3a, tr. auct., adjuv. Ware (5), pp. 138, 139; Maspero (7), pp. 235, 236.

ⁱ This points the moral about the divers of the sea.

¹ 服氣

² 吸

³ 噓

⁴ 呼

⁵ 息

⁶ 閉氣

⁷ 黃元君

⁸ 行氣

⁹ 噓吸

¹⁰ 紫陽真人內傳

¹¹ 攝養枕中記

¹² 孫思邈

¹³ 太清調氣經

¹⁴ 中山玉櫃服氣經

beats,^a and then exhales it (gently) through the mouth. Neither during exhalation nor inhalation should one hear with one's ears the sound of the breathing, and one should make sure that more goes in than comes out. A wild goose feather may be placed in front of the nose and mouth, and during exhalation this should not show any movement. After continual practice one may very gradually increase the number of heart-beats (during which the breath is held) to as much as 1000, and when this proficiency is reached,^b an old man will be able to grow younger daily, returning (*huan*¹) to youth by one day every day.

This must have been current practice for centuries. Another text suggests the use of counting-rods (*chhou*²), one being thrown down at short intervals of time and the pile then counted to reckon the number of respiratory cycles suppressed.^c Yet another mentions little white specks or balls (*tien*³) of *chhi* like rice-grains.^d These the disciple had to learn to form below the umbilicus and to circulate round the body. But as the rhythm was used for timing there must have been a counting, so the practice may well have been inspired by the signalisation of the passage of time in the annunciator mechanisms of anaphoric water-clocks and hydro-mechanical clockwork by the dropping of balls into resounding receivers.^e And indeed a third text^f describes the timing of meditation (and other exercises) by means of a sinking-bowl clepsydra,^g with an indicator-rod divided into graduations for hours and quarters. For the various 'rounds' there were technical terms; 12 respiratory cycle suppressions^h were known as a *hsiao thung*,⁴ 120 as a *ta thung*.⁵ ¹ It can be imagined that serious and painful effort was required. 'At the end of 300 respiratory cycles'^j wrote Sun Ssu-Mo, 'the ears have no hearing left, the eyes see no more, the mind can no longer think; then one must stop holding the breath.'^k Sometimes after long holding of the breath, said one of the Adepts of Mao-Shan, sweat pours forth and the head and feet are burning hot, because the *chhi* is passing through them.^l Or there might be abdominal pains.^m

Well there might, for there can be no doubt that this technique produced con-

^a Perhaps about 1½ min.

^b About 12½ mins., difficult to believe possible. Continuing anoxaemia depresses the heart's action.

^c *TT*830, p. 10b; *YCCC*, ch. 33, p. 10a. On counting-rods see Vol. 3, pp. 70ff. The 'stopwatch clepsydra' (Vol. 3, pp. 316, 318, 326) may well have been used in this procedure.

^d Fragment of ancient date, in *YCCC*, ch. 35, p. 4b.

^e Cf. Vol. 4, pt. 2, p. 499.

^f *Chhüan-Chen Tso Po Chieh Fa* (*TT*1212), by an unknown writer of late Sung or Yuan date. Cf. Chhen Kuo-Fu (*i*), vol. 2, p. 444 for another reference.

^g See Vol. 3, p. 315. In this text the sinking bowl is considered superior in time-keeping properties to combustion-clocks (incense sticks or trails), partly because humidity affects their rate of burning, and partly because the rate of sinking can be artificially adjusted so easily. It is curious that this description has the bowl sinking exactly at sunset and sunrise each day, allowance being made for the unequal periods at different times of year by the addition of small metal weights (coins). This was very un-Chinese, for normally equal double-hours always prevailed (apart from the night watches, cf. Needham, Wang & Price, 1), so perhaps it betrays Indian (Buddhist) influence at this relatively late time.

^h About 36 secs.

ⁱ About 6 mins.

^j Some 15 mins.

^k *Chhien Chin Yao Fang* (*TT* ed.), ch. 82, p. 5a. Cf. Maspero (7), pp. 204-5.

^l *Mao Shan Hsien Chê Fu Na Chhi Chieh* (Oral Instructions of the Adepts of Mao-Shan for Absorbing the Chhi), in *YCCC*, ch. 58, p. 4a.

^m *Thai-Chhing Thiao Chhi Ching*, *TT*813, p. 13a.

¹ 還

² 大通

³ 籌

⁴ 全真坐鉢捷法

⁵ 點

⁶ 茅山賢者服內氣訣

⁷ 小通

siderable anoxaemia with all its strange effects—buzzing in the ears, vertigo, perspiration, sensations of heat and formication in the extremities, fainting and headache.^a One cannot help wondering whether there was some connection here with the ancient use of hallucinogens from plants and fungi, the respiratory exercises reproducing some of their effects in a simpler way.^b And a further possibility presents itself, that sometimes the exercises had intensified effects when carried out in temples on high mountains, where a veritable induction of partial 'mountain-sickness' may have occurred.^c This involves further asphyxic symptoms, cyanosis of the lips and face, nausea and vomiting, intestinal disturbances, great hyperpnoea on exertion, difficulty in mental effort, and psychical aberrations like those of alcoholic excess, finally torpor with exhilaration, and loss of consciousness which (as the early balloonists found) may be irreversible. If the Taoist breath-holding was performed under altitude conditions of low barometric pressure, some of these further effects may have entered in. At all events there was quite an array of rather spectacular phenomena to be encountered in induced anoxaemia, though it may seem strange at first that they should ever have been thought to conduce to longevity and immortality. However, prolonged anoxaemia, as on high mountains, brings with it loss of appetite, an effect which would have made the restricted diet of the recluses easier to bear, contributing as it did in its turn to the reduction of cardiac strain and heightened awareness and well-being consequent on loss of all excess body-weight.

The purposive apnoea was accompanied by an interesting theory, that of 'embryonic respiration' (*thai hsi*). Ko Hung was heard referring to it in the quotation just now given. But one of the fullest accounts is that in the preface of the *Thai Hsi Khou Chüeh*,² a tractate probably of the Thang. It says:^d

That which is in the womb is called foetus, that which has been born is called child. As long as the foetus is in the abdomen of the mother, its mouth is filled with a kind of mud (*khou han ni thu*),^e and respiration (*chhuan hsi*) does not penetrate there; it is through the navel (and the umbilical cord) that it receives (lit. swallows) the *chhi*, and the nourishment for its bodily form. Thus it is that it arrives at its completion. Hence we know that the umbilicus (*chi*) is the 'gate of destiny' (*ming mén*).^f Most babies, if they are alive at birth, fail for a short time to breathe in (the external air), but when the umbilical cord (*chi tai*) near the belly, is dipped into warm water three to five times, the infant 'resuscitates' (and breathes). So indeed we know that the umbilicus is the 'gate of destiny', no mistake about it.

All those who wish to practise the Tao of reversion (*hsiu tao*)⁶ and to attain embryonic respiration must first know the source and origin of this, then they can do it themselves,

^a Any textbook of physiology may be consulted, e.g. Bayliss (1), p. 634.

^b Cf. Vol. 5, pt. 2, pp. 116 ff. and Sect. 45 in Vol. 6.

^c We met this before, Vol. 1, p. 195.

^d YCCC, ch. 58, p. 12a, b, tr. auct. adjuv. Maspero (7), p. 198.

^e A reference to the meconium, etc.

^f This expression is here used in a non-technical sense, for properly it belongs to one of the kidneys in the system of the reins.

¹ 胎息

² 胎息口訣

³ 口含泥土

⁴ 喘息

⁵ 臍

⁶ 命門

⁷ 臍帶

⁸ 修道

breathing like the foetus in the mother's abdomen. Hence the name (of the technique). It is in reverting to the origin (*fan pên'*) and regenerating the primary vitalities (*huan yuan*²) that old age can be chased away, and that one can return to the state of the foetus. Truly there is a point in this (exercise). Softly, gently, without holding the breath, that is the way to bring about the germination of the Tao of immortality . . .

All this fitted together very reasonably. To understand that the mammalian embryo 'breathes' through the placenta and the maternal circulation as well as gaining its nourishment, its food materials, through the same route, was an excellent piece of early biological observation, as also the awareness of the occlusion of the foetal intestinal tract by the meconium.^a It followed that he who would recreate in himself the youthful perfection of the embryonic tissues must also cease to breathe by the mouth.^b The subsequent insistence on the swallowing of saliva was also reasonable, as it could help to re-create the aquatic environment of the mammalian foetus. Yet the 'embryonic respiration' theory involved a physiological fallacy somewhat parallel to that of 'returning the *ching* to nourish the brain'; just as the semen was afterwards voided from the bladder and had no way to ascend to the brain such as the early Taoist physiologists imagined, so also no retention of the air could compensate for the absence of a placenta in the adult. But the theory persisted indestructibly. Already the early *Tao Té Ching* commentators had talked of reducing respiration to its utmost softness and imperceptibility, and their almost scriptural authority was venerated for many a century.

During the period of retention the *chhi* was supposed to circulate throughout the body repeatedly—which was certainly no error, little though the old Taoists knew about oxyhaemoglobin. 'It runs through the entire body, from the nose and mouth right to the extremities of the ten fingers, and back' says the *Yuan Yang Ching*,³ a text of the first half of the +6th-century, known now only by quotations in subsequent books.^c The circulation-mindedness of traditional Chinese physiological thought, so much in advance of the rest of the world, however archaic in form, is always worth emphasising. The more or less contemporary *Huang Thing Nei Ching Yü Ching* describes it as starting in the Long Valley (*chhang ku*,⁴ the nose), flowing down to the Dark Land (*yu hsiang*,⁵ the reins), then through the Suburbs (*chiao*,⁶ the five or six Yin-viscera) and the Towns (*i*,⁷ the five or six Yang-viscera).^d More bizarre was the fact that each of these organs was associated with a particular manner of exhaling the air after retention. These were the Six Exhalations (*liu chhi*⁸).^e Besides the standard *hu*,⁹ there were also *hoi*,¹⁰ *ho*¹¹ (= *hsü*¹², *hu*¹³), *hsü*,¹⁴

^a For comparisons with the growth of embryological knowledge in other cultures see Needham (2) and Sect. 43 in Vol. 6.

^b The 'breathing' was to be concentrated in the umbilical region. The time elapsing before the onset of perspiration was called one *thung*¹⁵ (op. cit. p. 13b).

^c Here, in *Yang Shêng Yen Ming Lu*¹⁶ (On Delaying the Destiny by Nourishing the Life-Force), between +1013 and +1061, of which more anon. *TT*831, p. 1b.

^d P. 7b, (ch. 21). Liang Chhiu Tzu commentary, in *TT*260, *HCSS*, ch. 56, p. 12a.

^e Cf. *Yang Shêng Tao Yin Fa*, p. 21 a, b.

¹ 返本

² 還元

³ 元陽經

⁴ 長谷

⁵ 幽鄉

⁶ 郊

⁷ 邑

⁸ 六氣

⁹ 呼

¹⁰ 呵

¹¹ 呵

¹² 煦

¹³ 呵

¹⁴ 嘯

¹⁵ 一通

¹⁶ 養生延命錄

*chhui*¹ and *hsi*^{2, 3, 4}. The fourth of the six meant to exhale gently with wide open mouth, and the fifth certainly to blow out forcibly with closed lips; the explanations have something to do with breaths cooling and warming.^a The third probably meant strong expiration with opened mouth, but there is uncertainty as to how all were done; what is sure is that they were regarded as of great therapeutic value, each one with special relation to a particular organ of the body.^b

We now come to an important turning-point. In his deep and remarkable study of all this literature, Maspero described a great change which came over respiratory technology (if we might so call it) towards the middle of the Thang period. Instead of absorbing the external aerial *chhi* and circulating it the adept was to circulate and manipulate the internal *chhi* (*nei chhi*⁵) of his own organs, remoulding it thereby, or recasting it, so as to re-create the *chhi* of the primary vitality (*yuan chhi*⁶) lost since infancy. About +770 Li Fêng-Shih⁷ epitomised this in his *Sung Shan Thai-Wu hsien-sêng Chhi Ching*⁸ as follows:^c

The most important techniques of Taoism are not to be found in the books but rather in the instructions orally transmitted. The procedures of absorbing the *chhi* described in the two 'Manuals of the Yellow Courts', with those called the 'five ya' (*wu ya*^d) and the 'six mou' (*liu mou*^e) all have to do only with the external *chhi* (of the air). But the *chhi* of the external world is hard and powerful; it is not something coming from the interior (of the body), and so no benefit is to be gained by absorbing it. As for the internal *chhi*, that indeed is what can be called (the breath of) 'embryonic respiration' (*thai hsi*^f); it exists naturally within (the body), it is not something which one has to go outside to borrow. But if one does not obtain the personal explanations of an enlightened teacher, all one's efforts will be but labour and sorrow, and one will never succeed in one's objective.

Perhaps what happened was that the pre-Thang idea of the circulation of the *chhi* gradually came to be more emphasised at the expense of the breath-holding—which might indeed have led to certain accidents just as the metallic elixirs did—and thus the breathing became secondary to an imaginative voluntary circulation of the *chhi* of the internal organs, with the idea that the more this was done the more the *chhi* of primary vitality would be re-formed. This was a significant conceptual expansion, for the 'essences' of all the organs were now emphasised as valuable, not only the saliva (from the lungs) and the semen (from the reins); and it did embody the truth that all the organs contribute their products to the blood-stream. This inner round, it was thought, corresponded with the respiratory cycle though not part of it; when the external *chhi* came upwards to be exhaled, the internal *chhi* also

^a As is familiar to us, witness the expressions 'blowing to cool one's porridge', and 'blowing to keep one's fingers warm'.

^b For a fuller discussion see Maspero (7), pp. 248 ff.

^c YCCC, ch. 59, pp. 7b, 8a, tr. auct. adjuv. Maspero (7), pp. 200, 211. The authorship of Li Fêng-Shih is not quite certain.

^d Respiratory exercises done facing different directions, to absorb the *chhi* of their several elements into the appropriate viscera, cf. Maspero (7), pp. 364 ff.

^e Similar, also with attention to special times. In some versions of the *Huang Ting* texts, *liu mou* appears as *liu ting*.¹²

¹ 吹

² 噓

³ 噓

⁴ 噓

⁵ 內氣

⁶ 元氣

⁷ 李奉時

⁸ 嵩山太无先生氣經

⁹ 五牙

¹⁰ 六戊

¹¹ 胎息

¹² 六丁

came up from the lowest region of vital heat (*tan thien*¹), and when the air went down into the lungs in inspiration so also the internal *chhi* pursued a downward path. The expression *fu chhi*² is now increasingly supplemented by the phrase *yen chhi*,^{3,4} a more specific term for swallowing; this was one process and the circulation was another.

There were two ways of making it circulate (*yün chhi*⁵). Concentrating the will to direct it to a particular place, such as the brain, or the site of some local malady, was termed *hsing chhi*.⁶ Visualising its flow in thought was 'inner vision' (*nei shih*,⁷ *nei kuan*⁸), differentiated (not very convincingly to us) from ordinary imagination. 'Closing one's eyes, one has an inner vision of the five viscera, one can clearly distinguish them, one knows the place of each . . .'^a Such texts give the impression that anatomical demonstrations may have taken place from time to time in the Taoist temples,^b and of course all possible parts of the domesticated mammals were eaten, so that there could have been much familiarity with their visceral and vascular systems.^c The more passive way, of letting the *chhi* take its normal course in circulating, was called *lien chhi*,⁹ re-casting it. Here the analogy with proto-chemical and metallurgical alchemy was close, as always when the word *lien* appears, and the regions of vital heat doubtless represented the action of the fire upon metals and minerals. At an earlier stage (p. 73) we mentioned the *kuan*¹⁰ or 'bottle-necks' through which the *chhi* had to pass, and how this idea was further developed into a system of obstructions (*ko chieh*¹¹) which the adept had to break down by his will and imagination.^d Furthermore, the ancient retention of the breath was not entirely given up, but incorporated in milder form perhaps in the whole system of 'employment of the *chhi*' (*yung chhi*¹²).^e

Beyond this it is hardly necessary for us to go. There were elaborate permissions and prohibitions concerning time, place, and other conditions for the respiratory exercises, here of marginal interest only.^f There is also the more important question to what extent the later Taoist adepts pictured their *chhi* as circulating along the tracts of the acupuncture physicians; this we may look at again when consider-

^a *Thai-Chhing Wang Lao Fu Chhi Khou Chüeh*¹³ (The Venerable Wang's Instructions for Absorbing the Chhi), Thang or Wu Tai period. *TT815*, here from *YCCC*, ch. 62, p. 15a.

^b See further in Sect. 43, Vol. 6.

^c Of course besides this sound knowledge there was a considerable lore of archaei in the organs of the body (cf. pp. 80, 108 above), and other texts recommend imagining a 'homunculus' (*ying jen*¹⁴) and sending him to carry the *chhi* to every part desired (Cf. *YCCC*, ch. 35, p. 5a).

^d Cf. *Thai-Chhing Wang Lao Fu Chhi Khou Chüeh*, in *YCCC*, ch. 62, p. 1b. This whole tradition of ideas must have had some connection with the old medical notion of stasis (*yü*¹⁵), or the blockage of pores; cf. Vol. 1, p. 219; Vol. 2, p. 370; Vol. 4, pt. 3, p. 268.

^e This is clear from several passages in the *Yen-Ling hsien-sêng Chi Hsin Chiu Fu Chhi Ching*¹⁶ (New and Old Manuals of Absorbing the Chhi, Collected by the Teacher of Yen-Ling), *TT818*, a work which may be dated in the neighbourhood of +745. See the long passages, *YCCC*, ch. 59, pp. 18b to 20b, ch. 61, pp. 14b to 19a, and 19a to 20a, translated by Maspero (7), pp. 222, 225 and 220 respectively. But it is still said: 'hold the breath until one can stand it no longer'.

^f See further in Maspero (7), pp. 353ff.

¹ 丹田	² 服氣	³ 嚥氣	⁴ 咽氣	⁵ 運氣	⁶ 行氣
⁷ 內視	⁸ 內觀	⁹ 鍊氣	¹⁰ 關	¹¹ 隔結	¹² 用氣
¹³ 太清王老服氣口訣	¹⁴ 影人	¹⁵ 鬱	¹⁶ 延陵先生集新舊服氣經		

ing them in Sect. 44. One point more alone remains, a rather curious one.

At a certain point in his study Maspero let drop a suggestion to which he did not recur, namely that in some of the Taoist techniques a veritable aerophagy took place, a voluntary deglutition of air into the intestinal tract.^a At first we scouted this, believing that the practices were always restricted to particular forms of breathing alone, but we are now not at all sure that he may not have been right.^b The involuntary phenomenon is a matter of common knowledge in suckling infants; air is swallowed along with liquid, especially if respiratory sobbing takes place, and this has to be relieved by 'burping'. But nitrogen and oxygen are normal constituents of the intestinal gases of man and other mammals, and their only source is the atmosphere, whether via the oesophagus or by diffusion through the gastric and intestinal walls.^c Many foods are rich in air, such as breads and soufflés, while an apple has 20% air by volume, but besides this, the air in the tract may be greatly augmented by voluntary swallowing, as was first reported by Magendie in 1813. Significantly, this aerophagy, besides occurring under anaesthesia, can accompany hyper-salivation and frequent swallowing with an empty mouth in the conscious subject, and is much increased under certain conditions of trauma, pain and anxiety. Moreover the technique for air-swallowing is said to be easily learned. Initially air normally present in the pharynx is forced into the oesophagus by elevation of the chin, extension of the neck to pull the larynx forward, and inspiration against a closed glottis. Then on relaxing or swallowing naturally, the air mass is propelled into the stomach. The procedure is carried out more easily in the recumbent position than when erect.^d The rationale is that a small opening appears in the superior oesophageal sphincter at the moment of inspiration with the glottis closed. A skilled subject can aspire as much as 170 ccs. with a single effort, and there is no reason why the Taoists should not have acquired this skill. After ingestion, the air may be removed in three ways, by absorption into the blood-stream, by eructation, or most usually, by further passage down the intestinal tract. Traversing the pylorus, it descends the small and large intestines to issue from the rectum as egested flatus; and the time taken for the passage is quite short—after addition of 1 litre to the stomach in man, that cavity is cleared in 30 mins., flatus begins in about 20 mins. and the whole canal is cleared in some 45 mins.

If we are to envisage the Taoists swallowing air in the strict sense instead of simply taking it into the lungs, the various technical terms for 'absorbing the *chhi*' which we have encountered above will be seen in a new light, but the most obvious moment for a change (if there was one) would surely have been that time in the Thang period when the theory of the circulation of the internal *chhi* began to supplant the old theory of the hugging to oneself of the external *chhi* during long

^a (7), p. 212.

^b An excellent article on gas in the alimentary canal is fortunately now available, and it is from Calloway (1) that much of the information in this paragraph is derived.

^c The dominant gas is neither of these, but carbon dioxide, derived from secreted bicarbonate and some bacterial fermentation. The action of the intestinal flora mainly produces hydrogen and methane, however, apart from volatile amines and mercaptans.

^d This in fact agrees with ancient instructions, e.g. in *YCCC*, ch. 50, p. 166, ch. 62, p. 3a.

breath-retention. From the middle of the +8th-century one begins to get still more striking expressions such as *khung fan*,¹ 'meals of emptiness'.^a This interpretation is supported by words such as the following, from the *Fu Nei Yuan Chhi Ching*² (Manual of Absorbing the Internal *Chhi* of Primary Vitality), due to Huan Chen hsien-sêng³ (Mr Truth-and-Illusion), who was writing about +755.

The internal *chhi* and the external *chhi* resonate naturally with each other. Following the expulsion (of the air or external *chhi* in exhalation) the natural *chhi* from the Pool of *Chhi* (*chhi hai*,⁴ in the *hsia tan thien*) rises up into the throat, but at the last moment when the throat is expelling the air, one closes the mouth with a snap, one beats the (celestial) drum^b several times, and swallows (*yen*⁵) (the internal *chhi* and saliva) which makes a noise like gurgling water. In men it goes down the left-hand conduit, in women the right, passing the 24 nodes (vertebrae) like water falling drop by drop—you can distinctly hear it. Hence one can be sure that the internal *chhi* and the external *chhi* are different. . . .^c

Thus in this conception the external *chhi* went in and out of the lungs, crossing the path, as it were, of the more important internal *chhi*, precisely in the throat and mouth, whence the latter was actually taken down into the stomach and so returned to its circulatory routes among the viscera.^d Furthermore, in view of the speed of passage of gases through the intestinal tract, urged on by peristaltic movements, there may be significance in the growing concern of the Taoists about flatus. The *chhi* may occasionally escape, we are told, through the lower part of the body (*hsia hsieh*⁶) and that is harmless,^e but it must not be swallowed too quickly or it will accumulate below and give rise to prolapse of the rectum (*tho kang*⁷).^f This last text goes on to say that during the techniques one should not lie down, because of pain in the heart and chest; and further that while the *chhi* of the organs are resonating with each other there will be noises in the abdomen. The ignorant say that this does harm, but the Yen-Ling Teacher contradicts them, comparing it with thunder and lightning among the mountains, where the Yin *chhi* is melted and recast.^g Such references to intestinal borborygms strengthen the impression that the terms of deglutitions were no metaphors after the middle of the Thang, and that aerophagy was a standard component of later Taoist 'pneuma technology'. But the question needs further investigation.

For example, it would be conceivable that the great emphasis on the ingestion of saliva (jade juice, *yü chiang*,⁸ cf. pp. 30, 85 above) took its rise in the Thang, when aerophagy was added to breath-retention. The two are closely connected

^a In a Yen-Ling Teacher text, YCCC, ch. 59, p. 19b, Maspero (7), p. 224.

^b The meaning of this expression is explained on p. 158 below.

^c YCCC, ch. 60, p. 12b, tr. auct. adjuv. Maspero (7), p. 213.

^d Presumably it must have been supposed that the internal *chhi* followed the external *chhi* towards the end of the expiration, and that one could catch it in time and remit it to the circulation.

^e *Thai-Chhing Thiao Chhi Ching*, TT813, p. 13a, which goes on to explain (p. 14a) that one of the reasons for avoiding 'strong and pungent foods' and cereals is that the *chhi* would not be malodorous when it did. Usually, of course, the word *hsieh* refers to liquids only.

^f YCCC, ch. 61, p. 15b; Maspero (7), p. 226. CKI, p. 2723.2.

^g Cf. Maspero (7), p. 227.

¹ 空飯

² 服內元氣經

³ 幻眞先生

⁴ 氣海

⁵ 嚥

⁶ 下泄

⁷ 脫肛

⁸ 玉漿

physiologically since hyper-salivation makes air-swallowing easier, and it may well turn out that some of the plant drugs mentioned in the Taoist books have a stimulatory action on the salivary glands. At all events, the words of Mr Truth-and-Illusion were echoed in Huang Hsiu-Fu's¹ *Mao Thing Kho Hua*² (Discourses with Guests in the Thatched Pavilion) written some time in the Northern Sung (+ 11th-century).^a

The method of Tu Ting-Shêng^{3b} for swallowing the water of the jade spring (*yü chhüan*,⁴ saliva), a method which drives away the three parasites (*san shih*⁵), makes firm the teeth and hair, and repels the hundred diseases, is as follows. 'The jade spring water is the secretion of the two vessels (*mo*⁶) underneath the tongue. Every morning sit up, close your eyes, clear your mind of all anxiety, gnash the teeth 27 times until the mouth is full, then rinse the teeth with it and swallow it, keeping in mind that you are sending it (to the lower region of vital heat) below the umbilicus, through the Pool of Chhi. For some time it makes a noise like a waterfall flowing in a deep grotto. In this way the circulation in all the vessels and tracts is harmonised. Thus the *Huang Thing (Ching)* says:

'The pure water of the Jade Pool (*yü chhih*,⁷ the mouth) irrigates the Numinous Root (*ling kên*,⁸ i.e. the primary vitalities).'^c

And again:

'Rinsing and swallowing the Numinous Fluid (*ling i*,⁹ the saliva) puts a man beyond the reach of calamities'.^d

From these descriptions it seems as if one had to do a kind of gargling with saliva. The quotations from the 'Manuals of the Yellow Courts' show that in its origin at any rate the saliva-swallowing was not posterior to the Late Han or San Kuo periods (+ 3rd-century), but it may well have awaited the Thang for its full development. By the Sung, as here, one can quote from a scholar's book, the ideas being no longer confined to the circles of Taoist adepts.

Were they ultimately even confined to Chinese culture? One would hardly expect to come across the circulation of the *chhi* when reading about the communist and cooperative colonies in North America, but one does. In 1861 Thomas Lake Harris founded a Brotherhood of the New Life at Brocton on Lake Erie, which lasted till 1906. Like so many similar cooperative communities this sprang from a milieu of evangelical or revivalist protestantism, with the difference that this was Swedenborgian. It is arresting to read that Harris used to prepare a 'special wine filled with the divine breath' and that he taught 'a new method of respiration which would ensure immortality'; but the members, even if married, refrained from sexual intercourse.^e That the community contained some Japanese members

^a In *Lei Shuo*, ch. 54, p. 23b, tr. auct.

^b A well-known calligrapher of the + 11th-century.

^c The quotation is from the *Wai Ching*, TT329, ch. 1, p. 11a, with slight verbal divergence. Cf. *Nei Ching*, TT328, ch. 2, p. 2a.

^d From *Nei Ching*, TT328, ch. 3, p. 2a, verbally identical.

^e See Holloway (1), pp. 215 ff.; Noyes (1), pp. 577 ff., 581-2.

¹ 黃休復

² 茅亭客話

³ 杜鼎升

⁴ 玉泉

⁵ 三尸

⁶ 脈

⁷ 玉池

⁸ 靈根

⁹ 靈液

might at first seem a clue to the origins of these ideas, but in fact they are to be found in the writings of Emanuel Swedenborg (+ 1688 to + 1772) himself.

It was shown to me [he wrote] that (before the degeneration of the Adamites) the internal respiration proceeded from the navel towards the interior region of the breast, and retired towards the region of the back and towards the abdomen, thus outward and downward. Immediately before the flood, scarce any internal respiration subsisted. At last it was annihilated in the breast, and its subjects were choked or suffocated. In those who survived, external respiration was opened. With the cessation of internal respiration, the immediate intercourse with angels, and the instant and instinctive perception of truth and falsehood, were lost.^a

And again:

My respiration has been so formed by the Lord as to enable me to breathe inwardly for a long time without the aid of the external air, my respiration being directed within, and my outward senses, as well as actions, still continuing in their vigour, which is only possible with persons who have been so formed by the Lord. I have also been instructed that my breathing was so directed, without my being aware of it, in order to enable me to be with the spirits, and to speak with them.^a

If this is not the circulation of the *chhi*, and the breath-retention, as practised by the Taoists,^b one can only say, as was said long ago in the hall of Queens' College: 'Verily, thou must needs be Erasmus or else the devil himself!' But to investigate the influences, whether Chinese or Indian,^c which worked upon Swedenborg in the elaboration of these doctrines and practices would take us too far at this time.

Suffice it to say that Massignon described the use of breathing exercises in the litany-like *dhikr* services of the Muslim sufis from the + 13th-century onwards.^d He conjectured that the sufi philosopher 'Alā' al-Daula al-Simnānī (+ 1259 to + 1336), founder of the *wahdat al-shuhūd* (unity of vision) school of idealist metaphysics,^e could have been an important intermediary in the transmission of Taoist techniques westwards, since in his youth he had served the Mongol Ilkhan of Persia, Arghun, and would have been well acquainted with Chinese ideas.^f The hesychasm of the Byzantine church was probably the next way-station. This mystical movement, culminating in the late + 14th-century, was partly directed against the intellectualism of the Latin scholastics, but also partly derived from Indian and Chinese antecedents. It has been called a 'yogistic quietism',^g and seems to have involved breathing exercises with some anoxaemia, postural control, auto-hypnosis and visions of light.^h Its greatest protagonist, Gregory Palamas,¹

^a Quoted by Noyes (1), pp. 590-1.

^b Even a kind of theory of embryonic respiration was present. Man in his holy state, before the Fall, was supposed to have been connected with God by a kind of spiritual umbilical cord, suffusing him with airs from Heaven which kept him in a state of divine purity and innocence. The techniques would restore the respiratory connection with God.

^c We shall come across another example of apparent Chinese influence on + 18th-century Sweden a few pages further on (p. 173).

^d (5), pp. 320ff. Cf. the excursus of Eliade (6), pp. 220ff.

^e Nasr (1), p. 338.

^f Much has been said in pt. 4, pp. 388ff. on the influence of China on Arabic scientific thought and practice.

^g *Hēsychia* (ἡσυχία) is quietness.

^h Sarton (1), vol. 3, pp. 95-6, 584-5.

¹ *Op. cit.*, vol. 3, p. 588.

died in +1357, having seen his opponents defeated and anathematised in +1341. But how did hesychasm find its way to Swedenborg and the American continent?

Whatever the links were, one thing is sure; those who study the communities of early Taoism in China could find valuable comparative material in the communist and cooperative experiments of late Christendom.^a There are many strange similarities.^b For example, the Woman-in-the-Wilderness Community, formed near Philadelphia by pietists and millenarianists under Johannes Kelpius in +1694 and lasting till +1748, had significant Rosicrucian and Kabbalistic elements (cf. pp. 3, 18-9). Kelpius himself made chemical and astrological experiments, and his followers believed that they would not die but undergo a physical translation.^c Then there was the Ephrata Community (+1735 to +1786) on the Cocalico River, under J. K. Beissel, which numbered among its members Jacob Martin the alchemist. The community was celibate in principle, but Beissel spent a great deal of time with his *agapetae* or Spiritual Virgins.^d This was the community which had the honour of being mentioned by Voltaire.^e Of all the others the most famous, the most numerous and the wealthiest were the Shakers (c. +1785 to the present time, but now moribund), and the Oneida Community (1844 to 1880). The former, founded by Ann Lee, was a Quaker offshoot of original beliefs, such as the bisexuality of God;^f they were notable for their religious dancing,^g and strictly celibate though living together in close community.^h The latter, also of evangelical origin, were still more original in their practice, inclined under J. H. Noyes to industrial production rather than agriculture, and neither celibate nor conventional in sex relations, since they used for a long time successfully a form of group or collective marriage, involving *coitus reservatus* and pregnancies planned on eugenic principles.ⁱ One after another, elements of the Taoist life and outlook of the +1st millennium make their appearance again in the Western world towards the end of the +2nd.

Of course they are alive and well, and living in East Asia, to this day. They came down through the eighteenth century, traceable in many sources including some Japanese, such as the *Yōjōkun*¹ of the famous scholar Kaibara Ekiken,² about +1700.³ There may well be remote Taoist abbeys in more than one country where all the techniques of physiological alchemy are practised and taught in their fullness

^a See, for example, Gide (1); Nordhoff (1) who visited many of the communities in 1874; Noyes (1), himself the *fang chang* of Oneida; and now Holloway (1).

^b It will be remembered that Maspero (e.g. 7) always translated *kuan*,¹ the ancient Taoist temple communities, as 'phalansteries', after the term used by Charles Fourier (+1772 to 1837) for the vast collegiate buildings he planned, in which all the workers by hand and brain, with their families, would live. Cf. Holloway (1), pp. 103, 139.

^c See Holloway (1), pp. 38ff.

^d Holloway (1), pp. 44ff., 49.

^e *Dictionnaire Philosophique*, 1789 ed., vol. 4, p. 81.

^f Holloway (1), pp. 53ff.; Nordhoff (1), pp. 117ff.

^g There may be some similarity here with Taoist calisthenics (pp. 161ff. below). And there is certainly a striking resemblance with the rites of the present-day Tenri religion in Japan.

^h It is strange that none of them probably ever knew anything of the canons and canonesses of St Gilbert of Sempringham in medieval East Anglia.

ⁱ See Holloway (1), pp. 183ff.; Nordhoff (1), pp. 259ff.; and of course Noyes (1).

¹ See p. 55 for the respiratory exercises.

at the present time; what is certain is that some of the milder forms of the respiratory exercises are widely used in Chinese hospitals as a kind of physiotherapy. For many patients the meditation techniques (cf. p. 179) are also systematically taught, constituting an effective relaxation therapy, and many physical factors are affected thereby, giving decreases in blood-pressure, diminutions of adrenalin-content, and the like. There is a considerable literature on these subjects in Chinese,^a and something too in Western languages.^b

In the *Chuang Tzu* book we find an interesting passage.^c Chuang Chou is criticising the Confucians' attempts to impose their ethics on human society, the Legalists' pursuit of political power, the hermits' total withdrawal from the world, and the Taoists' belief in techniques of longevity. His own ideal, as he goes on to explain, is what we could call a more Stoic one, that of the Taoist philosopher who attains liberation while yet playing the part that falls to him upon the stage of life; and he inveighs against all these other objectives, ambitions, obsessions and *idées fixes*, dubbing them in the title of his chapter 'ingrained ideas' (*kho i*). He goes on:

As for blowing and exhaling with open mouth (*chhui hu*²), breathing out and breathing in (*hu hsi*³), expelling the old (*chhi*) and taking in the new (*thu ku na hsin*⁴),^d going through the motions of bears, and stretching and twisting (one's neck) like a bird—all this simply shows the desire for longevity. This is the cherished aim of those scholars who practise gymnastics and massage (*tao yin*⁵), those men who (believe in) nourishing the bodily form, and those who make it all their study to find out how Phêng Tzu achieved his longevity.

From this we see once more that the roots of the techniques of physiological alchemy are to be found at least as far back as the — 4th-century. And the passage affords an admirable link between the respiratory practices which we have been examining and those which aimed at a much wider exercise of all the muscles of the body.

(ii) *Gymnastics, massage and physiotherapeutic exercise*

In the foregoing pages there have been many references to the circulation of the *chhi*, and to theories of gates, obstructions, and blockage of pores within the body, impedimenta to this circular flow. The need for its facilitation explains why gymnastic exercises and massage came to play the large part they did in the techniques of physiological alchemy. The *chhi* could not make its rounds, and the reagents of immortality could not meet, if the passages were occluded. Here we must not rehearse the succinct account already given in Section 10,^e nor entrench upon the

^a For example, books by Chiang Wei-Chhiao (1, 2, 3, 4, 5); Chiang Wei-Chhiao & Liu Kuei-Chen (1); Liu Kuei-Chen (1); Anon. (77); Chhen Thao (1); Chou Chhien-Chhuan (1) and Hu Yao-Chen (1).

^b The most considerable book is that of the Hungarian physician Pálos (2); but there are also interesting articles such as Anon. (148). The books of Lu Khuan-Yü (1, 4), and Chang Chung-Yuan (2), pp. 130 ff., 146 ff., are less directly concerned with medical applications; and this is true to some extent also of Stiefvater & Stiefvater (1).

^c Ch. 15, tr. auct., adjuv. Legge (5), vol. 1, p. 364.

^d This phrase became proverbial, and appears very often in general literature far beyond the boundaries of Taoist books. Thus in 1969 Chang Hsien-Fêng (1) recorded that 'Chairman Mao recently said: "Man's body works by breathing out the stale and taking in the fresh. A proletarian party must also do the same, for only thus can it be full of vitality."'

^e Vol. 2, pp. 145 ff.

¹ 刻意

² 吹胸

³ 呼吸

⁴ 吐故納新

⁵ 導引

closely related and important subject of physiotherapy and medical gymnastics which we shall discuss in Section 44;^a but there is a clearly distinguishable field now needing attention, namely the history of gymnastics as practised specifically for aiding the formation of the *enchymoma* of longevity (and immortality), and its relation to the theory of the three primary vitalities.^b The Thang and early Sung manuals of nourishing the life-force by gymnastics say that the exercises should be done both to render the body more supple and to rest it, alternating with the breath-retention periods and the sexual practices; moreover they assure the free passage of the *chhi* and blood, help to expel all malign *chhi*, and cure a great variety of diseases.^c

The expression *tao yin*^d has often been taken by sinologists as meaning all macrobiotic gymnastics,^d but this is rather loose and inexact, for what it really came to designate is that part of them which involves self-massage.^e Massage done by a second person has always been called *an mo*.^f After all, *tao yin* is a 'leading and guiding', of the *chhi* in fact; hence Teacher Ning could say '*Hsing chhi*^g regulates (the circulation) internally, *tao yin*^h regulates it externally'.^g The more all-embracing and colloquial term for gymnastic and physical exercises was *kung fu*^{5,6}, 'the results of (meritorious) work', or alternatively *nei kung*,⁷ 'interior achievement'. *Kung-fu* was the name under which knowledge of it came to Europe in the +18th-century, as we shall see. Towards the end of the nineteenth it was given a monographic treatment by Dudgeon (1) quite remarkable for the time,^h and it is interesting that already then the connection with alchemy was recognised.

Alchemy [he wrote] was pursued in China by the priests of Tao long previous to its being known in Europe. For two centuries prior and for four or more subsequent to our era, the transmutation of the base metals into gold, and the composition of an elixir of immortality were questions ardently studied by the Taoists. The Arabs, in their early intercourse with China, thus borrowed it, and they were the means of its diffusion to the West.ⁱ *Kung-fu* owes its origin to these same investigators, and was adopted at a very early period (as a means) by which to ward off and cure disease, and for strengthening the body and prolonging life, (a purpose for) which it has been declared a far-reaching and efficacious system.^j

^a In Vol. 6.

^b Among the most elaborate accounts are those of Maspero (7), (32) pp. 578ff.

^c See YCCC, ch. 34, pp. 1a, 2a, b, 13b.

^d Even by Maspero (7).

^e Cf. Anon. (75), p. 4, a definition taken from the *Ichhiieh Ching Yin I*, the +7th-century dictionary of Hsüan-Ying. Also Anon. (76), ch. 12, p. 133. It is true that *yin* can mean to stretch or draw out, but *tao* will not pair with it well as 'contraction'.

^f The expression is ancient. The bibliography of the *Chhien Han Shu* (ch. 30, p. 52b), lists a *Huang Ti Chhi Po An Mo*⁸ in ten chapters among the books on Taoism. *Chhi Po* was one of the chief medical interlocutors of Huang Ti. For an up-to-date account of the principles and practice of massage in Chinese medicine see Anon. (73).

^g Quoted by Tseng Tshao⁹ in *Tao Shu*¹⁰ (Axial Principles of the Tao), a +12th-century work, TT1005, ch. 28, p. 1a. Cf. YCCC, ch. 34, p. 2b.

^h John Dudgeon was one of the medical officers of the Chinese Customs Service. An earlier paper by his colleague D. J. McGowan (2), though even less accessible, is also well worth reading.

ⁱ For the prescience of these opinions cf. pt. 4, pp. 388ff., 491.

^j (1), p. 349.

¹ 導引

² 按摩

³ 行氣

⁴ 導引

⁵ 工夫

⁶ 功夫

⁷ 內功

⁸ 黃帝岐伯按摩

⁹ 曾慥

¹⁰ 道樞

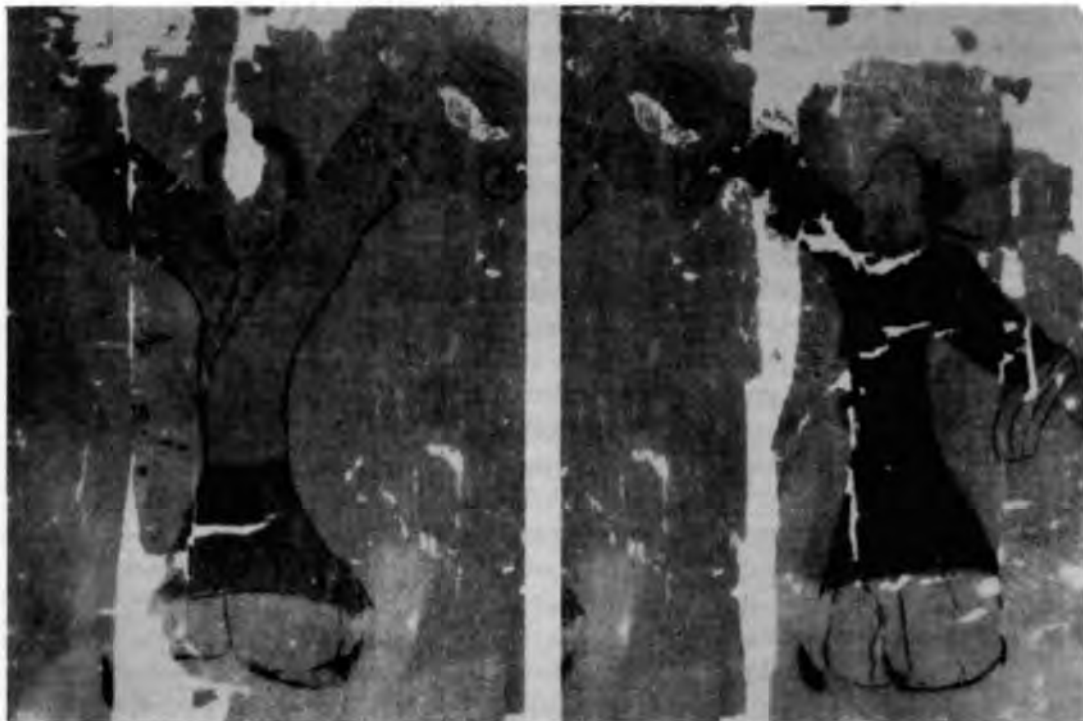


Fig. 1596. Photographs of two of the figures in the silk document on Taoist calisthenics recovered from the tomb Ma-wang-tui no. 3, near Chhangsha, and therefore dating from -168. Anon. (202).

When we first drafted this sub-section no documents were known as early as the Han, but the finds at Ma-wang-tui tomb no. 3 (-168) have since revealed a cardinal one.^a It is an un-titled text written on silk and dealing with therapeutic calisthenics, *tao yin*, 'the guiding (of the breath) and the (flexion and) extension (of the muscles of the body)'. Originally it must have contained at least 40 coloured drawings, each with a short caption, but now, because of damage by damp, there are only 28 (cf. Figs. 1596, 1597). One can see the exercises mentioned by Chuang Tzu,^b the 'bear rambling' (*hsiung ching*²) and the 'bird stretching' (*miao shen*³), but there are also many other interesting procedures such as 'getting in touch with the Yin and Yang by the aid of a long pole' (*i chang thung Yin Yang*⁴).^c Both men and women are shown carrying out the exercises, both old and young. The manuscript thus clearly demonstrates that the hygiene and physiotherapy glimpsed in the *Chuang Tzu* book and developed so much in later times was very well known in the -2nd-century, the time of the Lady of Tai and her sons.

^a Descriptions and discussions in Anon. (198) and Wang Chia-Fu (1); plate in Anon. (204).

^b Ch. 15, tr. Legge (5), vol. 1, p. 364; the whole passage has been given on p. 154 above. The two exercises in question are nos. 17 and 28.

^c This is interesting in connection with Figs. 1572 and 1573, 'stretching out to take the Yang from the heavens and to fish up the Yin from the depths of the sea'. The exercise is no. 1 in the scroll.

¹ 導引

² 熊經

³ 鳥伸

⁴ 以杖通陰陽



Fig. 1597. Outline drawings of the twenty-eight remaining postures in the Ma-wang-tui document on Taoist calisthenics (*chi kung chhiang shen*). Anon. (198).

The focal point of the ancient literature on Taoist gymnastics is the *Thai-Chhing Tao Yin Yang Shêng Ching*¹ (Manual of Nourishing the Life-Force by Physical Exercises and Self-Massage), a collection which must have been made either in the late Thang or the early Sung.^a Herein are several sets of exercises, some bearing the name of legendary personages such as Phêng Tsu² (the Chinese Methuselah),^b Chhih Sung Tzu³ (the Red Pine-tree Master),^c and Teacher Ning, Ning hsiên-sêng⁴ (Ning Fêng Tzu,⁵ patron saint of founders, metal workers and potters);^d others attributed to historical characters of Chou antiquity such as Wangtzu Chhiao,⁶ a 6th-century prince.^e

Most of these exercises were carried out lying down, or sitting cross-legged, tailor fashion, in the *padmāsana* or lotus-position, though a few were done

^a *TT811*, and in *YCCC*, ch. 34. No writer's name has come down to us.

^b Cf. Kaltenmark (2), p. 82. A set of ten exercises, tr. Maspero (7), p. 415.

^c Cf. pt. 3, pp. 9–10 above, and Kaltenmark (2), p. 35. Also ten exercises, tr. Maspero (7), p. 415.

^d Cf. Kaltenmark (2), pp. 43, 168. Four sets of exercises, each named after an animal, the toad, the tortoise, the wild goose and the dragon. The second and the fourth tr. Maspero (7), pp. 425 ff.

^e See Kaltenmark (2), p. 109; Pokora (3), p. 363; Hughes (9), p. 33. Thirty-four exercises, summarily described by Maspero (7), p. 422. On Wangtzu Chhiao himself, see pt. 2, pp. 98–9.

¹ 太清導引養生經

² 彭祖

³ 赤松子

⁴ 寧先生

⁵ 寧封子

⁶ 王子喬

standing; but some of the motions needed vigour, and the practiser was instructed to stop as soon as he began to perspire. In all cases there were directions about the proper type of breathing. No apparatus was used, but in Teacher Ning's 'tortoise' method the exercises took place under a suspended rope, which the subject had to grasp and hang from in various ways. Reading these descriptions one is assuredly in presence of age-old material which must go back at least as far as the Later Han. It was certainly well known to Ko Hung, who has many references to the *tao yin*¹ exercises in the *Pao Phu Tzu* book. Adepts imitate the movements of tortoises and cranes because of their longevity,^a with good results for health and hearing,^b but gymnastics is only one of the macrobiotic arts,^c not to be followed to the exclusion of others,^d and in the end not to be compared in effectiveness with chemical elixirs.^e

There are no illustrations now in the *Tao Yin Yang Shêng Ching*, but an interesting set has come down in the *Tao Tsang* with the text of the *Chungli Pa Tuan Chin Fa*² (Eight Elegant Exercises of Chungli Chhüan).^f The author is best placed in the late +8th-century, the teacher and interlocutor supposedly of Lü Yen (Lü Tung-Pin, Figs. 1569, 1598). The following directions accompany the pictures shown in Fig. 1599:

- (1) Gnash the teeth 36 times to assemble and alert the archæi (of the organs). Clasp the head (*khun-lun*³) with both hands, and beat the celestial drum (*thien ku*⁴) 24 times.^g
- (2) Twist the vertebral column (*thien chu*⁵) looking at the shoulder (and upper arm) to the right and to the left, each 24 times.
- (3) Stir up (the saliva) to right and left with the tongue against the palate 36 times. Rinse the mouth with it and gargle 36 times. Separate it into three lots as if it was a hard thing, and swallow it. After this, one can walk through fire.
[The illustration shows the arms held upward vertically; doubtless this movement took place after each of the 36 mouth exercises but the instruction dropped out of the text.]
- (4) Massage the Hall of the Reins (*shen thang*,⁶ the loins, above the pelvis dorsally) with both hands 36 times. The more one does this the more wonderful (the effects).
- (5) With the single right and left (arms) make a turning movement like a pulley (*lo-lu*⁷) revolving (to sweep the lateral costal region), successively 36 times each.
- (6) Repeat this using both arms simultaneously, 36 times.
- (7) With the two hands joined (in front of the body) make 5 *ho*⁸ exhalations,^h then interlace the hands above the head in the position of 'supporting the sky' (palms upwards), then massage the vertex of the head. Repeat the cycle three or nine times.

^a *PPT/NP*, ch. 3, pp. 1a, 4a, tr. Ware (5), pp. 53, 58.

^b Ch. 15, p. 9b, Ware tr., p. 257.

^c Ch. 5, p. 4a, Ware tr., p. 103. Here there is mention of the methods of Hua Tho, on which see p. 161 below.

^d Ch. 6, p. 3b, Ware tr. p. 113.

^e Ch. 4, p. 8b, Ware tr. p. 81. Here Ko Hung was quoting a verse from a *Thai-Chhing Shen Tan Ching*.⁹

^f It is in *Hsiu Chen Shih Shu* (TT260), ch. 19. Tsêng Tshao's *Lin Chiang Hsien*,¹⁰ in ch. 23, pp. 1b, 2a of the same collection, says in a statement dated +1151 that the text was inscribed on stone by Lü Tung-Pin himself and so handed down.

^g This was done by placing the palms of the hands over the ears and knocking on the occipital region of the head with both index and middle fingers.

^h Cf. p. 146 above.

¹ 道引

² 鍾離八段錦法

³ 崑崙

⁴ 天鼓

⁵ 天柱

⁶ 腎堂

⁷ 轆轤

⁸ 呵

⁹ 太清神丹經

¹⁰ 臨江仙



Fig. 1598. The shrine of Lü Tung-pin at the Yün-Lu Kung Taoist temple on the top of Yo-lü Shan, across the river from Chhangsha in Hunan (orig. photo. 1964). The inscription at the top says: 'The Veritable Portrait of the Venerable Immortal and Teacher Lü', but the shrine is of much later date than 'Thang.

(8) Make the two hands like hooks, stretch the arms forward, and take hold of the soles of the feet. Do this (for each alternately) 12 times, then return the feet and resume sitting in the correct position (i.e. cross-legged).^a

These exercises were normally interspersed with breath-retentions and repeated in cycles of varying permutations and combinations.

Besides Chungli Chhüan and the anonymous ancients who cloaked their identities under the names of legendary immortals, certain other originators of macrobiotic body-training stand out fairly clearly. One was the famous physician and

^a Tr. auct., adjuv. Maspero (7), pp. 419 ff., Dudgeon (1), pp. 375 ff. The latter gives a paraphrased translation of the preamble, including some interpretations which he probably got from oral instruction, e.g. the use of the heel of the left foot for applying perineal pressure at the correct place to prevent seminal emission and 'make the *ching* return to nourish the brain'. The text itself is allusive and obscure in places.

徑捷著雜書十真修

四第九十卷

第一段
叩齒集神三
十六兩手抱
崑崙雙手擊
天鼓二十四

第二段
左右搖
天柱各
二十四



第三段
左右舌攪上嚙
三十六漱三十
六分作三口如
硬物嚙之然後
方得行火

第四段
兩手磨腎
堂三十六
以數多更
妙



徑捷著雜書十真修

五第九十卷

第五段
左右單
關轆轤
各三十
六

第六段
雙關轆
轤三十
六

字五



第七段
兩手相握當
呵五呵後又
手托天按頂
各三或九次

第八段
以兩手如鈞
向前攀雙脚
心十二再收
足端坐



Fig. 1599. The physical exercises of the *Chungli Pa Tuan Chin Fa* portrayed in two pages from *Hsiu Chen Shih Shu* (TT260), ch. 19, pp. 4a,b, 5a,b. Translations of the captions are given in the text.

surgeon of the Later Han and the Wei Kingdom, Hua Tho¹ (c. +190 to +265). In his biography in the *San Kuo Chih* we read:^a

Wu Phu² of Kuang-ling and Fan A³ of Phêng-chhêng were both pupils of Hua Tho. Wu Phu followed exactly the arts of Hua so that his patients generally got well. Hua Tho taught him that the body should be exercised in every part but that this should not be over-done in any way. 'Exercise', he said, 'brings about good digestion (lit. causes the dispersal of the *chhi* of cereals, *ku chhi tê hsiao*⁴), and a free flow of the blood (*hsüeh mo liu thung*⁵). It is like a door-pivot never rotting.^b Therefore the ancient sages engaged in *tao yin*⁶ exercises, (for example) by moving the head in the manner of a bear, and looking back without turning the neck. By stretching at the waist and moving the different joints to left and right one can make it difficult for people (to grow) old. I have a method' said Hua Tho, 'known as the "play of the five animals (*wu chhin chih hsi*⁷)"', the tiger, the deer, the bear, the ape and the bird. It can be used to get rid of diseases, and it is beneficial for all stiffness of the joints or ankles. When the body feels ill, one should do one of the exercises. After perspiring, one will sense the body grow light and the stomach will manifest hunger.' Wu Phu followed this advice himself and attained an age greater than 90 yet with excellent hearing, vision and teeth.

We do not know of any detailed set of instructions for the 'play of the five animals' from that early time,^c but by the Ming period they were well standardised; and since the possibilities of variance are after all rather limited it is likely enough that the traditional movements were in fact closely similar to those invented by Hua Tho himself. Dudgeon translated his set^d from the *Fu Shou Tan Shu*⁸ (Book of Elixir-Enchymoma Techniques for Happiness and Longevity) of +1621, but an earlier version is contained in the *Yang Shêng Tao Yin Fa*⁹ (Method of Nourishing the Vitality by Gymnastics and Massage)^e of +1506, a book to be mentioned again in a moment. These exercises were of course done standing, with abundant movements of the extremities and of the head and neck.^f

Another originator seems to have been Chhen Thuan¹⁰ (Chhen Hsi-I¹¹), the Taoist adept and mutationist of the Wu Tai period between Thang and Sung (+895 to +989), perhaps the originator of the Thai Chi Thu¹² diagram,^g and a man who was consulted by at least two emperors on proto-chemical *wai tan* alchemy.^h By the +15th-century a set of vigorous physical exercises, one for each of

^a *Wei Chih*, ch. 29, pp. 6aff., tr. Needham & Lu Gwei-Djen (1). Parallel passage in *HHS*, ch. 112B, pp. 9b, 10a.

^b On the antiquity of this proverb cf. p. 124 above.

^c Apart from the pictures in the Ma-wang-tui scroll (p. 156 above).

^d (1), pp. 386ff.

^e Pp. 20aff.

^f Some Liu Chhao and Thang Taoists also studied and imitated the cries of birds and beasts; cf. Belpaire (3). Though this was done for spells, or for communication with the immortals, it led to some interesting phonetic developments such as the identification of palatal, plosive and labial consonants, etc.

^g See Vol. 2, p. 467.

^h See above, Vol. 5, pt. 3, p. 194.

¹ 華佗

² 血脈流通

³ 養生導引法

⁴ 吳譜

⁵ 導引

¹⁰ 陳搏

⁷ 樊阿

⁸ 五禽之戲

¹¹ 陳希夷

⁹ 穀氣得消

⁶ 福壽丹書

¹² 太極圖

the twenty-four fortnightly periods of the year,^a had become traditional. The *Pao Shêng Hsin Chien*¹ (Mental Mirror of the Preservation of Life) in +1506 calls the set^b the *Thai-Chhing Erh-shih-ssu Chhi Shui Huo Chü San Thu*,² but the title in the *Ssu Shih Thiao Shê Chien*³ of +1591 is *Chhen Hsi-I Tao Yin Tso Kung Thu*,⁴ which thus reveals the name of the original author.^c The *Pao Shêng Hsin Chien* was the work of a Taoist whom we know only by his pseudonym Thieh Fêng Chü-Shih⁵ (the Recluse of Iron Mountain), but the second book was one of the parts of a large collection, the *Tsun Shêng Pa Chien*⁶ (Eight Disquisitions on Putting Oneself in Accord with the Life-Force) by a distinguished scholar, Kao Lien,⁷ who lived in retirement and devoted himself to studying everything which could promote the health of mind and body.^d Here we reproduce three exercises from the *Pao Shêng Hsin Chien*.^e

Appropriate for the beginning of the 5th month (Fig. 1600).^f Every day during the *yin-mao* double-hours (from 3 to 7 a.m.) stand straight up, throw the body backwards, and extend the hands and arms upwards as if supporting something heavy. Use force to raise it up with left and right hands alternately 30 times. Settle the breathing, gnash the teeth, exhale softly and slowly, inhale quietly and continuously, and swallow the saliva.

Appropriate for the beginning of the 6th month (Fig. 1601).^g Every day during the *chhou-yin* double-hours (from 1 to 5 a.m.), press both hands to the ground behind you, bend one leg and foot under the body, then kick out and retract the other leg with force 15 times. (Repeat conversely). Gnash the teeth . . . (as before).

Appropriate for the middle of the 11th month (Fig. 1602).^h Every day during the *tsu-chhou* double-hours (from 11 p.m. to 3 a.m.), sitting evenly, extend both legs, and clenching the fists press (or massage) both knees with maximal force, left and right alternately, 15 times. Gnash the teeth . . . (as before).

In general the Chhen Thuan gymnastics seem distinctly more vigorous than those of Chungli Chhüan.ⁱ The latter occur also in the *Yang Shêng Tao Yin Fa* already mentioned,^j together with the sets of Phêng Tsu, Teacher Ning and Wangtzu Chhiao. Its author or editor was again the Recluse of Iron Mountain, to whose *Pao Shêng Hsin Chien* it is usually found appended.

^a See Table 35 on p. 405 of Vol. 3.

^b Pp. 76ff.

^c *Tsun Shêng Pa Chien*, ch. 3, pp. 24a ff. Here also, in the part called *Yen Nien Chhio Ping Chien*⁶ (ch. 10, p. 23b) we find a picture of Chhen Thuan lying down, with the *kua* Khan and Li marked on his abdomen; this concerns the proper postures to be adopted during sleep (*Chhen Hsi-I Tso Yu Shui Kung Thu*). Cf. Dudgeon (1), pp. 448ff.

^d We shall have more to say about him in relation to botany and horticulture in Section 38.

^e Tr. auct. adjuv. Dudgeon (1), pp. 393 ff.

^f P. 16a.

^g P. 18a.

^h P. 29a.

ⁱ They are also interspersed in Dudgeon with a set of pictures of the archæi of the organs portrayed as animals. This is from *Tsun Shêng Pa Chien*, e.g. ch. 3, p. 4b, ch. 6, p. 2b.

^j As well as in *Tsun Shêng Pa Chien*, ch. 10, pp. 19a ff. and elsewhere.

¹ 保生心鑑

² 太清二十四氣水火聚散圖

³ 四時調攝牋

⁴ 陳希夷導引坐功圖

⁵ 鐵峯居士

⁶ 遵生八牋

⁷ 高濂

⁸ 延年却病牋

⁹ 陳希夷左右睡功圖



Fig. 1600. An exercise from the *Pao Shêng Hsin Chien* (Mental Mirror of the Preservation of Life), + 1506, suitable for the fifth month.



Fig. 1601. Another exercise from the same manual, suitable for the sixth month.



Fig. 1602. A third exercise in this book, suitable for the eleventh month.

Many other groups of gymnastic procedures could be mentioned, including a notable one of 48 exercises each allied with one or more particular pharmaceutical prescriptions (*kung yao*¹), which Dudgeon took^a from the *Fu Shou Tan Shu* of +1621, but this is well over the medical, indeed the iatro-chemical, borderline. Yet it was very much in the Taoist tradition since it pays great attention to preventing emissions of semen.^b We may return to it in Section 45. The flourishing state of macrobiotic hygiene and physiotherapy in the later Ming will have already become evident from the dates of the books we have quoted, but it continued right through the Chhing, indeed through the nineteenth century, and is still flourishing at the present day. This can be well seen from the serious contribution of Pálos (2), who spent much time in recent years studying the methods of modern Chinese physiotherapists in hospitals and sanatoria. Everything, including the breathing techniques,^c the gnashing of teeth and the swallowing of saliva, even meditation practices drawn from Taoism and Buddhism, is still taught to this day.^d The Chungli Chhüan exercises appeared, for instance, in the *Tan I San Chüan*² (Three Books of Draft Memoranda on Elixirs and Enchymomas), prefaced by Pa Tzu-Yuan³ in 1801, but later in the century, as in the books of Hsü Ming-Fêng,⁴ Phan Wei⁵ and Wang Tsu-Yuan⁶ (*Nei Kung Thu Shou*⁷) a Buddhist tradition came more and more strongly in. In this last book (1881) we find a tractate of very uncertain age, the *I Chin Ching*⁸ (Manual of Exercising the Muscles and Tendons), from which we reproduce a figure (Fig. 1603); this has been ascribed to the Northern Wei period and attributed to Ta-Mo⁹ (Bodhidharma, d. c. +475), but it may not be older than the +16th-century.^e It is preceded by another set of 12 exercises, called *Shih-erh Tuan Chin Thu*¹⁰ and done seated, which seem to be an enlarged and Buddhicised version of those of Chungli Chhüan, (Fig. 1604).^f

It was only natural that Chinese Buddhism should have had a strong physical

^a (1), pp. 427 ff.

^b Ibid. pp. 440 (Li Chhi-Chhan's¹¹ method), 454 (perineal pressure), 477, etc.

^c As we have noted on p. 154 above.

^d See the books by Anon. (77); Chhen 'Thao (1); Chiang Wei-Chhiao (1, 2, 3, 4), Chiang Wei-Chhiao & Liu Kuei-Chen (1); Liu Kuei-Chen (1), and Hasegawa Usaburō (1). To the work of Pálos may be added those of Hsiao & Stiefvater (1) and Stiefvater & Stiefvater (1).

^e It sometimes has prefaces, 'probably spurious', of +628 and +1143, and it seems to have had a close association with the famous Shao-Lin temple, of which more in a moment. Text. tr. Dudgeon (1), pp. 529 ff.; Pálos (2), pp. 179 ff. Movements done standing.

^f Tr. Pálos (2), p. 197. Phan Wei's introduction to these was translated, more or less, by Dudgeon (1), pp. 558 ff. Many collections of such tractates circulate in the world, such as Anon. (206) which combines the *I Chin Ching* with the *Pa Tuan Chin* and other materials. They go under many titles, such as the similar *Lien Tao Chhang Shêng Fa*,¹² which contains the series of both Chungli Chhüan and Chhen Thuan, and has been translated by Lê Hu'o'ng & Baruch (1). Other books, like that of Ni Chhing-Ho (1), combine an account of postures and exercises with a modern version of physiological alchemy in general. He appends a question-and-answer session with a Taoist named Chen-I¹³ who covers briefly all the techniques, respiratory, gymnastic and sexual, for the re-moulding and perpetuation of the three primary vitalities. Others yet again, such as the small work of Ku Chêng-Hua (1), amplify the *Pa Tuan Chin* and add other sets of exercises such as the *liu tuan kung*.¹⁴ These last figure again in books such as Anon. (207), which describe themselves as dealing with hygienic and therapeutic self-massage (*pao chien an mo*¹⁵).

¹ 功藥

² 丹擬三卷

³ 巴子園

⁴ 徐鳴峯

⁵ 潘霽

⁶ 王祖源

⁷ 內功圖說

⁸ 易筋經

⁹ 達摩

¹⁰ 十二段錦圖

¹¹ 李棲蟾

¹² 煉道長生法

¹³ 眞一

¹⁴ 六段功

¹⁵ 保健按摩

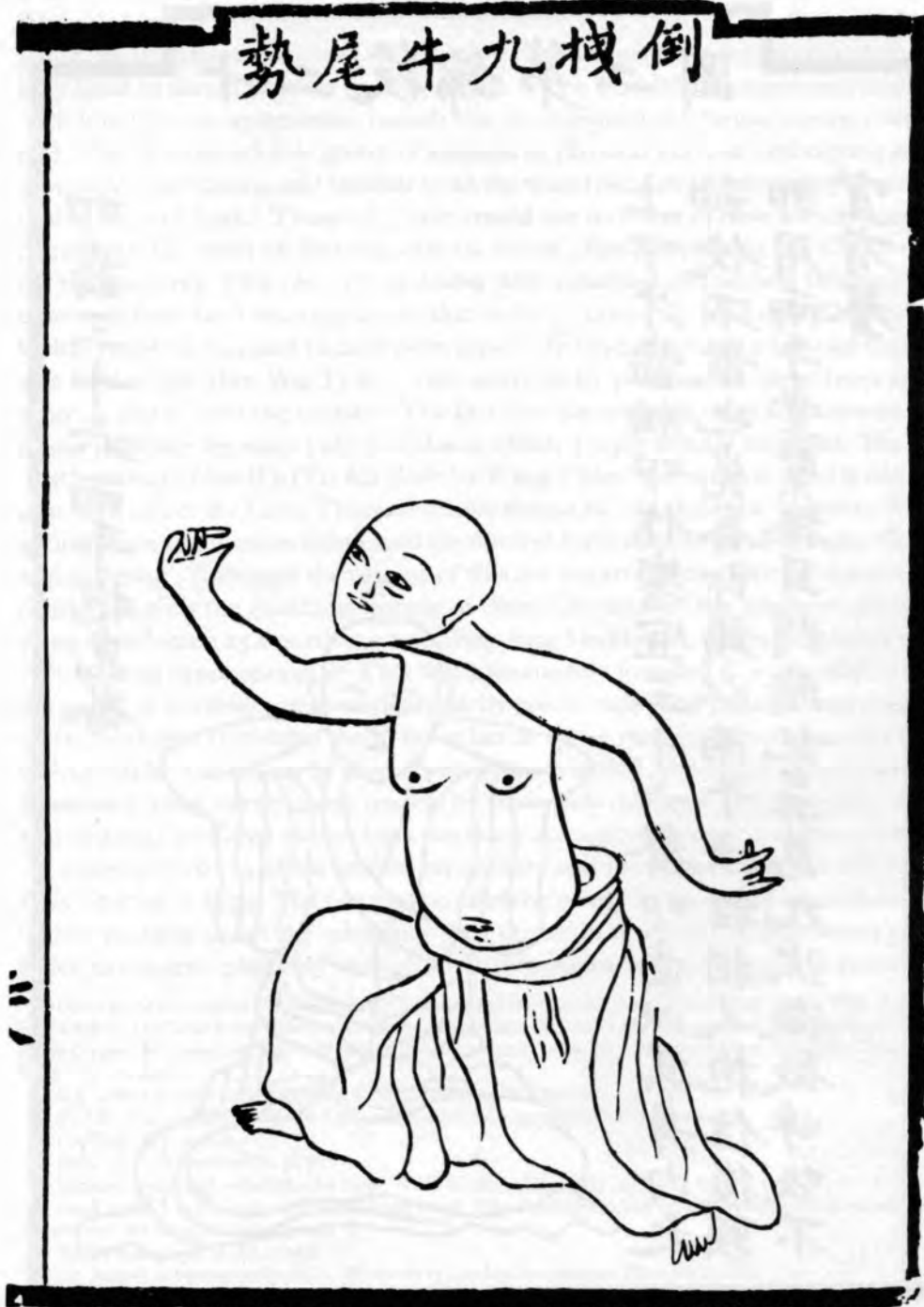


Fig. 1603. An exercise from the *I Ch'in Ching* (Manual of Muscles and Tendons), ascribed to the + 5th century but in its present form probably not earlier than the + 16th. The caption says: 'Picture of Wagging the Nine Oxtails upside-down' (*tao chuai chiu niu wei shih*). The exercise is the fifth in the series.

圖二第錦段二十

叩齒三十六兩手抱崑崙

上下牙齒相叩作響宜三十六聲叩齒以集身內之神使不散也崑崙即頭以兩手十指相叉抱住後頸即用兩手掌緊掩耳門暗記鼻息九次微微呼吸不宜有聲



Fig. 1604. An exercise from the set called *Shih-erh Tuan Chin Thu* (Twelve Elegant Exercises Illustrated), probably Ming in date, and a Buddhicised version of Chungli Chhüan's series. This is the second of the set.

exercise tradition of its own because it inherited much of Indian yoga technique. The relations of Chinese physiological alchemy with yoga, if any, form a subject which we shall have to discuss briefly at the conclusion of this sub-section; here we only need to sketch another curious way in which Buddhist monasticism inserted itself into Chinese gymnastics, namely the development of Chinese boxing (*chhüan po*¹). This is a remarkable group of systems of physical exercise embodying some aspects of ritual dance, and familiar to all the world because still so widely practised to this day in China.^a Those who have traced out its history^b have usually made it begin with the sport of 'butting with ox-horns', first heard of in the Chhin time (– 3rd-century). This *chio ti*^{2,3} or *hsiang phu*⁴ consisted of combats between two unarmed men each wearing an ox-skin with its horns on his head. The second Chhin emperor was said to have been especially fond of it,^c and a famous tourney was held under Han Wu Ti in – 108, watched by people who came from as far away as 300 *li* from the capital.^d The fact that the contests were accompanied by music indicates the aspect of ritual dance which it must already have had. The late + 5th-century *Han Wu (Ti) Ku Shih*⁵ by Wang Chien⁶ mentions it,^e and it was still practised under the Later Thang and Liao dynasties.^f By this time, however, it was giving place to the more subtle and rhythmical form of boxing, *chhüan po*, 'fisting and gripping'. Although the origins of this are uncertain, one form of it was early connected with the Buddhist temple of Shao-Lin Ssu⁷ on the northern slopes of Sung Shan⁸ some 25 *li* north-west of Têng-fêng,^g in Honan, where the monks were very famous exponents of it. This was a monastery founded *c.* + 494 with which the name of Bodhidharma was legendarily connected,^h and physical exercise was certainly always cultivated there, for as late as the + 16th-century the monks were giving displays of the art in several eastern provinces.ⁱ About this time, when the Japanese pirates were causing trouble by their raids there, a Chinese general, Chhi Chi-Kuang,⁹ included a short but systematic account of boxing as a form of physical training in ch. 14 of his treatise on military and naval efficiency, the *Chi Hsiao Hsin Shu*¹⁰ of + 1575. The fact that he used the word *jou*,¹¹ softness or gentleness—'deftly pinning down the adversary face upwards is termed its gentleness'—led Giles to suggest, plausibly enough, that the origins of the now world-renowned

^a Often in the form called *thai-chi chhüan*.¹² Authoritative accounts are those of Anon (74); Chang Wên-Yuan (1); Hsü Chih-I (1); Tshai Lung-Yün (1). In Western languages the books of Cheng Man-Chhing & Smith (1), or Delza (1) may be consulted. *Thai-chi chhüan* may have some connection with the *nei tan* alchemist Chang San-Fêng¹³ (d. + 1420).

^b E.g. Giles (5), pp. 132 ff., following *TSCC*, *I shu tien*, ch. 810, *tsa lu*, pp. 3 aff.

^c So Chu Hui¹⁴ in his *Shih Yuan*,¹⁵ a Sung book on the origins of things and customs.

^d *CHS*, ch. 6, p. 24 a, b.

^e Para. 37, tr. d'Hormon (1), p. 77.

^f Dates of + 925 and + 928; for the latter, *WHTK*, ch. 119, (p. 3867.3), cf. ch. 147, (p. 1288.2).

^g Itself some *li* north-west of Yang-chhêng (mod. Kao-chhêng) the site of the ancient central astronomical observatory of China; cf. Vol. 3, p. 291.

^h See Pelliot (3), pp. 248 ff., 252 ff.

ⁱ On Shao-Lin boxing today see R. W. Smith (1), and on its exercises Pálos (2), p. 168.

¹ 拳搏

² 角抵

³ 角抵

⁴ 相撲

⁵ 漢武帝故事

⁶ 王儉

⁷ 少林寺

⁸ 嵩山

⁹ 戚繼光

¹⁰ 紀效新書

¹¹ 柔

¹² 太極拳

¹³ 張三峯

¹⁴ 朱繪

¹⁵ 事原

Japanese art of *jiu-jitsu*¹ may be traced to the contact of the two cultures at this time. In the end Chinese boxing received its definitive manual, the *Chhüan Ching*² of Chang Khung-Chao,³ but though not easy to date, this text is most probably of the + 18th-century.

Our little digression, if such it was, on Chinese calisthenics, has brought us to the time when the Jesuit P. M. Cibot (3) presented Europeans with a short but celebrated paper on the strictly macrobiotic exercises of the physiological alchemists.^a His 'Notice du Cong-fou [Kung-fu] des Bonzes Tao-sée [Tao shih]' of + 1779 was intended to present the physicists and physicians of Europe with a sketch of a system of medical gymnastics which they might like to adopt—or if they found it at fault they might be stimulated to invent something better. This work has long been regarded as of cardinal importance in the history of physiotherapy^b because it almost certainly influenced the Swedish founder of the modern phase of the art, Per Hendrik Ling. Cibot studied at least one Chinese book, but also got much from a Christian neophyte who had become expert in the subject before his conversion. Cibot did not care much for the Taoist philosophy, but believed that *kung fu* and its medical theory was an 'estimable system' which had really worked many cures and relieved many infirmities. As to the former, he wrote:

Les nuages épais de la superstition et les affreuses ténèbres de l'idolâtrie ont tellement caché la vraie théorie du Cong-fou à la multitude, qu'elle est persuadée, d'après les récits des Bonzes, que c'est un vrai exercice de religion qui, en guérissant le corps de ses infirmités, affranchit l'âme de la servitude des sens, la prépare à entrer en commerce avec les Esprits, et lui ouvre la porte de je ne sais quelle immortalité, où l'on arrive sans passer par le tombeau. On composerait de très-amples volumes, des fables, contes, rêves, chimères et extravagances qu'on débite ici sur le Cong-fou . . . Les Tao-sée qui ont le secret du Cong-fou se sont fait une langue à part pour l'enseigner, et en parlent en des termes aussi éloignés des idées communes que nos Alchymistes du grand-oeuvre.

These lines are intriguing; the Jesuit was clearly incapable of understanding the Chinese conception of material immortality, and someone had evidently been mystifying him with talk of 'true lead' and 'true mercury'. Nevertheless, he was impressed by the variety of motions and positions which the Taoist gymnastic adepts had devised (cf. Figs. 1605, 1606). 'Nous ne craignons pas de le dire', he wrote, 'en réunissant toutes les postures et attitudes des comédiens, des danseurs, des sauteurs et des figures académiques, on n'auroit pas la moitié de celles qu'ont imaginées les Tao-sée.' Cibot also gave due weight to the respiratory techniques, including the six exhalations, or some practice very like it. Furthermore he ventured into an account of the medical theory, saying that in the view of the Taoists the mechanism of the human body is essentially hydraulic, that is to say, the circulation of spirits,

^a In Vol. 2, p. 146 we attributed this communication, unsigned as so many of them were, to J. J. M. Amiot (as numerous writers, including Dudgeon, had also done), but discovered the real author in time for Cibot's name to have the credit in the bibliography. Pfister (1), p. 896, is unambiguous on the subject, and the style is Cibot's.

^b We reserve this subject for Sect. 44 in Vol. 6, mentioning meanwhile only the historical accounts of McAuliffe (1); Joseph (1); Licht (1) and Saurbier (1).

¹ 柔術

² 拳經

³ 張孔昭

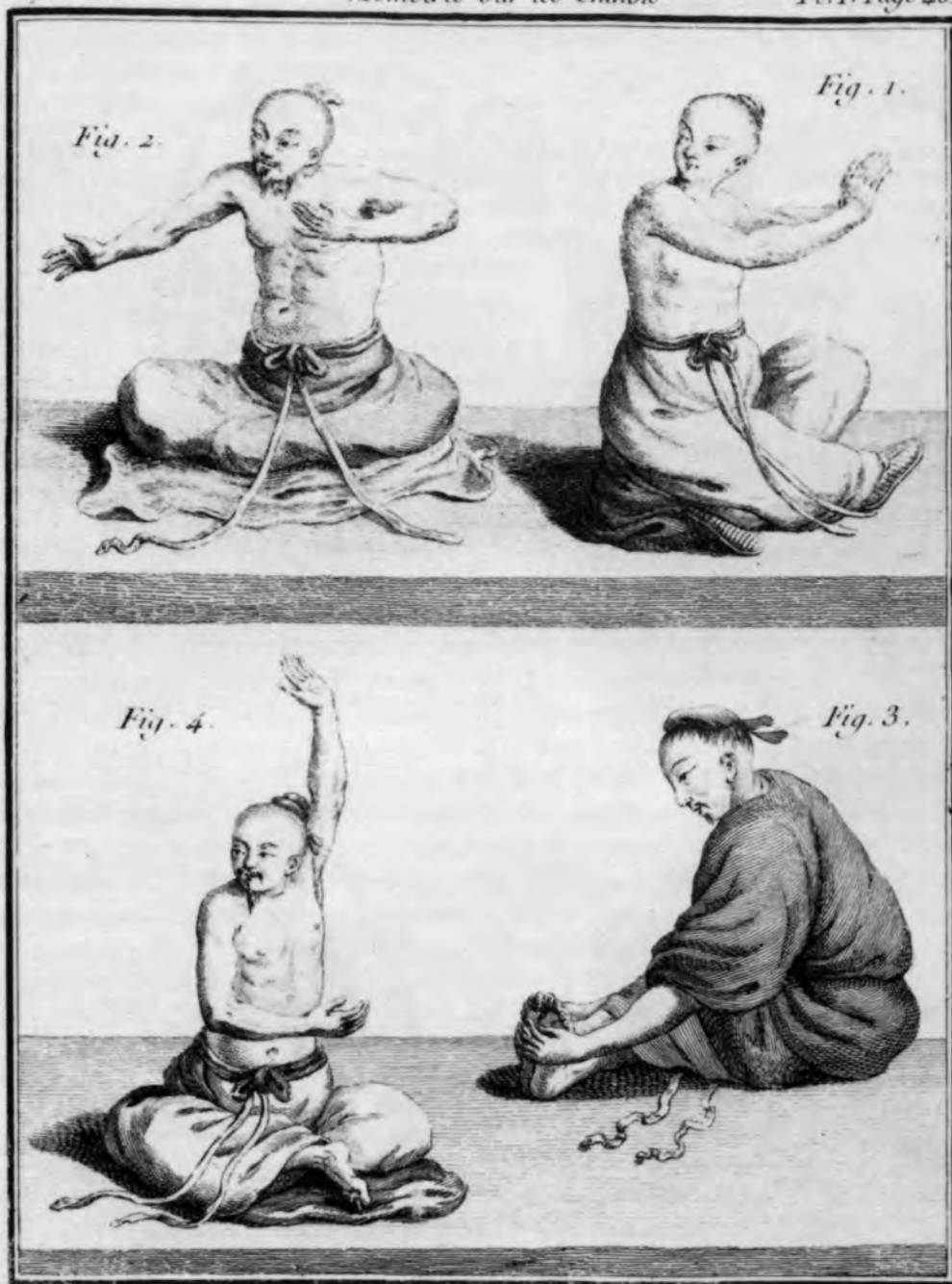
*Tom. IV.**Memoires sur les Chinois**Pl. I. Page 451*

Fig. 1605. Four pictures of Taoist calisthenics from Cibot (+ 1779), the first paper to bring Chinese macrobiotic gymnastics to the attention of the Western world. Note the similarity between his fig. 3 and the eighth exercise in Fig. 1599.

blood and humours is the most important thing, and that their fluidity is tempered by the inspired air; consequently everything is useful which can diminish the obstacles of weight and friction, and so adjust to perfection the circular flow. From the point of view of a comparison between the medical philosophies of China and Europe in the late +18th-century^a it is instructive to hear Cibot say:

It follows that the various postures of the *Kung-fu*, if well directed, should effect a salutary clearance in all those illnesses which arise from an embarrassed, retarded, or even interrupted, circulation. But how many diseases are there which have a cause other than this? One may well ask whether, apart from fractures and wounds which injure the organisation of the human frame, there are any such diseases?^b

Of the three primary vitalities (*san yuan*,¹ or *san chen*² cf. p. 47 above) Cibot said nothing, but knowledge of this idea seems to have been brought to Europe about the same time through other intermediaries,^c for later writers recognised them in the system of Ling, though wearing early nineteenth-century Naturphilosophie dress.

P. H. Ling (+1776 to 1839) started as a fencing-master, but worked out an elaborate system of physical exercises for use both in health and disease.^d These he continued to teach and develop for three and a half decades after the foundation of his institute in Stockholm in 1813, thus giving a fundamental impetus to modern Western gymnastics. The theoretical part of his writings, however (1), was constructed, as McKenzie deprecatingly says, 'in the light of the physiology of his day, which often sounds fantastic in the presence of modern discoveries. Ling's ideas on the nature of life, the laws of organic unity, and the relation of the parts, seem quaint to modern thinkers, and are not easily translated into the scientific terms of today.'^e Indeed, du Bois Reymond and others violently attacked them.^f But that does not render them any the less interesting for the historian of scientific thought.

In common with other biological thinkers in the first half of the nineteenth century Ling accepted a tripartite division of the operations of the vital force. He spoke of dynamical, mechanical and chemical agents, the first of a mental, moral and intellectual character, the second muscular, circulatory and respiratory, and the third concerned with nutrition, sanguification, secretion, generation and reproduction. The first, 'intellectuality', would correspond to the Chinese *shen*,³ the second, 'animal spirits', to the *chhi*,⁴ and the third, 'vital spirits or organic forces', to the *ching*⁵ (cf. p. 46 above).^g Dally (1), pondering this in 1857, was convinced that

^a Cf. Needham (59).

^b P. 450, *eng. auct.*

^c Lawrence Lange, for example, a Swede who was Russian Consul at Peking in the +18th-century (Dudgeon (1), p. 356).

^d The chapter on his life in Tait McKenzie (1) may be read. Most of the elaborate biographical work of Westerblad (1, 2) is in Swedish only. Cf. Cyriax (1); Georgii (1).

^e (1), p. 112.

^f Cf. Licht (1), p. 403.

^g So Dudgeon (1), pp. 354, 355. Dally and Dudgeon were not always quite clear about the terminology. In one place, Dudgeon (1), p. 370, refers to the 'animal, muscular, locomotive' component as Yang, the 'vegetative, secretory, chemical' as Yin, and the mental, 'physical', as Thai-Chi.

¹ 三元

² 三眞

³ 神

⁴ 氣

⁵ 精

such a doctrine did not differ from that of the Taoists.^a 'It must be admitted', he wrote, 'that Ling had in his hands the *Notice* of Amiot [Cibot], or some other, original, Chinese treatise, (or one) produced, it may be, by other missionaries, or by some persons attached to embassies from Europe to China.' And again: 'The doctrine of Ling in its entirety, theoretical and practical, is only a sort of counter-drawn daguerrotype of the *kung-fu* of the Taoists. It is the royal vase of Dresden, the splendid Chinese vase, with its Chinese figures overlaid with European paint. This is the real merit of Ling'. And Dudgeon himself wrote:

According to Amiot [Cibot] the Taoists consider the human body as a purely hydraulic mechanism, and he explains their physical principles and their physiological theory according to this one fundamental idea. In this case, there will be between the doctrines of the Taoists and those of the Iatro-mechanists such a similitude or affinity that one can believe that they pertain to the same school. Yet Amiot [Cibot] makes it understood that *kung-fu* relies still upon other principles.^b The primitive priests considered the body not only as a physical and mechanical apparatus but also as a chemical one. They recognised that the physical and chemical laws of the body are subject to the influence of a superior principle which rules and harmonises them in the unity of the human being. This Chinese conception recalls exactly the theory of Ling—of mechanical, chemical and dynamic agents which balance themselves and hold themselves in equilibrium upon a central point, which is the life, and whence proceed the three principal agents. Dr Bayes of Brighton, in his memoir on the 'Triple Aspect of Chronic Disease' . . . takes also for the basis of his observations the theory of the Chinese balance of the three vital forces, which he borrowed probably from the doctrine of Ling.

The book of Bayes (1) in 1854 did indeed assume this system, with a slightly different terminology—the Psychological, the Musculo-vital (or locomotive) and the Chemico-vital. And one finds similar things in many other writings of the period, not only among the relatively small fry,^c but in the thoughts of very great men. For example, Claude Bernard, early in 1857, jotted down the following in his 'Red Notebook':^d

There is in living creatures a developmental force that is not encountered in the dead. Living creatures have a development, a specific mission to fulfil. This cannot be provided by the external world, although it is required for this accomplishment. We cannot avoid seeing that their destiny is that of reproducing themselves to perpetuate their race into eternity, so that life and matter become eternal.

It is thus necessary to acknowledge in living beings, *development* (that is to say, *creation*) as well as *attraction* and *affinity*.^e

^a (1), in Dudgeon, *ibid.* p. 356.

^b Not in the *Notice on Kung-fu*. But the *san yuan* may well have been discussed in some other of the voluminous Jesuit writings.

^c E.g. Blundell (2); Roth (1). Dally (1) correlated the classification with the Pauline tripartite division in *Ep. Thess.* 5, 23. (cf. pt. 2, p. 72 above). This had been known in China through Nestorian writings, e.g. an extant document dated +641 (Saeiki (2), p. 171), but it could hardly have had much influence there. For it was not at all closely similar to the Chinese system of the three primary vitalities, which was already crystallising in Han times (cf. p. 137 above).

^d Recently translated and edited by Hoff, Guillemin & Guillemin (1), his pp. 52, 53, theirs, p. 30.

^e The brackets, and the italicising of the last word, in this sentence, have been introduced by us, to make Bernard's meaning clearer.

The first is the *vital force*.

The second is the *physical force*.

The third is the *chemical force*.

But what is most clear is that all three are unknown.

The first expresses the law of organic movement of beings.^a The second expresses the law of general movement of non-living things. The third expresses the law of molecular movements of composition and decomposition.

It would obviously be impossible to follow further here the course of biological philosophy in the first half of the nineteenth century. Obviously Claude Bernard's 'thinking aloud' could conceivably have been derived from the Aristotelian doctrine of the 'three souls',^b rather than from any Chinese ideas. Or he might have been reading the book that Francis Glisson published in +1672, *Tractatus de Natura Substantiae Energetica* . . . 'The Energetic Nature of Substances; or, the Life of Nature, and its Three Primary Faculties, the Natural Perceptive, the Natural Appetitive and the Natural Motive'.^c Here Glisson joined with Harvey in regarding perception, differentiation, absorption, irritability, and the like, as essential properties of living matter, not due to the presence or guidance of any anima or archaeus. The origins of this threefold classification of Glisson would repay further research, but it seems a good deal closer to Sun I-Khuei than to Paul of Tarsus. All these formulations, physiological though they were, could conceivably have had some connection with the *tria prima* of Paracelsian doctrine, salt, sulphur and mercury.^d In any case, there are grounds for thinking that an important thesis could be written on specifically Taoist influences on the development of the Naturphilosophie movement, a phase of European scientific thought often much decried by historians, yet a genuine part of the evolution of modern science.

We may have to envisage a kind of second wave of Chinese influence on Europe during the second half of the eighteenth and the first half of the nineteenth centuries. This has so far been completely overshadowed by the immense impact of Confucian ideas (e.g. morality without supernatural revelation) from about +1675 onwards, with the great sinophiles such as Leibniz, Voltaire, Diderot, Helvetius, Quesnay and d'Argens ranged against the resistance led by Rousseau, de Pauw, Renaudot, Montesquieu and Fénelon.^e In +1721 the eminent philosopher Christian Wolff was expelled from Halle and from his chair in that university at twenty-four hours' notice for a lecture maintaining that Confucianism showed how high ethical behaviour was independent of revealed religion.^f This had arisen from

^a In the original, the word 'organic' is italicised, but none of the other explanatory words.

^b See Vol. 2, pp. 21 ff.

^c This important work has been analysed and discussed by Pagel (16, 17) and Temkin (4).

^d For a reminder of this we have to thank Mr Richard Hood. Chinese influences on Paracelsian ideas we discussed already at some length in pt. 4, pp. 502 ff. Cf. Hartmann (1), p. 148.

^e There is still no better book for an orientation in this subject than the monograph of Pinot (1).

^f This was his *Oratio de Sinarum Philosophia Practica*, printed in +1726 and again in German in +1740. Wolff soon got another chair at Marburg and nearly twenty years later was recalled to Prussia by Frederick the Great. His pupils meanwhile kept up the good fight, especially G. B. Büllfinger with his *Specimen Doctrinae Veterum Sinarum Moralis et Politicae*, +1724. Wolff himself had been a pupil of Leibniz. On the whole incident see Reichwein (1), pp. 83 ff. and especially Lach (6).

Francis Noel's amplification of the *Confucius Sinarum Philosophus* (+ 1687), presenting six of the classics in Latin translation in + 1711.^a But presently someone must have brought further knowledge of the more developed Taoist and medical ideas such as that of the three primary vitalities. At an earlier point we touched upon the question of the oldest translations of the *Tao Tê Ching*; two were available before + 1720 and a third, made probably about + 1760, is preserved in the library of the Royal Society.^b As will be evident from the parts of Ho Shang Kung's commentary on this classic which we gave on p. 132 above, any of the more extensive later commentaries, if translated and even in manuscript circulated, could have explained something of *nei tan* ideas. We know that they were being sought for. In + 1735 Fréret wrote to de Mailla:

Les traditions des Tao-sse me semblent une chose qu'il seroit important d'examiner, cette secte ayant quelque antiquité à la Chine, et ces traditions ayant esté écrites dez le temps des premiers Hanes, peut estre sur des livres plus anciens. Elles doivent faire une partie considérable de l'histoire des sciences et des opinions chinoises. Le détail de ces opinions opposées à celles des sectateurs de Confucius servira à faire mieux connoistre le système de ces derniers. Une notice des anciens livres des Tao-sse et de ceux qui ont le plus d'autorité parmi eux nous mettroit en estat de connoistre au moins les fondemens de leur doctrine. Un semblable travail ne doit pas même beaucoup couster à une persone aussi habile que vous l'estes dans toutes les parties de l'Erudition chinoise.^c

These were prescient words. Another hint comes from Bishop Berkeley's book on 'tar-water' in which, starting from chemistry and hygiene, he ascended through philosophy to theology. In this 'Siris' of + 1744 he wrote:

A notion of something divine in Fire, animating the whole world, and ordering its several parts, was a tenet of very general extent, being embraced in the most distant times and places, even among the Chinese themselves; who make *tien*,^d aether or heaven, the sovereign principle, or cause of all things, and teach that the celestial virtue, by them called *li*,^e when joined to corporeal substance, doth fashion, distinguish, and specificate all natural beings. This *li* of the Chinese seems to answer (to) the forms of the peripatetics.^f And both bear analogy to the foregoing philosophy of Fire . . . The *tien* is considered and adored by the learned Chinese, as living and intelligent aether, the *πῦρ νοερόν* (*pyr noeron*) of the Chaldaeans and the Stoics . . .^g

This is of course drawing from Neo-Confucianism, but could not some talk of 'true fire' and 'true water' have been among Berkeley's sources? This was just before the

^a He added Mencius, the *Hsiao Ching* and the *San Tzu Ching* to the three others (*Ta Hsüeh*, *Lun Yü* and *Chung Yung*) previously done by Intorcetta, Couplet *et al.* (1).

^b Vol. 2, p. 163. One was by Noel himself (Wei Fang-Chi'), the other by J. F. Foucquet (Fu Shêng-Tsê'), the third by an anonymous translator, probably Portuguese.

^c Letter printed by Pinot (2), p. 103.

^d *Thien*.³

^e *Li*.⁴

^f On this question see Vol. 2, p. 475.

^g (1), pp. 180, 182.

¹ 衛方濟

² 傅聖澤

³ 天

⁴ 理

birth of Goethe, still better known for his interest in Chinese ideas,^a and Goethe stood at the beginning of the Naturphilosophie movement.^b Associated with the names of Oken, von Kiemayer, Meckel, Carus and many others, this school sought for scientific laws governing the vegetable and animal world not purely empirical, hence they were often called transcendentalists.^c Though largely concerned with comparative morphology (a word, indeed, invented by Goethe), their influence spread strongly in physiology too, as in the work of J. C. Reil in the last decade of the century.^d For example, among those who occupied themselves much with cogitations on the nature of the Lebenskraft in the style of Naturphilosophie was P. F. von Walther (+ 1781 to 1849), in whose writings we find again the 'triad'—Sensibilität, Irritabilität and Reproduktionskraft.^e

To detect what seem like traces of the medieval Taoist doctrine of the three primary vitalities in the early nineteenth century, the time of the foundations of modern experimental physiology, is indeed an unexpected outcome of the study of gymnastic practices intended at the other end of the world for the attainment of longevity and material immortality. It would seem that once again the alchemists of East Asia were not so far removed from us intellectually as we often tend to think. Nor was China indebted to Europe for a knowledge of the health-giving effects of physical and gymnastic exercises, as innocent readers of some historians of physiotherapy might be led to suppose.^f

All this was surely the background of the very influential macrobiotics book of Christopher Hufeland (1), printed in many editions after it first came out in + 1796.^g In the preface of his 'Art of Prolonging Life' he said that life, 'that peculiar chemico-animal operation... can be promoted or impeded, accelerated or retarded'.^h He advocated 'diaetetic rules and a medical mode of treatment for preserving life, and hence arises a particular science, the Macrobiotic, or the art of prolonging life'. This was in order to cultivate the 'vital power'. Hufeland believed that Paracelsian *wai tan* elixirs might have temporary efficacy, but on the whole condemned them. 'The use of such medicines, which are all hot and stimulating', he wrote, 'naturally increases vital sensation; and such people (as use them) consider increase of vital sensation a real increase of the vital power, not reflecting that a continual increase of the former is, by irritation, the surest means of shortening life'.ⁱ Here then in the vital power was the enchymoma in a new guise, and Chungli

^a + 1749 to 1832. Cf. e.g. Eckermann (1) for 31 Jan. 1827 (pp. 164 ff.); Düntzer (1), vol. 2, pp. 300, 386; R. M. Meyer (1) *passim*.

^b See E. S. Russell (1), pp. 89 ff.; Singer (1), pp. 212 ff.; Merz (1) *passim*.

^c Lorenz Oken (+ 1779 to 1851), C. F. von Kiemayer (+ 1765 to 1844), J. F. Meckel (+ 1761 to 1833), K. G. Carus (+ 1789 to 1869). Many of these men and their colleagues made great contributions to biological knowledge.

^d See Rothschild (1), pp. 164 ff., 191 ff., 204 ff. On Johann Christian Reil (+ 1759 to 1813) cf. Needham (13), pp. 207 ff.

^e On the history of our knowledge of the nature of muscular contraction, including the concept of irritability, see D. M. Needham (1).

^f 'In 1908 Dr Max Exner introduced the teaching of physical training in Shanghai, and began the systematic education of teachers under government encouragement' (McKenzie (1), p. 168).

^g We have had something to say about it already in pt. 4, p. 502.

^h P. viii of the first English edition, + 1797.

ⁱ Pp. 237 ff. We are indebted to Mr David Hallam for discussions on Hufeland.



Fig. 1607. Drawing of Ssuma Chhng-Chên, writer of the *Tso Wang Lun* (Discourse on Meditation) about +715. From *Lieh Hsien Chhuan Chuan*, ch. 5, p. 33b.

Chhüan and Chang Po-Tuan were living again in the midst of Naturphilosophie Europe, the world of Coleridge and of Frankenstein.

(iii) *Meditation and mental concentration*

There now remain but three more subjects for discussion, the meditation techniques, the heliotherapeutic techniques, and the sexual techniques. Of the first and second of these there is relatively little to be said, partly because we may have to return to the practice of meditation in Section 43 on physiology and psychology, and partly because the exposure of the body to light was an art of minor importance about which not much is known; but the sexual techniques were indeed of great concern, to ordinary people as well as to adepts, and the ideas involved are of deep interest to our theme, vital indeed (in more senses than one) for physiological alchemy.

The meditation techniques were closely connected with the physical postures and exercises about which we have just been speaking.^a One has to understand that Taoist meditation was not necessarily a disciplined following out of particular trains of thought (as much Christian meditation has been)^b but rather perhaps the disciplined banishment of all trains of thought, with the object of freeing the mind from the natural flux of passing thoughts and images.^c Unfortunately we know of no study of the techniques for this, adequate both sinologically and psychologically.^d A proper investigation would have to centre round works such as the *Tso Wang Lun*¹ (Discourse on Meditation)^e written about +715 by the famous adept, diviner and alchemist Ssuma Chhêng-Chên,^{2f} and the relevant chapters (3-5) of the *Tao Shu*³ (Axial Principles of the Tao)^g produced by the Taoist librarian Tsêng Tshao⁴ about +1145. At the other end of the line, the tradition in its still living form would have to be studied in such works as those of Chiang Wei-Chhiao (1-4) and Lu Khuan-Yü (1),^h preferably by personal discipleship at the feet of contemporary practitioners.ⁱ

^a We refrain from embarking here on the vast related subject of mysticism and mystical experience as such, on which the rather impartial book of Staal (1) may be consulted.

^b Cf. Knox (1).

^c Whether or not this was sometimes accomplished by concentration upon a particular word the meaning of which the meditator did not understand (i.e. a *mantram*), we do not know. Such a technique, quite powerful psychologically, is obviously very different from the long-continued repetition of a phrase that the meditator does understand, such as the 'Jesus prayer' of Orthodox Christian spirituality, which has a close connection with the Hesycheasts (cf. pp. 152 ff.). On this see Maloney (1) and Neyt (1). But that way may have been used too.

^d The same applies, alas, to dream-interpretation, about which there is a substantial medieval and traditional Chinese literature. We hope also to return to this in Sect. 43.

^e TT1204, and in TTCY.

^f Analysis by Fujiyoshi Jikai (1). Cf. Fig. 1607.

^g TT1005.

^h Here we find many things with which we are now familiar, such as the meditation postures (pp. 167 ff.), foetal respiration (p. 175), the six exhalations (p. 208), the circulation of the *chhi* (pp. 176, 186, 191, 205 ff.), teeth gnashing (p. 206), saliva swallowing (pp. 184, 206), 'rejuvenation', and the marriage of fire and water (p. 212).

ⁱ This is the value of Pálos (2), but he is far more informative about the physical exercises than about the meditation, the title of his book notwithstanding. He too describes the continuing practice of the six exhalations (p. 82). Cf. Hasegawa Usaburo (1) on the uses of Zen in medicine.

So far this has not been fully done, and much more work is needed before we can expect to know how far, if at all, hypnosis,^a auto-hypnosis,^b or similar methods of producing various kinds of trance states,^c were employed in Taoist physiological alchemy. Its meditational aspect seems to have been really rather different from those found in other religions. Maspero had little to say about it in his wonderful study of the Taoist 'procedures for nourishing the vital principle' (7), but his posthumous papers have more.^d Taoist meditation was generally known as 'concentrating on the unity of the Tao' (*shou i*¹) or 'visualising the Unity' (*tê i*²); a contemplation of the universe which evidently came down from the conviction of the unity of Nature common to all the early Taoist philosophers from the 5th-century onwards—'the gentleman holding on to the idea of the One', as the *Kuan Tzu* book has it.^e But later, after the elaboration of the Taoist pantheon, and the Mao Shan revelations,^f it generated a visualisation of the Trinity (*San Chhing*³) and the most exalted spirits, powers, dominions and principalities below it; this was 'maintaining one's thought' (*tshun ssu*⁴). In the early centuries of the era, the time of the *Thai Phing Ching*, a similar phrase had been in use, 'reflecting uninterruptedly' (*hsiang tshun*⁵).^g Certainly the contemplators were lost to the external world, as the expression 'sitting in forgetfulness' (*tso wang*⁶) clearly implies;^h but in late times there was also the phrase 'repairing the heart' (*hsiu hsin*⁷), though this had a wider sense which embraced most of the doings of physiological alchemy, as well as the liturgies themselves. Would that we knew more about the psychological techniques which were used by the Taoist masters in the different centuries. There can be no doubt that for results of any significance henceforward the collaboration of sinologists with clinical and experimental psychologists will be essential.

Biochemistry and physiology are going to be involved too, for much research is being devoted to the measurable concomitant phenomena in meditation. Interesting reports are those of Kasamatsu & Hirai (1) on electro-encephalographic studies

^a Huard, Sonolet & Huang Kuang-Ming (1) have devoted a remarkable paper to three previously unpublished letters of the Jesuit J. J. M. Amiot, written between +1783 and +1790 to the brother of the minister J. B. Bertin (+1719 to +1792) in Paris. He says that at first he did not think much of the *kung-fu* paper (cf. p. 170 above), but was struck later on by what the Abbé Bertin wrote to him about the successes of F. A. Mesmer (+1734 to 1815). Amiot believed that the Taoists used hypnotism therapeutically, and he applied Chinese natural philosophy to explain 'animal magnetism'.

^b See the book of Fromm & Shor (1), with its interesting contributions such as that of Bowers & Bowers (1).

^c We leave on one side here the possible use of psychotropic drugs by the ancient and medieval Taoists for inducing altered states of consciousness along with the meditation processes. Its connection with alchemy has already been discussed in some detail in Vol. 5, pt. 2, pp. 121 ff., 150 ff., 154. Out of an enormous literature on these pharmacological effects we may mention only Aldous Huxley (1); Solomon (2); Hyde (1) and Longo (1). On the botany and chemistry of the hallucinogens Schultes & Hofmann (1) is the standard work.

^d (32), pp. 397 ff.

^e Cf. Vol. 2, pp. 46 ff.

^f Vol. 5, pt. 4, pp. 213 ff.

^g Jao Tsung-I (3). The *Hsiang Erh*⁸ was a Han book of commentary on the *Tao Tê Ching*, so the link between the early Taoist philosophers and the later Taoist theologians comes out particularly clearly.

^h Cf. the *tso chhan* (*zazen*)⁹ of Chhan and Zen Buddhism, 'sitting in *dhyāna*', studied by Fujiyoshi Jikai (1) and many others.

¹ 守一

² 得一

³ 三清

⁴ 存思

⁵ 想存

⁶ 坐忘

⁷ 修心

⁸ 想爾

⁹ 坐禪

of Zen sitting;^a and Das & Gastaut (1) on similar measurements during Indian *samādhi*.^b Recent studies have shown that during deep meditation there is a great decrease of oxygen-consumption and CO₂-elimination, a decrease in respiratory rate, a marked rise in the electrical resistance of the skin (much more than in sleep), a great increase of slow alpha-waves (EEG), and a sustained fall of blood lactate.^c This last is particularly interesting because anxiety neurosis states are associated with high blood lactate levels.^d Little change in blood pressure occurs, however.^e The next thing will be to find out how the neuro-transmitters fit in to the picture. There can be no doubt today that meditation is a special hypometabolic physiological situation quite distinct from the normal waking state, from sleep^f or coma, and from hypnosis. Its role in personality integration must always have been considerable,^g and Western man has perhaps now acquired enough humility to follow in the steps of the Taoists and Buddhists of old.

One pleasant sidelight on the relaxed atmosphere in the great Taoist abbeys of old^h is afforded by something in Li Kuang-Hsüan's¹ catechism on physiological, especially respiratory, alchemy, the *Chin I Huan Tan Pai Wên Chüeh*² (Questions and Answers on the Metallous Fluid and the Cyclically-Transformed Enchymoma), written during the Sung period. In this the Taoist says to the seeker: 'If you do not worry about whether you are going to become one of the Immortals, but just study to perfect yourself by the techniques, then you will be sure to attain realisation.'³ Nothing could have been more in line with the great paradoxes of the *Tao Tê Ching* which we expounded in Sect. 10. The way to get it is not to want it. 'The sage has no personal aims, therefore all his desires are fulfilled.'

(iv) *Phototherapeutic procedures*

Something must now be said of a complex which for want of a better name may be

^a Cf. the semi-popular book of Hirai (1).

^b Cf. the survey of Fenwick & Hebden (1) and the review of Gellhorn & Kiely (1).

^c See Henrotte (1); Anand, Chhina & Baldev Singh (1); and the papers by R. K. Wallace and his collaborators—Wallace (1); Wallace & Benson (1); Wallace, Benson & Wilson (1). There is a bibliography by Timmons & Kamiya (1), and a critique by Staal (1), pp. 106ff.

^d Pitt (1).

^e But yogistic voluntary reduction of heart-rate and respiratory rate has been demonstrated in quantitative experiments by Anand & Chhina (1); Wenger & Bagchi (1); Wenger, Bagchi & Anand (1). Complete cessation of heart-beat, however, which earlier workers such as Brosse (1) thought they had confirmed, is not now accepted. Her long-continued work on the physiological aspects of meditation in general, however, is still of much value today.

^f Whether the induction or slow waking periods, whether dreamless or REM sleep.

^g Claims are made that habitual meditation alleviates or cures drug addiction, as by Otis (1); Benson, Wallace, Dahl & Cooke (1).

^h Elsewhere, in connection with acupuncture and moxa, we have had a good deal to say (Lu Gwei-Djen & Needham, 5) on the work of Selye (1-4) on physiological stress, and the 'general adaptation syndrome'. It is very relevant to all that is said in this book on the aims of the physiological alchemists in old China. Sorenson (1) has evaluated yoga disciplines from the neuro-physiological point of view in relation to stress phenomena. Curtis (1) and Terigi (1) have come very near to Taoist interests in the deceleration of ageing by their books on geriatric aspects of stress. Timiras (1) has studied the decline in homeostatic regulation during ageing in relation to stress-resistance. And Engle & Pincus (1) are still worth reading on hormones and the ageing process.

¹ *TT263, p. 2a. Mo pei hsien hsi, ché yao tzu hsiu, pi tē chhi chen erh!*

² 李光玄

³ 金液還丹百問訣

³ 莫愁仙兮只要自修必得其真耳

called 'heliotherapy' or 'phototherapy', the forerunner, in a way, of all types of irradiation of the human body. Passing mention has already been made (p. 143) of a process for 'absorbing the *chhi* of the planets' or the Great Bear, and another example could be found in the *Lao Tzu Shou Wu Chhu Ching*¹ (Manual of the Five Kitchens, i.e. the five viscera),² which explains how to take in the *chhi* of the four directions of space and the centre, so as to strengthen by them the corresponding organs in the body. These were all particular techniques within the general department of respiration and aerophagy (cf. pp. 149 ff. above), which had a multitude of them,³ but it was from these attempts to capture the *chhi* of far-off things and spaces that the procedures of insolation and lunar irradiation arose. The sun, moon and stars were doubtless at a great distance, yet their beneficial influences could be caught and retained. Now this was not at all as crazy as it might seem at first sight, because of the conviction in old Chinese physics of the real and natural existence of action at a distance. This depended on a persistent attachment to the concept of wave motion in a continuous universal medium as opposed to discrete atomic impulsions.⁴ Its great triumph was the Chinese exploration of magnetic phenomena centuries before any other civilisation.⁵

So the Taoists concentrated on the sun, the great luminary. The *chhi* radiating from it was considered of a different quality in the morning East, the midday South and the evening West, as would only be expected from the importance of the cardinal points in the symbolic correlation system.⁶ Moreover, the three kinds of *chhi* or rays to be absorbed were analogised with the three primary vitalities (*san yuan*⁷), the *shen*, the *chhi* and the *ching* (cf. pp. 46-7). The procedure for taking the *chhi* and rays of the rising sun after dawn was described in a lost book called the *Hua Yang Chu Tung Chi*⁸ (Records of the (Inhabitants of the) Various Caves on the Southern Slopes of Mt Hua) which was based on the methods of a Later Han Taoist Fan Yu-Chhung.⁹ But the instructions have survived, partly in the *Chen Kao*⁵ (Declarations of Perfected Immortals)^f of Thao Hung-Ching,⁶ about +489, and partly in a later Thang or pre-Thang book largely devoted to such matters, the *Shang Chhing Wo Chung Chüeh*⁷ (Explanation of the Method of Grasping the Central Luminary) by some writer whose name has been lost.⁸ One faced it, standing, or sitting in the lotus position.⁹ As in most of the other similar descriptions there is a good deal about the perception of coloured lights or shining *chhi* (*san sé*

¹ YCCC, ch. 61, pp. 56 ff.

² For example, we have found in various places a procedure for absorbing the *chhi* of the mountain mists (*fu wei*). One account is in *Teng Chen Yin Chüeh* (TT418), ch. 2, pp. 196 ff., another in ch. 27 (ch. 8) of the *Tao Shu* (TT1005). ³ On all this see Vol. 4, pt. 1, pp. 8 ff., 12 ff., 28 ff., 32 ff., 60.

⁴ The story has been told in full in Sect. 261. (Vol. 4, pt. 1, pp. 229 ff.).

⁵ Cf. Vol. 2, Table 12, p. 262.

⁶ TT1004.

⁷ *Chen Kao*, ch. 10, p. 1a, b; *Shang Chhing Wo Chung Chüeh* (TT137), ch. 2, pp. 14b, 15a, hence in YCCC, ch. 61, p. 14a, b.

⁸ In one instruction, after imbibing the *chhi* which comes with the first rays of the sun (or moon) one calls down the five solar gods and their lunar consorts and then ascends in their company (*Shang-Chhing Thai-Shang Ti Chün Chiu Chen Chung Ching* (TT1357), ch. 2). As this account immediately precedes one of the versions of the *Thai-Shang Pa Ching Ssu Jui*... text (cf. pt. 4, p. 216), it probably goes back to a very early phase of the Mao Shan school.

¹ 老子說五廚經

² 三元

³ 華陽諸洞記

⁴ 范幼冲

⁵ 眞誥

⁶ 陶弘景

⁷ 上清握中訣

⁸ 服霧

kuang chhi'), green, white, red, etc. streaming out 'like ribbons'. Maspero judiciously surmises that these colour effects were brought about by shutting the eyes firmly after gazing for some time at the rising sun.^a Other descriptions of procedures speak of haloes of five colours surrounding the body, which suggests that the Taoists observed interference colours in some way, and also of conjuring into oneself at sunrise the *hun* soul or animus of the sun (*jih hun*²).^b One of the most curious practices was the 'absorbing of the image of the sun' (*fu jih hsiang*³), described in Thao Hung-Ching's + 5th-century *Téng Chen Yin Chüeh* (Confidential Instructions for the Ascent to Perfected Immortality).^c Here the adept stood for some time in the early morning sunshine holding in his left hand a piece of green paper with the character for the sun within an enclosure written on it in red, thus

日

. When all the prayers and meditations during the insolation had been completed, and the paper imagined to be gloriously radiant like the sun itself, as if by a kind of transubstantiation, the adept then disintegrated it in water and consumed the whole. This method was often used in other contexts for such cantraps and talismans (*fu*⁴), many of which were given by Ko Hung in the *Pao Phu Tzu* book,^d and especially in medical apotropaics. Of course it will be said that a procedure such as this is indistinguishable from magic, and quite rightly, but in the era before controlled experimentation, scientific cosmology and statistical analysis, who could say that eating and drinking the sacrament of the sun was false and that the seeking of the magnetic north by the lodestone and the needle was true?

It is interesting also that the Taoist women were not forgotten. For them it was necessary to stand similarly in the moonlight, absorbing the rays of their tutelary orb and holding a piece of yellow paper with the character for the moon within an enclosure written upon it in black, thus 月. This was held in the right hand, and when sufficiently impregnated with the *chhi* and the rays of the moon, it too was disintegrated and consumed. Both sexes again could use another procedure in which the *chhi* or image of the celestial luminary was made in imagination to circulate around the body.^e For the men adepts this was the *fu jih mang chih fa*,⁶ the absorption of the rays of the sun, a meditation done standing or sitting three times a day facing successively east, south and west as the sun passed on its course.^f For the

^a (7), p. 375. There must have been some danger to the eye in these practices, especially after the sun had risen somewhat in the heavens, unless the Taoists used pieces of thin jade or mica, as the Chinese astronomers certainly did (cf. Vol. 3, pp. 420, 436).

^b *Shang Chhing Wo Chung Chüeh*, ch. 1, pp. 5b, 6a.

^c (TT418), Ch. 2, pp. 15 aff., also in *Shang Chhing Wo Chung Chüeh*, ch. 2, pp. 14 aff. ^d PPT/NP, ch. 17.

^e Or taken into and held in the mouth. This is found in the *Shang Chhing Ming Thang Yuan Chen Ching Chüeh* (TT421) and the *Shang Chhing San Chen Chih Yao Yü Chüeh*⁶ (TT419), pp. 1 aff. and 9 aff. respectively. Both these texts come from the school of Thao Hung-Ching in the late + 5th or early + 6th-centuries. Since no one at that time had any idea of the real substance of the sun and moon, the idea that their glory could be absorbed into the body was not in itself absurd.

^f Another form of the imagined circulation of the sun within the body occurs in the *Chuan Hsi Wang Mu Wo Ku Fa*,⁹ a fragment in HCSS (TT260), ch. 24, pp. 1 aff. *Wo ku* was a special method of clenching the hands in meditation, like an Indian *mudrā* (p. 261 below). The thumb was to be placed between the lines *hai*¹⁰ and *tsu*,¹¹ and the fingers wrapped over it. This can easily be understood from the text and illustration in *Tung I Pao Chien*, ch. 9 (Tsa Ping Phien, ch. 1), (p. 333).

¹ 三色光氣

² 日魂

³ 服日象

⁴ 登真隱訣

⁵ 符

⁶ 服日芒之法

⁷ 上清明堂元真經訣

⁸ 上清三真旨要玉訣

⁹ 傳西王母握固法

¹⁰ 亥

¹¹ 子

women there was the parallel *fu yüeh mang chih fa*,¹ done in the night by the light of the moon. There is no positive evidence that any of these activities were carried out naked,^a but it is quite probable that at least in earlier times they were;^b what the surviving instructions always do include are precepts for the usual teeth-gnashing and saliva-swallowing as an accompaniment of the phototherapy. Thus in sum the physiological alchemists were forerunners of all those who, like Finsen, have explored the effects of light and other forms of radiant energy upon the human body.

(v) *Sexuality and the role of theories of generation*

We now come to the part played by sexual techniques in the Great Work of preparing the 'inner elixir' or enchymoma, the guarantee of longevity or immortality sought for by the philosophers 'per aquam' rather than 'per ignem', the physiological rather than the proto-chemical experimentalists. In considering these matters we should like to repeat our warning that it is essential to disembarrass the mind from all the conventional ideas and prejudices of Western civilisation, and to try to understand how things looked to people for whom sexual activity was the most natural thing in the world, the model indeed of the working of heaven and earth themselves, fraught of course with sociological implications but laden with no particular burden of sin or guilt. Naturally this is not to say that Chinese culture contained no anti-sexual components, on the contrary Confucian prudery, associated with patriarchal property relationships, had great influence even before the time of the Sage himself, and later on Buddhist other-worldliness pressed the attack on Taoist sexuality from the other flank.^c But for many centuries the Taoist thought-connection between sex, if rightly used, and health, longevity and material immor-

^a It is curious to reflect that while the solar irradiation would have contributed to health by aiding the synthesis of vitamin-D in the skin, no similar benefit would have been obtained from the moonlight.

^b Ritual nakedness in magico-religious ceremonies, especially supplications in time of drought and flood, has a long history in Chinese culture, as Schafer (1) showed in a remarkable monograph; and lasted down at least as late as the Thang. *Vis-à-vis* the great light-sources it would have been natural and logical.

^c Eichhorn (6) has made a special study of the attacks on Taoist sexuality and the imposition of the celibate status on Taoist 'monks'. The movement may be said to have started with Khou Chhien-Chih and his visions at the beginning of the +5th-century (cf. p. 138); in order to maintain or even expand the Taoist ecclesiastical organisation it was necessary to take some of the wind out of the sails of the Buddhists, and one of the implications of this was that some at least of the Taoist priests and thaumaturgists should refrain from sexual life. Hence the animus against the perished Chang family of Taoist patriarchs under whose influence from the +2nd to the +5th-centuries sexual relations, even in liturgical form, had been so important. During the Thang period there were 'reformed' and 'un-reformed' temple cloisters (*kuan*),² Taoists in the former being celibate and in the latter married (or at any rate of both sexes). But there was no State interference until an early Sung decree of +972, recorded by Wang Yung³ in his *Yen I I Mou Lu*,⁴ forbade for the first time the latter. Although these then became illegal, and the old orthodoxy represented as heretical, it is likely that they continued in remote parts of the country until a much later date. They were afterwards sometimes connected with rebellions, as in the uprising of Fang La,⁵ a small-scale industrialist who headed a serious revolt in +1120, partly nationalist (demanding greater resistance to the Jurchen Chin Tartars) and partly against the activities of the court; see further in Shih Yu-Chhung (1). Moreover, edicts such as that of +972 never applied to those many Taoist priests who lived with their families in the world outside the temple communities, officiating in village temples at the seasonal festivals and the periodical liturgies of communal purification.

¹ 服月芒之法

² 觀

³ 王詠

⁴ 燕翼詒謀錄

⁵ 方臘

tality, was accepted by millions of people, and even today it is by no means dead.^a To the history of sexual ideas and relations in China van Gulik (3, 8) has already made outstanding contributions, but we cannot simply refer the reader to his works because sex as a part of alchemy is a rather special phase of the subject, with different technical texts, and a motive neither hedonistic nor philoprogenitive.^b Van Gulik, on the other hand, was primarily concerned with the popular lay literature, and the place of sex in family and court life as well as its public manifestations.^c In Sect. 10 (Vol. 2, pp. 146 ff.) a description of the high place which sexuality played in ancient Taoist religion has already been given; here again we have to do something different, to show what part it took in physiological alchemy.^d Both aspects were affected by the influence of Buddhist asceticism from the T'ang period onwards more and more, but the former to a much greater extent than the latter, since macrobiotics was a recondite affair of adepts and not a concern of temple worshippers as a whole.^e In all that follows we must maintain that celebrated attitude of clinical detachment, and be content to let the Chinese call a spade a spade, even if a jade one.

In order to save space the simplest method will be to illustrate the principles, drawing indiscriminately from texts of very varying dates. It will also be best to let them speak for themselves, with a minimum of commentary; and they can hardly but be rather numerous, since the whole subject is so bizarre for Westerners naturally carrying in their minds a burden of contrary preconceptions. What has to be said will unfold itself most easily in accordance with the following set of ideas. The *ching*¹ in man corresponded to the blood, *hsüeh*,² in woman, especially the menstrual blood (*yüeh hsüeh*³); and here we have to translate *ching*¹ as semen, keeping 'seminal essence' for the same word when used as one of the three primary vitalities (cf. pp. 46, 47 above). The mutual benefit of sexual union, analogised with that of

^a Murakami Yoshimi has an interesting discussion (1) on the 'affirmation of desire' in Taoism. The oft-repeated phrase *wu yü*,⁴ 'desirelessness', meant, he believes, purification, the victory over mean and cruel desire, not prohibition. All the *nei tan* techniques were part of an endless search for perfection, including the spiritualisation of desire, but this was not at all a sublimation in the psycho-analytic sense. True, the numinous, even liturgical, sexuality of the medieval Taoists was hemmed about by elaborate regulations concerning lucky or unlucky days, times, places, and the like, yet spontaneity, naturalness and freedom were assuredly Taoist ideals.

^b Another work of considerable value is that of Ishihara & Levy (1). Although we find their translations inelegant, and cannot always concur in their views, they provide an excellent bibliography containing many little-known items.

^c There is an abundant iconography, for which reference may be made to the collections of Shêng Wu-Shan (1); Beurdeley (1) and Giehner (2); but very little of it specifically concerns the Taoists. Phallic imagery, on which Ito Kenkichi (1) and Ritchie & Ito (1) have written, was prominent in Japan but not at all in China. Temple 'prostitution' (cf. Penzer, 2) was unknown in either culture.

^d Here the unrivalled guide is Maspero (7), reprinted in (32), pp. 553 ff.

^e At the same time we should not visualise the sexual techniques as existing within the Taoist religious communities alone; they may well have been developed there in the first place, but were certainly widely used also in private homes of Taoist persuasion. One may recall with advantage the remark made to me (J. N.) by Dr Kuo Pên-Tao at Chhêngtu in 1942 (see Vol. 2, p. 147). Nor have the techniques died out, for in 1958 the *Tao Tsang Ching Hua*⁵ (containing for example the Chang San-Fêng⁶ books, cf. p. 240) was reprinted in Taiwan, certainly not only for scholarly purposes. On him see Seidel (1). And quite recently the book of Chang Chung-Lan (1) has been translated into several Western languages.

¹ 精

² 血

³ 月血

⁴ 無欲

⁵ 道藏精華

⁶ 張三峯

Yin and Yang, heaven and earth, was essential and undeniable; celibacy was dangerous and inadmissible.^a Since there was a mutual nourishment of the Yang *chhi* by that of the Yin and vice versa it was desirable to have as many partners as possible, but at the same time the *ching*¹ (semen) was the most precious thing in the world physiologically and therefore should never be emitted—except where children were sought. Beyond that however there was found a procedure (cf. p. 30 above and p. 197 below) whereby the adept could proceed to orgasm yet ejaculate none of the valuable secretion, 're-routing' this, it was believed, up the spinal column, to nourish the brain and participate in the formation of the enchymoma. Authority was found in scripture (e.g. the *Tao Tê Ching*) for these procedures. It was felt that grave dangers to health and to the search for longevity and immortality were incurred by not carrying them out correctly; and several texts show the very serious, almost liturgical, character of what was to be done when a man and woman adept came together in sexual intercourse.^b The importance of secrecy in transmission of the arts, and the prevalence of oral instruction, is often emphasised. Finally the association with alchemy lay in the fact that the sexual techniques were recommended and practised by proto-chemical *wai tan* alchemists not so much as an end in themselves but as a means of acquiring sufficient centuries of longevity to enable them to understand all the mysteries of chemistry and to prepare the true golden elixir of perpetual longevity. And then too there was the flowering of the chemical analogies, the body of the girl considered as the crucible or reaction-vessel (*ting*²), and that of the man as the furnace (*lu*³).

Where and what was the *ching*? One finds an answer in the *Thai Hsi Kên Chih Yao Chüeh*⁴ (Instructions on the Essentials of Understanding Embryonic Respiration), an anonymous text of the Thang or Sung.^c After an interesting account of the development of the foetus in the womb, it goes on to say:

Therefore those who seek to restore and nourish (their primary vitalities) all imitate it, saying that 'to return to the source' (*fu chhi kên pên*⁵) is the important thing about 'embryonic respiration'. Formerly it was always said that the Pool of Chhi (*chhi hai*,⁶ in the lower *tan thien*) was the source of the *chhi*, but this is not so.^d If one does not know where it stops, there is no benefit from the 'returning'. The immortals of old always handed down (the true doctrine) by word of mouth, never committing it to writing, but I am anxious to reveal it to my like-minded brothers—therefore I say that the root and origin is right opposite the umbilicus, at the level of the nineteenth vertebra (counting from above), in the empty space (in front of) the spinal column, at the place where it approaches the bladder from below. It is called the Stalk of Life (*ming tî*⁷), or the Gate of Life (*ming môn*⁸), or the Root of Life (*ming kên*⁹), or the Reservoir of Semen (*ching shih*¹⁰). Men store there their

^a Indian parallels will be discussed on p. 275 below, but here one cannot help referring to the Tantric ceremonies of *stripuja* which seem to have a distinct resemblance, though involving a different theory.

^b To this present day marriage is usual for Taoist priests living in the world.

^c In *YCCC*, ch. 58, pp. 46ff. Here pp. 56, 6a, tr. auct. partly adjuv. Maspero (7), p. 380. We may return to it in Sect. 43 on embryology.

^d *Chhi hai* is an acu-point (JM 6), 1.5 ins. below the umbilicus in the mid-line (cf. Anon. (135), pp. 198-9; Lu & Needham (5), pp. 50, 56).

¹ 精

² 鼎

³ 爐

⁴ 胎息根旨要訣

⁵ 復其根本

⁶ 氣海

⁷ 命蒂

⁸ 命門

⁹ 命根

¹⁰ 精室

semen, and women their menstrual blood (*yüeh shui*¹). This then is the origin of the *chhi* of longevity and immortality...^a

This looks like an attempt to describe the vesiculae seminales as the result of some dissection, but what is equally interesting is the parallelism between semen and menstrual blood, in Greek theory also the fundamental constituents from which the embryonic body is built.^b Another account appears in a rather later text, probably of the early +13th-century, the *Thi Kho Ko*² (Song of the Bodily Husk) written by a Taoist known to us only by his pseudonym Yen Lo Tzu,³ the Smoky-Vine Master. Here we read:^c

General Discussion of the Reins (*shen tsang*⁴).

The *ching*⁵ is in the reins, which are also called the Mysterious Flower (*hsüan ying*⁶). They belong to the class (*shu*⁷) of the element Water, and winter brightness, their colour is black, their direction *jen-kuei*, their sign the Sombre Warrior (of the North), their Tao is under *chih*,⁸ their *kua* is Khan.⁹ They have two departments, on the left that called *lieh nü*,¹⁰ on the right that called *ming mên*.¹¹

The formation (of *ching*⁵) is connected with (the generation of) children, (but it can also) penetrate up to the brain (*ni wan*¹²),^d (where its effects) are seen internally by the (strengthening of the) bones, and externally by the (reversion of the colour of the) hair (from white to black). The ear is the gate, the bladder is the store (*fu*¹³).^e If it receives the control of the spleen, it is subdued and expelled; if it is used in the heart and attains the lungs it comes to its full (virtue); if it passes to the liver it is diminished (in effect). Eating too many sweet things will be harmful (to the macrobiotic effects of the *ching*⁵).^f

Here we are nearer once again to the symbolic correlations of physiological alchemy.

The mutual benefit of the union of Yin and Yang, male and female, is affirmed in some of the oldest texts which have come down to us. They are associated with Phêng Tsu,¹⁴ a legendary Methuselah (Fig. 1608) who owed his longevity to the mastery of sexual techniques; and with the names of five goddesses or wise women, who taught these to men 'in the beginning'.^g Of these the most important were Su Nü,¹⁵ the Immaculate Girl, and Hsüan Nü,¹⁶ the Mysterious Girl, both appearing in the titles of ancient books on the subject, some of which have survived; but another, Tshai Nü,¹⁷ the Chosen Girl, often appears as an interlocutor of Huang Ti or Phêng Tsu in such texts.^h The fragments of the *Phêng Tsu Ching*¹⁸ collected and

^a Cf. Schipper (5), p. 370, translating from parallel sources.

^b See the discussions in Needham (2).

^c In *Hsiu Chen Shih Shu* (TT260), ch. 18, pp. 8b, 9a, tr. auct.

^d This is the procedure described on p. 197 below.

^e This was truer than the Taoists themselves realised.

^f Because obesity would certainly militate against health and longevity.

^g Perhaps an order of bewitching sorceresses (*tsu*¹⁹).

^h H. Franke, in his review of van Gulik (3), pointed out the interesting fact that in Western antiquity also the most ancient books on sexual techniques were written by, or attributed to, women. Philainis wrote a *Peri Schēmatōn Synosias* (περι σχημάτων συνουσίας), and there were also Niko of Samos, Astyanassa, and Kallistrate.

¹ 月水

² 體殼歌

³ 煙蘿子

⁴ 腎臟

⁵ 精

⁶ 玄英

⁷ 屬

⁸ 智

⁹ 坎

¹⁰ 烈女

¹¹ 命門

¹² 泥丸

¹³ 府

¹⁴ 彭祖

¹⁵ 素女

¹⁶ 玄女

¹⁷ 采女

¹⁸ 彭祖經

¹⁹ 巫



Fig. 1608. Drawing of Phêng Tsu, the Methuselah of China, who was believed to owe his longevity to the mastery of sexual techniques. From *Lieh Hsien Chhuan Chuan*, ch. 1, p. 19a.

preserved by Yen Kho-Chün may well be of late Chou or early Han date, for the style is archaic and the book listed as such in the *Pao Phu Tzu* bibliography^a though not in that of the *Chhien Han Shu*.^b The writer says:

Many are the things which harm men—vaulting ambition, mourning and melancholy, joy and jubilation, anger and frustration, inordinate desire, apprehensive anxiety, unseasonable heat and cold, abstention from sexual life—many indeed are these things, and what happens in the bedchamber is mainly responsible (for their effects). How people are deluded by this! Man and woman naturally complete each other, just as heaven and earth mutually generate each other, and so the Tao nourishes the *shen*¹ and the *chhi*,² preventing human beings from losing their harmony. Heaven and earth have always had the (true) Way of union, therefore they are everlasting, but men and women have lost this Way, therefore their time has become broken and injured by mortality. Thus to obtain the Art of the Yin and Yang is to avert all harmful dangers and to tread the path of life eternal.^c

This certainly places the salutary effects of sexuality in the centre of the picture. And the editorial comments in the *Chhien Han Shu* breathe a somewhat similar spirit:^d

The arts of the bedchamber constitute the climax of human emotions and touch the very hem of the Tao itself. Therefore the sage-kings regulated man's outer pleasure in order to restrain his inner passions, and set down in writing precepts (for the union of the sexes) . . . If such joys are moderate and well-ordered, peace and longevity will follow; but if people are deluded by them and have no care, illnesses will ensue, with serious damage to the nature and span of life.

It is interesting to see what Ko Hung said about Phêng Tsu in the *Pao Phu Tzu* book, a legendary account of course but revealing.^e

According to the *Phêng Tsu Ching*, Phêng Tsu served as counsellor all through the reigns of Ti Ku and Yao^f continuing as a high officer of State down to the end of the Hsia (dynasty). Then the king of the Yin (Shang) sent him to the Chosen Girl to learn the arts of the bedchamber. After the king had tried them and found them to be effective, he wanted to call Phêng Tsu and put an end to the dissemination of these secrets, but Phêng sensed his design, fled away and was no more seen. At this time he had reached an age of some seven or eight hundred years, but there is no record that he died. Indeed the *Huang Shih Kung Chi*^g records that some seventy years afterwards a disciple came across him west of the Shifting Sands,^g so evidently he lived on . . . And Liu Hsiang in the *Lieh Hsien Chuan* considered him an immortal.^h

In such a way was enshrined the idea that human sexuality, if wisely ordered, was a prime desideratum for health and length of days.

^a Ch. 19, p. 36.

^b Ch. 30, pp. 51*b*, 52*a, b*, where eight books on the subject are given. Cf. Vol. 2, p. 148.

^c *CSHK* (Shang ku sect.), ch. 16, p. 7*b*, tr. auct., adjuv. van Gulik (8), p. 96.

^d *CHS*, ch. 30, p. 52*a, b*, tr. auct., adjuv. van Gulik (8), p. 70.

^e *PPT/NP*, ch. 13, p. 4*a*, tr. auct., adjuv. Ware (5), p. 217; van Gulik (8), p. 96.

^f Legendary emperors.

^g The Gobi desert.

^h Cf. Kaltenmark (2), pp. 82ff., a translation of the entry, no. 17, with annotations.

¹ 神

² 氣

³ 黃石公記

Moreover, celibacy and chastity were considered injurious and unnatural. At the beginning of the *Su Nü Ching* (a Han text) we find the following:^a

Huang Ti spoke to the Immaculate Girl and said: 'Now supposing I wish to refrain permanently from copulation. How can I manage this?'

The Immaculate Girl replied: 'You cannot. Heaven and Earth have their (successive moments of) opening and closing,^b the Yin and the Yang have their (successive moments of) rushing forth (like semen) in order to transform (the world, as in generation). Man is modelled on the Yin and Yang, exemplifying (in his life-cycle) the four seasons.^c Now if you do not copulate, the *shen*¹ and the *chhi*² will be barred up and obstructed (within you); how then will you be able to repair your frame? To recast the *chhi*² many a time, exhaling the old and breathing in the new, that indeed is to give some assistance to it. But if the Stalk of Jade (*yü hêng*³)^d does not continue active (in spontaneous erections) you are mortifying (the *ching*⁴) within itself . . .'

Thus sexual activity is here considered more important than any of the other exercises tending to health and longevity.

The neuroses of deprivation were also recognised. Some time between +1013 and +1161 an unknown Taoist compiled a book of considerable value entitled *Yang Hsing* (or *Shêng*) *Yen Ming Lu*^e (On Delaying Destiny by Nourishing the Natural Forces),^e the sixth chapter of which is devoted to sexology (Yü Nü Sun I Phien⁶). Among its dialogues is this:^f

The Chosen Girl asked Phêng 'Tsu, saying: 'Ought a man sixty years of age to retain his *ching*⁴ entirely and guard it? Is this possible?'

Phêng 'Tsu replied: 'It is not. Man does not want to be without woman; if he has to do without her his mind will become restive, if his mind becomes restive his spirit (*shen*¹) will become fatigued, and if his spirit becomes fatigued his life-span will be shortened. Now if it were possible for him to keep his mind always serene, and untroubled by thoughts of sex, this would be excellent, but there is not one among ten thousand who can do it. If with force he tries to retain and block up (the *ching*⁴) (*yü pi chih*⁷), it will in fact be hard to conserve and easy to lose, so that it will escape (during sleep), the urine will become turbid, and he will suffer from the illness of haunting by incubi and succubi (*huei chiao chih ping*⁸).'

And the *Su Nü Ching* in the Han had spoken long before of the demonic hallucinations caused by sexual deprivation and frustrated libido, going on to describe

^a P. 1 b, tr. auct., adjuv. Maspero (7), pp. 381-2; van Gulik (8), p. 137. For the continuation of the passage see p. 201 below.

^b This language is reminiscent of the style of the 4th-century *Kuei Ku Tzu* book; cf. Vol. 2, p. 206.

^c On the Taoist emphasis on natural cycles cf. Needham (56).

^d The anatomical term was *liao*,⁹ or *chhiu*¹⁰, but they are never met with in this literature. The Buddhist term was *shêng chih*,¹¹ the 'life-limb'; and its counterpart, *yoni*, was *nü kên*.¹² Another word, *tiao*,¹³ now used in the sense of 'phallus', was traditionally a term of vulgar abuse; associated with *tshao*,¹⁴ *jih*,¹⁴ 'copulation' or 'to copulate', according to the pronunciation, also in coarse speech.

^e Or 'Extending one's Destined Span . . .'. TT831. The book is attributed in the *Tao Tsang* both to Thao Hung-Ching and Sun Ssu-Mo, which was perhaps a tribute to its good medical sense, but in fact it cannot be earlier than the Sung, though of course some passages and expressions in it may well be.

^f Ch. 2, p. 9a (ch. 6), tr. auct. adjuv. Maspero (7), p. 382, as also van Gulik (8), p. 196, who was translating from the parallel passage in the *Chhien Chin Yao Fang*.

¹ 神	² 氣	³ 玉莖	⁴ 精	⁵ 養性 (生) 延命錄
⁶ 御女損益篇	⁷ 鬱閉之	⁸ 鬼交之病	⁹ 屌	¹⁰ 屌
¹¹ 生支	¹² 女根	¹³ 屌	¹⁴ 尪	

graphically the visions, like the 'temptations of St Anthony', which plague, and eventually destroy by illness, the hermit who goes to dwell alone in marshy mountain fastnesses.^a Elsewhere the Chosen Girl says:^b

One cannot fight against the nature and affections of man. And besides, by means of (the sexual act, wisely used) he can augment his longevity. And besides, is it not a pleasure in itself?

The *Pao Phu Tzu* book, too, has a passage on the same theme, listing abstention from sexual intercourse (*yin yang pu chiao*¹) as one of the several 'wounds' (*shang*²).^c

Someone observed: 'Wouldn't you say that injury comes from lust and licentiousness?'

Pao Phu Tzu replied: 'Why only from that? The fundamental thing in macrobiotics is the reversion of one's years (*huan nien*³). . . . If a man in the vigour of youth attains knowledge of how to revert his years (by the arts of the bedchamber), absorbs the enchymoma of the Yin to repair his brain, and gathers the Jade Juice (the saliva) from under the Long Valley (the nose), without taking any (prolongevity) drugs at all, he will not fail to live for three hundred years, though he may not become an immortal'.

The keynotes, then, of classical Chinese sexology in relation to macrobiotics, were (a) that there is a mutual nourishment of Yang and Yin, provided that intercourse be skilfully managed, (b) that frequent change of partners is desirable for this, and (c) that these unions should involve female but not male orgasms, the semen being as far as possible retained within the male body.^d The first of these ideas was sound enough in terms of modern knowledge, though it tended to lead to the conclusion that each partner was capable in some way of draining the vitality of the other for his or her own macrobiotic purposes. The second principle was not at all related to the ideal of a 'permissive' society with the utmost tolerance for all deviations from traditional monogamy, a society which many reformers of the present day (by no means unreasonably) seek to propagate; on the contrary it directly arose from the institution of concubinage, in those large families of court, gentry and high official character, where the legal wife was seconded by a number, even a large number, of subsidiary consorts, concubines and maid-servants.^e Here the interests of social harmony necessitated absolutely a distribution of attentions on the part of the men concerned, and there might even indeed be political importance

^a P. 11 b, tr. Maspero (7), p. 382, as also van Gulik (8), p. 152, who translates the passage in full.

^b *Yü Fang Chih Yao*,⁴ perhaps 4th-century, p. 1 b, tr. auct. adjuv. Maspero (7), p. 382.

^c *PPT/NP*, ch. 13, p. 7b, tr. auct. adjuv. Ware (5), p. 223.

^d This calls for several observations. First, all these procedures were entirely within the realm of sexological normality. The elaborate researches of van Gulik (3, 8) have shown that perversions appear only very late in Chinese society, even then involving very little of a sadist or masochist character. The ancient and medieval literature also has almost nothing on the minor aberrations. Secondly the change of partners was appropriate only in a society pre-dating the discovery of America and the introduction of the serious venereal diseases which followed thereon. At the same time it would have helped the transmission of minor parasitoses such as moniliasis. Thirdly the high estimate placed upon the sexual satisfaction of the feminine partners was a trait of really cultured civilisation, doubtfully attained in Europe till long afterwards.

^e On the very unexpected importance of this for the development of horological science see Needham, Wang & Price (1).

¹ 陰陽不交

² 傷

³ 還年

⁴ 玉房指要

attached to this, since the relations of a neglected spouse might cause grave trouble to emperor, governor or magistrate. Hence the third technique of seminal retention,^a but if these were its sociological origins it certainly acquired macrobiotic significance at quite an early time, and very naturally so, for otherwise the man involved would have been exhausted by the claims made upon him.^b

The *Yü Fang Chih Yao* (Important Matters of the Jade Chamber) has an admirable passage which enshrines the principles mentioned above. It runs as follows:^c

The Taoist Liu Ching¹ described the proper way of uniting with a woman. He said that it was essential first to embrace in mutual play, unhurried, gentle and relaxed, so as to bring the spirits (*shen*²) into accord, and let the minds resonate (*kan*³) together perfectly, and only when this has been achieved for a long time should intromission take place. Entrance should be made when the Stalk of Jade is still only partially erected, rapid withdrawal when it is fully so. In between, the movements should be restrained and slow, and spaced at suitable intervals. A man should not throw himself violently about, for that turns the five viscera upside down, does permanent injury to the tracts and vessels,^d and brings on the hundred diseases. But intromission should not be accompanied by emission. He who can make several dozen unions in a day and a night without once emitting semen will be cured of all diseases, and benefit himself by augmentation of longevity. If there can be several changes of partner the advantage is heightened, if for example during a single night he couples with ten different women, that is in the highest degree excellent.

The background of this appears in the opening passages of the *Su Nü Ching*.^e

Huang Ti spoke to the Immaculate Girl, saying 'My *chhi* is debilitated and in-harmonious. I feel depressed at heart, and always filled with fear. What should I do about it?'

The Immaculate Girl replied: 'Debility in men can always be attributed to a faulty exercise of the sexual act. Now woman is superior to man in the same way that water is superior to fire.^f And those who are expert in the arts of sex are like good cooks who know how to blend the five tastes into delicious dishes. Those who know the Tao of the Yin and Yang can fully achieve the five pleasures. Those who do not know it die untimely, without ever

^a It might at first sight be difficult to understand what physiological principle could have been at the basis of the great nervousness of the old Taoists about what they considered dangerous or excessive seminal losses. But there might well be an endocrinological explanation, especially in view of modern knowledge of the prostaglandins (cf. p. 323 below) for semen is very rich in them. Here there is another of those curious male-female asymmetries in mammals and man, for in female ovulation nothing very vital (for the parent body) seems to be lost. This was a direct consequence of the evolutionary invention of intra-uterine fertilisation. But retained semen would mean retained hormones. Doubtless also male restraint would amplify sexual activity as such, a way commended not only by the old Taoist texts, but by modern books such as that of Chang Chung-Lan (1). One would suppose that *coitus conservatus* (cf. p. 199) would have meant more female orgasms and fewer male ones, but we have met sexologists who assure us that the human male can be trained to have orgasm without ejaculation; this at present we have no evidence to support. Conceivably some of the Taoist texts may have meant this, though so far as we know none of them ever exactly says so.

^b Another obvious social aspect of the third principle was its contraceptive effect, but this was not, we think, its original purpose.

^c P. 1 b, tr. auct. adjuv. Maspero (7), pp. 384-5, as also van Gulik (8), p. 139 who used the text in *I Hsin Fang*, ch. 28, (p. 637. 2). This omits the last sentence.

^d Conduits of *chhi* and blood.

^e P. 1 a, b, tr. auct. adjuv. van Gulik (8), pp. 135-6.

^f A reference to the 'mutual conquest order' of the five elements; cf. Vol. 2, p. 257. Water overcomes Fire as Fire overcomes Metal.

having experienced sexual joy. Is this not something that should be guarded against?’

Then she went on to say: ‘The Chosen Girl had a wonderful knowledge of the arts of the Tao, so the King sent her to Phêng Tsu to enquire about the methods of lengthening one’s days and attaining longevity. Phêng Tsu told her that a man can gain immortality by conserving his *ching*¹ and nourishing his *shen*,² also by dieting and taking various drugs, but if he does not know the art of sexual intercourse, diet and drugs will be of no avail. The union of man with woman, he said, is like the mating of Heaven and Earth. It is because they have the art that they last for ever, it is because men have lost it that their days are short. If a man could learn how to stop this decline, and keep away all ills by the art of Yin and Yang, he too could last for ever.

The Chosen Girl bowed twice and asked if she might learn the essence of this art. Phêng Tsu answered that it was easy to know, though few people would believe and practise it . . . The essential principle is to have frequent unions with the young concubines, but to emit semen only rarely. This makes a man’s body light and drives away all illnesses.’^a

The explanation of this is given in the *Yang Shêng Yen Ming Lu* (+ 11th-century) where we find the following:^b

Changing of partners can lead to longevity and immortality. If a man unites with one woman only, the Yin *chhi* is feeble and the benefit small. For the Tao of the Yang is modelled on Fire, that of the Yin on Water, and Water can subdue Fire. The Yin can disperse the Yang, and use it unceasingly . . . so that the latter becomes depleted, and instead of assistance to the repair and regeneration (of the body) there is loss. But if a man can couple with twenty women and yet have no emission, he will be fit and of perfect complexion when in old age. . . . When the store of *ching*¹ sinks low illnesses come, and when it is altogether used up, death follows.^c

The physiological justification for the retention of the *ching* in old Taoist and *nei tan* thought appears in a striking conversation in the *Su Nü Ching*.^d

The Chosen Girl said: ‘In sexual intercourse the emission of the semen is a pleasure, yet now you say that it should be retained. How can that be a pleasure?’

Phêng Tsu replied: ‘After the semen is emitted the body suffers fatigue, the ears lose their acuity and drowsiness supervenes, the throat is dry and the bones and sinews feel spent and collapsed. Although a man may temporarily renew the pleasure, in the end he does not feel happiness (because the body is exhausted). But if there is erection without emission the *chhi* and the strength are more than abundant, the body is at ease, and the ears and eyes are sharp and bright. Although he thus suppresses and quietens his passions and emotions, he is all

^a How is it possible that these ancient Taoist ideas should reappear in Francis Bacon? In his *Historia Vitae et Mortis* of + 1623 he has a section entitled ‘Operatio super Spiritus, ut maneant juveniles et revirescant’. In this we find the following words: ‘Etiam ad calorem robustum spirituum facit venus saepe excitata, raro peracta; atque nonnulli ex affectibus de quibus postea dicitur. Atque de calore spirituum, analogo ad prolongationem vitae, jam inquisitum est,’ (i, 67, Montagu ed. vol. 10, p. 197). From what he says earlier on about prolongevity drugs, it is clear that he knew the older writings of his namesake Roger (cf. Vol. 5, pt. 4, p. 496). Presumably the sexual prescription was well known in Elizabethan circles, but we must leave the further exploration of this to the literary specialists of that period.

^b Ch. 2, p. 9b (ch. 6), tr. auct. Attention was drawn to the importance of this by Maspero (7), p. 380.

^c The thought here clearly is that though each can benefit the other the female power surpasses that of the male, therefore the latter must move more sparingly. If this is carried to the extreme, material immortality will follow.

^d P. 9a, tr. auct., adjuv. van Gulik (8), p. 145, translating from *I Hsin Fang*, ch. 28, (p. 643. 1).

the more strengthened in love (for his partners), and acquires doubled persistence, almost as if it would never fail. Is this not a (still greater) pleasure?'^a

The contest of water and fire has reminded us how close these ancient ideas were to the unifying and synthetic conceptions of physiological alchemy later on. Equal mutual nourishment would undoubtedly have been affirmed by many of the early thinkers, but in some statements there appears uncertainty as to which sex could borrow most macrobiotic life-giving essence from the other, draining off, as it were, vitality for his or her own purposes. This went so far as to imagine illness resulting in the one who was the donor of the pair. These ideas occur, in somewhat archaic form, in the propositions of Chhung Ho 'Tzu' at the opening of the *Yü Fang Pi Chieh*,² a text of the +4th-century if not older.^b Van Gulik regarded him as the author of some lost book on 'sexual alchemy'.

Master Chhung Ho said: 'Those who are expert in the nurturing of the Yang (within themselves) should not allow the women to steal a glimpse of understanding of this art and mystery. (Their knowing it) will not benefit men, and may cause illness. This is what is meant by the proverb "Don't lend dangerous weapons to others". For they may use them on you, and then all your efforts will not avail.'

He also said: 'It is not only the Yang that can be nourished, the Yin can also be. Hsi Wang Mu³ (the Mother Queen, or Goddess, of the West) was a woman who obtained the Tao (of immortality) by nourishing the Yin (within her). Whenever she had intercourse with a man he would immediately fall ill, yet she herself was fair of colour and form, glowing with beauty and needing no rouge or fard. Feeding on nothing but milk, she played the five-stringed lute, so that her heart was always harmonious, her thoughts composed, and no other desires plagued her. Having no husband, she liked to couple with young men and boys. But such secrets must not be spread abroad, lest other women copy the methods of Hsi Wang Mu.'^c

'When a woman has intercourse with a man her heart should be at peace and her thoughts

^a This raises a technical question; how was it possible for the adepts to reduce the sensitivity of the glans sufficiently to permit what they were supposed to do, and to prolong subliminal excitation postponing the neuromuscular climax. It must be remembered that circumcision was unknown in China until the early Middle Ages brought contact with the Semitic cultures, and even then never practised by the Chinese. The techniques appear to have been both psychological and physiological. First, there seems to have been a meditational technique intended to depreciate the female body, almost in the style of the +11th-century Odo of Cluny ('quomodo ipsum stercoris saccum amplecti desideramus', cf. Havelock Ellis (2), p. 208). The *Su Nü Ching* says (p. 1b): 'When engaging the adversary the man should view her as (worthless) like tile or stone, but himself as (precious) like gold or jade.' This is a recurring theme (cf. van Gulik (3), vol. 2, p. 103, (8), pp. 157, 282). Secondly, there may well have been pharmacological methods of inhibiting male sensitivity, though no adequate search of the numerous prescriptions in the literature has been made for these. Thirdly, mechanical means were undoubtedly used, (a) for preventing detumescence, and perhaps (b) for increasing the stimuli to female sensitivity. Regarding the former of these, constriction of the base of the penis by tied ribbons, or rings of ivory or jade, is often referred to in Ming technical books and novels, notably the sexological work *Hsiu Chen Yen P* by Têng Hsi-Hsien⁴ (c. +1560), which describes this in detail (see van Gulik (3) and (8), p. 281). Jade tubes used for this purpose are figured in Gichner (2). Conversely, the so-called 'penis-spurs', ornamental objects of bone, bamboo, ivory, wood, metal, etc. threaded through a permanent channel at the distal end like an ear-ring lobe hole, would have the effect of accelerating female orgasm. This is the *palang* of South-east Asia, on which Harrisson (8) has written. Its use in China is uncertain, and apparently not ancient, though it may have played a part there from the +14th-century onwards.

^b Pp. 1a to 2a, tr. auct., adjuv. van Gulik (8), p. 158.

^c There must be some relation here with the old world-wide motif of 'poison-damsels', but Penzer (2) did not mention the Complaisant Harmony Master in his notable study of the subject.

¹ 冲和子

² 玉房秘訣

³ 西王母

⁴ 修真演義

⁵ 鄧希賢

composed. When the man is about to attain orgasm, and when she feels moved to the same, responding with muscular motions similar to his, she should contain herself and refrain, for otherwise her Yin *ching*¹ will be exhausted. And if her Yin *ching* is exhausted, there will be an emptiness and eremosis in her body, so that *fêng*² (nervous diseases) and *han*³ (fevers) will be able to gain entry.⁴ Nor should she become jealous or depressed when she sees the man coupling with another woman, for then her Yin *chhi* will become over-excited. This will cause pains even when sitting still or standing, and there will be spontaneous loss of her seminal essence and secretions (*ching i*⁵). These are ills that cause a woman to wither, and age prematurely, so she should be on her guard against all this.⁶

Again Master Chhung Ho said: 'If a woman knows how to nourish her Yin, and how to effect the harmonisation of the two *chhi* of Yin and Yang, she can transform herself into a man.⁷ If (during intercourse) she can prevent the man absorbing her fluids and secretions (*ching i*) they will flow into the hundred vessels (of her body), and his Yang will nourish her Yin. This will drive away the hundred diseases, and her face and form will be smooth and well-liking. Prolonging her years she will never grow old, but always remain as comely as a girl. A woman who has learned this Tao will be able to feed on her copulations with men, so that she can go without food for nine days and yet suffer no hunger . . .'

The recognition here that there was a female as well as a male secretion is of some interest,⁸ for it recalls the Hippocratic-Epicurean 'double seed' theory of Greek antiquity,⁹ which lasted on as late as Harvey's time with Nathaniel Highmore (+ 1651) and A. Kyper (+ 1655). The idea continued as long as Chinese traditional physiology itself, for what looks like 'human female semen' (*nü jen ching*¹⁰) occurs (with certain therapeutic properties) in late Ming pharmaceutical natural histories.¹¹ As with the Greeks, this must always have been the lubricatory secretion of the vestibular glands, corresponding to that of the bulbo-urethral in the male, and not to that of the testes. Ancient Chinese parallels to the Aristotelian theory of male semen and menstrual blood as the basic constituents of the embryo¹² we have

¹ Here the suppression of orgasm on the female side is an exact parallel with what was so often prescribed for the male. But it must be said that such instructions were exceptional, and occur only in this context of woman adepts.

² The warnings against jealousy, repeated in endless variations throughout Chinese literature, were obviously another corollary of the concubinage system. Though the double system of sexual morality cannot be defended, there was something very pleasant and amiable about the relations of women among themselves in traditional Chinese society, when things went well.

³ Changes of sex in man and animals were quite well known in ancient China, and recorded in the dynastic histories. See Sect. 45 in Vol. 6, and Needham & Lu (3).

⁴ It must always be remembered that when the word *ching* is used, it may refer to *ching chhi* or *ching i* (cf. pp. 75, 78, 116, 123), which are rather different, internal things.

⁵ See Needham (2), pp. 16, 42, 62, 108, 129, 193. The Hippocratic tractates on semen and on embryonic development are now available in English translation by Ellinger (1). Hippocrates thought (or rather, the writer of these, who may have been of the Cnidian school), that both men and women had male and female semen (Yang and Yin as we should say), in preponderating quantities according to their sex, but also in varying amounts at different times and under different conditions, and that the sex of the child depended on the particular intermixture.

⁶ *PTKM*, ch. 52, (p. 101). Cf. R425 and Cooper & Sivin (1). We shall return to this subject in considering quasi-empirical endocrine preparations in Sect. 45. The blood generally continued, however, to be involved, for Li Shih-Chen mentioned only a *nü jen ching chih*,⁷ referring to Sun Sau-Mo. And indeed the *Chhien Chin I Fang* says that this is the extract of menstrual blood obtained by washing the absorbent; ch. 24, (p. 283.1).

⁷ See Needham (2), pp. 24 ff. The Hippocratic writer did not deny that blood was to a large extent the origin of the foetal body, but only that it was the sole maternal contribution. The further identification of semen with form and menstrual blood with matter (with all that that implied) was of course a purely Aristotelian complication.

already come across (pt. 4, p. 229), and we shall find more immediately (pp. 207, 222, 225). This was assuredly the general view until modern times. But one wonders whether there could have been an analogous debate in ancient China,^a and that for some proto-*nei-tan* schools it was a question of which sex could steal most of the other's vital Yang and Yin *ching* or *chhi* without forming an actual material embryo;^b though the enchymoma might have been considered an anablastemic equivalent—hence perhaps the origin of the expression *ying erh*,^c so widely found later on. There would thus have been a 'battle' of the sexes in a sense more than metaphorical. If the theory of equal benefit (conceivably associated with the semen-blood school) eventually triumphed, as was natural in view of the characteristic Chinese good sense, the vitality-drainage theory had quite a long innings in some quarters, probably from Han to Thang.

These ideas can be followed further in connection with the *Ju Yao Ching* (Mirror of the All-Penetrating Medicine) already mentioned, written by Tshui Hsi-Fan about +940. This book contains relatively little about the sexual techniques as we have it now, but we know that it did so before the expurgations of later times because Tsêng Tshao strongly criticised it about +1145 in his *Tao Shu* (Axial Principles of the Tao), another work to which we have referred above. The eighth chapter of this (Jung Chhêng Phien^d) contains a most revealing passage.^e

I once obtained the (*Ju Yao Ching* of Master Tshui, which explains the 'battle' of sexual intercourse. The 'guest' or the 'host', (he said),^d may be confused or frigid or not *en rapport*, the two partners may know what they are doing but not be of one mind and heart, they may carry out obscene actions together accumulating no mutual benefit, or again they may have intercourse without really becoming one flesh, or their bodies may join without true union—all this is known as 'facing one another without (true) orgasm'. But if there is an inner and an outer harmony of thought and action, yet with little movement of the bodies, that is the way of obtaining the true life-nature. If the partners can keep calm and not be carried away, then their original vitalities (*yuan wu*^e) will remain and not be lost, the *chhi*^f and the *shen*^g will be settled, and both will combine together in the centre of the body to form an (enchymoma) which conserves the Yang refined and purified from Yin.

Red Snow (*hung hsieh*^h) (said Master Tshui) means the true substance of (the woman's) blood, and this it is which forms the embryo (in the womb).^e It resides in the uterus as a Yang *chhi*, and when it comes forth it is (the menstrual) blood. When the 'tortoise(-head)' (i.e. the Stalk of Jade) enters, the moment must be watched for when the movements bring about her orgasm, then while the man holds his breath the tortoise(-head) must turn, drink in (the *chen* Yang *chhi*) and convulsively absorb and conduct it. When the *chhi* (of the

^a We shall hope to say more about this in Sect. 43.

^b Chinese history records a number of relevant stories. Master Chhung Ho's talk about Hsi Wang Mu explains a case such as that of the enchantress (*nü wu*), a 'beauty of mature age', who travelled about under commission of one of the Thang emperors to offer Taoist sacrifices to various local deities, 'attended by a troop of depraved young men' (*Chiu Thang Shu*, ch. 130, p. 1 a, b; cf. de Groot (2), vol. 6, p. 1235).

^c Ch. 3, pp. 4b to 5b (ch. 8), tr. auct. adjuv. van Gulik (8), p. 225.

^d This imagery, often found in such texts, is drawn from the fact that the host pours out the wine for the guest and not vice versa. A man refraining from emission was the 'guest', as also a woman adept seeking to absorb Yang *chhi* from her partner.

^e Here again is exactly the Aristotelian theory of generation.

partners) has almost settled, and the spirits are in harmony, the (female) *chhi* will enter the (lowest) 'gate' (*kuan*¹) (of the male vertebral column) and be drawn up by the Windlass (*lo lu*²) and the Chain-pump (*ho chhē*³), until it has ascended to Mt. Khun-Lun⁴ (the head and the brain).⁵ Then it manifests itself in the Metallous Gate (*chin chhüeh*⁶) and enters into the central region of vital heat (*tan thien*⁶) where it develops into the enchymoma.

When I read all this, I burst out in vilification and exclaimed: 'Did Master Tshui really say these things? I never heard that the adepts of old practised such disciplines. Formerly when Chang Tao-Ling⁷ taught the Tao of the Yellow and the Red (*huang chhih chih tao*⁸), and the service of 'homogenising the *chhi*' in (liturgical) sexual intercourse (*hun chhi*⁹), these were only a way of emitting and transforming in order to obtain (more) children. It was not something that concerned Taoist adepts. And after Chang Tao-Ling perished these practices disappeared. The Chhing-Ling¹⁰ adept said that he had seen people practising these things yet dying childless, but never saw anyone obtaining long life through them.'

Here we are obviously in presence of a much more sophisticated phase of physiological alchemy, with a developed terminology for anatomical and physiological routes and structures. The Confucian-Buddhist reactions of T'sêng Tshao are of relatively minor interest;^b more significant is the delicacy with which Tshui Hsi-Fan delineated the sober, almost numinous, character of the sexual act when-undertaken by Taoist men and women for macrobiotic purposes, and the detail of the description of the process by which the *chen Yang chhi* was received into the male body to form an enchymoma.^c Here the feminine partner also benefits. Soon we shall read another account which explains more clearly how both sexes obtained their respective macrobiotic advantages. But even the foregoing passage cannot properly be understood without a closer examination of the system by which it was thought possible to make the contents of the urethra (or its *chen Yang chhi*) rise into the uppermost parts of the body and generate centrally the enchymoma of life eternal. This centers round the classical phrase *huan ching pu nao*,^d 'making the semen return to nourish the brain'.

At some very early time, doubtless during the Chou period, the discovery was made that if pressure was applied at the right point in the perineal region the urethra could be occluded, so that at the moment of orgasm the semen instead of being ejaculated could be made to pass into the body.^d In fact, of course, it passed

^a Cf. pp. 60, 99, 112, 115-6, 117-8 above, the same phrases.

^b His references to Chang Tao-Ling and the Taoist Church of the +2nd and +3rd-centuries are of course to the collective ceremonies which involved either hierogamies, or multiple unions of the male and female members of the ecclesia, or very likely both. They are not germane to our present subject, but we have discussed them briefly in Vol. 2, pp. 150 ff., and further details will be found in Maspero (7). Cf. p. 205 below.

^c There may be more than meets the eye in this, but we cannot explain it until we reach the point of comparing Chinese with Indian yogistic techniques. Cf. p. 270 below.

^d It is not generally known that what is called in medicine 'retrograde ejaculation' can occur naturally and spontaneously in some individuals, probably due to a congenital neurological abnormality. It can also happen under the influence of certain drugs, notably resperene, the tricyclic anti-depressants, and in general those with an anti-cholinergic action; cf. Goodman (1); Anon. (155). Thirdly it is common after prostatectomy, for one of the functions of that gland in normal life is to direct the semen through the urethra. As in the procedure of the ancient Taoists it is later excreted with the urine, but they would be astonished to know that viable spermatozoa can now be recovered from it, and used in artificial insemination (Heslinga, Schellen & Verkuyl, 1). We are much indebted to Dr Eric Trimmer for discussions on the medical aspects of this sub-section.

¹ 關

¹ 張道陵

² 轆轤

² 黃赤之道

³ 河車

³ 混氣

⁴ 崑崙

⁴ 清靈真人

⁵ 金闕

⁵ 還精補腦

⁶ 丹田

into the bladder, whence it was later evacuated by micturition, but this always escaped the notice of the Taoists, and over more than two thousand years a great structure of theory grew up which traced out the way in which the precious secretion (or its *chhi*) was conveyed up into the head and ultimately to the centre of the body for the preparation of the enchymoma. Traces of these beliefs have persisted down to our own time, as will be seen hereafter.^a The practice meant that the male adept did not have to refrain from orgasm, since it was thought that the *ching* was conserved, and this probably liberated the female adepts also from the unfortunate doctrine of Master Chhung Ho and his friends. The *locus classicus* for the method is in the *Yü Fang Chih Yao*.^b

The Manuals of the Immortals describe the way of making the *ching*^c return to nourish the brain. During sexual intercourse, when the *ching* has become very agitated and is on the point of coming out, strong pressure must be applied with the two middle fingers of the left hand to a spot behind the scrotum and in front of the anus,^d while at the same time the breath should be fully expelled through the mouth, none being retained (in the lungs), and the teeth gnashed several dozen times.^d Thus the *ching* will be emitted, but not to the outside world, for it will come back from the Stalk of Jade and mount upwards to enter the brain. This procedure has always been transmitted by the immortals to one another, but they who receive it swear a solemn oath sealed in blood not to hand on the method lightly, under pain of suffering calamity themselves.

We know of no other text where the explanation is so clear. Perhaps the oldest mention occurs in the *Hou Han Shu* where the commentary quotes a passage from the *Lieh Hsien Chuan* afterwards expurgated.^e This occurs in the biography of Lêng Shou-Kuang², a great expert on sexual techniques who was thought to be 160 years old in the time of Hua Tho (early + 3rd-century). The text says that Lêng was an outstanding practitioner of the arts of Jung Chhêng.³ The commentary goes on:

The 'Lives of the Famous Immortals' says that the Venerable Jung Chhêng was good at the affairs of 'restoring' (*pu*⁴) and 'conducting' (*tao*⁵). He could gather the *ching*⁶ from the 'Mysterious Feminine'.^f The essential point of this art is to guard the life-force and to nourish the *chhi* by (relying on) the 'Valley Spirit that never dies'.^g When this is done white hairs become black again, and teeth that have dropped out are replaced by new ones. The art of commerce with women is to close the hands tightly and to refrain from ejaculation, causing the sperm to return and nourish the brain.^h

^a P. 243 below.

^b P. 1b, tr. auct. adjuv. Maspero (7), p. 385, van Gulik (8), p. 145.

^c It is in fact identical with the acu-point JM 1; cf. Anon. (135), pp. 198-9; Lu & Needham (5), pp. 50, 56.

^d The text actually indicates that the expulsion of the breath should start before the application of the pressure. One might note that the emptying of the lungs would raise the diaphragm and help to create a partial vacuum in the bladder.

^e Ch. 112 B, pp. 10b, 11a, tr. auct., adjuv. van Gulik (8), p. 71.

^f This might conceivably be another reference to 'female semen' in the Hippocratic-Epicurean style.

^g On feminine concavity as contrasted with masculine convexity see Vol. 2, pp. 58ff. The 'ewig weibliche' is thought of as the door of life, the 'gate from which Heaven and Earth sprang', and as we know from Sect. 10, all the best qualities of the female sex were seen as the essential basis of a harmonious and co-operative social order. Physical sexual union, and the immortality which it could induce, was only one aspect of a far wider philosophy.

^h *Yü fu-jen chih shu*, *wei tao ku pu hsieh*, *huan ching pu nao*.⁷ *Wo ku* was a special Taoist technical term for a way of clenching each hand with the thumb in the palm. It often occurs in connection with physical exercises and meditation postures. Must it not mean here: 'grip (the urethra) tightly'?

¹ 精

² 冷壽光

³ 容成

⁴ 補

⁵ 導

⁶ 精

⁷ 御婦人之術謂握固不瀉還精補腦

Although the last part of the passage was removed from the *Lieh Hsien Chuan*, the references to the *Tao Tê Ching* were retained:^a

The Valley Spirit (*ku shen*¹) never dies,^b
It is named the Mysterious Feminine (*hsüan phin*²) . . .

As for Jung Chhêng, he was one of the semi-legendary founding fathers of Chinese sexology, and the author of a lost book, *Jung Chhêng Yin Tao*,³ listed in the appropriate section of the *Chhien Han Shu* bibliography.^c Hence we can certainly regard the technique under discussion^d as having been current as early as the – 2nd-century.^e

^a Ch. 6, cf. Vol. 2, p. 58. No doubt from the beginning these lines had had an optional sexual interpretation. YCCC, ch. 108, p. 2b, preserves only the expurgated version, as in Kaltenmark (2), p. 55, whose notes are well worth reading. Even this still conserved the pregnant phrase: *shan pu tao chih shih*.⁴

^b Here we use an interpretation that has become classical, but there is an alternative which has the authority of Ho Shang Kung (cf. Erkes (4), p. 21), where *ku* is taken as the equivalent of *yang*, to nourish, and the reference is therefore to the cultivation of the spirits of the five viscera. See Conrady (3); Neef (1).

^c Ch. 30, p. 33a.

^d The problems of nomenclature and comparative distribution are both of interest. In 1935 Griffith (1) wrote: 'Another method (of contraception) which is occasionally practised by men deserves consideration, if only to point out its harmfulness. Some men seem able to perform the whole sex act in a perfectly normal manner and then, at the last moment, when ejaculation is imminent, instead of allowing this to occur normally, they contrive to experience an orgasm and yet allow the (seminal) fluid to flow back into the bladder. I have also come across cases of masturbation where this was the method employed. I should not have deemed it worthy of mention had I not found the condition occurring in men of high standing and ideals. Where they learnt it from I cannot imagine; how they manage to practise it is a still greater mystery. Its harmfulness need hardly be stressed. Quite apart from the fact that it is most unnatural, it demands great mental concentration and will-power to carry out satisfactorily, and must impede the natural muscular action that should accompany ejaculation,' (p. 95). Griffith offered no evidence, however, of harmfulness, and other medical experts such as Dr F. Hilton (in private correspondence) have found none, the only possible sequel being slight subsequent urinary retention. We are indebted to Mr P. Coates for bringing the work of Griffith to our notice.

At an earlier stage (Vol. 2, p. 149) we recorded the common practise of the method among the Turks, Armenians and Marquesan Islanders; subsequently we learnt of its occurrence in India (private communication from Dr L. Picken). It cannot be called *coitus interruptus* (as van Gulik sometimes did) because that term must be reserved for the contraceptive method of sudden withdrawal and external ejaculation, a technique widely disapproved of by medical psychologists as leading to neuroses of anxiety. But as Dr Picken pointed out, the term we ourselves used, *coitus reservatus*, is also unsuitable, as it has usually meant allowing the state of excitation to fade without withdrawal. The Chinese methods need two new terms, one for seminal retention and withdrawal after female orgasm, and another for the 're-routing' of the secretion into the bladder. For the first we would like to adopt his suggestion of *coitus conservatus*, and for the second *coitus thesauratus* might be proposed. The latter has in fact already got a name, i.e. *coitus saxonicus*, introduced by Ferdy (1), who found it widespread among the country people of Styria. It would be very interesting to know more of the comparative occurrence of these techniques in the Old and New Worlds, but we have not so far been able to pursue the matter further. We are indebted to Dr F. Hilton for knowledge of Ferdy's book.

^e Hence it was quite reasonable of the late +5th-century author of the *Han Wu Ti Ku Shih*⁵ ('Tales of the Emperor Wu of the Han) to attribute a knowledge of 'The Method' to his reign (– 140 to – 87). Here in sects. 12, 25 and 40 we may read how at that time there were many experts, for example a woman adept named Hsü I-Chün,⁶ who may have taught it to the emperor, while many others, such as the Taoist virtuoso Tungfang Shuo⁷ and the courtier Chhen Shêng⁸ and his son practised it with her. Although 137 years of age she looked like a young girl. She was eventually exiled, however, about – 80, to Tunhuang, went away among the barbarians and was no more seen. There is also much information in the book about the Imperial Concubine Pernoctation Rota (cf. Vol. 4, pt. 2, pp. 477–8; Needham, Wang & Price (1), pp. 171–2), according to which the court ladies in their different ranks shared the emperor's couch in an order strictly regulated by cosmic natural philosophy. Just how historical the whole account can be considered to be is quite another matter; many things in it are also found in the dynastic history, but Wang Chien⁹ greatly embroidered them. See the translation by d'Hormon (1), pp. 43, 61–2, 80–1.

¹ 谷神

² 玄牝

³ 容成陰道

⁴ 善補導之事

⁵ 漢武帝故事

⁶ 徐儀君

⁷ 東方朔

⁸ 陳盛

⁹ 王儉

Among the other ancient texts referring to *coitus thesauratus* is of course the *Huang Ting Wai Ching Yü Ching* (cf. p. 83 above), at least as interpreted by its Thang commentators Wu Chhêng Tzu and especially Liang Chhiu Tzu,^a who knew what they were talking about, and this text may be as old as the +1st-century, certainly not later than the +4th. But partly on account of its obscurity and allusiveness, and partly because its chief concern is with the Taoist physiology of the route of the *ching* in the male body, we shall not reproduce it here, referring only to the brilliant translation and exegesis by Maspero.^b More important for our purpose is to quote from the great alchemist Ko Hung, especially to see fully a little later how the sexual techniques fitted in to the Great Work of preparing chemical elixirs, of which they were only one subordinate part. Already old in +300, and therefore comparable with the foregoing, is the rhyme that Ko Hung quotes in the *Pao Phu Tzu*:^c

The Manuals of the Immortals say:

‘Those who take chymic elixirs
And guard the primal unity^d
Will come to a stop from living
No sooner than Heaven itself;
Making the sperm return,^e
Breathing like babe in womb,
They will lengthen their days in peace
And blessing, world without end’.

Apart from various passing references^f to *coitus thesauratus* there is a long and interesting passage which cannot be omitted.^g

On the technology of sex [wrote Ko Hung] at least ten authors have written,^h some explaining how it can replenish and restore injuries and losses, others telling how to cure many diseases by its aid, others again describing the gathering of the Yin force to benefit the Yang, others showing how it can increase one's years and protract one's longevity. But the great essential here is making the semen return to nourish the brain (*huan ching pu nao*'), a method which the adepts have handed down from mouth to mouth, never committing it to writing. If a man does not understand this art he may take the most famous (macrobiotic) medicines, but he will never attain longevity or immortality.

Besides, the union of Yin and Yang in sexual life should not be wholly given up, for if a man does not have intercourse he will contract the diseases of obstruction and blockage by his slothful sitting, and end by those which arise from celibate depression and pent-up resentment—what good will that do for his longevity? On the other hand, over-indulgence

^a *HCSS (TT260)*, ch. 58, p. 4b

^b (7), pp. 388ff.

^c *PPT/NP*, ch. 3, p. 1b, tr. auct. adjuv. Ware (5), p. 54.

^d Of the vitalities.

^e To nourish the brain (and make the enchymoma).

^f E.g. Ch. 5, pp. 2a, 4a (Ware tr., pp. 100, 103).

^g Ch. 8, p. 3b, tr. auct. adjuv. Ware (5), p. 140, the first paragraph also in Maspero (7), pp. 410, 411.

^h Presumably a reference to the *Chhien Han Shu* bibliography, ch. 30, p. 33a.

diminishes the life-span, and it is only by managing copulations so that the seminal dispersals are moderated, that damage can be avoided. Without the (right) oral instructions hardly a man in ten thousand will fail to injure and destroy himself in practising this art.

The disciples of the Mysterious Girl and the Immaculate Girl, with the Venerable Jung Chhêng, and Phêng Tsu, all had a rough acquaintance with it, but in the end they never committed to paper the most important part of it.^a Those bent upon immortality, however, assiduously seek this out. ^b As for myself, I had instruction from my teacher Chêng (Yin¹), and I record it here for the benefit of future believers in the Tao, not retailing my own ideas. At the same time I must truthfully say that I feel I have not yet mastered everything that could be got from his instruction. (Lastly), some Taoists with a smattering of knowledge teach and follow the sexual techniques in order to pattern themselves on the holy immortals, without doing anything about the preparation of the great medicine of the Golden Elixir. O what a height of folly is this!

Here the final cry of the devoted proto-chemical *wai tan* alchemist is of particular interest.

So much for the oldest references; we shall come across more indications in later texts as we proceed (Fig. 1609). But before leaving the Han period we have to take note of something which was destined to have considerable effect a thousand years later when Confucian-Buddhist prudery and anti-sexuality had succeeded in watering down the pure milk of the Taoist gospel. This was simply that the essential procedure of *coitus thesauratus* could be effected by masturbation, without the presence of any woman at all. The words occur as the continuation of a passage from the *Su Nü Ching* already quoted on p. 190, after the remark that the celibate is 'mortifying (the *ching*) within itself.' The Immaculate Girl then goes on to say:^c

Therefore (if you insist on refraining from women) you should regularly exercise it (the Jade Stalk) by masturbation.^d If you can erect it (in orgasm) and yet have no ejaculation, that is called 'making the *ching* return', and making the *ching* return is of great restorative benefit, fully displaying the Tao of the life(-force).

Thus already in the +1st-century it was considered that though celibacy was an inferior state, it might be combined with the search for longevity and immortality if this technique were adopted. Peering into the past for the sociological background one senses withdrawals of 'Huang Ti' because of irreconcilable quarrels among the womenfolk of a great house—but the Taoists were right to feel that this was a withdrawal from the responsibilities of true humanity, and the Immaculate Girl only recommended her bizarre system as very much a second-best.

To end these paragraphs, we may quote a couple of poems from the *Ju Yao*

^a Obviously the details of *coitus thesauratus*.

^b Presumably by knocking at the doors of adepts in remote Taoist temples, and serving there in humble capacities until one or another could be persuaded to adopt you as his disciple. And of course there were many techniques to be learnt beside those of sex.

^c Pp. 1b, 2a, tr. auct.

^d *Tao yin*² is the expression used.

¹ 鄭隱

² 導引

圖 照 友

摩尼珠 太微宮 祝融峰 玄都 天符 瓶山 帝乙 突矣 紫府 丙院 天宮 泥丸 瑤池 彼岸 玄門 天樞 上島 真際 天宮 黃房 玄室 崑崙山

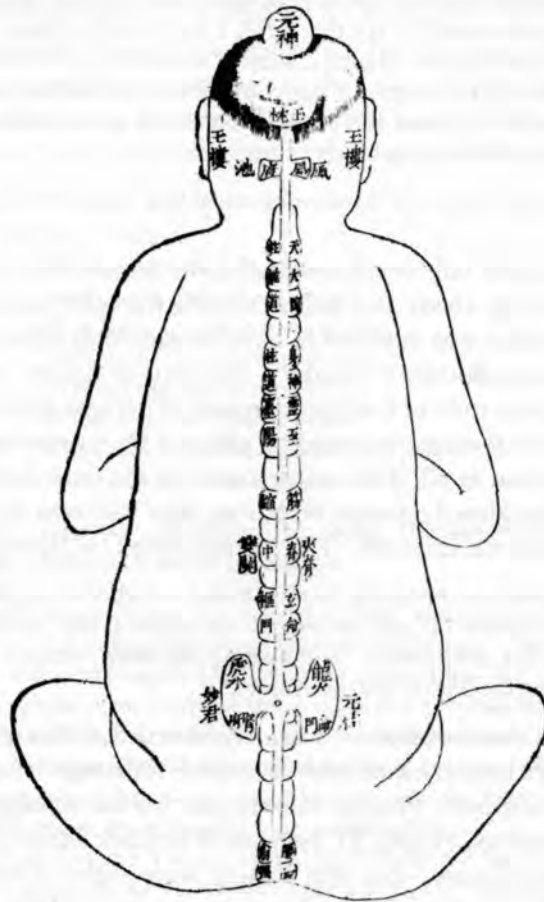


Fig. 1609. A drawing from *Hsing Ming Kuei Chih* (+1615), ch. 1, p. 21a, illustrating the theory of *huan ching pu nao*, on which see text. The vertebral axis, up which the *ching* was thought to rise (cf. the *suṣūmnā* channel of India) is labelled with the names of acupoints on the auxiliary tract Tu Mo, beginning from TM 1, Chhang-chhiang, half-way between the coccyx and the anus. The point at which pressure was applied was JM 1, half-way between the anus and the scrotum, in the centre of the perineum, i.e. the first acupoint on the auxiliary tract Jen Mo, passing frontally in the median line. In the drawing 14 out of the 28 acupoints on Tu Mo are marked, continuing with TM 2 Yao-shu, but the third, Yao-yang-kuan, appears only as a spot in the centre between the two kidney-shaped objects. Further acupoint names follow, such as TM 4, Ming-mên, TM 5, Hsüan-shu, TM 6, Chi-chung, etc. ending at TM 15, Fêng-fu. Twenty-four 'vertebrae' are shown, and one of the 'bottlenecks', *shuang kuan*, is marked to the left of the spine, while one of the primary vitalities, *yuan shen*, appears at the top of the head. The list of phrases above the figure look like acupoint names, but in fact they are terms in Taoist anatomy, *ni wan*, the brain, for example, in the centre. The drawing is entitled 'The Glory of Reversion' (Fan Chao Thu), but one must recognise that by this time, the early +17th century, the classical physiological techniques were being replaced by euphemistic allegorical or mystical interpretations.

Ching, to see how things looked in the + 10th-century. These are some that survived the expurgation already referred to (p. 196). So we find:

Returning to the orifice of the root,^a
 Returning to the gate of life,^b
 Let it pass through the coccygeal channel,^c
 And penetrate up to the brain.^d
 Engage the Yellow Dame^e
 As go-between for the Elegant Girl,^f
 Softly, lightly, let it descend,^g
 Darkly, silently, let it rise up.^h
 If you know what floats and what sinksⁱ
 If you understand who should be host and who guest,^j
 You will be able to convoke the Great Meeting^k
 With neither stitch nor veil between them.^l

By now the reader will be able to follow these hidden thoughts almost as well as any adept of the Sung.

The *Pao Phu Tzu* passage just quoted contains a severe warning of the dangers inherent in sexual technology if not fully understood, and such admonitions are repeated again and again in the old texts. The *Su Nü Ching* says that 'coupling with a woman is like trying to control a galloping horse with rotten reins, or like being afraid of falling into pit-traps set with sharp blades'.^m The *Yü Fang Chih Yao* says that 'the Yellow Emperor (Huang Ti) lay with twelve hundred women and yet rose into the heavens as an immortal; ordinary people have but one woman each, yet their life-span is cut off thereby. Knowing how to act, and not knowing how to act—what a vast distance stretches between! For those who know the art, their only difficulty is to get enough women with whom to lie.'ⁿ These dangers so often mentioned are perhaps a little puzzling biologically. It is easy to think of the psychological effects of *coitus interruptus* (if indeed these are substantiated), and of exhaustion

^a Urethra or vagina.

^b Vagina, or more likely the lowest of the 'gates' in the vertebral column through which the semen had to ascend.

^c *Wei lü* strictly means the anus, both of man and animals, and also cosmically (on which see Vol. 4, pt. 3, p. 549); but here it is taken in a wider sense as the region of the rump, particularly the coccyx, past which the upward flow of the semen was visualised as occurring. Cf. Liu Tshun-Jen (1), p. 71.

^d *Kuei kên chhiao, fu ming kuan, kuan wei lü, thung ni wan.*² P. 21 b, tr. auct.

^e One of the four *hsiang* (cf. p. 58), representative of the central, therefore yellow, region, Huang Thing, *chung tan thien*, etc. corresponding to the element Earth, the region where the enchymoma will be formed. Cf. *Chin Tan Ta Chheng*, p. 12 a.

^f I.e. 'true' mercury, cf. p. 62 and Table 121 c.

^g The saliva. Alternatively, the stanza is referring to the *chhi* circulation.

^h The semen. *Tho Huang Pho, mei Chha Nü, chhing chhing ti, mo mo chü.*³ P. 25 b, tr. auct.

ⁱ The two reagents just mentioned.

^j Cf. p. 196. The male adept is the guest as well as the female one with him, for he does not 'pour out the wine' either.

^k Of the two reagents of the anablastemic enchymoma, thought of here as lovers.

^l *Shih fou chen, ming chu kho, yao chü hui, mo chien ko.*⁴ P. 31 b, tr. auct.

^m P. 1 b, tr. auct., adjuv. Maspero (7), p. 380; van Gulik (8), p. 157.

ⁿ P. 1 a, tr. auct., preferring van Gulik's interpretation, (8), p. 137 to that of Maspero (7), p. 381.

¹ 尾閭

² 歸根竅復命關貫尾閭通泥丸

³ 託黃婆媒姪女輕輕地默默舉

⁴ 識浮沉明主客要聚會莫間隔

from over-indulgence (if it does in fact bring a lowered resistance to disease), and of course increased possibilities of transmission of the minor venereal maladies (but that would not be lessened by the adept's management of his sperm). One cannot help feeling that the unconscious aim of the warnings was to keep the common people more or less contented with their lot, leaving to the grandees—and to the Taoist adepts who alone knew what to do about it—the opportunity of more extensive sexual relationships.

Secondly, there was the 'scriptural authority' for sex. We have just seen it in the quotation from the *Lieh Hsien Chuan*, and earlier (p. 132) when considering the commentary of Ho Shang Kung on the *Tao Tê Ching*. We can illustrate it for the last time by a passage from the *Wang-Wu Chen-Jen Khou Shou Yin Tan Pi Chüeh Ling Phien*¹ (Numinous Record of the Confidential Oral Instructions on the Yin Enchymoma handed down by the Adept of Wang-Wu),^a a text dating from the close neighbourhood of +765 and probably written by Liu Shou.² It runs as follows:^b

The Yang enchymoma can make one ascend (into the heavens); the Yin enchymoma can confer longevity. The Yang enchymoma is a 'returning' (i.e. regenerative) medicine, the Yin enchymoma is the (regenerative) technique of making the *ching*³ return.

Huang Ti asked Kuang Chhêng Tzu⁴ about the 'Tao (of these things) and he replied: 'Do not exhaust your physical form, avoid wasting your seminal essence (*ching*³). If these techniques are carefully adhered to, longevity and immortality will result'—such is the meaning of it.

The Ruler of Primary Chaos (Hun Yuan Huang Ti⁵ = Lao Tzu) says in the 'Canon of the Virtue of the Tao': 'Strengthening the root and making firm the trunk—that is the Tao of longevity and everlasting perception.'⁶ Ho Shang Kung in his commentary says: 'Man's semen (*ching*³) is the root, and his *chhi* is the trunk'^d—that is the meaning of it. Again, (Lao Tzu) says: 'Empty their minds (of ambition) and fill their bellies; weaken their self-seeking and strengthen their bones'.^e This method of strengthening the bones is indeed the meaning of it.^f

Again, the 'Manual of the Yellow Court' says:^g 'By the radiance of the sun and moon there can be rescue from the despoilment of old age.' The mutual union of Yin and Yang is what is meant by the radiance of the sun and moon. And, in another place:^h 'Continually nourish the numinous sprout, and it will not wither;ⁱ close and fasten the gate of life (*ming mên*⁶), preserve the city of jade (*yü tü*).⁷ Now the gate of destiny is just below the reservoir of semen (*ching shih*⁸), and the city of jade is the five (Yin) viscera.

^a Or, 'the Perfected (or Realised) Immortal of Wang-wu (Shan)'.

^b YCCC, ch. 64, pp. 13a,b, 14a, tr. auct.

^c *Tao Tê Ching*, ch. 59, cf. p. 135 above.

^d Actually he says just the opposite, but no matter.

^e *Tao Tê Ching*, ch. 3, cf. Vol. 2, p. 86.

^f Ho Shang Kung says: 'Conserve the *ching*³ and hinder its dissemination, then the marrow cavities will be full and the bones strong.' Erkes (4), p. 18.

^g *Huang Thing Nei Ching Yü Ching*, ch. 33, p. 11a, speaking of the liver.

^h Ibid. ch. 35, p. 11b, speaking of the spleen.

ⁱ This refers to the saliva.

¹ 王屋真人人口授陰丹秘訣靈篇

² 劉守

³ 精

⁴ 廣成子

⁵ 混元皇帝

⁶ 命門

⁷ 玉都

⁸ 精室

If you divest yourself of cravings the four limbs will be free from disease, just as when the roots (of a plant) are flourishing the leaves and branches will be luxuriant. Nature endows people with foolishness or intelligence, but it never determines their individual span of life. It is like the fruits and seeds of trees, which may be sweet or acid; if they fall into good ground the plants flourish exceedingly, but if they fall upon stony ground they are retarded and soon wither. The life-span of man is just like this. Thus all the Taoist traditions say that one's destiny depends upon oneself and not upon Heaven—that is the meaning of it . . .

Here perhaps the chief fresh interest is the deep conviction that a man's life-span depended on his own actions and not on fate. This comes as a refrain through all the *nei tan* literature.^a

In this connection it is indispensable to give some idea of the very serious, religious, almost liturgical, character of the rites of sexual union as carried out by medieval Taoist adepts.^b One of the most interesting accounts was discovered by Maspero in a tractate called *Chhing-Ling Chen-jen Phei Chün (Nei) Chuan*¹ (Biography of the Chhing-Ling Adept, Master Phei), written by one Têng Yün Tzu² about a teacher of uncertain date, Phei Hsüan-Jen,³ who was supposed to have been born in -178.^c Maspero regarded it as a 'hagiographical romance' of the +5th-century, with perhaps some early 'Thang additions, but it gives a very clear idea of what was done. The passage is as follows:^d

The second procedure^e should be started at the hour when the (Yang *chhi*) begins to increase, after midnight, at the end of a *khai* or *chhu* day in a ten-day period the first day of which was a *chia-tzu* day. (The couple) should be free from the effects of wine or repletion of food, and they should be clean of body, for otherwise illness and disease will afflict them. First by means of meditation they must have put away all worldly thoughts, then only may men and women practise the Tao of life eternal. This procedure is absolutely secret, and may be transmitted only to sages; for in it men and women together lay hold of the *chhi* of life, cherishing and nourishing respectively the seminal essence and the blood. [It is not a heterodox thing].^f In it the Yin is gathered up in order to benefit the Yang. If one practises it according to the rules, the *chhi* and the fluids will circulate like clouds, the pure wine of the *ching* will coagulate harmoniously, and whether one is old or young one will revert to the state of youth.

^a Cf. pp. 46, 123, 292.

^b We have said little here about the communal liturgical sexual ceremonies described already in Vol. 2, pp. 150-1 because they were practised by all the adults of the Taoist parish (more or less between the +2nd and the +7th-centuries), and not confined to couples seeking salvation and immortality through physiological alchemy. But it is worth adding something still little known, namely that the service-book or rituale has been preserved unrecognised to this day in the *Tao Tsang*, i.e. in the *Shang-Chhing Huang Shu Kuo Tu I* (TT1276). Similarly the talismans and certificates which the participants received are to be found in the *Chêng I Fa Wên Wai Lu I* (TT1225). We have to thank Dr Kristofer Schipper for this interesting information.

^c According to the biographical introduction of the book in question, but neither he nor any of the adepts named as his masters appear in the present text of the *Lieh Hsien Chuan*. This Chhing-Ling chen-jen may well be the same person as the adept of the same pseudonym mentioned in the passage by Tsêng Tshao on p. 197 above.

^d YCCC, ch. 105, p. 3a, b, tr. auct. adjuv. Maspero (7), pp. 386-7; van Gulik (8), p. 199.

^e It is one of five. The others concern different techniques, e.g. for absorbing the *chhi* of the five planets by respiratory exercises during the night, and various other Taoist rituals, prayers and cantraps.

^f Van Gulik suspected that this sentence was an interpolation of Ming date, hence our square brackets.

¹ 清靈真人裴君內傳

² 鄧雲子

³ 裴玄仁

⁴ 上清黃書過度儀

⁵ 正一法文外錄儀

The two partners should begin by meditating, so that they detach their minds both from their own bodies and from all earthly things. After that they gnash their teeth repeatedly seven times, and say the following prayers:

'May the Metallous Essence of the Original Whiteness^a bring our Five Blossoms^b to life'.
'May the Yellow Lord of the Centre^c harmonise our *hun* souls, and strengthen our seminal essences'.

'May the Supreme Essence of the Great Emperor above solidify our humours and fortify our spirits'.

'May the Unsurpassed Supreme True One bind together our six *chhi*'.

'May the Mysterious Patriarch of the Supernal Essence regenerate our *shen*' and repair our brains'.

'May he make the two of us unite and blend so as to recast the embryo and guard the precious treasure'.

These prayers being ended, (the man and the woman begin coition). The man guards (controls) his reins (i.e. his libido), keeping firm grasp of his semen and refining its *chhi*, (till eventually) they ascend along the spinal column to the brain going against the (normal) current. This is called 'regenerating the primary (vitalities; *huan yuan*²)'. The woman guards (controls) her heart (i.e. her emotions) and nourishes her *shen*,¹ not allowing the refined fire to move (*lien huo pu tung*,³ i.e. refraining from orgasm), but making the *chhi* of her two breasts descend into her reins, and then also rise up from there (along the spinal column) to reach the brain. This is called 'transforming (life) into the primary (vitalities; *hua chen*⁴)'.

If (their bodies) are nourished (in this way) the door (is opened) for the development of an enchymoma of magical potency after a hundred days. If the procedure is followed for a long period of time it will become a natural and habitual thing, and will lead to true longevity and immortality as the generations pass. (Truly) it is the Tao of the Deathless.

This passage is of rare value, giving as it does an insight into the rites of the medieval men and women Taoists in their mountain abbeys, assuredly not without the prior strains of the lute and the burning of appropriate incense in the form of sticks or labyrinthine trails.^d It is also important because it emphasises the extent to which both sexes were regarded as beneficiaries of the exercise, a counter-current upward flow of *chhi* or fluid occurring in both. The male adept used, it is clear, the technique of *coitus thesauratus*, conserving his *ching*, while the abstention of the female adept from orgasm conserved (in this old Taoist view) her Yin and blood forces.^e Van Gulik felt that this equivalence of benefit was rarer than the formulations which awarded most of the profit of the sex techniques to the male side,

^a The Spirit of metal and the north and whiteness.

^b The five viscera.

^c Probably cosmological as well as microcosmic.

^d Cf. Vol. 3, p. 330 and the subsequent monographs of Bedini (5, 6). Timing by the burning of incense was greatly used in China, and the phases of the present procedure could well have made use of this aid. It may well also have been involved in the timing of the respiratory and gymnastic techniques (cf. pp. 142, 154 above).

^e A hint about the position used may be gained from one of the statements concerning the public ceremonies. 'They join the four eyes, the four nostrils, the two mouths, the two tongues and the four hands, in such a way as to confront exactly the Yin and the Yang' (*Hsiao Tao Lun* and *Pien Cheng Lun*, see Maspero (7), pp. 404-5). In this connection the bronze figures on box lids described by Salmony (2) may be recalled, a man and a woman, naked, kneeling and facing each other.

¹ 神

² 還元

³ 煉火不動

⁴ 化眞

but we have found it in very similar form elsewhere, for example in the *Thai Hsüan Pao Tien*¹ (Precious Records of the Great Mystery),^a a Sung or Yuan book of the +13th or +14th-century, by an unknown writer. Here there is a closely analogous parallel passage to the one just given.^b It uses the same alchemical terms but omits the prayers, and explains that in generation the father's contribution forms the reins, while the mother's forms the heart and blood. This is reminiscent of the old Hellenistic and Talmudic doctrine that 'the father sows the white, the mother sows the red'.^c

So just as their generative functions differ, their work in macrobiotic union is not the same. And much practice is needed.

When this is performed for a hundred days, with the man (ensuring) that no *ching*² is ejaculated, his *chhi* will be that of longevity and immortality, and he will return to a state like infancy and youth—this is a magical and numinous thing. (Similarly) if the woman (ensures) that her blood does not move (*hsüeh pu tung*)³, her *shen*⁴ will thereby be settled, and she will return to the state of a young girl, receiving (again) the two vessels, one of which forms milk, the other (menstrual) blood—the wonder and the mystery of this is inexhaustible. Those who continually practise it will find their hair growing (black again), their breasts calmed, their reins transformed and their bodies transfigured.

Over and over again, as we have seen, the texts enjoined the illuminati of Taoist sexuality never to hand down their knowledge, whether theoretical or practical, to those unworthy to receive it.^d In this the usual personal relationships of fellow-countrymen (*thung hsiang*)⁵ or descendants of class-mates, as well as actual consanguinity, all played a natural part. One glimpses this from passages such as the following, taken from the *Wang-Wu Chen-Jen Liu Shou I Chen-Jen Khou Chüeh Chin Shang*⁶ (Confidential Oral Instructions of the Adept of Wang-Wu presented to the Court by Liu Shou) shortly after +780. It says:^e

In the reign of Tai Tsung (+763 to +780) there was an adept called Wang, of the given name Chhang-Shêng,^f who wandered to many famous mountains and lived in many different places. Your servant (Liu Shou), when visiting Wang-wu Shan, saw him there, and indeed he was known by the name of the Wang-wu Adept. He himself said that he was a man of the Eastern Chin dynasty (+317 to +420).

He had a wife named Liu who said herself that she had been born in the time of Thai Tsung (+627 to +649). Outwardly their relationship appeared to be like snow and ice, yet in their explorations of the mountains to find suitable places for Taoist practices they always went about together.

My own uncle, named (Liu) Têng,⁷ studied Taoism at the Northern Sacred Peak of

^a *TT1022*, also in *TTCY*.

^b *TTCY* ed., p. 18b, tr. auct.

^c Needham (2), p. 60.

^d On oral tradition in general the book of Vansina (1) may be consulted. He is concerned mostly with historiography but touches now and then on esoteric oral instruction (pp. 31, 67, 146-7).

^e *YCCC*, ch. 64, pp. 144ff., tr. auct.

^f Wang Chhang-Shêng⁸ was certainly a taken, not a given, name.

¹ 太玄寶典

² 精

³ 血不動

⁴ 神

⁵ 同鄉

⁶ 王屋真人劉守依真人口訣進上

⁷ 劉登

⁸ 王長生

Hêng Shan under the teacher Chang Kuo¹ for over 50 years. He lived to be 116 years of age. In the third month of spring in the 14th year of the Thien-Pao reign-period (+755), he spoke to all his disciples, saying: 'My primary vitalities (*yuan chhi*²) have gone wrong; it will not be possible for me to go on dwelling here permanently. I shall travel to the three mountains and cross the great lakes to search for famous drugs. If my return is delayed do not be anxious.' So he left and never came back. That year in the eleventh month the rebellion of An Lu-Shan broke out.

Your servant comes of a scholarly Taoist family, and I studied on Wang-wu (mountain) more than ten years. I often used to see there an old man gathering firewood; I knew that he never ceased practising the Tao, but did not quite realise that I was meeting an extraordinary person, none other than the Wang-Wu Adept himself. He asked me where I came from, and about my family, then he told me that he studied under Chang Kuo at the same time as my uncle. Our friendship was thus much increased. At this time I myself was getting on in years, with failing eyesight and hearing, so the Adept took pity on me and gave me this oral instruction. Since then, although I have not regained my youth, all my ailments have greatly lessened.

Thus far the preamble. It is unnecessary to give the Adept's instructions in detail because we already know the gist of them. But a few words of the *Chüeh* are worth recording.³

One should not dare to be the host, but rather play the part of the guest. We can borrow from the Taoist manuals in speaking of these affairs. He who first lifts up the cup (at a party) is the host, he who responds is the guest. The host first pours out benefits for others, but the guests are those who receive. If one gives like this one's *ching*³ is dispersed and one's emotions are exhausted. But if one receives, one's *ching*³ is strengthened and one's emotions concentrated. This is because the absorption of the *chhi* of union assists one's own (primary) Yang—in that case what is there to worry about?

It then goes on to explain a technique of applying the perineal pressure in *coitus thesauratus* with the heel rather than the hand; this was called 'riding the wine-pot' (*chhêng hu*⁴).^b There follows a detailed description of intercourse in which the Yin and Yang mutually unite, penetrate and fuse, harmonising the *ching* and the *chhi* in both partners. It quotes as an old Taoist saying:

Who wishes life unending to attain
Must raise the essence to restore the brain.^c

And after quoting Phêng Tzu to the effect that the Yin can nourish the Yang, it adds significantly that we know how correspondingly the Yang can nourish the Yin.^d 'The *ching* being elevated against the current, both the man and the woman can become immortals and obtain the Tao.'^e And finally, 'Thus all the old Taoist

^a Ibid. p. 15a, tr. auct.

^b Ibid. p. 15b. This suggests the use of the lotus posture, but the adept would have to be thin, and agile in the joints.

^c Ibid. p. 16a.

^d Ibid. p. 16b.

^e Ibid. p. 17b. It goes on to say: 'For the man the Yang can be the host and the Yin the guest; for the woman the Yin can be the host and the Yang the guest. So the guest helps the host, and the host finds peace.' Presumably this refers to the outflowing of their respective *chhi*.

¹ 張果

² 元氣

³ 精

⁴ 乘壺

traditions say that if (the semen is) ejaculated it leads to other men, that is to say, a child is born, but if it is retained it leads to the man himself, that is to say, an (immortal) body is born—that is the meaning of it.’^a Such statements are repeated time after time in later books, even down to the nineteenth century when the union of the sexes had generally given way under Confucian-Buddhist pressure in favour of solitary practices.

We reach now an important matter—what exactly was the relation of sexual technology to *wai tan* proto-chemical alchemy? From the words of Ko Hung in the *Pao Phu Tzu* book, c. +300, it is quite clear that in relatively early times the sex practices were thought of only as a means to an end, just one of the helpful ways in which a man could prolong his life for the several centuries required for a perfect understanding of the Great Work, the making of the golden elixirs which alone could confer immortality. Many a modern scientist today might also like to live on a few hundred years, no doubt, to follow further the understanding of Nature in the particular branch to which he had devoted his normal life. Of course, for Ko Hung, it was not so much a matter of theoretical understanding in the modern sense, but the difficulty of collecting books and finding out those who knew the secrets of alchemy, and the rareness of the opportunities of procuring the necessary ingredients and reagents. Only in rather later times did the *nei tan* begin to take precedence of the *wai tan*—then, together with the other psycho-physiological techniques, such as breathing, meditation and gymnastics, sexology (if we might so call it) came to be an end in itself. Ko Hung did not believe it was, and said so very firmly. But then he was a man who had no objection to getting his hands dirty among his stoves and athanors, or talking with the cinnabar miners of the south; in later times from Thang to Sung predominance passed to the gentlemen who despised the ‘messaging about’ with minerals, herbs and metals, the trade of the proto-chemists—physiological ‘alchemy’ was so much cleaner. Of course, it was none the less prophetic for that, but this we shall consider presently. Now we must listen to Ko Hung, the opinions of a great proto-chemical alchemist, on what sex could do and what not. He certainly regarded it as an indispensable *sine qua non*, yet an auxiliary rather than a determining factor. In *Pao Phu Tzu* we read:^b

Even if drugs (elixirs) are not attainable and one can only practise the circulation of the *chhi*, several hundred years of longevity may be gained if the principles are thoroughly understood; but of course for this it is necessary that one should know the arts of the bed-chamber. Anyone who does not comprehend these techniques of Yin and Yang will become exhausted and injured by repeated (loss of sperm) so that the breathing exercises will not succeed.

Thus sexology was thought of here as adjuvant to pneumatology, and that in its turn to chemistry or pharmacy. Ko Hung elaborated in a long and inspired reply to a questioner, worth reproducing in full:^c

^a Ibid. p. 18a.

^b *PPT/NP*, ch. 5, p. 5a, tr. auct. adjuv. Ware (5), p. 105.

^c *PPT/NP*, ch. 6, pp. 8aff., tr. auct., adjuv. Ware (5), pp. 122ff.; van Gulik (8), p. 95.

Someone said: 'I have heard that he who has fully mastered the sexual techniques of the bedchamber can travel (through the wildernesses safely) alone, and can summon the spirits and immortals; he can divert disasters and absolve from guilt, turn misfortunes into blessings, rise high in the civil service, and double profits if in trade. Is this true, do you think?'

Pao Phu Tzu replied: 'This is all nonsense, exaggerated talk of enchantments derived from the books of wizards and magicians, embellished by the glosses and embroideries of busybodies; in fact it has lost all relation with the facts. Some of it indeed is the work of licentious charlatans who deceive the masses with absurd and empty claims, secretly scheming for rank and respect, gathering disciples to further their ambitions.

Actually the best of the Yin-Yang techniques can cure minor diseases, and the least of them can prevent debilitation and exhaustion, but that is all it amounts to. There are obvious natural limits to these principles (*li*). How on earth could they enable one to summon spirits and immortals, or to turn misfortunes into blessing?

It is of course inadmissible that a man should sit and bring illness and anxieties upon himself by not engaging in sexual intercourse. On the other hand if he indulges his lusts inordinately and indiscriminately, unable to moderate his seminal dispersals, he might as well take an axe to the tree of his life-span. . . . But those who know the art can rein in the runaway steeds and repair the brain, they can draw in the Yin enchymoma to the Scarlet Gut (the heart), and they can conduct the jade juice (the saliva) to the Metallous Pool. . . . Thus an old man can look like a young one, and live out his appointed days to the full.

Ordinary people, hearing that the Yellow Emperor (Huang Ti) had 1200 concubines and yet ascended into the heavens, suppose that that was the sole reason why he could do so. What they do not realise is that Huang Ti mounted aloft on a dragon only after having successfully sublimed the nine-fold (cyclically transformed cinnabar) elixir on the shores of Cauldron Lake at the foot of the Ching² mountains. Naturally Huang Ti could have 1200 concubines, but what happened was not due to that alone.

In fact no benefit will accrue from taking thousands of drugs, or living on the three meats either,^a as long as one does not understand the erotic arts. The ancients, therefore, fearing that people might treat physical love and sexual indulgence too lightly, praised and emphasised these arts perhaps too much, so that one need not believe all that is said about them. Yet sexual intercourse was (rightly) compared by the Mysterious Girl and the Immaculate Girl with water and fire, either of which can kill man as well as bringing him to life, all depending on whether he knows how to use them properly. Broadly speaking, once the essential rules are known, the benefits will increase in proportion with the number of copulations; but if one makes love without properly knowing this Tao, it is enough even to bring danger of quick and sudden death, as has been seen in one or two cases.

All the essentials are contained in the old methods of Phêng Tsu. Other books on the subject teach only many troublesome methods difficult to carry out, and the resulting benefits are not always such as they claim. Even young people can put (Phêng Tsu's instructions) into effect, as well as those amounting to several thousand words (by custom) orally handed down. Without a knowledge of bedcraft one will never attain to longevity or immortality, however many hundreds of (macrobiotic) drugs one may succeed in consuming.'

Thus it is not enough in itself but a necessary condition of everything else. Ko Hung certainly believed in gods, spirits and archaëi, to say nothing of talismans,

^a Abstaining from cereals.

magic and spells—but he was remarkably level-headed about sex. The third paragraph of his speech shows that the double enchymoma of saliva and semen was already visualised in his time; and his argument in the fourth, though quite in the sceptical style of Wang Chhung, shows that he thought the success of Huang Ti had really been due to proto-chemical alchemy.^a

Ko Hung returns to the subject in several other places. In one he emphasises the necessity of deep understanding, and says that for sex as well as for the breathing techniques and the macrobiotic drugs there are manifold ways of proceeding, so that one has to know which are effective and which are not.^b In another he tells the story of an adept named Ku Chhiang,^c who specialised in herbal medicines and was much given to the sexual techniques.^c Ku attained the age of 80 without showing any of the ravages of old age, and was called 'the Immortal' or 'Old Millennial'; he talked cleverly about ancient times which he claimed to have lived through, but in the end he died, and the fact that his corpse did not disappear from the coffin showed that he had never become an immortal. But the most important statement of Ko Hung suggests that the physiological techniques would greatly help to gain longevity when there were difficulties in mastering that proto-chemical alchemy which for him was the sovereign method of attaining immortality. This is perhaps the keynote of the first phase in the *wai-tan nei-tan* relationship. The *Pao Phu Tzu* book says:^d

The (nine-fold cyclically transformed cinnabar) elixir, and the potable gold, are by far the most important products in the mastery of the (art of the) immortals, but the procedures for making them are so elaborate and the expenses so heavy that it is hardly possible to carry them through to completion. This is why it is absolutely imperative to conserve the semen and to cherish the *chhi*; moreover by taking in addition certain lesser medicines and studying certain lesser techniques to ward off malign influences and other evils, one can also lengthen one's years and life-span. In this way one can gradually ascend to the comprehension of the subtlest matters.

It now only remains to say a few words about the veiling of the sexual techniques under the symbolism of proto-chemical alchemy. As a good example of this one could take the *Chin I Huan Tan Yin Chéng Thu*² (Illustrations and Evidential Signs of the Regenerative Enchymoma elaborated from the Metallous Fluid),^e a book by one Lung Mei Tzu³ (the Dragon-Eyebrow Master) which may perhaps be assigned to the + 12th-century. It opens with pictures of two robed figures (as in Fig. 1579 above), the male with a furnace (*lu*⁴) confronting the female with a reaction-vessel (*ting*⁵); they are of course the personifications of the *kua* Chhien and Khun, but for

^a The contrast of Huang Ti and ordinary people recurs in this literature again and again. See, for example, the *Lung Hu Huan Tan Chieh Sung*⁶ (Eulogy of the Instructions for Preparing the Regenerative Enchymoma of the Dragon and the Tiger), by Lin Ta-Ku⁷ (Ku Shen Tzu,⁸ the Valley-Spirit Master), *TT*1068, c. + 985, p. 18b.

^b *PPT/NP*, ch. 8, p. 2a, tr. Ware (5), p. 138.

^c *PPT/NP*, ch. 20, p. 2b, tr. Ware (5), p. 321.

^d *PPT/NP*, ch. 6, p. 3a, tr. auct., adjuv. Ware (5), p. 112.

^e *TT*148.

¹ 古強

⁶ 龍虎還丹訣頌

⁴ 金液還丹印證圖

⁷ 林太古

¹ 龍眉子

⁸ 谷神子

⁴ 爐

⁵ 鼎

三第圖證印丹還液金



Fig. 1610. The *matrimonium alchymicum* in the *Chün I Huan Tan Yin Chêng Thu* (Illustrations and Evidential Signs of the Regenerative Enchymoma elaborated from the Metallous Fluid) by Lung Mei Tzu, probably of the + 12th century (p. 3a,b). Masculine Chhien with his furnace confronts feminine Khun with her reaction-vessel. The passage headed *Ting chi* gives what appear to be dimensions for the reaction-vessel but what are really numerological magical numbers connected with the *I Ching* and the timing of the immortality exercises.

those who know, the body of the girl is the reaction-vessel and that of the man the stove (see Fig. 1610). Beside it the text says:^a

All the documents about transforming elixirs relate to the reaction-vessel and the furnace, but these are essentially nothing but the *kua* Khun and Chhien. The reaction-vessel is round like the hempen patch of a mourning garment, as 5 to 3 in circumference and diameter, as 1 around the lips (in darkness), as 4 to 8 in belly and navel. As for disclosing the (nature of the) lead in the reaction-vessel, if you wish to judge of it, it is necessary to fix the Yang fire so that it plays underneath, but it must not be allowed to spread so that it attains the intensity of human passion. This is to show the practitioner under instruction where he must stop. This decision is called the Mysterious Axis (*hsüan shu*).¹

Here what seem to be the dimensions of a material piece of apparatus are really numerological numbers drawn from the *I Ching* (Book of Changes).^b The fire is of course the masculine ardour, and 'knowing where to stop' indicates the skilful management of the *coitus thesauratus* procedure. Further on, the text becomes, in a sense, still more alchemical.^c

^a P. 3b, tr. auct.

^b There are obvious echoes from the *wai tan* passages quoted in pt. 4, pp. 16 ff. .

^c P. 4b, tr. auct.

¹ 玄樞

Lead [it says] comes from white metal, mercury from cinnabar. The (ordinary) alchemists find it easy to take hold of these things, and go to and fro boasting like generals that these chemical substances are the true medicines. Yet one must winnow the wheat and the barley to look out for the long hemp (weeds). Within the *kua* Khan there is the red-yellow boy whose name is Ancestor of Mercury. Within the *kua* Li there is the mysterious girl who belongs to the Family of Lead. He who can distinguish the true from the false will know that the product of the 'true lead' looks like 'horse teeth'.

Here there is evident reference to the physiological lead and mercury of the semen and the saliva, as also to the central lines within the *kua*, and the 'horse teeth' is a cover-name for 'yellow sprouts', i.e. the bright metal of lead within the oxide layer, the Yang within the Yin. Near by there is a picture (Fig. 1611) of the reaction-vessel smoking away on its altar-steps capped by the usual Taoist sword, with Yin and Yang in the shapes of toad and phoenix.^a Particularly interesting for the background of every type of exercise in physiological alchemy is another illustration (Fig. 1612) where we see a small hall or pavilion for the practitioners, having in front of it a platform-altar with two swords and a polyvascular clepsydra for timing the procedures.^b The text says:^c

Rules and arrangements.

The altar is built with three steps corresponding to Heaven, Earth and Man. The Nine Palaces (of the body) and the Eight Trigrams give out their orders. The mirrors are hung up above and below to drive away evil influences. The swords are placed at the corners to suppress all ghosts and demons. With the Pace of Yü you ascend at the proper time the three enclosures.^d The sign of the Great Bear points the way for all the diabolic spirits (to depart). (You must pay attention to) the dripping of the clepsydra without the slightest mistake. Then before long your exercises will conquer (the effects of the passage of) ten thousand springs (and autumns).

In such surroundings, then, we may set the meditations, the respiratory exercises, the gymnastic techniques, the sexual unions, the prayers and orisons.^e

Another connection between sexology and *wai tan* alchemy may be traced in a text entitled *Chin Hua Yü Nü Shuo Tan Ching*¹ (What the Jade Girl of the Golden Flower said about Elixirs and Enchymomas).^f The date of this is very uncertain but it must be either Wu Tai or Sung. Its interest lies in the fact that it takes the form of a dialogue between a Taoist demiurge, Thai Chi Yuan Chen Ti² (the Supreme-Pole Ruler of the Primary Vitalities) and our old friend the Mysterious Girl (Hsüan Nü³). It deals with *nei tan* physiological alchemy but with much *wai tan* imagery,

^a Pp. 5b, 6a.

^b P. 7a. On the clepsydra see Vol. 3, Fig. 140. The polyvascular system was well established in the +7th-century, but the form here is very like others which date from the middle of the +12th-century, and this may be an indication of the time when the book was written.

^c P. 7b, tr. auct.

^d This was a special dance step; see Granet (1), vol. 2, pp. 549 ff.

^e And, for that matter, also, the operations of laboratory alchemy. Compare the scroll-painting of Ko Hung at work (Fig. 1613), taken from Sung Ta-Jen (6).

^f In YCCC, ch. 64, pp. 1 aff.

¹ 金華玉女說丹經

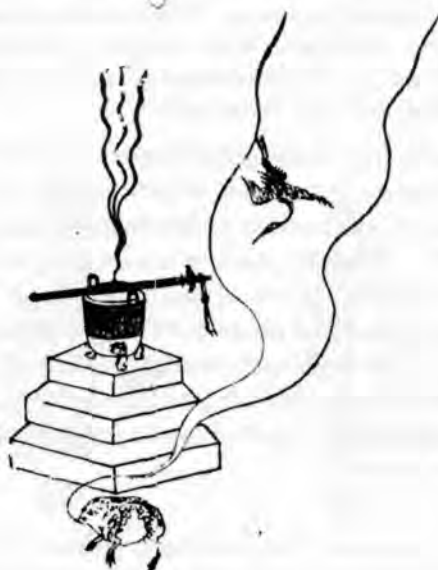
² 太極元真帝

³ 玄女

第六圖 證印丹還液金

夜半霞光北海明金丹一粒慶圓成不因采
取知玄妙枉使飛騰入太清鶴翅每隨霜色
勁蟾酥多逐月華生憑佗氣類潛通感運劍
追來掌上擎

采取



先天一炁號真鉛莫信迷徒妄指傳萬化滋
張綠睽兆一靈飛走賴拘鈴有形生質皆非
正無質生形始是玄寄語道流勤學取用鉛
莫錯認凡鉛

真土 即真鉛黃芽

湖六

七

Fig. 1611. Another picture from the same work (p. 6a, b). The preparation of the enchymoma in the living bodies symbolised by the smoking furnace and reaction-vessel accompanied by sword and platform; the crane of immortality flies away as an emanation from the moon-toad (cf. Fig. 1565). The passage on the left relates to this.

speaking of mercury and lead, cinnabar, furnaces and vessels; and it was probably expurgated later as there is little or nothing about the *huan ching* procedure in it now.

Finally we may quote a short passage from the *Chin Tan Chen Chuan*¹ (Record of the Primary Vitalities regained by the Metallous Enchymoma), written by Sun Ju-Chung² in +1615. This seems to show that by the end of the Ming the ancient theory based on the amalgamation of lead and mercury was being applied not only to saliva and semen, but to the masculine semen on the one hand, and to the feminine *chen Yang chhi* and fluids on the other. The preface says:^a

My endowment as a man has a Yin within its Yang; this is *Li kua* and mercury. Unless I can obtain the true lead from someone else, and (conduct it) counter-current-wise to join the (true) mercury, how can the holy embryo be generated which gives rise to immortals and bodhisattvas? Similarly in the endowment of someone else there is a Yang within her Yin; this is *Khan kua* and lead. Unless she can obtain my true mercury flowing in normal current, and throw it into her (true) lead, how can the ordinary foetus be formed which gives rise to boy and girl children? Thus following the normal current leads to more human

^a P. 1a, tr. auct.

¹ 金丹真傳

² 孫汝忠

圖證印丹還液金

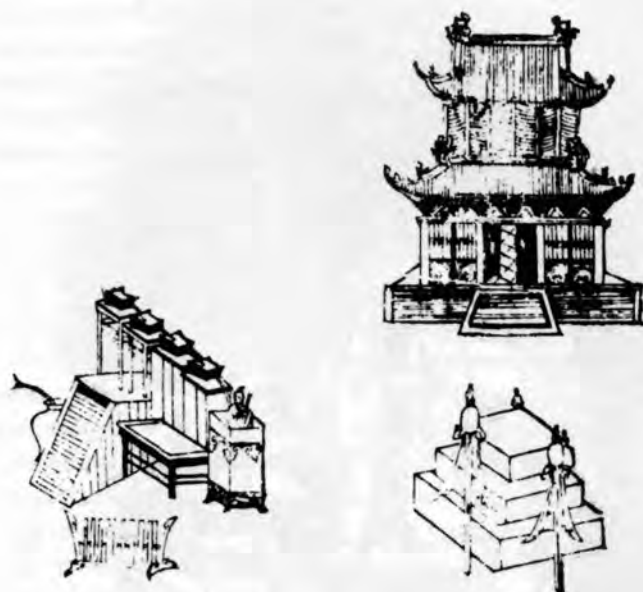


Fig. 1612. A third illustration from the same work (p. 7a); the scene of the *nei tan* practices. Behind, a pavilion suitable for their performance; in front an alchemical platform flanked by Taoist swords; to the left a polyvascular clepsydra (cf. Vol. 3, p. 323) with a monastic figure holding the indicator-rod, used for timing the procedures.

beings, but going counter-current leads to the enchymoma—that is the teaching to remember. The elixir manuals speak very often about this enchymoma.^a

To obtain it by bedcraft is not a matter of ordinary sexual life, choosing (positions for the flowery) 'battle', and so forth; that goes on in every family. It is not however to be found in one's own body alone; the profit of the method comes from the reaction-vessel (the woman's body). . .^b This is the orthodox teaching, not merely what my own teacher taught me.

This is partly pure theory, and partly a practice which every couple could follow,^c

^a An indication that what seems *wai tan* is very often *nei tan*.

^b Cf. the role of 'self' and 'other' in the theory of the enchymoma (pp. 60, 95 above, and Table 121 c).

^c In the Ming, sexual alchemy was no longer confined to remote temples in the mountain mists. Democratized, it spread among the people. Cf. the remark of Dr Kuo Pên-Tao which I recorded in Vol. 2, p. 147.



Fig. 1613. A scroll-painting of Ko Hung's alchemical laboratory in a cave, similar to that published by Sung Ta-Jen (6), p. 8; to show the similarity between *wai tan* and *nei tan* operations. The *famulus* is tending the platform-stove, on which a reaction-vessel is flaming away, the sword and the mirror are prominent, with talismans (*fu*) hanging on the wall, and below on the right is a digester similar to that shown in Vol. 5, pt. 4, Fig. 1388. There is a still on the left, and a tame deer looks in at the entrance. Photo. Dr Sung Ta-Jen.

though it is not clear with what benefit to the feminine side.^a And here for the moment we may end our exposé of the sexual component in physiological alchemy.

Before leaving this subject it is indispensable to place it in some adequate perspective. All the other Taoist methods for inducing longevity and material immortality by means of psychological alchemy could be carried on in solitude by isolated hermits, but once sexual relationships entered into the picture the whole human

^a Only slightly distorted, the account could be applied to masturbation.

community came with them. The adept could no longer be a world unto himself. Moreover in the greatest days of religious Taoism there had been an incorporation of the physical phenomena of sex in numinous group catharsis, free alike from asceticism and class distinctions.^a The collaboration of men and women through the ages in the formation (as they thought) of a 'holy embryo of eternal life' within themselves, rather than in the generation of children 'according to the flesh', meant the exploration of a dimension of human love not easily comprehensible for those brought up, as Westerners are, in a society nominally Christian yet deeply Manichaean. Simply to recall that Taoist sexual unions were accompanied by incense and prayers to the gods and the holy immortals is in itself sufficient to indicate the gulf that separates the Taoist from the European sexuality, a transaction which can never quite escape the feeling of impiety that centuries of ideal 'chastity' and asceticism have imposed upon it. Taoist sexuality was neither sensual nor guilt-ridden, neither antinomian nor irreligious; for Taoism as for Tantrism the operations of physical love were a powerful aid to the mystical apprehension of the divine power within the universe—'one Yang and one Yin together make the Tao'.^b They were a natural amplification of the meditational and other exercises, a further form, as it were, of the contemplative life, though also in China a technical procedure of preparing the 'elixir within', the anablastemic enchymoma, for which no other process could substitute. The conviction that the attainment of health and longevity needed the cooperation of the sexes was an admirable doctrine. But as Watts has well said:^c 'Relationships of this kind cannot adequately be discussed, as in (modern) manuals of "sexual hygiene", as a matter of techniques. It is true that in Taoism and Tantric Buddhism there are what appear to be techniques or "practices" of sexual relationship, but these are, like sacraments, "the outward and visible signs of an inward and spiritual grace"'. No worse mistake could be made than to suppose that the medieval Taoist men and women practitioners were engaged in loveless sexual activity of a coldly mechanical character—in various ways, as we have seen, they 'played it cool', but there was 'fire down below'. And again, relationships of this kind cannot be discussed without reference to the whole background of Taoist philosophy,^d the recognition of the importance of women in the scheme of things,^e the acceptance of the equality of Yin and Yang, of women with men, the considered admiration for certain feminine psychological characteristics,^f the exaltation of community and aggregation as opposed to division and class separation.^g We must reiterate what was said at an earlier stage:^h though the physiology of the Taoists may have been primitive and fanciful, they had a far more

^a See Vol. 2, p. 150, and the preceding pages.

^b *I Ching*, Hsi Tzhu (Ta Chuan), 1, ch. 5 (ch. 2, p. 35*a*); Wilhelm-Baynes tr., vol. 1, p. 319.

^c (2), p. 174. His whole book, especially the part which seeks to interpret Taoist and Tantric sexuality in a way valuable to men and women in the Western world at the present time, is well worth reading.

^d See Sect. 10 in Vol. 2.

^e Stemming originally perhaps from the *wu* priestesses of high antiquity, as also the matriarchal background of ancient society.

^f Cf. Vol. 2, pp. 57 ff., 61 ff.

^g Cf. Vol. 2, pp. 86 ff., 100 ff. And this is still seen down to the present day in the liturgical Taoism of unmodernised Chinese villages.

^h Vol. 2, p. 152.

adequate attitude to the male, the female and the cosmic background than the paternal-repressive austerity of conventional Confucianism, so typical of feudal property ownership, or the chilling other-worldliness of classical Buddhism, for which sex was no natural or beautiful thing, but only a device of Māra the Tempter.

(5) THE BORDERLINE BETWEEN PROTO-CHEMICAL (*WAI TAN*) AND
PHYSIOLOGICAL (*NEI TAN*) ALCHEMY

The ending of this study of the *nei tan* complex now draws near. But we have yet to consider four things, the borderline between physiological and proto-chemical alchemy, the persistence of the former into modern, even contemporary, times, the problem of its relation with Indian yoga, and finally the meaning of the whole affair for the history of scientific thought in general. Let us examine then first the overlap between *nei tan* and *wai tan* activities, the problems of differentiating their texts, the explanations of physiological reality in terms of chemical imagery, the conscious and designed use of parable and metaphor, and the supersession of proto-chemical operations as time went on by the more fashionable physiological practices.

There can be no doubt that for many centuries, one might perhaps say from the - 3rd to the + 13th, the great majority of alchemists engaged in both spheres of work, the oratory no less than the laboratory—widely different though the prayers and practices were from those of Christendom. From Ko Hung we know (p. 209) that in his time the physiological techniques were ancillary to the proto-chemical, just granting longevity out of the ordinary so that the adept could master the Great Work and achieve immortality by it. For other alchemists at various times, the *nei* and the *wai* must have been thought of rather as complementary, both being needed for the achievement of material immortality. Of this we have seen some hints in the quotations here given. There is a curious parallel between Chinese and Western alchemy in that moral and religious perfections were often enjoined upon both the Taoist^a and the Christian practitioner.^b The Byzantine alchemist Archelaos, writing about + 715, said in his poem 'On the Sacred Art':^c

The work which thou expectest to perform
Will bring thee easily great joy and gain
If soul and body thou dost beautify
With chasteness, fasts and purity of mind,
Avoiding life's distractions, and alone
In prayerful service giving praise to God,
Entreating him with supplicating hands
To grant thee grace and knowledge from above
That thou, O mystic, may'st more quickly know
How from one species to complete this work. . .

^a See pp. 29, 61, 65, 100, 130ff., 135, 189, 205.

^b Perhaps the oldest European document of this kind is pre-Christian, the text in *Corpus Alchem. Gv.* I, xiv; attributed by Cedrenus to Pseudo-Democritus (cf. pt. 4, p. 325). The language, however, seems more Byzantine in character, suggesting the + 5th-century. Similar passages are found in the Jābirian corpus (cf. pt. 4, pp. 396-7, 477-8). See also Berthelot (1), pp. 119, 160, 206.

^c Tr. Browne (1), cit. Holmyard (1), p. 153.

Similarly, a +15th-century neophyte was made to swear that like the Chinese *chen jen*¹ he would never commit to writing the secret which he would be taught, nor should he pass it on to any man save that he knew him to be of good life.

Nor teach yet to no man except thou be sure
That he is a perfect man to God, and also full of charitie,
Doing alle waies good deede, and that he be full of humilitie. . .

And a third text of the same period says that the adept should trust fully in God, lead a rightful life, subdue falsehood, be patient and not ambitious, and take part in no sinful strife.^a At an earlier point, too, we quoted Ben Jonson's 'Alchemist' to the effect that though the purchaser of an elixir might promise himself unlimited sexual pleasures, the operator himself must be ascetically chaste, otherwise the chemical experiments would explode in confusion (as in fact in the play they do, if only as part of a stratagem which assumes these beliefs).^b Of course the parallel cannot be pushed very far because the Christian alchemist was vowed to a religious continence while the Taoist alchemist was religiously physiological,^c yet at the same time part of a civilisation permeated through and through by a numinous non-supernatural ethic to which he certainly responded, albeit the Taoist system of 'inner light' spontaneity was rather different from the prevailing Confucian code. Obviously the Taoist and the Frankish conceptions of morality were poles apart, yet the resemblance is there in that in both cases where laboratory operations were concerned the 'unworthiness of the minister' was indeed believed to 'hinder the effects of the sacrament'. As the old phrase went, *nei tan pu chheng, wai tan pu chiu*,² 'if the enchymoma is not achieved, the elixir will never be accomplished'.^d

Now for parable and metaphor.^e There are many clear statements in the old Chinese literature that chemical imagery was used to refer to physiological reality. Its terms were used in simile, parable or illustration (*phi yü*,³ mod. *pi yü*⁴), in metaphor, allegory and fable (*yü yen*⁵).^f Take for example the *Chin Tan Chih Chih*⁶ (Straightforward Explanation of the Metallous Enchymoma), a book of the Sung period, probably +12th-century, by Chou Wu-So,⁷ a *nei tan* alchemist of whom otherwise little is known.^g 'The "furnace" and the "reaction-vessel" are just meta-

^a These examples are cited by Holmyard (1), p. 154.

^b Pt. 3, pp. 214-5 above.

^c Although we have had no room to say much about them, it must be remembered that all the Taoist practices were hedged about with a maze of prohibitions and rubrics, connected with a complex hemerological calendar, and even the state of the weather. This mattered because it was so important to be in tune with Nature. There were also detailed rules about ritual purity and cleanliness. And all the temples had important charitable aspects, especially as so many Taoists practised medicine.

^d *San-Fêng Chen Jen Hsüan Than Chhüan Chi* (cf. p. 240 below), p. 9b, early +15th-century, if the text is genuine. It is true that in this case the writer was using the terms *nei* and *wai* in a rather special sense, that of p. 42; but similar phrases are often found.

^e Luke viii, 4 - is very Taoist. 'Unto you it is given to know the mysteries of the Kingdom of God; but to others in parables, that seeing they might not see, and hearing they might not understand.'

^f On symbolism in general, and its varieties, see the interesting if preliminary paper of Sheppard (3).

^g *TT1058*, quoted at some length by Chhen Kuo-Fu (1), vol. 2, pp. 447ff. Chou Wu-So's book is not to be confused with another of the same title and similar date prefaced by the words *Chih-Chou hsien-sêng*⁸ (the Paper-Boat Teacher), *TT239*, the author being Chin Yüeh-Yen.⁹

¹ 真人

² 内丹不成外丹不就

³ 譬喻

⁴ 比語

⁵ 寓言

⁶ 金丹直指

⁷ 周無所

⁸ 紙舟先生

⁹ 金月巖

phors for the human body (*lu ting i shen pi chê*¹). And 'the "chemicals" are but a parable for the precious substances within the body's organs (lit. heart), (*yao wu i hsin chung chih pao yü chih*²). These precious substances were numbered as seven, secretions (*chin*³), juices (*shui*⁴), saliva (*thuo*⁵), blood (*hsüeh*⁶), and of course the three great vitalities, *shen*⁷, *chhi*⁸ and *ching*,⁹ mentality, pneuma and seminality. Chou Wu-So goes on to tell us that 'as for the technique of "fire-times" (*huo hou fa*¹⁰), and intensities (*tu*¹¹) and that sort of terminology, it all refers to the periods of activity and repose (*tung ching*,¹² in the exercises of physiological alchemy), but people do not understand the inwardness of such ideas, therefore there is this veiled language (*yü*¹³). And again: "'fabricating the embryo" (*chieh thai*¹⁴), and "doffing the bodily form" (*tho thi*¹⁵); these are metaphors (*phi*¹⁶) for what far exceeds the vulgar ideas of how one becomes a sage.'

Nei tan treatises are even liable to be illustrated with *wai tan* pictures, for example furnaces. An instance of this is the *Hsiu Chen Li Yen Chhao Thu*¹⁷ (Transmitted Diagrams illustrating Tried and Tested Methods of Regenerating the Primary Vitalities).^a No author's name is attached to this in the *Tao Tsang*, but the version in the *Yün Chi Chhi Chhien*, which bears a slightly different title, is attributed to Tung Chen Tzu¹⁸ (the Understanding-the-Truth (or the Primary Vitalities) Master), who must have written some time before +1020, probably in Thang, Wu Tai or early Sung.^b Here we have an illustration of two furnaces (Fig. 1614) surmounted by an inscription. Each of the stoves bears a hexagram, and two more are placed beside the wording. Between the apparatus are three bowls, that on the left marked 'mercury' (true, of course), that on the right, true 'lead', and that in the middle, the enchymoma. The significance of the reaction to be accomplished is obvious. The *kua* on the left-hand furnace is no. 12, Phi,¹⁹ signifying autumn and retrogression, that on the right-hand one is no. 11, Thai,²⁰ signifying upward progress; hence the failure or success of the operations.^c Of the two *kua* at the top near the inscription, that on the left is no. 13, Thung Jen,²¹ i.e. people together, the state of union and community; that on the right is no. 41, Sun,²² which stands for spoiling, subtraction, diminution, hence disaggregation.^d Thus these two represent the forces which have to be taken advantage of and overcome respectively in the uniting of the

^a TT149.

^b YCCC, ch. 72, pp. 17bff. A similar text, the *Ta Huan Tan Chhi Pi Thu*²³ (Esoteric Illustrations of the Concordance of the Great Regenerative Enchymoma), by some unknown author, in YCCC, ch. 72, pp. 1 aff., also contains illustrations of furnaces and reaction-vessels, though clearly *nei tan*, and indeed labelled so at the opening of the chapter.

^c For the explanation of this see p. 63 above.

^d Further on these see Table 14 in Vol. 2. In the YCCC version, the two *kua* on the furnaces are replaced by (left) no. 54, Kuei Mei²⁴ standing for union as in marriage, and (right) no. 63, Chi Chi²⁵ standing for consummation or perfect order. This last *kua* has a close connection with the sexological literature, where it appears in book titles, cf. van Gulik (8), pp. 36, 277ff. Here both obviously refer to the enchymoma. But as we saw in pt. 4, pp. 70ff. Chi Chi is also important in connection with various forms of *wai tan* chemical apparatus.

¹ 爐鼎以身譬者	² 藥物以心中之寶喻之	³ 津	⁴ 水	⁵ 唾
⁶ 血	⁷ 神	⁸ 氣	⁹ 精	¹⁰ 火候法
¹¹ 度	¹² 動靜	¹³ 喻	¹⁴ 結胎	¹⁵ 脫體
¹⁶ 譬	¹⁷ 修真歷驗鈔圖	¹⁸ 洞真子	¹⁹ 否	²⁰ 泰
²¹ 同人	²² 損	²³ 大還丹契秘圖	²⁴ 歸妹	²⁵ 既濟

五第



Fig. 1614. The furnaces and hexagrams in the *Hsiu Chen Li Yen Chhao Thu* ('Transmitted Diagrams illustrating Tried and Tested Methods of Regenerating the Primary Vitalities'), attributed to Tung Chen Tzu, and written probably in the 10th century, in late Thang, Wu Tai or early Sung. For explanation see text.

sexes and the grand synthesis of the anablastemic enchymoma. What the inscription says is as follows:

The two reaction-vessels are equally light pink,
 The red furnace-openings have the same colour;
 The enchymoma of (true) mercury and lead
 Must form by a process like that of dyeing.^a

And finally the caption to the whole says: 'Diagram of the Collection of True Lead and Mercury.' The symbolism here is all of intercourse and union, yet the interaction envisaged is biochemical rather than mystical. The accompanying text is curious, and runs as follows:^b

^a The caption in the *YCCC* version (p. 21b) is considerably longer, but tells us nothing new. ^b P. 4b, tr. auct.

Lead is the fountain of the mysterious origin (of the primary vitalities). This fountain is the source of the element Water. Men can only see the spring water running through the grottoes of stone,^a but none know its fountain-source nor whither it goes. It is like the primary *chhi* which generates and rears the myriad things, completing and ripening them, but no man can see the path of the primary *chhi* nor whence it comes. Therefore the Manuals of the Tao say that it is minute, mysterious, unsearchable in its depth, and unknowable. But although it is undetectable there are ways of forcing it to appear, which is why it is called the Formless Form.

The wheel of the heavens turns to the left, while the sun, moon and five planets always move to the right. The fiery lead (true Yang) symbolises the sun's redness, mercury (true Yin) symbolises the moon. The moon moves quickly at a speed of 13° in one day and night; the sun more slowly, making 1° in a day and a night. The moon makes one revolution in a lunation, and the sun makes one in a year. In twelve months the year is completed. So also the generation and transformation of the myriad things necessarily follows a cycle of twelve *kua* (hexagrams), returning to the starting-point cycle after cycle. When the ninefold regeneration (or circulation) of the *chhi* has been sufficiently (perfected), then the 'lead', the 'mercury' and the *shen*¹ are all present, and thus the enchymoma is attained. Hence the Manuals say that just as the sun and moon have their retardations and accelerations, so also medicinal substances have their caustic and their bland qualities. As a (mnemonic) rhyme has it: 'Slow for the sun, fast for the moon, why so much fuss and chatter about these distinctions?'

True lead originates from fire and is the ancestor of the *ching*.² True mercury likes to fly up (i.e. sublime or distil), yet abides within the red blood. The semen of a man and the blood of a woman mutually embrace (and intermingle); the blood gives rise to the (red) flesh, and the semen produces the (white) bones.^b All these happenings arise from good match-making and marriages, and happiness in the bearing of children results.

What is (true) mercury? It is the effulgence of the infinite origin, and the ancestor of the myriad things. The ancestor of mercury is the red dragon (*chhih lung*³). The red dragon is cinnabar (*tan sha*⁴), but this is not common cinnabar; it is the Flowing Fluid of the Great Mystery (*tai hsüan liu i*⁵), which the primary *chhi* has prepared during a period of 2160 years.^c And it is called the Vital Enchymoma of Emptiness and Nothingness (*hsü wu chen tai*⁶).^d

Here we have an excursion into astronomy to illustrate the ever-recurring cycles of Nature governed by the *kua*, and an unusual parallel with the properties of drugs. The implicit thought is that by not following the normal procedures of generation which lead to children and grandchildren, men and women can make their bodies into alchemical furnaces and prepare an enchymoma which will free them from bondage to the cycles of life and death in the natural order.^e

^a Probably a reference to the swallowing of saliva.

^b Again the Aristotelian theory of embryogenesis.

^c Echo of the famous *Huai Nan Tzu* passage; see Vol. 3, pp. 640-1, Vol. 5, pt. 4, pp. 224-5. One is reminded of the theory of the *tria prima* in the West, mercury being one of the constituents of everything.

^d I.e. of all things in *potentia*. On the fundamental idea of nothingness as infinite immanent potentiality, both in Taoism and Buddhism, see Link (1); Holmes Welch (3).

^e This was of course a far cry from the Taoist philosophy of old which advocated ataraxy and submission to the natural cycles; cf. Vol. 2, pp. 63 ff., 75 ff.

¹ 神

² 精

³ 赤龍

⁴ 丹砂

⁵ 太玄流液

⁶ 虛無真丹

In all this literature there are many places where one can find fairly clear explanations of what the proto-chemical symbolism meant in *nei tan* usage. Help can be gained, for instance, from a group of tractates in the *Tao Tsang* which starts with the *Chin Tan Fu*¹ (Rhapsodical Ode on the Metallous Enchymoma),^a written probably in the +13th-century, with a commentary by Ma Li-Chao.² The *Nei Tan Fu*³ (Ode on the Physiological Enchymoma), written in the same century towards the end of the Sung by Thao Chih,⁴ is a similar quarry,^b as also the accompanying anonymous *Chhin Hsüan Fu*⁵ (Ode on Grappling with the Mystery).^c Further light can be had from the *Chung Lü Chhuan Tao Chi*⁶ already mentioned (Dialogue between Chung-li Chhüan and Lü Tung-Pin on the Transmission of the Tao),^d a work of the +8th or +9th-century edited by Shih Chien-Wu;⁷ and the wonderful catechism in the *Chin Tan Ta Chhêng*⁸ of Hsiao Thing-Chih,⁹ written just before +1250, must always be remembered. In this connection, an interesting passage is to be found in Chhen Chih-Hsü's¹⁰ *Chin Tan Ta Yao*¹¹ dating from +1332. Here he wrote:^e

My teacher said: 'The sages were apprehensive of divulging the secrets of the mechanism of Nature. The Taoists, conscious of the mystery of things, take the Emptiness (i.e. the all-embracing totipotence) of the Primary (Vitalities) (*chen khung*¹²) as their basic principle, but borrow many parables and metaphors (*chieh yü*¹³) of the following kind:

<i>chu sha</i> ¹⁴	(red sand—cinnabar)
<i>shui yin</i> ¹⁵	(water-silver—mercury)
<i>hung chhien</i> ¹⁶	(red lead—a hormone preparation from blood) ^f
<i>hei hung</i> ¹⁷	(black mercury)
<i>chha nü</i> ¹⁸	(elegant girl—mercury—true mercury, semen)
<i>ying erh</i> ¹⁹	(baby boy—enchymoma)
<i>Ting Kung</i> ²⁰	(the Venerable Ting—cyclical sign)
<i>Huang Pho</i> ²¹	(the Yellow Dame—central site of enchymoma formation—one of the <i>hsiang</i>)
<i>huang ya</i> ²²	(yellow sprouts—unoxidised bright lead or tin—the incipient central enchymoma)
<i>pai hsüeh</i> ²³	(white snow—white powder—the radiance of the enchymoma)

These come near to expressing the facts, yet serve to bewilder (ordinary) people, draw them into utter confusion, and keep them guessing. Even scholars follow the appearance rather than the reality, and think they have understood it. Accordingly they believe that the *chin tan*²⁴ (gold elixir) is some common external medicine (*wai yao*²⁵), impeded by form, dross and brute matter, gained by searching and struggling amidst filthy (soot). In the end they never achieve any realisation of the mysterious (effect) of the Emptiness of the Primary (Vitalities)—(a metallous enchymoma prepared within the body itself)'.^f

^a *TT*258, esp. pp. 17bff., 23b.

^b *TT*257.

^c *TTCY* ed., ch. 1, p. 28b.

^d *TT*256.

^e In *HCSS* (*TT*260), chs. 14–16 incl.

^f See Sect. 43 in Vol. 6.

¹ 金丹賦

² 馬蒞昭

³ 內丹賦

⁴ 陶植

⁵ 擒玄賦

⁶ 鍾呂傳道集

⁷ 施肩吾

⁸ 金丹大成

⁹ 蕭廷芝

¹⁰ 陳致虛

¹¹ 金丹大要

¹² 真空

¹³ 借喻

¹⁴ 朱砂

¹⁵ 水銀

¹⁶ 紅鉛

¹⁷ 黑汞

¹⁸ 姦女

¹⁹ 嬰兒

²⁰ 丁公

²¹ 黃婆

²² 黃芽

²³ 白雪

²⁴ 金丹

²⁵ 外藥

And he then goes on, as was appropriate in his time, to make a similar set of parallels with Buddhist technical terms. One notices also already in this passage a hint of the disdain which the *nei tan* practitioners were beginning to feel for the 'sooty empiricks' of the *wai tan* laboratory, and this is a note which we shall hear again shortly. Similar phraseology may be found in the *Huan Tan Nei Hsiang Chin Yo Shih*¹ (A Golden Key to the Physiological Aspects of the Regenerative Enchymoma),² due to Phêng Hsiao² about +950. Someone asked a question about the metal lead.

In answer it was said: 'This black lead is nothing to do with ordinary (lead); it is the divine water of the heavenly mystery,³ it was generated before the appearance of heaven and earth (i.e. the cognisance of them by the individual human organism), it was the mother of the mass of things (in the body) and the essence (*ching*)⁴ of the primary unitary (vitality)'.⁵

In other words it was something in the body inherent in the original endowment of the embryo, and something which could help a man to regain by rejuvenation that endowment.

Much help in the interpretation of the forest of *nei tan* technical terms can also be obtained from books of later date, always remembering that the practical techniques which their writers actually used and recommended differed as the centuries went by, and also according to the various schools to which they themselves belonged. Among such treatises of the late Ming and Chhing periods we may mention the *Liao Yang Tien Wên Ta Pien*⁶ (Questions and Answers of the Liao-Yang Hall), attributed to an Adept Yin (Yin chen jen⁷) and probably of the early +17th-century, later edited by Min I-Tê⁸ about 1830. The same adept is also the putative author of a much larger book, *Hsing Ming Kuei Chih*⁹ (A Pointer to the Meaning of Human Nature and the Life-Span), several illustrations from which have already been given (Figs. 1546, 1548, 1554, 1574, 1609), and which we shall refer to again presently. This was first printed in +1615 and again in +1670.

Here we cannot but pause to wonder why it was that this one-sided situation arose. Why did the physiological techniques tend to be veiled under the proto-chemical terminology and not *vice versa*? One could imagine that a system of physiological, anatomical and medical terminology might have grown up first, and then found application to the compounds of metals and minerals which the alchemists prepared in their search for the elixir of life. We suppose the only possible answer is that the proto-chemical alchemy was in fact the older proto-science of the two, springing directly from the most ancient metallurgy and other technical arts, just as the plant names descended from the most ancient wort-cunning of medical herbalists. Although there were always very close relations between the traditions of medicine and those of the alchemists,¹⁰ the former did not perhaps provide suf-

¹ In YCCC, ch. 70, pp. 1 aff.

² I.e. the *hsien thien chen i chih shui*,³ cf. Vol. 4, pt. 1, p. 296.

⁴ P. 2b, tr. auct.

⁵ There is a contrast here between the alchemists of China and the proto-chemists of Hellenistic Europe. Temkin (3) noted, in a penetrating paper, on which we also remark elsewhere (pt. 4, p. 475), that the Greek proto-chemists were much closer to metallurgy than to medicine, while in China, on the other hand, as we see all the time, the relations between alchemy and medicine were extremely close. This Arabic culture inherited.

⁶ 還丹內象金鑰匙

⁷ 彭曉

⁸ 精

⁹ 寧陽殿問答編

¹⁰ 尹真人

¹¹ 閱一得

¹² 性命圭旨

¹³ 先天眞一之水

ficient technical terms for the growing Chinese conviction that there was a specific chemistry of the human body, indeed an alchemy to be pursued within it, so that a borrowing necessarily had to take place (precisely as Chhen Chih-Hsü said), with so often the adjective *chen*,¹ 'true', prefixed to the name drawn from proto-chemical usage.² This of course did not prevent the gradual elaboration of many special *nei tan* terms, and indeed it is these more than anything else, perhaps, which enables the reader to spot a *nei tan* text and distinguish it from a *wai tan* one.

Next, another point is to be made—the growing tendency as the centuries went on to interpret ambiguous ancient texts in a *nei tan* rather than a *wai tan* manner. Between +713 and +755 Liu Chih-Ku² gave the first clear interpretation of the *Chou I Tshan Thung Chhi* (cf. pt. 3, pp. 50ff. above) as a *nei tan* text, and wrote on it an *Yih Yüeh Hsüan Shu Lun*³ (Discourse on the Mysterious Axis of the Sun and Moon, i.e. the Yang and Yin).⁴ Phêng Hsiao's book from which we have just quoted was in exactly the same tradition. By the second half of the +11th-century, with works such as the *Wu Chen Phien* (already analysed, pp. 88ff. above) there were monuments of alchemical literature which made no pretence of being *wai tan* in nature.⁵ From what we have said on this its meaning cannot be mistaken, but with the older texts double interpretations are still possible. For example, take the sentence in the *Tshan Thung Chhi: wu chin chih chu, pei fang ho chhê*.⁶ On the *wai tan* interpretation, one reads: 'the chief of the five metals is the "river chariot" of the north, i.e. lead', *ho chhê* being a familiar cover-name for the metal.⁷ But an anonymous *nei tan* commentator thus expounds it:⁸

During development in the womb, the father's semen (and the mother's blood) form the Five Viscera. Among these the Metal element (corresponding to) the reins is the chief. What is stored there is the Metal (of the semen), and its essence must be made to ascend (*fei*⁹) in a circulation by the 'river chariot'. What is the 'river chariot' (*ho chhê*)? It is the *chhi* which is carried from the north (i.e. the lower parts of the body) right up to the brain (*ni wan*¹⁰), (as in a water-raising machine).¹¹

It is interesting to find again here that common ambiguity between *chhê* as vehicle and *chhê* as machine.¹² For the raising of one of the components of the enchymoma up the spinal column, some physiological machinery was necessary, and the analogy here was with the square-pallet chain-pump (*fan chhê*¹³). In *wai tan* terminology lead was often referred to as the ancestor (*tsu*¹⁴) of the precious metals, partly of

^a The reader will of course recall (e.g. from pp. 26, 46 above) that *chen* was also universally understood in these fields to signify the primary vitalities of the human genetic endowment.

^b This is no longer extant, though there are quotations of it in the *Tao Shu*.

^c Though translators have of course unwarily taken them as such.

^d Ch. 7, p. 16a.

^e *Shih Yao Erh Ya*, ch. 1, p. 1a. This great glossary is itself a mixed text, *nei tan* terms being included along with the *wai tan* ones.

^f *TT991*, ch. 1, p. 15b.

^g Metal is connected with the reins and semen here instead of Water because it is the mother of Water in the Mutual Production Order. The following section in the text says just this. And the semen Metal is the 'true lead'; cf. *Chin Tan Ta Yao*, ch. 3, p. 12a,b. Lead and mercury can both correspond functionally to Water.

^h Noted in Vol. 4, pt. 2, p. 267 and other references *sub voce*.

¹ 眞

² 劉知古

³ 日月玄樞論

⁴ 五金之主北方河車

⁵ 飛

⁶ 河車

⁷ 泥丸

⁸ 翻車

⁹ 祖

course in line with the theory common to East and West that they developed in the earth from the ignoble ones, and partly no doubt because of the phenomena of cupellation and amalgamation.^a

Sometimes one finds in the literature texts which are inextricably mixed. A good example of this is the *Thai-Chhing Chin I Shen Tan Ching*¹ (Manual of the Potable Gold or Metallous Fluid and the Magical Elixir or Enchymoma; a Thai-Chhing Scripture).^b One has to translate its title in this ambiguous way, for it is both *nei* and *wai* in character. The preface and part of the first chapter are mostly *nei*, with much discussion of the respiratory techniques, but immediately following there is a section evidently *wai*,^c with references to alum, rock salt, arsenolite, and the compounding of the *liu i ni*² lute for sealing. A sacrificial rite intervenes,^d and then more chemical procedures, while the second chapter is rhyming and physiological once again. This is an ancient book, which must be at least in part pre-Liang, as it contains dates between +320 and +330, but most of the prose is probably of the early +5th-century; the chapters are variously attributed but the real writers unknown. The third chapter, which is devoted to descriptions of foreign countries which produced cinnabar and other chemical substances, may be of the first half of the +6th-century.^e A somewhat similar work is the *Tan Lun Chüeh Chih Hsin Chien*³ (Mental Mirror Reflecting the Essentials of Oral Instruction about the Discourses on the Elixir and the Enchymoma),^f written in the +9th-century by Chang Hsüan-Tê,⁴ who criticises the teachings of Ssuma Hsi-I.⁵ But this is certainly more *nei* than *wai*. In distinguishing between texts of the two kinds it is often convenient to see how many chemical substances are named, for the physiological ones always make great play with (true) lead and mercury, mentioning other metals and minerals more rarely. The *Tan Fang Ao Lun*⁶ (Subtle Discourse on the Alchemical Laboratory),^g written by Chhêng Liao-I⁷ in +1020 or thereabouts, might thus be considered more *wai* than *nei*, for it mentions many things such as sulphur, realgar, orpiment, magnetite, brown haematite, actinolite (asbestos tremolite), amber, cinnabar, and the like, not usually spoken of by the physiologists. This is a borderline text which deserves more attention than we have been able to give it, but it certainly has a strong *nei tan* tendency for it says much of *shou fa*⁸ (manual dexterity) and *huo hou*⁹ ('fire-times' as exercise times), averring that the 'ordinary elixir scholars of these days (*hou shih hsüeh tan chih shih*¹⁰)' have no understanding of such things;

^a E.g. *Chin Tan Ta Yao*, ch. 1, p. 30a.

^b TT873 and in YCCC, ch. 65, pp. 1 aff., but abridged and without the third chapter.

^c Pp. 6bff. in YCCC. A translation has been prepared by Ho Ping-Yü (10).

^d P. 10a in YCCC.

^e See Maspero (14), pp. 95 ff. (22); Stein (5). Most of the information was taken from Wan Chen's *Nan Chou I Wu Chih*, compiled in the +3rd-century, but not the part on the Roman Orient (*Ta Chhin*) which Maspero translated in full.

^f TT928, and in YCCC, ch. 66, pp. 1 aff.

^g TT913, and in TTCY.

¹ 太清金液神丹經

² 六一泥

³ 丹論訣旨心鑑

⁴ 張立德

⁵ 司馬希夷

⁶ 丹房輿論

⁷ 程了一

⁸ 手法

⁹ 火候

¹⁰ 後世學丹之士

and if it lists many of the proto-chemical reagents it is only to dismiss them as ineffective. Thus a further criterion is needed, and one may conclude that a text cannot be considered really in the *wai tan* tradition unless it gives concrete instructions for laboratory operations. Of course, as we have seen (pt. 3, pp. 199, 203 above) there are many that do. Chhêng Liao-I's elaboratory was surely the body, and his *tan* was an enchymoma. Nevertheless he shows also that he had worked at the bench, for he says:^a

The great thing in the preparation of precious (elixirs, or enchymomas) is the management of mercury. For this it is necessary to use the love of mother and child, and the desire for union of husband and wife. If this is lost sight of nothing can be done. So for example, sulphur is the husband of mercury, gold and silver are its mother. When it unites with sulphur it hardens (to mercuric sulphide), when it meets with gold and silver it solidifies (in amalgamation). This is respecting the principle of husband and wife, mother and child.

Here we are close to the basic analogy of human affections with chemical affinity and reaction.^b If space permitted, many further examples of chemical-seeming texts cloaking physiological ideas could be given from the Ming and Chhing literature, such as Li Wên-Chu's *Huang Pai Ching*² (Mirror of the Art of the Yellow and the White), written in +1598, or the *Lei Chen Chin Tan*³ (Earth-shaking Discovery of the Metallous Enchymoma) some time not long after +1420, or the romantically named *Huo Lien Ching*⁴ (Manual of the Lotus of Fire) which is very hard to date.^c

Let us now illustrate the growing hostility of the physiological towards the proto-chemical alchemists by a passage from the *Chhü I Shuo Tsuan*⁵ (Discussions on the Dispersal of Doubts), the book produced by Chhu Yung⁶ in the neighbourhood of +1230. The hostility is quite understandable. The proto-chemical alchemists had been treading the same weary round for a good many centuries, making few new fundamental discoveries, since no revolutionary system of scientific thought had come to help them build a modern science out of their empirical observations. Their elixirs had proved to be deadly poison time and again,^d while on the other hand, whatever might be thought of the detailed *nei tan* theories, the practices accompanying them were never harmful, and doubtless often contributed radically to the improvement of health and the prolongation of life. Furthermore, they were more genteel, less artisanal. And metallurgical operations always invited charlatanism, even though patronised by emperors. So a good scholar like Chhu Yung had no doubt where he stood. On an earlier occasion we read one of his diatribes against the metallurgical alchemists,^e modified only by the interest he felt in the natural wonder that small amounts of metals could be obtained from certain plants. Continuing, he wrote:^f

^a *TTCY* ed., p. 3b, tr. auct.

^c The title echoes an earlier saying (p. 92 above).

^e Pt. 3, pp. 206-7.

^b Cf. pt. 4, p. 321.

^d See Ho Ping-Yü & Needham (4).

^f Ch. 1, pp. 12b, 13a, tr. auct.

¹ 李文燭

² 黃白鏡

³ 雷震金丹

⁴ 火蓮經

⁵ 祛疑說纂

⁶ 儲祿

On Heating Gold and Transforming Silver.

The Taoists often talk about *chin tan*¹ (lit. gold and redness, or golden elixir, or metallous enchymoma), so most of those who study these matters make experiments in the 'Art of the Yellow and the White' (metallurgical and proto-chemical alchemy), forging, melting and transforming assiduously. But what they do not understand is that '*chin tan*' refers to the Yang of the primary (vitality) within human beings, which follows the mysterious principle of ascent.^a The Taoists use the word '*chin*' as a metaphor (*chieh yü*²) like the gold in the phrase 'incorruptible diamond body' (gold-precious hard undecaying body, *chin-kang pu huai shen*³) used by the Chhan Buddhists to refer to beings without birth or dissolution, having bodies ever-persisting and immune from deliquescence.^b Again, the word '*tan*' (is but a metaphor) referring to the *kua* Chhien,⁴ which symbolises the great ruddiness (of the sun), and pure Yang. For this reason the *kua*-element combination Chhien *chin*^c is called '*tan*' (enchymoma). So the phrase '*chin tan*' by no means only refers to the Art of the Yellow and the White.

This Art (was one of elixir-making) elaborated and used by the holy immortals to help scholars who were content to be poor and who took their delight in the Tao (of Nature); but nowadays the aim of those who practise the Art is to satisfy by aurifaction their greedy desire for gain. How could Taoists be willing to teach their techniques to such people? Even if they could manage to come by the skill and make ten thousand ounces (of gold), what would it profit them in relation to the really great matters of life and death? Besides, the true methods (of aurifaction) are very difficult to find out, so that enthusiasts fall a prey to fraudulent profit-seeking charlatans, even to the extent of ruining entire families. They do not stop to think that if these people really had the true techniques they could become rich themselves, and all they would fear would be that others would discover them. Why should they have to make their livings by teaching aurifaction to others? So in general no pure and high-minded scholar could devote himself to the Art of the Yellow and the White. How could it ever suffice for the study of the Tao?

Thus once again we have the affirmation that there was an esoteric physiological meaning to much in the manuals of the alchemists, and that instead of working away in the laboratory they would be better advised to follow the reality rather than the symbol, going over to the practice of the physiological macrobiotic techniques. That was where real enrichment and peace would be found.

As one becomes familiar with the *nei tan* literature, a certain romantic quality in it impresses more and more. Its basic ideas seemed to lend themselves naturally to poetic expression. We have already encountered a few examples of this, and may now add one or two more in words to which Chhu Yung would have assented warmly. About a century later Chhen Chih-Hsü wrote in his *Chin Tan Ta Yao*:

It isn't a matter of copper or iron, nor yet of any metal,
There's no need to borrow a furnace and make an ordinary fire;
With the sword of one's own endowment,
and the flesh and bone of Heaven's gift
One must know exactly what can kill
and what can be the giver of life.^d

^a Doubtless a reference to the ascent of the *ching chhi* to form the enchymoma.

^b E.g. Vajraketu, one of the four *lokapala* or guardian gods.

^c See p. 56 and Fig. 1551 above.

^d Ch. 1, p. 71 a, tr. auct.

And again:

To master the dragon and subdue the tiger is not difficult,
 Descent and secret (ascent) meet at the gate with the jade lock,
 Brightness of sun and moon pours from the seething reaction-vessel—
 Why be fearful of failing to make the remedy of perpetual youth?^a

And I add a poem which was given to me in China more than twenty-five years ago, collected from some temple inscription or the works of some Thang scholar:^b

Messengers were sent over the empty sea, searching for the five-hued mushrooms,
 But in the end the smell of decaying shellfish came in on the breeze,
 Verily this inspires compassion for the estate of man.
 Yet through the Peach Spring there *is* a road to immortality,^c
 Though Chhin Shih Huang Ti was never able to discover it.

(6) LATE ENCHYMOMA LITERATURE OF MING AND CHHING

How late did it all go on? We have already mentioned that the remedial macrobiotic postures and gymnastic exercises, including such practices as the gnashing of teeth to increase salivation, still persist in Chinese sanatoria to the present day.^d The exact nature of the final phases of the *nei tan* tradition, however, still await their historian, and we cannot accomplish his work here.^e The only thing we can do is to draw attention to certain of the most important sources from which such a history could be written.

Perhaps we could begin with the *Chih Yu Tzu*¹ (Book of the Attainment-through-Wandering Master), prefaced in +1566 by a Taoist named Yao Ju-Hsün.² It was probably written early in the +15th-century, like the books that bear the name of Chang San-Fêng³ (p. 240), and its putative author^f was Chang Shang-Ying.⁴ Its twenty-four chapters are clearly concerned with physiological alchemy, including meditation, the circulation of the *chhi*, the *kua* Li and Khan, and the formation of the enchymoma in the Yellow Court; only in the sexological section does the author condemn the earlier techniques of immortality. One of his chapters (16) reproduces the *Pai Wên Phien* of which we have already spoken (p. 88).

Towards the end of the +16th-century there was produced a treatise of substantial size which might be regarded as the *Summa* of physiological alchemy. This was the *Hsing Ming Kuei Chüi*⁵ (A Pointer to the Meaning of Human Nature and

^a Ibid., p. 72b, tr. auct.

^b It is, if I am not mistaken, in the writing of my old friend Dr Chang Tzu-Kung.

^c The Peach Springs Forest was a semi-legendary refuge of certain country people during the social disturbances of the Chhin period. One could be safe there, but it was easy to lose one's way in it. Here the reference is to the practice of physiological alchemy in some mountain temple or other retired place.

^d Cf. p. 179 above.

^e A beginning has been made in the interesting contribution of Liu Tshun-Jen (3), though it appeared too late to be helpful to us. It will be found well worth study in parallel with our presentation of the *nei tan* idea-complex.

^f *SKCS/TMTY*, ch. 147, p. 96.

¹ 至游子

² 姚汝循

³ 張三峯

⁴ 張商英

⁵ 性命圭旨



Fig. 1615. Syncretism of the Taoist, Confucian and Buddhist traditions as seen in *Hsing Ming Kuei Chih*, ch. 1, p. 1b (+ 1615). Caption: 'The Three Sages'; Confucius on the left, Lao Tzu with the Yin-Yang symbol on the right, and a Buddhist figure behind. Significantly he seems to be Dharaṇī-bodhisattva, a form of the Tantric goddess Tārā (cf. p. 260), Our Lady of the esoteric schools of Mantrayāna, Vajrayāna, Yogācārya and the 'true words' (Chen-Yen, Shingon).

the Life-Span),^a first printed in +1615 and several times subsequently during the Ch'ing, as in +1670. It was based on the extensive teachings of the Adept Yin (Yin chen jen¹) written down by his disciple Kao Ti.² We have already referred to it in various connections and taken advantage of its pictures to illustrate a number of points (Figs. 1546, 1554, 1574, 1609). Mistaken by Dudgeon (1) for a manual of gymnastics, and used iconographically without much understanding by Wilhelm & Jung (1), it has not been properly studied by sinologists either Western or Chinese, yet it covers all the phases of the subject which we have outlined in this subsection. For example it gives a wonderful list of the chief varieties of the 'three thousand six hundred' techniques with which men and women worked towards the preparation of the enchymoma,^b though it qualifies most of them as 'unorthodox' (*hsieh tao*).³ One must of course remember that the *Hsing Ming Kuei Chih* was a product of its time, and that its valuations of these are liable to be very different from those which had been in favour a thousand years or so earlier. Moreover there is naturally by this time considerable Buddhist influence, and a determined attempt to syncretise the three traditions of Taoism, Buddhism and Confucianism (Fig. 1615).^c

If we take a look at the situation between about +1770 and 1830 we find two collections from which there is a great deal to be learnt.^d These are the *Tao Tsang Hsü Pien (Chhu Chi)*⁴ edited by one of the patriarchs of the Lung-mên school, Min I-Tê,⁵ between 1820 and 1830;^e and the *Chêng Tao Pi Shu Shih Chung*⁶ (Ten Books of Traditional Lore Testifying to the True Tao) edited and printed by Fu Chin-Chhüan⁷ (Chi I Tzu⁸) in 1825. These two collections both contain a variety of miscellaneous *nei tan* texts of all dates from the Yuan period onwards, indeed a few purporting to be still older, but problems of authenticity arise, and while some may be genuine documents handed down in particular Taoist temples and not previously printed, others may have been written in the late +18th-century and fathered on famous adepts of the past. Until much more research has been done on the philology of this literature we cannot expect to know. Moreover, it is not at all easy to be sure exactly what techniques the writers, especially Min and Fu themselves, with their contemporaries, believed in and taught, so that the only practicable way to describe their work is to give a few examples of the texts which are to be found in their collections.

^a The title contains a pun on *kuei* and *thu*,⁹ earth, doubled, earth referring to the central region, *huang thing*, where the enchymoma is formed. The Neo-Confucian cloak of the words *hsing ming* will also not escape our notice.

^b Ch. 1, p. 18 *aff.* These include not only various derivatives of the original sexual procedures but also a number of the hormone preparations of the iatro-chemical period (see Sect. 45).

^c This can be seen in most of the extant sets of statues of the 500 Lohan (arhats) in Chinese Buddhist temples (cf. Figs. 1616, 1617, 1618, 1619).

^d An earlier one of the same kind, supposedly collected by Han Chhan Tzu¹⁰ about +1440, is entitled *Chin Tan Chêng Li Ta Chhüan*¹¹ (Comprehensive Collection of Writings on the True Principles of the Metallous Enchymoma). This we have not seen, but a detailed analysis of its contents has been made by Davis & Chao Yün-Tshung (6).

^e Its first printing seems to have been in 1834.

¹ 尹真人

² 高第

³ 邪道

⁴ 道藏續編初集

⁵ 閔一得

⁶ 證道秘書十種

⁷ 傅金銓

⁸ 濟一子

⁹ 土

¹⁰ 涵蟾子

¹¹ 金丹正理大全



Fig. 1616. One of the 500 Lohan at the Buddhist temple of Chhiung-Chu Ssu near Kunming, Yunnan; riding on the Yin tiger, he passes safely through the churning ocean of *samsara*. Between thumb and forefinger of his right hand he holds the 'elixir pill', i.e. the enchymoma (cf. Fig. 1548). Orig. photo., 1972.



Fig. 1617. Another of the Lohan at Chhiung-Chu Ssu (orig. photo. 1972). Although it is a Buddha wrapt in meditation who appears in the opened abdominal region, the analogy with the 'baby boy' or enchymoma of Taoist *nei tan* verges on identity.

One of these we have mentioned already, the *Liao Yang Tien Wên Ta Pien*¹ (Questions and Answers in the Eastern Cloister of the Liao-Yang Hall, of the White Clouds Temple at Chhing-chêng Shan in Szechuan), certainly a Ming or Chhing work, attributed to Yin Chen Jen (Yin Phêng-Thou²). This was edited from a manuscript preserved in the Blue Goat Temple (Chhing-Yang Kung³) at Chhêngtu.^a It is useful in that it explains many of the *nei tan* terms, and others used in Taoist anatomy and physiology. While it is still committed to the double theory of ascent and descent in the formation of the enchymoma, and continues the system of *nei* and *wai* within the *nei* which we have already studied (pp. 35 ff.), it cloaks the methods used under a veil of obscurity, preferring to make much play with the *kua* of the 'Book of Changes'.

Another tractate is entitled *Hsieh Thien Chi*⁴ (A Divulcation of the Machinery of Nature) and dates from c. + 1795, its source being Li Ong⁵ (Ni-Wan shih⁶)^b and the actual writer Min Hsiao-Kên,⁷ perhaps Min I-Tê's uncle. It has a doctrine of three 'roads', a red one (*chhih tao*⁸) corresponding to one of the auxiliary acupuncture tracts, *jen mo*,⁹ which runs down the front of the body, and along which the saliva (or its *chhi*) was now thought to descend; and a black one, (*hei tao*¹⁰) corresponding to another tract, *tu mo*,¹¹ which runs up the back of the body, and along which the semen (or its *chhi*) was now thought to rise up. Fig. 1620, taken from the recent book of Itô Mitsutoshi (1), illustrates this system of *chhi* circulation, doubtless rooted in the past but not prominent before the period under discussion. Li Ong added a third road, the yellow one (*huang tao*¹²), which seems to have been some central perambulation of the enchymoma itself with all its benefits.^c He also used a good deal of chemical metaphor in his discussions. Other books such as Li Tê-Hsia's¹³ *Shang Phin Tan Fa Chieh Tzhu*¹⁴ (Expositions of the Techniques for Making the Best Quality Enchymoma), and Min I-Tê's own *Kuan Khuei Pien*,¹⁵ cover much the same ground, but exactly what their authors did in practice is never clearly stated. An acceptable dating (+ 1678) appears in another short work, by Lu Shih-Chhen,¹⁶ called *Chiu Chêng Lu*.¹⁷ Then there is a book of Taoist-Buddhist-Confucian syncretism, otherwise banal from the *nei tan* point of view, with the title *Lü Tsu Shih San Ni I Shih Shuo Shu*¹⁸ (Record of a Lecture by the Taoist Patriarch Lü Yen on the Healing of Humanity by the Three Ni Doctrines),^d most probably nothing to do with the real Lü Yen (Lü Tung-Pin), but significant for the times of which we are speaking.

^a Cf. Vol. 2, p. 160, Vol. 4, pt. 3, p. 62, Fig. 743.

^b A Taoist patriarch or abbot of the late + 16th-century, according to Miyuki (1).

^c The parallelism in terminology here with the astronomers' words for equator and ecliptic (cf. Vol. 3, p. 179) strikes the eye, but it was probably fortuitous.

^d Chhing-Ni¹⁹ for Taoism, Mou-Ni²⁰ (Shih-chia-mou-ni, Sakyamuni) for Buddhism, and Chung-Ni²¹ (Confucius' name) for Confucianism.

¹ 寧陽殿問答編

² 尹蓬頭

³ 青羊宮

⁴ 泄天機

⁵ 李翁

⁶ 泥丸氏

⁷ 閻小良

⁸ 赤道

⁹ 任脈

¹⁰ 黑道

¹¹ 督脈

¹² 黃道

¹³ 李德裕

¹⁴ 上品丹法節次

¹⁵ 管窺編

¹⁶ 陸世柱

¹⁷ 就正錄

¹⁸ 呂祖師三尼醫世說述

¹⁹ 青尼

²⁰ 牟尼

²¹ 仲尼



Fig. 1618. A third Lohan at Chhiung-Chu Ssu, bearded like a Taoist and riding on a crane, is also 'ferried over to the other side'. Orig. photo. 1972.



Fig. 1619. A fourth Lohan at Chhiung-Chu Ssu achieves salvation through children (orig. photo. 1972). This recalls the emphasis on reversion to infancy, with regeneration of the primary vitalities, but also the value of the *chhi* of youth, the *fumus juventutis* (cf. pt. 4, pp. 496-7 and p. 297 below). These four pictures vividly illustrate the process of syncretisation of the 'three religions' of China in comparatively late times, and reinforce what has already been evident from Figs. 1545, 1553, 1565-7 and 1571-3.

The collection also contains a few intriguing books about the Taoist 'nuns'.^a For example, there is the *Hsi Wang Mu Nü Hsiu Chêng Thu Shih Tsê*¹ (The Ten Rules of the Mother Goddess, Queen of the West, to Guide Women Taoists along the Right Road of Restoring the Primary Vitalities), attributed again to Lü Yen (Lü Tung-Pin) of the +8th-century, but assuredly written a thousand years later by Shen I-Ping² and others, and given a commentary by Min I-Tê³ about 1830. These books are rather strange because the ancient enchymoma techniques in which sex played so important a role, both theoretical and practical, had now to be combined, and were, with an ethos permeated by Buddhism and Confucianism. The Taoist Sisters must be docile, diligent, quiet, respectful (and, significantly perhaps, like all Confucian women, un-jealous), they must abstain from meat and never drink wine; and they should remain celibate, preserving if possible the hymen (*fer*⁴) of virginity. They should dress in a sober habit, take no animal life, and be kind to servants, slaves, and strange characters. They are to engage (as of old) in the techniques of salvation for the attainment of material immortality, including meditation, the circulation and harmonisation of the *chhi*, the 'management of the juices' such as saliva-swallowing, some of the respiratory practices and some of the gymnastic exercises, especially forms of self-massage. If all their techniques were well carried out they would become rejuvenated, but as young boys rather than young girls.^b In all matters concerning sex the text is ambiguously worded, so that masturbation (as among the male Taoists) is not positively excluded—but here a further development intervenes, seemingly characteristic of the Ming and Chhing, namely the idea of the conversion by 'will-power' of the *ching*⁵ or semen, and the *hsüeh*⁶ or (menstrual) blood, into their corresponding *chhi*, and then the circulation of these respectively up and down the body in thought by spiritual exertion. This was therefore a third way, needing no physical perineal pressure or its equivalent (whatever that was).^c 'Sending up the *ching* to nourish the brain' was thus fully retained in theory, and here for men called *yü i chih huan tan*,⁷ while the corresponding practice for women got a new name, *thi hu kuan ting*,⁸ 'irrigating the brain with nectar', or (since the phrase was a Buddhist one) 'anointing the head with the oil of Buddha gladness'. Just as the Taoist adept had now to change his *ching* into *chhi* before circulating it, so the Taoist 'nun' had to change her blood, the

^a One would like to know a good deal more about the life of these women in practice. The line between them and lay adepts may have been rather thin, and both probably served as 'mediums' in Taoist hypnotic and planchette séances.

^b Here a strange Gnostic echo comes to mind. In the 'Gospel of Thomas' (logion 114) we read: 'Jesus said: "I myself shall lead Mary in order to make her male, so that she too may become a living spirit resembling you men. For every woman who will make herself male will enter the Kingdom of Heaven".' This is in one of the Nag Hammadi scrolls, ed. Robinson (1), p. 130, tr. Lambdin. There could be an edifying allegorical interpretation of this, but most probably we have to see in it yet another manifestation of patriarchalism, like the speeches of Apollo and Athene in the third play of the *Oresteia*. But these words belong in date to the +2nd-century.

^c It is always difficult to see exactly what the female technique was which corresponded to the man's in *coitus thesauratus*, but we have given at least one passage in translation from a medieval text above (p. 206) which goes some way to making it understandable.

¹ 西王母女修正途十則

² 沈一炳

³ 閔一得

⁴ 卵

⁵ 精

⁶ 血

⁷ 玉液之還丹

⁸ 醍醐灌頂



Fig. 1620. Theoretical diagram by a contemporary physiological alchemist, Itō Mitsutoshi (1), in his book *Yang Shêng Nei Kung Pi Chüeh* (Confidential Instructions on Nourishing the Life-Force by Gymnastics and other Physical Techniques), published in 1966. Here the dorsal median acu-tract, Tu Mo, is seen as the channel in which the *ching chhi* ascends, while the anterior median acu-tract, Jen Mo, brings other *chhi* down again in a sort of circulation. The cyclical character *tsu*, evoking midnight, the north, darkness and water, together with the *kua Khun*, denotes the fundament; while the cyclical character *wu*, evoking noon, the south, brilliance and fire, together with the *kua Chhien*, denotes the brain and head. The whole system is marked *tho-yo*, the bellows-and-tuyère, which is glossed *ho phi*, alternately closed and open. The diagram is captioned: 'Achieving the metallous enchymoma by harmonising the reactants and transmuting the seminal essence' (*thiao yao lien ching chhêng chin tan thu*).

'juice of the red dragon' (*chih lung i*¹) into the 'marrow of the white phoenix' (*pai fêng sui*²), and so send it upwards. 'The red must be converted into the white' was the alchemical slogan and parallelism for this. There is a good deal of emphasis on the massage of the breasts, which may have had physiological effects; and also indications that considerable use was made of drugs, some suppressing menstruation, others as galactogogues, while it must be remembered that by this time the isolated but unpurified steroid sex-hormones were fully available, so that with some skill it might have been possible to induce certain endocrine phenomena such as masculinisation.^a The loss of menstrual blood seems to have been thought to involve a loss of *yuan chhi*³ or *chen chhi*,⁴ primary vitalities, just as the loss of semen through the urethra (*hsüan kuan*⁵) had classically been, so it was important to reduce both. The final chapters of the *Hsi Wang Mu* . . . *Shih Tsé* deal with the service of the gods of the Three Doctrines, so one may safely assume that the Taoist Sisters were much employed as sacristans in the preparation of the altars and paraphernalia of the liturgical services, if not indeed as vested participants or inspired prophetesses therein. Moreover every temple carried on good works, so that they were certainly visiting the poor and the afflicted; and most of the Taoist temples also had workshops in them which produced various commodities,^b so that they probably did a good deal of sewing, embroidering and cooking. Thus their time would have been fully occupied, and a large Taoist temple about the year 1800 would be a place of extraordinary interest if we were able to visit it. There was of course another side to the picture, and it is impossible to ignore completely the tradition of the novels and popular literature^c that some Taoist 'nuns' could be as bad as or worse than the Buddhist as purveyors of love-potions, aphrodisiacs, contraceptives and abortifacients; go-betweens in illicit love-affairs, and the like. Much of this can be attributed simply to Confucian prejudice, but not all, and we must be content to wait until the evidence is fully in before drawing any general conclusions.

The *Hsi Wang Mu* . . . book is followed by another on the same subject, entitled *Nü Tsung Shuang Hsiu Pao Fa*⁶ (A Precious Raft of Salvation for Women Taoists practising the Double Regeneration of the Primary Vitalities), due apparently to Li Ong⁷ (Ni-Wan shih⁸), and written down in verses by the Taoist abbot Shen I-Ping⁹ in +1795 or thereabouts. 'Double regeneration (*shuang hsiu*)^d suggests the ancient methods which required the cooperation of the two sexes, and with typical ambiguity this meaning was probably never absolutely excluded as one legitimate interpretation, but the explanation by now orthodox was that 'double' meant the

^a Cf. Sect. 45, and pp. 301 ff. below.

^b One that I knew well during the Second World War, the temple at Miao-Thai-Tzu in the Chhinling Mountains between Szechuan and Shensi, engaged in the large-scale manufacture of the thin-walled cast-iron pans (*kuo*¹⁰) used in cooking. Here the Taoist priests were metal-workers for much of their time.

^c Inherited directly by one of us (G.D.L.)

^d We have already made acquaintance with this technical term, in pt. 4, p. 212.

¹ 赤龍液

² 白鳳髓

³ 元氣

⁴ 眞氣

⁵ 玄關

⁶ 女宗雙修寶筏

⁷ 李翁

⁸ 泥丸氏

⁹ 沈一炳

¹⁰ 鍋

Yang and the Yin, nature and life-span, true lead and true mercury, the two operations, in fact, which a single person could carry out within his or her own body. The *Hsiu Chen Pien Nan*¹ (Discussion of the Difficulties encountered in the Regeneration of the Primary Vitalities), written by Liu I-Ming² in +1798, explains this further in terms of the late theory just mentioned. A man must 'transmute the *chhi*' (*lien chhi*³) by 'not letting the degenerated *ching* escape, then he can precipitate the enchymoma and lengthen his days'.^a A woman must 'transmute the form' (*lien hsing*⁴) 'by not letting the grosser part of the blood leak out, then she can escape death and enter into life'.^b The parallel between semen and menstrual blood was thus complete, for both contained, or were, the raw material, if skilfully transmuted, of an enchymoma in a deathless body.^c

When we come to the books attributed to the early Ming adept Chang San-Fêng⁵ (Fig. 1621)^d, the problem of exactly what the late Taoists admitted as legitimate practices reaches puzzling perplexity. Min I-Tê's collection contains a *San-Fêng Chen Jen Hsüan Than Chhüan Chu*⁶ (Complete Collection of Mysterious Discourses . . .), and Fu Chin-Chhüan's has a *San-Fêng Tan Chüeh*⁷ containing smaller tractates with similar titles and a series of fine poems called *Wu Kên Shu*⁸ ('The Rootless Tree'). Whatever is genuine in these would have to be of the first decades of the +15th-century, but the authenticity can only be considered uncertain. The difference is that the former expresses a strong aversion from physical sex, with metaphor piled on metaphor in complex ramifications, while the latter has many descriptions of the utmost frankness which it is hard to dismiss as imagery and parable. There are also a number of references to the endocrine preparations from urine, menstrual blood and colostrum, which show how closely this latter text relates to the iatro-chemical tradition.^e Here is scope for much further investigation.

Fu Chin-Chhüan himself contributed several books (1 to 5) to the second collection. In one of them, the *Chhieh Shui Yin*⁹ (Chants of the Red River) we come across some of the few hints in Taoist literature that certain magi trained themselves to accomplish the feats associated with Indian yoga technique, gaining voluntary command of the sphincters and other involuntary muscles (see on, pp. 269 ff.). In Fu's biography of an adept named Tsui Hua Tao Jen,¹⁰ the Flower-Intoxicated Taoist, we read that he was able to drink through his nose, could 'make the river run backwards' and 'played the game of going away small and coming

^a *Hou thien chih ching pu hsieh lou, kho i chieh tan, kho i yen nien.*¹¹

^b *Yin cho chih hsieh tzu pu hsia hsing, kho i chhü ssu, kho i ju shêng.*¹²

^c Is this not in a very logical way yet another echo of the Aristotelian theory of generation? See further in Sect. 43.

^d See p. 169 above. Biography in Seidel (1).

^e See Sect. 43. It is also interesting as one of those which uses the term *huo yao*¹³ in a *nei tan* sense, a term which in all other contexts invariably means gunpowder. Here of course the fiery or Yang reagent in enchymoma-making.

¹ 修真辯難

² 劉一明

³ 煉氣

⁴ 煉形

⁵ 張三峯

⁶ 三峯真人玄譚全集

⁷ 三峯丹訣

⁸ 無根樹

⁹ 赤水吟

¹⁰ 醉花道人

¹¹ 後天之精不泄漏可以結丹可以延年

¹² 陰濁之血自不下行可以出死可以入生

¹³ 火藥



Fig. 1621. A drawing of Chang San-Fêng, physiological alchemist of the early Ming (fl. c. +1400); from *Lieh Hsien Chhuan Chuan*, ch. 8, p. 24b. The artist by mistake wrote *shou* for *fêng* in the caption.

back big'. One cannot know how metaphorical these flowers were. Fu Chin-Chhüan also edited a large group of short texts, some older and some newer, under the title *Wai Chin Tan*¹ (Disclosures of the Nature of the Metallous Enchymoma), including it in his main collection. This embodies, *inter alia*, a very difficult piece entitled *Huo Lien Ching*² (Manual of the Lotus of Fire) which carries the name of Liu An³ (Huai Nan Tzu⁴), hardly conceivable as Han in date though seemingly closer than the others to proto-chemical *wai tan* alchemy.⁵ Near it there is a *Huang Pai Ching*⁵ (Mirror of the Art of the Yellow and the White), apparently by one Li Wên-Chu⁶ in +1598, which has the opposite tendency, denying that proto-chemical alchemy ever existed at all save as a veil for the physiological; this also repeats the *nei* and *wai* distinction within the *nei* (cf. p. 35 above).^b Of the thirty pieces contained in the *Wai Chin Tan* there are several which border on *wai tan* processes and explanations,^c use precise measures and weights in an obviously allegorical way,^d or elaborate expositions in terms of the *kua* of the *I Ching*.^e Some contain poems such as that reproduced here, from the *Lei Chen Chin Tan*⁷ of very uncertain date, but presumably later than about +1420.

White cinnabar grows in the furnaces of the holy immortals,
They are the real elixir adepts of heaven and earth.
It is only a matter of making true lead subdue true mercury^f
So that the white jade can be transmuted and the yellow sprouts can grow.^g
The five metals and the eight minerals are of a quite different category,
The myriad plants and the ten thousand prescriptions are something else again;
If you ask what things are used in the school of the immortals
It is only the golden flowers^h that grow on the rootless tree.ⁱ

Another of Fu Chin-Chhüan's writings contains a valuable passage on the 'secret language' of the physiological alchemists. This is the *Tan Ching Shih Tu*⁸ (Guide to the Reading of the Enchymoma Manuals), dating from the neighbourhood of 1825. In this he says:^j

When the enchymoma manuals of late times talk about the son they really mean the mother.^k It is as if four arrows were meeting at the same target. 'Tis the bull's-eye that will explain the mysterious wisdom. Sometimes there are plain words, but often things are expressed in mirror-images, sometimes there are direct statements, but often phrases

^a Ch. 1, p. 26b. Cf. p. 227 above.

^b Ch. 2, p. 69b.

^c E.g. the *Huo Lung Chüeh*⁹ attributed to Shang Yang Tzu.¹⁰

^d Cf. pp. 38b, 62a, 63a in ch. 3, p. 39b in ch. 4, and p. 14a in ch. 5.

^e E.g. the *Chu Chhüan Chi*¹¹ by Tung Chhung-Li¹² (+1465).

^f Cf. pp. 49ff. above.

^g The enchymoma, in the central yellow region of the body.

^h Or, better, the 'metallous radiance'; cf. below, p. 250. And pt. 4, p. 229.

ⁱ A reference of course to the poems of Chang San-Fêng. Tr. auct.

^j P. 1b, tr. auct.

^k The 'mother' is traditionally Metal (Immature or lesser Yin), and the 'son' is the Yang Water; cf. Fig. 1515 and p. 250 in pt. 4.

¹ 外金丹

² 火蓮經

³ 劉安

⁴ 淮南子

⁵ 黃白鏡

⁶ 李文燭

⁷ 雷震金丹

⁸ 丹經示讀

⁹ 火龍訣

¹⁰ 上陽子

¹¹ 竹泉集

¹² 董重理

which seem obscure and doubtful; there are metaphors and parables (*pi yü'*) (to be understood), right inferences to be made (from symbols behind symbols), pairs of opposites, explanations of principles, and oral instructions in mnemonic rhymes. Although the truth in the oral instructions is never written down, you cannot say that it isn't there. The Shen² Dragon lies hidden and its appearance is unpredictable; in the east you might get a glimpse of its claw, in the west you might catch sight of its scales, but without a real teacher how could you ever apprehend the whole picture? If I were to lift the curtain in one sentence (I would say that) there is a way of using the common human condition to regenerate (the primary vitalities) and so to escape from the common human condition. One can put it in a nutshell: the normal current leads to the generation of children, but going counter-current leads to the enchymoma (of eternal life). In these two phrases I have disclosed to you the entire mechanism of Nature (whereby man can discover the fountain of perpetual youth).

This must surely have been one of the best things ever written on the *nei tan* tradition. Elsewhere in the same book^a it is said fairly clearly that all three ways of proceeding (p. 234) are admissible, but passionate emotion must at all costs be avoided,^b and the exercise of meditation and will-power must be cultivated to the full. Finally the collection of Fu Chin-Chhüan terminates with a book we have already mentioned, the *Nei Chin Tan*³ of Chhen Ni-Wan⁴ or Wu Chhung-Hsü⁵,^c part dated +1615, part +1622. This is the text which uses throughout a curious system of symbolic notation for its exegesis of physiological alchemy (Fig. 1593).

All these traditions have continued down to the present time, taught by such eminent masters as Chao Pi-Chhen⁶ (b. 1860), whose *Hsing Ming Fa Chüeh Ming Chih*⁷ (A Clear Explanation of the Oral Instructions concerning the Techniques of the Nature and the Life-Span) has been translated into English by Lu Khuan-Yü (4).

(i) *The 'Secret of the Golden Flower' unveiled*

The object of the foregoing excursus has partly been, we admit, to have occasion to refer to the *Thai I Chin Hua Tsung Chih*,⁸ one version of which was printed in the *Tao Tsang Hsü Pien*. This was the short book of which the first eight sections were translated by R. Wilhelm and published by him in 1929 in collaboration with the great psychologist C. G. Jung (1) under a famous title: 'The Secret of the Golden

^a P. 4a.

^b Once again a strange Gnostic parallel can be discovered. Irenaeus (+130 to c. +200) tells us that the so-called 'libertine' Gnostics had a saying to the effect that 'whoever is in the world and has not loved a woman so as to possess her, is not of the truth, and will not attain truth; but he who comes from the world and is possessed by a woman will not attain truth because he is possessed with passion for (or by) a woman' (*Adv. Haer.* 1, 6, 3 ff., cf. Foerster (1), vol. 2, pp. 314 ff.). This sounds like praise of non-possessive love, and seems also to echo the Taoist idea of sexual union without ejaculation. It is remarkable that this religious sexuality should have existed in the Mediterranean world just about the same time as the teachings of the Three Changs and Sun Ên in China (cf. Vol. 2, p. 150), that is to say, from the +2nd to the +5th-century.

^c According to Miyuki (1), Wu's *floruit* was c. +1550 to c. +1635.

¹ 比喻

² 神

³ 內金丹

⁴ 陳泥丸

⁵ 伍冲虛

⁶ 趙避塵

⁷ 性命法訣明指

⁸ 太一金華宗旨

Flower; a Chinese Book of Life'.^a Since this translation (with its Jungian commentary) has during the past forty years become widely known and influential it demands consideration in the light of the tradition which we have been elucidating throughout this sub-section. The *Thai I Chin Hua Tsung Chih* is in fact a *nei tan* book of late type, much influenced by Buddhism but clearly still in the line of descent of the Taoist *philosophia perennis*.

Thai I Chin Hua Tsung Chih is one of those titles which only very brave men will venture to translate—we offer our ten cents' worth here in the form: 'Principles of the (Inner) Radiance of the Metallous (Enchymoma) (explained in terms of the) Undifferentiated Universe',^b i.e. the primordial macrocosmic and microcosmic freshness and perfection.^c Obviously this is not at all like the title adopted by Wilhelm & Jung, but its relation to what has gone before will also be evident. The version in Min I-Tê's collection^d has an enlarged title: *Lü Tsu Shih Hsien-Thien Hsü Wu Thai I Chin Hua Tsung Chih*,^e which we would english as 'Principles of the (Inner) Radiance of the Metallous (Enchymoma) (explained in terms of the) Undifferentiated Universe and of the All-Embracing Potentiality of the Endowment of Primary Vitality, taught by the (Taoist) Patriarch Lü (Yen),' i.e. Lü Tung-Pin (+ 8th-century, Fig. 1622). The text also differs to some extent, especially in the first chapter, from that which Wilhelm used.^e The history of this book, which has had a number of alternative titles,^f is obscure. We have the gravest doubt whether it ever had anything to do with Lü Yen himself, and suspect that many of the prefaces printed by Tan Jan-Hui should be considered apocryphal, though one by Chang San-Fêng about + 1410 might be allowed. However, the text is so clearly of Buddhicised late Chhing character that it must at least have been re-written and

^a The bibliography is complicated. The first English translation from the German, by C. F. Baynes, appeared in 1931, and revised editions, both in German and English, continued to come out; that of 1957 included a translation of a still more Buddhist tractate, the *Hui Ming Ching*² (see on, p. 252) from Wilhelm's posthumous papers. More recently further reprints have been needed every other year since 1965. A French translation of both the Chinese texts by Liu Tsê-Hua (1) appeared in 1969. We have not had the opportunity of studying it carefully, but it seems to contain hardly any references to the work of Wilhelm and Jung.

^b Or, 'a Thai-I Scripture'.

^c The ancient Taoist symbols of the Uncarved Block and Primitive Solidarity (cf. Vol. 2, pp. 59, 112, etc.) will not be absent from the mind of the reader.

^d It is followed there by a kind of supplementary tractate entitled *Huang Chi Ho Pi Hsien Ching*³ ('The Height of Perfection attained by Opening and Closing (the Orifices of the Body); a Manual of the Immortals). This is attributed to the ubiquitous Yin Chen Jen,⁴ and was derived from a MS. kept at the Blue Goat Temple at Chhêngtu.

^e Wilhelm's translation was made from an edition published by Tan Jan-Hui (1) in 1921 which used the alternative titles *Chhang Shêng Shu*⁵ ('The Art and Mystery of Longevity and Immortality') for *Thai I Chin Hua Tsung Chih*, and *Hsü Ming Fang*⁶ ('Precepts for Lengthening the Life-Span') instead of *Hui Ming Ching*. We are greatly indebted to Professor Hellmut Wilhelm for placing at our disposal, through Dr Miyuki Mokusen, a xerocopy of the Tan Jan-Hui texts used by his father, on the occasion of the Bellagio Conference on Taoism in 1968.

^f E.g. *Lü Tsu Chhuan Shou Tsung Chih*⁷ ('Principles (of Macrobiotics) Transmitted and Handed Down by the (Taoist) Patriarch Lü).

¹ 呂祖師先天虛無太一金華宗旨

² 慧命經

³ 皇極闡關仙經

⁴ 尹真人

⁵ 長生術

⁶ 續命方

⁷ 呂祖傳授宗旨



Fig. 1622. A drawing of Lü Tung-Pin, the famous adept of the +8th century, sailing majestically in a cloud over the ocean of *samsara*, with his bottle-gourd containing the elixir of immortality, and his Taoist sword slung across his back. From *Lieh Hsien Chhuan Chuan*, ch. 6, p. 18a.

radically changed from anything that Chang could have known.^a Even Tan, in his historical account, admitted that the text had not been finalised till +1663 and that the present title, *Thai I Chin Hua Tsung Chih*, dated only from +1668. The first printing took place, it seems, before the end of the +17th-century.^b

By and large Wilhelm seems not to have been acquainted, great sinologist though he was, with the *nei tan* tradition of physiological alchemy which was the real background of the *Thai I Chin Hua Tsung Chih*. He could not profit by the fundamental work of Maspero (7) which we have referred to so often because that did not appear until eight years later; then by 1931 Wilhelm was gone, and although his *Hui Ming Ching* translation saw print posthumously in 1957 neither Jung nor the other editors and translators concerned had any access to the original Chinese literature, or apparently any conception that there was a lot more behind the *Thai I Chin Hua Tsung Chih* than appeared to the unwary eye. Consequently the most recent edition is no wiser than the first. The fact is that the doctrine of the double rise and fall of semen and saliva (or their *chhi*) within the body to make the enchymoma of material immortality is clearly present in this text, even though all physical practices seem to have been purged from it, and the *ching*¹ (or *hsüeh*²) has to be converted into *chhi* before circulation, just in the Ming and Chhing 'revisionist' style already noted (p. 237). Without this background knowledge, and without any clues as to what could be meant by references to '(true) lead',^c '(true) mercury', the 'Yellow Court'^d the 'holy embryo' (*shêng thai*)^e, the 'interpenetration of sun and moon',^f etc., it was inevitable that the translation should have a vaguely mystical, even 'occult' character, on which Jung in his turn could build psychological speculations with a high degree of freedom. Far be it from us to say that nothing now remains of these, for Jungian insight was truly profound and penetrating, but the exact relation which they have (if any) to what the Chinese text was trying to express is a matter deserving of further investigation, and that is not possible here. One may now feel that Wilhelm & Jung were particularly rash in their use of distinctively European concepts—logos for *hsin*,⁴ 'heart and consciousness',^g eros for *shen*,⁵ 'kidneys and sexuality',^h the 'backward-flowing movement' as *metanoia*,ⁱ the *ying erh*⁶ as puer aeternus, 'the Christ who must be

^a Wilhelm himself accepted a real derivation from Lü Tung-Pin, and suspected some Nestorian connection. It is true that Lü did use Nestorian Christian prayers and ejaculations as magic spells (cf. *Sueki* (2), pp. 400ff.), but he probably understood very little about them, and we for our part can find no trace of Christian ideas in the texts under discussion. Seidel (1) suggests that our text emanated from a mediumistic Taoist sect claiming descent from Lü Tsu, and popular in Hupei after +1700.

^b Another highly obscure subject is what connection there was, if any, between these texts and the secret religious society known as Chin Tan Chiao.⁷

^c Pp. 23, 59, 99. Our references are to the 1931 edition (7th reprint, 1947) unless otherwise stated.

^d E.g. p. 24. Wilhelm adopted the highly un-Chinese term, 'Yellow Castle'.

^e P. 71.

^e P. 33.

^h P. 71.

^f P. 65.

ⁱ P. 9.

¹ 精

² 血

³ 聖胎

⁴ 心

⁵ 腎

⁶ 嬰兒

⁷ 金丹教

born in us',^a *pho*¹ 'soul' as *anima*, *hun*² 'soul' as *animus*,^b and so on.^c This is surely the way how not to do it. No one can doubt for an instant the high-mindedness of Wilhelm & Jung, their determination that 'East and West are no longer to remain apart', but each civilisation, after all, must be allowed to have its own distinctive concepts, which can be explained and understood, but not identified, especially so long as the cultures have such inadequate understanding of each other's literature and the evolution of each other's thoughts and actions. It is no good setting up facile equations and equivalents between the ideas of China and Christendom until both have been given a thorough chance to explain themselves.

The 'mysticisation' of the *Thai I Chin Hua Tsung Chih* can be seen in one of the explanations of Wilhelm's preface. He is of course commenting on the statements in the text and commentary which follow the ancient watchword: 'Normal outflow leads to the generation of children; counter-current upward flow leads to the en-chymoma'. He wrote:^d

The usual, unchecked, 'normal-flow', that is, downward movement of the life-process, is the one in which the two souls [*hun* and *pho*]^e are related as the intellectual and animal factors. As a rule, it will be the *anima*, the blind will, which, goaded by the passions, forces the *animus* or intellect into its service. At least the *anima* will do this to the extent that the intellect directs itself outward, whereby the powers both of *animus* and *anima* leak away, and life consumes itself. A positive result is the creation of new beings in which life continues, while the original being 'externalises itself' and 'ultimately is made by things into a thing'. The end result is death. The *anima* sinks, the *animus* rises, and the ego, robbed of its strength, is left behind in a dubious condition . . .

If, on the other hand, it has been possible during life to set going the 'backward-flowing', rising movement of the life-forces, if the forces of the *anima* are mastered by the *animus*, then a release from external things takes place. They are recognised but not desired. Thus the illusion is robbed of its strength. An inner, ascending circulation of forces takes place. The ego withdraws from its entanglement in the world, and after death remains alive because 'interiorisation' has prevented the wasting of the life-forces in the outer world. Instead of these being dissipated, they have made within the inner rotation of the monad a centre of life which is independent of bodily existence . . .

Such a being survives as long as the inner rotation continues. Also it can invisibly influence men to great thoughts and noble deeds. The saints and sages of ancient times are beings like these, who for thousands of years have stimulated and educated humanity.

And the translator, C. F. Baynes, added a footnote on the two directions of flow, which, though evidently based on the ideas of *kundalini*-yoga (see on, p. 274) also said that it was easy for the student of analytical psychology to see a connection between them and the concepts of extraversion and introversion. This was a rather

^a P. 9.

^b P. 14.

^c We have had occasion to inveigh against this kind of thing before, e.g. the interpretation of *li* and *chhi* as Aristotelian form and matter (Vol. 2, p. 475), and the persistent translation of *li* and other terms as law in 'laws of Nature' (Vol. 2, p. 557).

^d Pp. 16, 17. A similar statement occurs on p. 73, where the penetrating remark is added that for him who reaches the 'stage of the Golden Flower' the ego is freed from the conflict of opposites.

^e 'Sets of souls', he should have said.

far cry from *nei tan* alchemy, but she wisely added that 'the Chinese concept seems to include both physical and physiological processes'.

Min I-Tê's description of the *Thai I Chin Hua Tsung Chih*, in the contents table of his collection, was as follows: 'Dealing with the life-giving methods of filling up the *kua* Li with the Yang line of the *kua* Khan, this book speaks of the "conjunction" or "intercourse" (i.e. the interchange of Yang and Yin lines) between these trigrams, (whereby the enchymoma is formed), all in a very refined and detailed way.' This we can understand in the light of what has gone before, especially Table 121 c. But to give an example of how far Wilhelm unknowingly wandered from the path of *nei tan* and *hsiu chen* tradition we ought to compare a short passage in translation. Here is a statement on the 'marriage of water and fire', referring very clearly to the primary vitalities, first in his version and then in ours.

The way to the Elixir of Life recognises as supreme magic, seed-water, spirit-fire, and thought-earth; these three. What is seed-water? It is the true, one power (eros) of Former Heaven. Spirit-fire is the light (logos). Thought-earth is the heavenly heart of the middle house (intuition). Spirit-fire is used for effecting, thought-earth for substance, and seed-water for the foundation.

But we would say^a:

The Tao of the enchymoma involves *ching*¹ (semen or seminal essence, corresponding to the element) Water, *shen*² (mentality or spirit, corresponding to the element) Fire, and *i*³ (the objective or purpose, corresponding to the element) Earth; these three. No higher insight than this can be given in any oral instruction. Now what is *ching*¹ the Aquose? It is the *chhi* of the primary vitality of the original endowment (*hsien thien*,⁴ man at his beginning). *Shen*² the Pyrial is the light (that can be made to shine in man).^b *I*³ the Terrene is the central region (*chung kung*⁵) (where the enchymoma is formed) and the focus of the natural endowment (*thien hsin*⁶).^c So here *shen*² the Pyrial is the activity (*ying*⁷) (of the *kua*), *i*³ the Terrene is their manifestation (*thi*⁸), and *ching*¹ the Aquose is the very basis (*chi*⁹) of all.

To understand this last distinction one has to know that beside the symbol of each *kua* (trigram or hexagram) there was also its manifestation (*thi*⁸) and its activity (*ying*⁷). For us it is evident that the text is derivative from all those which saw the two reagents meeting at the Yellow Court.^d But it is equally evident that almost any mystical or psychological system could be constructed on the basis of Wilhelm's rendering, and whatever it was it would not have much relation to the thoughts of the original Chinese writer.

That he followed the will-power method of transmuting *ching* into *chhi* without the aid of any physiological operations is probable from the following passage:^e

^a Ch. 2, p. 5 (p. 3a), tr. auct., adjuv. Wilhelm & Jung (1), p. 28.

^b The inner radiance, perhaps, of the title of the book.

^c This phrase is explained on p. 3 of the text.

^d An interesting list of the late synonyms for this is found on p. 2 of the text.

^e Ch. 3, p. 8 (p. 4b), tr. auct., adjuv. Wilhelm & Jung (1), pp. 34, 35.

¹ 精

² 神

³ 意

⁴ 先天

⁵ 中宮

⁶ 天心

⁷ 用

⁸ 體

⁹ 基

At the centre of all change and transformation the radiation of the Yang is the master and governor. In the physical world it is the sun, in man the eye. The emanation and dispersal of the *shen*¹ (vitality) through *shih*² (worldly sentiments and affections) is the most natural and normal current of events. Therefore the Tao of evoking the metallous radiance entirely depends on the method of counter-current flow (*ni fa*³).

[Comm.] Man's heart belongs to the element Fire, and the light of fire presses upwards into the two eyes. When they are looking at worldly things this may be called natural-current vision. Now if one closes the eyes (*pi mu*⁴) and reversing the gaze, directs it inwards to contemplate the 'primordial cavity' (*tsu chhiao*⁵),^a that may be called the 'counter-current' method. (It is just like) the *chhi* of the reins which belongs to the element Water. When the instincts are stirred, it runs downward, flows naturally outward, and gives rise to boy and girl children. But if, at the moment of release, it is not allowed to flow naturally outward, but is forcibly assisted to return, and made to ascend so that it enters the reaction-vessel of Chhien (*kua*, the creative, i.e. the head), refreshing and nourishing the body and the heart, that also is a 'counter-current' method. This is why it is said that the Tao of (making) the metallous enchymoma depends entirely on methods of counter-current flow.

Here the ancient genital counter-current flow is used as a parable for the counter-current of inwardly directed vision. Thus one begins to see how in these later times the idea of the adept as a 'hermetically sealed organism' (the term is strangely appropriate) began to take full form. Not only must the secretions be conserved,^b and the breath held in as long as possible, but also the sense-organs must be directed inwards rather than outwards, and the play of spontaneous thoughts dependent on the stimuli of the external world reduced to the absolute minimum. One may or may not sympathise with this final Buddhicised phase of the cult of material immortality. It probably produced some charismatic characters.

There is of course much in the *Thai I Chin Hua Tsung Chih* on meditation, respiratory exercises,^c the circulation of the *chhi*, and a light-mysticism which assuredly had some connection with the ancient photo-therapeutic methods; but little on gymnastics or the maintenance of special positions of the body. Further understanding of how it was interpreted is given by an interesting passage in the commentary to Ch. 8, which runs as follows:^d

The disciple has penetrated in his exercises (*kung fu*⁶) into mysterious territory, but if he does not know the method of forging and transmuting (*tuan lien*,⁷ the *ching* into the *chhi*?), it is to be feared that the metallous enchymoma will hardly be produced. Therefore the Patriarch revealed the secret which the immortals and the bodhisattvas would never transmit. If the disciple keeps his attention fixed upon the openings of the *chhi* (*chhi hsüeh*⁸),^e and at

^a Obviously this is only a new way of talking about the Yellow Court. The 'cavity' where the enchymoma is to form, *hsüan chhiao*⁹ or *chen chhiao*¹⁰ or just *chhiao*, is still more emphasised in the *Hui Ming Ching* (see on, p. 252).

^b Semen, saliva and menstrual blood are already familiar. One may query whether some enthusiasts did not dream of conserving the excretions also. Probably they did, incurring pathological dangers, yet practices of extreme fasting would reduce the excreta, and up to a point conduce to longevity.

^c Wilhelm & Jung tr., pp. 44 ff., 54.

^d Ch. 8, p. 32, tr. auct., adjuv. Wilhelm & Jung (1), pp. 68 ff.

^e I.e. the two eyes, as p. 30 explains.

¹ 神

⁶ 工夫

² 識

⁷ 煅煉

³ 逆法

⁸ 氣穴

⁴ 閉目

⁹ 玄竅

⁵ 祖竅

¹⁰ 眞竅

the same time maintains the deepest stillness, then out of the obscure darkness a something develops out of nothingness. That is the metallous radiance of (the vitality of) the undifferentiated universe (in all its pristine freshness).

At this time the light of sentiment (*shih kuang*¹) is (seen to be) different from the light of inbeing (*hsing kuang*²).^a Thus it has been said that to be stirred when stimulated by external things leads to a natural flow downward and outward, so that more people are brought into the world. That is the light of sentiment. But if at a time when the *chhi* of the primary vitality has copiously accumulated, the disciple commands it not to go forth, he may make it (return upward and inward) in counter-current wise.^b That is the light of inbeing. It is necessary to adopt the method of the water-raising machine (*ho chhê*³).^c If one winds away without stopping, the *chhi* of the primary vitality will (be felt to) 'return to the roots', as if drop by drop. Then when the water-raising wheels stop the body will be clean and the *chhi* fresh. A single turning corresponds to one revolution of the heavens, or what the Patriarch Chhiu called one small celestial cycle. If one does not wait long enough, and tries to collect the *chhi* when it has not sufficiently accumulated (and matured), it is then too weak and tender, and the enchymoma will not be formed. On the other hand if the *chhi* is there in plenty and yet is not collected, its virtue will be lost on account of staleness, and again the enchymoma will hardly be achieved. The right time to use it with determined purpose for this end is when it is neither too stale nor too weak.

This correct time is what the Buddhist patriarchs mean when they talk of sex (*se*^d) being equivalent to emptiness (*khung*^e); this is the same idea as the transmutation of the *ching* into the (primary) *chhi*. If the disciple does not understand this principle (*li*^f) and lets the *chhi* stream away downwards and outwards, then the *chhi* forms *ching*; this was what they meant when they said that emptiness was equivalent to sex.^g

Every ordinary man who unites bodily with a woman feels pleasure first and then fatigue, for when the *ching* has flowed out the body is tired and the spirit languid. It is quite different when the immortals and bodhisattvas make their *shen* unite with their *chhi*, for that brings first purity and then freshness; when the *ching* has been transformed the body has a sense of well-being.

There is a tradition that Old Master Phêng grew to an age of eight hundred and eighty because he made use of concubines to nourish his vitalities, but that is a misunderstanding. People do not understand that what he really made use of was the method of re-forging and re-casting the *shen* and the *chhi*. In the enchymoma books (*tan shu*⁷), symbols (*pi yu*⁸) are often used, and in them the fire (*kua*) Li is represented by the 'elegant girl' (*chha ni*⁹),^f while the water (*kua*) Khan appears as the 'baby boy' (*ying erh*¹⁰).^g Hence the idea that Old Master Phêng had a method of regeneration and revitalisation by means of sex. It was all a mistake of later generations.

But the adepts (*hsien chia*¹¹) use the art of inverting Khan and Li by directing them towards the true central region (*chen i*¹²), without which they cannot harmonise and combine them. This true central region belongs to the element Earth. Now Earth corresponds

^a Or, perhaps better, 'discernment'.

^b The idea here is that it is the *chhi* of the primary vitality which goes out within the *ching* to be the endowment of the resulting children.

^c The image in mind was certainly the square-pallet chain-pump (cf. Vol. 4, pt. 2, pp. 339ff.). Cf. Sect. 43.

^d Or, more conventionally, 'sexual attraction'.

^e This is probably Tantric (cf. p. 275 below). The more usual contrast with *khung* (*sūnyatā*) was *pei*¹³ (*karuṇā*, compassion for all beings), cf. van Gulik (7), p. 48.

^f A usual cover-name for mercury. Here of course it is the inner, Yin, line. ^g Here the inner, Yang, line.

¹ 識光 ² 性光 ³ 河車 ⁴ 色 ⁵ 空 ⁶ 理 ⁷ 丹書
⁸ 比喻 ⁹ 姦女 ¹⁰ 嬰兒 ¹¹ 仙家 ¹² 真意 ¹³ 悲

to yellow; therefore the enchymoma books speak of it symbolically under the name 'yellow sprouts' (*huang ya*¹). When Khan and Li unite, the metallous radiance appears. Now Metal corresponds to white; therefore it is symbolically referred to as 'white snow' (*pai hsüeh*²). But worldly people who do not understand the veiled words of the enchymoma school have mistaken 'yellow' and 'white' to mean the art of manipulating metals and minerals. Is that not a great foolishness?

An ancient worthy said: 'From the beginning every family has had this treasure, and only fools have failed to understand it'. If we reflect on this we can see that the ancients really attained long life by knowing when to collect (and convert) the *ching chhi* present in their own bodies, not by seeking to prolong it by swallowing this or that elixir. But worldly people can never see the wood for the trees.

The enchymoma manuals also say that when an orthodox man (*chêng jen*³) makes use of unorthodox methods (*hsieh tao*⁴), these wrong methods work in the right way. This is the same idea as the transmutation of the *ching* into *chhi*. Conversely, when an unorthodox man (*hsieh jen*⁵) makes use of orthodox methods (*chêng tao*⁶), these right methods work in the wrong way. This corresponds to the begetting of boy and girl children by the bodily union of man and woman. Fools waste the most precious jewel of the body in uncontrolled pleasure, and do not know how to conserve the *chhi* of their *ching*. When it is exhausted the body perishes. The saints and sages had no way of taking care of their lives other than by destroying desire and safeguarding the *ching*, piling it up in order to turn it into abundant *chhi*. With a sufficiency of that, Chhien (*kua*, the creative) is re-created, and an immortal, strong and holy body is born. The difference from ordinary people depends solely on whether the normal downward-flowing way or the upward counter-current way is practiced.

The passage is indubitably interesting. There is the old *idée fixe* about the retention of the semen, though now with the refinement that it should be turned into *chhi* before being circulated.^a The writer adapts certain Buddhist ideas to his purpose, distorting rather sadly the grand conception of the identity of *nirvāna* and *samsara*. There is a typical re-interpretation of ancient traditions, and a belated *coup de patte* at the proto-chemical and iatro-chemical practitioners.

How much Wilhelm & Jung themselves apprehended of the double enchymoma theory may be gauged from a note which the former contributed at the end of his section.^b It runs:

The two psychic poles are here contrasted with one another. They are represented as logos (heart, consciousness), to be found under the fire sign, and eros (kidneys, sexuality), under the water sign. The 'natural' man lets both these forces work outwardly (intellect and the process of procreation), and in this way they 'stream out' and are consumed. The adept turns them inward and brings them together whereby they fertilise one another and thus produce a psychically red-blooded, and therefore strong, life of the spirit.

The only comment on this that comes to mind is the expression so often heard on the lips of Chinese friends—it is certainly 'not exactly' wrong, but equally certainly 'not exactly' right. Whether any *nei tan* Taoist would have recognised himself in this mirror we shall never know.

^a One never feels quite sure how far these late Taoists excluded masturbation as one legitimate means of mobilising, and then storing, the *ching*.

^b P. 71, as a footnote to the beginning of the passage we have quoted on p. 249 above (his p. 35).

¹ 黃芽

² 白雪

³ 正人

⁴ 邪道

⁵ 邪人

⁶ 正道

The *Hui Ming Ching* (Manual of the (Achievement of) Wisdom and the (Lengthening of the) Life-span) is an even more difficult proposition.^a It was written in +1794 by Liu Hua-Yang¹ who had been a Buddhist monk before he came to Taoism. The syncretic fusion with Buddhism, even Chhan (Zen) Buddhism, is much further advanced, and the full explanation of the text would need an experienced buddhologist. Miyuki Mokusen (1) has attempted this in an interesting contribution, but unfortunately again without much knowledge of the prior Taoist *nei tan* traditions.^b The terminology is rather different from all our other texts. There is much talk of the *chhiao*² or *hsüan chhiao*,³ 'mysterious cavity', lamentably (though ingeniously) translated by Wilhelm as 'germinal vesicle', but perhaps only one more name for the Yellow Court, the central region of the body, or rather the natural enchymoma which was once there but which has to be re-synthesised. This is clear from the description which says that it is a great thing, part of the pre-natal endowment, containing all the natural perfections of the body and soul fused together like glittering precious metal in the refiner's fire, of primordial harmony (*thai ho*⁴) and heavenly pattern (*thien li*⁵) all compact. But when the foetus is born, it is like a man losing his foothold on a high mountain and plunging downwards with a cry; senescence from that moment begins, the *hsing*⁶ and *ming*⁷ are sundered and fate takes its course; youth gives way to maturity, maturity to old age, and old age to the bitterness of death. But there is a way open to man of repairing and re-integrating the 'mysterious cavity', and regenerating the virtue and perfection of embryonic life and infancy, a way in which he can, as it were, soar up through the air again, and land safe and sound at the top of the mountain.^c The Taoists had said this all along, and now it is re-stated with a Buddhist flavour as the compassionate revelation of the Tathāgata himself.^d

Another keyword is *lou chin*,⁸ 'cessation of outflowing' (Wilhelm), which Miyuki says represents the 'extinction of *klesās*', (stains, or passions) i.e. the stoppage of all that normally 'leaks out' through the sense-organs and other parts of the body. While this was doubtless intended to refer to all aspects of that 'hermetically sealed personality' of which we have just spoken, the picture (Fig. 1623) shows most unmistakably the vesiculæ seminales, kidneys, bladder and urethra.^e This must have been contributed by the Taoist side, as also the illustration which follows it

^a The first translation was by L. C. Lo (1), and it was then gone over again by Wilhelm before the 1957 edition of Wilhelm & Jung (1).

^b The same applies to his re-examination of the *Thai I Chin Hua Tsung Chih* (2).

^c The inescapable image here is of running a cinematograph film backwards, and precisely this trick was performed in one of Jean Cocteau's films, where a man shoots out of the sea and describes in reverse the trajectory of his dive from a cliff. Furthermore the metaphor of the mountain is interesting to any embryologist, since the model of a thermodynamic surface has often been used to illustrate the successive stages of embryonic determination, each irreversible, and leading in all to the complete or almost complete fixation of fates of the parts (cf. Needham (67), pp. 58ff. and figs. 8, 10, 11, 33).

^d This paragraph is a paraphrase of the text translated by Wilhelm & Jung (1), 1969 ed., p. 70, Miyuki (1), pp. 11 ff.

^e We suspect that the double meaning of 'no leak' (*tu lou*⁸) was already present in the *Wu Chen Phien*; cf. Davis & Chao (7), p. 114.

¹ 柳華陽

² 竅

³ 玄竅

⁴ 太和

⁵ 天理

⁶ 性

⁷ 命

⁸ 漏盡

⁹ 無漏

漏 盡 圖



Fig. 1623. Page from the *Hui Ming Ching* (Manual of the Achievement of Wisdom and Lengthening of the Life-Span) written by Liu Hua-Yang in +1794. Here the 'cessation of leaking' (*lou chin*) captions the picture, which makes an attempt to show the kidneys, vesiculae seminales, bladder and urethra, together with the vertebral axis up which the seminal secretion had been supposed to go. One of these organs is marked 'gate of wisdom', the other 'gate of destiny'. But by this time the old Taoist technique had become part of a figurative imagery describing Buddhist inward concentration intended to minimise the distractions of the sense-organs. As Sir Thomas Browne said of sleep: 'And now 'tis time to close the five ports of knowledge...' (*Quincunx*, V).



Fig. 1624. An earlier form of Fig. 1620; the circulation diagram in *Hui Ming Ching* (+ 1794). Here the rising TM channel up the back is associated with inspiration in breathing (*hsi*), while the descending JM channel down the front of the body is associated with expiration (*hu*). Each channel is marked with six graduations (*kuai*), while the brain is symbolised by heaven (*thien*) and the fundament by earth (*ti*); beneath this last the urethra is shown. Opening and closing (*ho phi*) mark the whole, while another couplet of alchemical technical terms, *mu yü*, bathing and washing, mark the ascending TM acu-tract and the descending JM acu-tract respectively.

(Fig. 1624), very similar to that on the circulation of the *chhi* which we have reproduced in Fig. 1620. Another teaching seemingly new for us is that of the 'three fires', *chiin huo*¹ (ruler fire), *hsiang huo*² (minister fire), and *min huo*³ (people fire), associated respectively with the heart, pericardium and reins. The *Hui Ming Ching* says:^a

Within the cavity there is the 'ruler fire', at its opening the 'minister fire', and all through the body the 'people fire'. When the first awakes the second responds to it, and when the second moves the third follows it. When the three fires follow the normal course and issue forth it leads to the begetting of new human beings, but when the three fires come back in counter-current flow, it leads to the formation of the Tao (i.e. the enchymoma). Thus the sage can make use of the 'mysterious cavity' of the 'completely un-leaking' (body) and so rise up into immortal life.

Whence one cannot but suspect that here also 'presbyter is but priest writ large', and that the three fires simply represent yet new incarnations of the three *tan thien*, regions of vital heat, in Buddhist robes. But of course there is much more of interest for which Miyuki's exposé must be consulted. The circulation of the *chhi* upwards dorsally along the *tu mo* tract and downwards abdominally along the *jen mo* tract is given in another picture (Fig. 1625), after which a drawing of the 'holy embryo' or enchymoma in personified form follows, and the rest of the text is concerned with the spiritual liberation brought about by meditation and *samādhi* ecstasy. This we need not follow.

Lastly we come to an extraordinary paradox. Jung repeatedly tells us that he decided to publish his first ideas on Western allegorical alchemy (see pp. 2ff. above), and to pursue further that line of study, only when his friend Richard Wilhelm put before him the translation of the *Thai I Chin Hua Tsung Chih*.^b It came, he says, at a time crucial for his own work.^c 'Light on the nature of alchemy'. Jung afterwards wrote, 'began to come to me only after I had read the text of the "Golden Flower"', that specimen of Chinese alchemy which Wilhelm sent me in 1928. Thus I was stirred by the desire to become more closely acquainted with the (Western) alchemical texts.^d Thus we have the strange situation that it was a Buddhicised (and indeed bowdlerised) text of late physiological alchemy which stimulated the construction of the whole edifice of research on the psychological or allegorical-mystical interpretation of alchemy in Europe. The fact that the background of the *Thai I Chin Hua Tsung Chih* was not quite what Wilhelm and Jung thought has of course nothing to do with the value or validity of the remarkable discoveries which Jung made in the writings of many of the Western alchemists, but it does throw into relief the fact that when European (and perhaps Arabic) alchemy was not proto-chemical it was allegorical-mystical, while when Chinese

^a P. 5, tr. auct. adjuv. Wilhelm & Jung (1), 1969 ed., p. 71, Miyuki (1), pp. 12, 13. Cf. Lu & Needham (5), p. 39.

^b Jung (1), p. 95. (3), pp. v. 4, 5, 11.

^c Jung (3), p. 3.

^d Jung (7), ch. 7.

¹ 君火

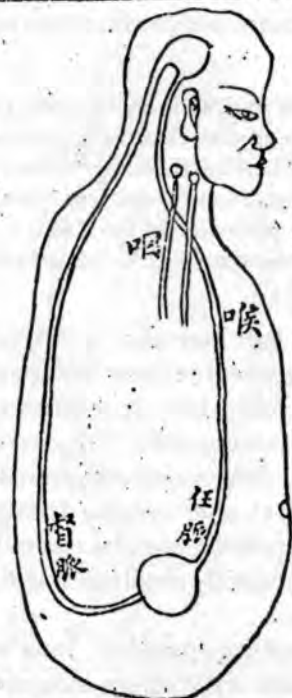
² 相火

³ 民火

任督二脈圖

續命方任督二脈圖

休忘白脉法輪下
檢點明珠不死關



任督二脈圖第一
現出元關消息路
常教火養長生宏

蓋此圖於前二圖原
也所重續者何為是然
道之人不知自身有法
之道路故備此圖以曉
志耳蓋人能通此二脈
百脈俱通矣所以鹿之
時鼻入肛門通其督脈
龜通其任脈三物俱有
歲之壽何況人乎修道
士既轉法輪以還慧命
意不長其壽而成其道也

九

Fig. 1625. Anatomical diagram from the *Hui Ming Ching* showing Tu Mo ascending from the reins to the brain and Jen Mo descending from the latter to the former, the first dorsally, the second frontally. The throat-and-trachea (*hou*) and the throat-and-oesophagus (*yen*) are also marked.

alchemy was not proto-chemical it was physiological, iatro-chemical and quasi-yogistic. Very likely this was not the first time that a stimulus diffusing from another civilisation was radically misinterpreted.^a But now we are in a position to put the record straight, and to understand Chinese physiological alchemy as it deserves to be understood, practically, not only mystically, as a real and experimental proto-science (by no means wholly without foundation) in its own right. All these reflections might have served as the dénouement of this Section if we had not still two tasks before us, first an essential glance at the relations of Chinese *nei tan* with Indian yoga,^b and secondly a terminal judgment of what the former amounted to from the point of view of the history of science.

(7) CHINESE PHYSIOLOGICAL ALCHEMY (*NEI TAN*) AND THE INDIAN YOGA, TANTRIC AND HAṬHAYOGA SYSTEMS

Here we reach one of those embarrassing situations where for the purposes of the present survey it is necessary to compress subjects of vast complexity into so little room that the discussion must seem inadequate to all who really know. But China and India gave and received mutually from early times, so that the reader who has reached this point can no way do without some sketch of what the Yoga system (*yogācāra*, *yoga-darśana*) really was. Space does not permit of any wide-ranging and documented treatment of such things as the role of sex in Indian religion; nor can we deal with the development of yoga, as we should like, historically, we can only give some rough idea of datings, important though they are for the relations with Chinese culture. Yoga, then, a word connected with *jugum* and yoke, meant both self-discipline and union, discipline to remove the individual aspirant from the 'red dust' *hung chhen*,¹ (as we should say in China) of the worldly turmoil of the world, and to lead to mystical union of the individual with the universe, a union which would liberate him or her from the dominion of events and history, an attainment of 'eternal life in the midst of time'. It thus became one of the six 'orthodox' Hindu systems, but it was also of the very fibre of Buddhism from the beginning, even affecting the Jains, and played a part in every form of Indian culture wherever it penetrated, whether to the snows of Tibet or the jungles of Indonesia.^c

Our first focal point is the — 2nd-century (the time of the Early Han in China) when were written, it is supposed, the first three chapters of the still extant *Yoga*

^a Again an embryologist is reminded of the inter-specific action of inductors and competent tissues. The same inductor brings about different differentiations in different animals, and if it is implanted in a foreign species (e.g. from frog to toad) it will induce the formation characteristic of the reacting tissue, not that which it would have induced in the normal course of events. The reacting tissue 'salutes', as Spemann used to say, 'but after its own manner'. So also perhaps different cultures are liable to respond to external stimuli by developing ideas that were latent within them already, without really understanding the ideas of the donor culture.

^b There are passing hints in Wilhelm & Jung (1) that they guessed they had to do with a system of yogistic character (pp. 7, 87, 99, 131)—but no more.

^c For general accounts see S. N. Dasgupta (4); Eliade (6); Masson-Oursel (4); Choisy (1); Jaggi (1), vol. 5.

¹ 紅塵

Sūtra, by Patañjali, the identity of whom with the famous grammarian^a is often though not universally accepted.^b Traditionally the yoga complex came to be associated with the philosophical system known as Sāṃkhya, embodied in the *Sāṃkhya Kārikā* of Īśvarakṛṣṇa, certainly written earlier than the +6th-century (when it was translated into Chinese), perhaps as early as +200, but in principle going back much earlier, to a legendary founder Kapila.^c Although from the Upanishads onwards the general Indian tendency had been to reject the phenomenal world as ephemeral, painful and illusory, for both Yoga and Sāṃkhya the world was real and not illusion. The difference between them was that while the latter was atheist in principle, the former admitted the existence of a supreme God (Īśvara) who could help the yogin at his labours. The two formed part of an antithesis running throughout Indian culture, that always there were two ways of salvation, on the one hand asceticism (*tapas*),^d on the other gnosis (*vidyā*, *jñāna*, *prajñā*)—and sometimes these two conflicted, even in Buddhism.^e The soteriological goal was the same, however, *mukti*, liberation from the human condition, 'absolute liberty', *jīvan-mukti*, deliverance of the individual within this present life.^f

Of course one must not assume that *yogācāra* began only in the time of this Patañjali. The strain is age-old in India; already the Mohenjo-Daro civilisation (–25th to –20th-centuries) left for posterity statuettes of 'yogis' sitting in the lotus or *padmāsana* position, and of naked goddesses or 'yoginīs', predecessors of those women who later incarnated the *śakti* consorts, the feminine creative energies. The *R̥g Veda*, datable about the –10th-century, knows of ascetics and ecstasies (*muni*), and a strange group of priests called *vrātya* in the *Atharva Veda*, who carry out breathing exercises, stand upright for a year at a time, and officiate at the *vrātyastoma* and *mahāvratā* sacrifices, accompanied by cantors (*māgadha*) and 'prostitutes' (*pumścalī*), perhaps the original devādasīs, who coupled in these fertility rites. Between the –6th and the –4th-centuries come the first appearances of later important yoga terms, such as *pratyāhāra*, the withdrawal of the senses from the phenomenal world; this occurs in the *Chāndogya* and *Taittirīya* Upanishads. A little later, in the *Śvetāśvatara Upanishad*, we find the words *āsana* and *prāṇāyāma*; highly important for our purpose, and easily explained. In fully developed yoga, the practitioner was bound to practise the eight *aṅga* (members), and these

^a Cf. Renou & Filliozat (1), vol. 2, pp. 90 ff.

^b The last chapter is generally considered to be of much later date, perhaps of the +5th-century, or perhaps of the +7th and +8th. See Eliade (6), pp. 21, 363; J. H. Woods (1); Dasgupta (3). Some eminent authorities, e.g. Woods, have placed the *Yoga Sūtra* as late as the +4th or +5th-century, which would make it contemporary with the early Tantric writings. But while Renou & Filliozat (1), vol. 2, p. 45, have doubts about the –2nd-century dating they seem to feel that it can hardly be later than the +1st.

^c Many expositions of this are available, e.g. Sengupta (1); P. N. Mukerji (1); Suryanavayana Sastri (1); Behanan (1). Although we do not need to go into it further here, it has deep interest for any philosopher of science, if only for the thorough-going incorporation of atomism in it.

^d Lit. heat, ardour, cf. Eliade (6), pp. 52, 116, 121.

^e The *jñāyin* or experimentalist monks were sometimes at odds with the *dharmayoga* or philosophical monks, to whom we owe the *abhidharma* treatises. A third group was the liturgical or *bhakti* (devotional) party, but it could hardly be the synthesis of the other two (cf. Eliade (6), pp. 180, 196). There may be certain parallels in the tension between mystical and rational theology in Christendom.

^f See Eliade (6), pp. 49, 107, 152.

terms refer to three of them. The first and second, *yama* and *niyama*, were the negative and positive aspects of an ethical code, which included abstention from hurting or killing any living creature (*ahimsā*), rejection of avarice (*aparigraha*), and total abstinence from generative sex (*brahmācarya*).^a Peace of mind under all circumstances, i.e. ataraxy,^b and avoidance of any particular attachments (*vairāgya*) were also inculcated. Next came the *āsana*, particular attitudes and postures of a gymnastic (indeed often a contortionist) character, which were adopted to assist mental concentration and strengthen the body. Equal in importance was *prāṇāyāma*, the control of the breathing by specific respiratory techniques, including prolonged apnoea, *prāṇa* (like Gk. *pneuma*) being a conception as near as may be to *chhi*^c in Chinese.^c The remaining four were all stages or types of mental withdrawal, i.e. *pratyāhāra*, the deliverance of the sensorial activity from the dominion of external objects, *dhāraṇā*, meditation or concentration, *dhyāna*, a higher state of contemplation, and finally *samādhi*, the highest stage of isolation, absorption or trance. The last three were often grouped together under the term *saṃyama*, 'the three vehicles'. We shall have more to say about most of these eight *āṅga* in relation to the specific subjects they deal with, in order to institute a comparison with their Chinese counterparts.

The second great movement of a yogistic character in Indian culture was Tantrism, which began to flourish from the +4th to the +6th-centuries and afterwards remained widespread and firmly rooted.^d The word *tan* means to extend, continue or multiply, suggesting some parallel with the Chinese *ching*² and its textile background, a succession, extension, or unrolling, in a continuous process. This came therefore, perhaps, not to destroy yoga but to fulfil it. If we except the shadowy and elusive alchemical philosopher Nāgārjuna of the +2nd-century (cf. Vol. 5, pt. 3,

^a The *niyama* included certain strange purifications (*śauca*) and purgations, to which we shall return in connection with the *āsana* postures and neuro-muscular training.

^b Cf. Vol. 2, pp. 63 ff.

^c Cf. Vol. 2, pp. 472 ff., Vol. 4, pt. 1, pp. 32 ff. and *passim.*, Vol. 5, pt. 2, pp. 27, 86 ff., 92-3, pt. 3, pp. 149-50. Cf. Ewing (1).

^d Cf. Eliade (6), pp. 205 ff., 386. We have already discussed this, approaching it from the Buddhist angle, in Vol. 2, pp. 425 ff., but there is more to be said in the present context, and we shall cover rather different ground. Since the pioneer works of Woodroffe (1, 2, 3) the literature has grown very large. We make no claim to a comprehensive knowledge of it, but feel like borrowing a leaf out of the book of Polonius (*Hamlet*, II, ii, 401) to describe some of the writings which have come our way. Thus you have the scholarly-illuminating, such as S. B. Dasgupta (1); Eliade (6); Bharati (1); Bhattacharya (2, 3); Evola (2); Zimmer (4)—the scholarly-mystifying, such as Chakravarty (1) and S. Chattopadhyaya (1)—the philosophical-incomprehensible, such as Guenther (1)—the iconographic-expository in the books of Rawson (1, 2) and Mookerji & Khanna (1)—finally the sociological-medical, such as Bose (1); D. Chattopadhyaya (4); Jaggi (1), vol. 5, pp. 107 ff. and Kanesar (1).

One of the most interesting distinctions is that elucidated by S. B. Dasgupta (1), pp. 3-4, 100, namely that in Buddhist Tantrism the activity belongs to the male god or *bodhisattva*, with the female *śakti* as the still centre; while in Hindu Tantrism all the energy and activity flows from the *śakti*, while the god is more like an instrument, and would be passive without her. Interestingly, Dasgupta attributes this second theology to the Taoists also, seeing Yin as kinetic and Yang as static. He gives no evidence, but this would be an interesting point to investigate in the abundant Taoist texts. Classically, motion (*tung*³) was associated with Yang and rest (*ching*⁴) with Yin (cf. Forke (9), pp. 93, 492, 497, and our Vol. 4, pt. 1, p. 61), but of course each always contained the germ of the other within itself, and it would be just like the *nei tan* Taoists to reverse the correlation and declare that in their world Yang was quiescence and Yin creative movement.

pp. 161 ff. above), the first great name connected with Tantrism is that of Asaṅga who seems to have flourished about +400. The *Suvarṇa-prabhāsa Sūtra* and others were translated into Chinese early in the +5th-century, but most of the oldest remaining Indian Tantric writings are of the +7th to the +9th. The oldest vajrayānic text^a is the *Guhya-samāja Tantra*, ascribed to the +3rd-century, and often attributed to Asaṅga himself;^b and there are others, such as the *Mahāyāna-sūtrālamkāra Śāstra* which must be of the +5th-century or earlier. The characteristic emphases of Tantrism may be summarised as follows. First great weight was laid on the importance of sex in the scheme of things; the real cosmic energy was feminine (creative as in the bearing of children and the inspiring of men), embodied in the *śakti* or consort of every one of the gods.^c New goddesses in their own right, too, came into prominence, particularly Tārā,^d while Prajñā-pāramitā, the Perfection of Wisdom, a kind of Hagia Sophia (ἁγία σοφία) was personified as a divine being. As Eliade puts it, it was a 'redécouverte religieuse de la mystère de la Femme',^e so that every woman could be an incarnation of a *śakti*, and the restorer (might not the word be significant?) of male energy and youth. Secondly, the movement was both anti-ascetic (in the extreme sense of the word)^f and anti-speculative. In the *Kālacakra Tantra* a Buddha reveals that man's own body is the true cosmos (hence, of course, the true laboratory also) and stresses the importance of sexuality as well as *prāṇāyāma*. Hence the body must be led to the perfection of health and maintained there, not mortified, for as the *Hevajra Tantra*^g says, the microcosmos is, as it were, a temple 'holy unto the Lord'. The *Kulārṇava Tantra* goes so far as to say that union with God is possible only through sexual (though non-generative) union. But this aim, which is radically mystical and not intellectual, requires a long and difficult path for realisation (*sādhana*), somewhat parallel indeed with the alchemical opus, for the body itself must be transmuted into a 'diamond body' (*vajra-deha*; we have already met with the expression *chin kang shen*,¹ p. 228). Moreover, and it brings us back to very familiar ground, 'the aim of this *sādhana* was the union of the two polar principles, sun and moon, fire and water, Śiva and Śakti, in the body and soul of the practitioner.'^h Thirdly, in

^a *Vajrayana* is the 'vehicle of the diamond thunderbolt', a mahāyānist conception (cf. Vol. 2, p. 426). In Tantrism the *vajra* is equated with the lingam, the male external generative organ. On Tantric Buddhism in general see S. B. Dasgupta (1).

^b Ed. B. Bhattacharya (1).

^c Hence the portrayal of gods and buddhas in sexual union with their *śaktis*, characteristic of Tibetan Lamaism but far from unknown in China (cf. Wu Shih-Chang, 1). On this subject in general see Wayman (1).

^d On her see the books of Beyer (1) and Eracle (1); the former containing information of interest on Tibetan alchemy. *Tārā* means star; her cult originated in the +7th-century, probably in Nepal, and spread widely through Asia. In India she is called Mahācina-Tārā, and her worship is described in two texts of uncertain date, the *Mahācina-Kramacārā* and the *Kāmākhya Tantra* (S. Chattopadhyaya, 1); here 'Great China' is much in evidence, but it seems to have meant most places north and east of the Himalayas. In this connection our argument that Tantrism had important roots in Taoism (Vol. 2, pp. 427 ff.) may be recalled. ^e (6), p. 207.

^f The extreme austerities or self-tortures of the *rṣis* of high antiquity were undertaken to acquire magic power over the gods. The *tapas* of yoga was always undertaken because conducive to the liberation of the personality from the dominion of things, and extreme ascetic practices were discouraged. Yoga was therefore, like Buddhism, a 'middle way'.

^g See the study of Snellgrove (2).

^h Eliade (6), p. 211.

Tantrism, iconography played a particularly important role, and the representation of the universe in *maṇḍala* form (cf. p. 13 above).^a *Bandha* and *mudrā* gestures were used ritually in the worship of the divinities portrayed, and in the *nyāsa* rite there was an invitation of each one to a particular part of the body so that the individual became a regular pantheon in himself.^b Fourthly the movement involved a great elaboration of *mantra* and *dhāraṇī*, that is to say, spells, charms and talismans of all kinds.^c

The third great movement of a yogistic character was Haṭhayoga, starting between the +9th and +12th-centuries,^d and ultimately bringing great reinforcement to a Tantrism which has lasted down to our own times in cults such as the Sahajiyā of Bengal.^e Though *haṭha* means violent effort, it was noted that the word was built from *ha*, the sun, and *ṭha*, the moon, so that we are again in presence of the *mysterium conjunctionis*. The importance of the human body as the real seat of the gods was strongly emphasised in Haṭhayoga, and under its influence the 'purification' procedures (*śauca*) probably reached their present form. Holiness was only realisable physically as well as mystically; and so for the first time there occurred a shift from the classical idea of deliverance here and now from the life within time and space (*jīvan-mukti*), to the idea of deliverance from the death of the body. This point is important and we shall return to it. Goraknāth, the semi-legendary developer of Haṭhayoga, and the founder of an order of *kānpḥaṭa-yogis*, must have been a contemporary of the Wu Tai and Sung adepts in China. He is supposed to have written the *Gorakṣa-śataka*, a text which still exists, but the bulk of this literature is of much later date, such as the *Haṭhayoga-Pradīpikā* of the +15th-century,^f and the *Gheraṇḍa Saṃhita* and *Śīva Saṃhita* which are later still. Goraknāth and other members of the group of the eighty-four magicians (*siddha*) such as Matsyendranāth, all continued to lay great emphasis on the value of the sexual practices, as we may see from the abundant folklore of the school as well as its writings.^g

Let us now take a brief look at certain general characteristics of the yogistic systems, thinking particularly of relations with China and the physiological alchemists there. First, 'contrariness' as such. Liberation (*mukti*), in Indian thought, always had a flavour of 'going contrary to all normal human inclinations'.^h The gaze must look inwards, the ears listen to the tune of eternity that has no note, the body must be deeply still instead of incessantly moving, the flow of images that wears out the mind must cease, and secretions such as saliva (called the water of life, *amṛta*) and semen (*bindu*, *śukra*) must pass inwards, not outwards. Moreover, the adept must

^a A remarkable exhibition of Tantric art was held in London in 1971 (catalogue by Rawson, 1).

^b One is reminded of the many Chinese texts and illustrations on the archaei which reside in, and control, the organs of the body.

^c Bolle (1) has given us an interesting account of the abiding place of Tantrism in Indian religion as a whole.

^d Cf. Eliade (6), pp. 231 ff.

^e See M. M. Bose (1).

^f See H. Walter (1).

^g Cf. Snellgrove (1) on the Tibetan aspects of all this.

^h Cf. also p. 279 below.

retrace all his previous existences in time, going backwards (*pratiloman*) till he comes to the gate of 'in the beginning' through which he will find his salvation.^a The *Mahā-nirvāṇa Tantra* calls this 'going against the current'.^b The 'in-mission' of the sperm is only one application of the same doctrine (*ujāna-sādhana*, counter-current, *ultā-sādhana*, regressive, and the oldest term perhaps, *parāvṛtti*, return).^c The yogi does not stand in the queue of life, he paces steadily in the opposite direction.^d

Secondly there is the question of magic powers. The dominion which the holy masochists of old got by their austerities over the gods has already been mentioned, but all the later yogins and haṭhayogins were credited with impressive, if lesser, magic powers (*siddhi*).^e Invisibility, insensibility to hunger and thirst, heat and cold, invulnerability, irresistible will-power and hypnosis, passing through or over water and fire, flying through the air, becoming enormous or tiny, heavy or light, at will, acquiring instantaneously knowledge of the workings of Nature—and producing gold from the ignoble metals: all these were believed of the *siddhas*.^f They were also clearly believed in +4th-century China, as one can see abundantly from the *Pao Phu Tzu* book. Orthodox Tantrism and Buddhism alike, however, forbade their use. There may be a remnant of the ancient shamanism complex here, with its ecstatic aerial voyages, its mastery of fire, and its changes in and out of animal forms.^g

Thirdly, there is the reconciliation of antagonists, the 'marriage of water and fire', the liberation from all opposites (*nirvandva*). Already noted in some of its Indian manifestations, it evokes all alchemy, and the Chinese physiological alchemy of the Yin and Yang more than most. *Samādhi* was in its way the attainment of it, for it was the recovery of the All, the Unity, the *coincidentia oppositorum* in which every antithesis was surmounted. The sexual union in Tantrism and

^a Eliade (6), pp. 98, 187ff. and especially Mus (1).

^b Eliade (6), p. 208; tr. by Woodroffe (3).

^c Ibid. (6), pp. 270, 315. As we saw in Vol. 2, pp. 428-9 there is a word *ūrdhva-retas* common in the epics *Mahābhārata* and *Rāmāyaṇa*; it is usually translated 'chaste' or 'continent', but since its literal meaning is 'upward-flowing (semen)' it must refer to this. One has to guard against the temptation of sensing references to esoteric practices in everything, but the counter-current symbolism is widely found in Asia. On the birthdays of boys Japanese families fly a wind-sock in the shape of a carp from a flag-pole, supposedly because they must be capable in later life of withstanding adversity, but one wonders whether there could not have been an implicit undertone here of the acts of heroic young ascetics. Some Shingon theologians at least could have been conscious of this. On the very curious history of the wind-sock itself, still not fully explored, cf. Vol. 4, pt. 2, pp. 597-8.

^d It is, clearly, our *ni hsing*!

^e For parallels in Western European hagiography see the book of Thurston (1), which deals with levitation, stigmata, telekinesis, incorruptibility, resistance to fire and heat, luminous phenomena, prolonged fasting without harm, absence of rigor mortis, etc. Though scholarly in its way, the professed scientific scepticism of the Jesuit author's work leaves one with a slightly uneasy feeling. Apparently even stigmata have been produced experimentally by suggestion in modern times. The miracle of 'bleeding hosts' has been shown to be due to the red pigment produced by *B. prodigiosus*; cf. F. C. Harrison (1). So also when 'the sea turns to blood', it is due to the red alga *Gymnodinium veneficum*; cf. Abbott & Ballentine (1).

^f Eliade (6), pp. 97, 101, 143, 152, 186 etc.

^g Though some scholars have been much concerned to stress the differences between shamanism and yoga. As Filliozat (2) pointed out, there is no spirit-possession in yoga and no ecstasy in the shamanic sense. Cf. Eliade (6), pp. 317ff.

Haṭhayoga was the supreme symbol of this heavenly oneness, a unity sought for no less in Jung's personality integration than in the Marxist identity of opposites. The pure spontaneity (*sahaja*) of the Sahajīyā groups was to be attained by the transcending of all dualities (the way of a *a-dvaya*), *prajñā* the wisdom and *upāya* the means, *śūnya* (emptiness, disillusion) and *karuṇā* (universal compassion), Śiva and Śakti, etc.^a

Lastly, a word might be added about the human body as microcosm. Just as in some of the Chinese statements (cf. p. 122 above), the idea of the parallel role of the *chhi* in world creation and in the development of individual human bodies was also present in India. Wind (*vāyu*) and pneuma (*prāṇa*) in its three Vedic forms (*prāṇa*, *vyāna* and *apāna*) did their cosmogonic work all over again in the formation of each individual human being.^b

We are now free to look more closely at each of the technical *āṅga* with Chinese parallels in mind.^c First come the respiratory exercises, the *prāṇāyāma*, which we found so prominent in the *nei tan* world. Nine of them are described by Behanan (1), but all involve the three phases, inspiration (*pūraka*) followed by expiration (*recaka*), with a more or less prolonged period of apnoea (*kumbhaka*) between (cf. p. 143 above). There were several traditional proportions of time for them, the most usual being as 1:4:2. Total cessation of respiration (*viccheda*) could take place in some of the exercises paralleling the long breath-holdings in China, and it is interesting that a *mātrā* unit of measure for these is mentioned already in the *Yoga-tattva Upanishad* which dates from the +2nd-century. Among the more famous forms of *prāṇāyāma* there are *ujjayi*, a purely thoracic type, *bhāstrika* where quick and sudden inhalations are followed by equally sudden exhalations, *kapālabhati* which lacks the apnoeal phase, *sūrya-bhedana* which uses the right nostril only, and so on. These various forms were (and are) practised in permutations and combinations with the postures, of which we shall speak in a moment.

Although we have not found any close Indian equivalent of the conception of 'foetal respiration' (*thai hsi*,¹ cf. p. 145 above), there was certainly a body of doctrine somewhat paralleling the Chinese ideas about the circulation of the *chhi*, and this is all the more intriguing because the physiological systems concerned were rather similar. There was a Tantric physiology as well as a Taoist physiology.^d A network of vessels or 'canals' (one dare not think of them as either blood-vessels, lymphatics or nerves) known as *nadī*, was the means of transport of the five sorts of *prāṇa* throughout the body,^e and at the nodes of this network there was a series of 'centres' (*cakra*).^f The texts never agreed about the number of the *nadī*, some

^a Eliade (6), p. 269.

^b Cf. Eliade (6), p. 238.

^c And we shall do so in the same order as that in which we dealt with the Taoist *nei tan shu* from p. 142 onwards above. ^d See Eliade (6), pp. 237, 239, 394 and Evola (2). ^e Eliade (6), p. 373; Jaggi (1), vol. 5, pp. 61 ff. etc.

^f These have been known in Europe not only through Indianists but through some of the disciples of Jacob Boehme, especially J. G. Gichtel (cf. the monograph of Leadbeater). For this and other information arising in discussions, our thanks are due to Mr. John Adamson of Holywell. See also of course the books of Woodroffe (Avalon).

counting them by the hundreds of thousands, others taking 72 as the most important; the *Śiva Samhita* speaks of 14, and ten was a commonly adopted number. But in any case the great three were *suṣumṇā*, through which the reversed semen came up dorsally, as also *iḍā* and *piṅgalā*, distinctly reminiscent of the Chinese auxiliary tracts *jen mo*¹ and *tu mo*.² In fact the entire system bears a rough (but uncanny) resemblance to the regular and auxiliary acupuncture tracts (*ching lo*³) of China, almost as if it was a somewhat distorted echo of them, with the *cakra* representing the larger entities (*thien*,⁴ *chhih*⁵) rather than the individual acu-points or loci (*hsüeh*⁶).^a Some indianists have sought to identify the *nadī* and *cakra* with structures in modern anatomy such as the carotid arteries or the plexuses of the autonomic nervous system, but this must surely be on the wrong track. The *brāhma-randhra* may indeed have been the bregma of the skull,^b but the *mulādhārā cakra*, between the anus and the testes, was more probably the place where the perineal pressure was applied in *coitus thesauratus* than the sacral plexus. A Taoist would probably have called it *wei-lü*.⁷ It was also the abode of *kuṇḍalinī*, serpent, goddess, archaeus or physiological energy, perhaps a personification of the reverted semen, for she or it arose also up the *suṣumṇā* channel.^c The epigastric *manipūra cakra* seems reminiscent of the lower *tan thien*,⁸ and the thoracic *anāhata cakra* of the middle one, while the 'cavernous plexus', *ajñā cakra*, between the eyes, occupies the place at least of the upper *tan thien*.

It would be fascinating to pursue such comparisons further, but they must be left for future research when we know far more about both the Chinese and the Indian proto-physiological systems. As usual, who borrowed what from whom at what time, is the question raised by these comparisons, and one must always remember that two things may spring from a common and more obscure source. But we have a few fairly sure mark-points. *Suṣumṇā* as an ascending vessel for *prāṇa* is first mentioned in the *Maitrāyaṇī Upanishad*, a text which may lie between the - 2nd and the + 2nd-centuries; and by the end of the + 2nd all three are there (*suṣumṇā*, *iḍā* and *piṅgalā*) in the very Tantric *Dhyānabindu Upanishad*, together with the

^a The parallelism between the Indian *cakra* system and the Chinese acupuncture tract circulation system has been studied in a preliminary way by Poix (1) and Finckh (1). The former says, rather surprisingly, that the 'méthode dite Orientale' of Chanson (1), i.e. *coitus reservatus sed non interruptus* rather than *coitus thesauratus* (p. 199 above), has been 'à la mode parmi nous catholiques' and welcomed by Latin theologians as a contraceptive method. This is a theme of Chang Chung-Lan (1) also. According to Peel & Potts (1), pp. 47, 50, 150, it is statistically more effective than all other methods except IUD and the pill. On the relationship between the two physiological systems, Finckh suspected a borrowing from China.

^b This is the anatomical term for the point where the frontal and the parietal bones meet, i.e. where the (transverse) coronal suture meets the sagittal. The bones do not close together till a year and a half or so after birth; during this time there is a membranous gap, the anterior fontanelle. For this reason the place may have been thought of in ancient India and China as a channel of communication between the microcosm and the heavenly influences of the macrocosm. At any rate, the bones of the skull (*thien ling kai*⁹), the Cover of the Ni-wan Palace, got into Chinese materia medica fairly early (cf. *PTKM*, ch. 52, (p. 105), R435). The bregma (*miao mên*¹⁰) plays a prominent part as the 'point of egress' of the immortal embryo in the Taoist physiological alchemy described by Lu Khuan-Yü (4), pp. 160ff.

^c See the works of Woodroffe (1, 2).

¹ 任脈

² 督脈

³ 經絡

⁴ 田

⁵ 池

⁶ 穴

⁷ 尾闕

⁸ 丹田

⁹ 天靈蓋

¹⁰ 妙門

'serpent-power', *kuṇḍalinī*. In the same way, the Chinese system of the tracts, even the auxiliary ones, is already established in the *Huang Ti Nei Ching, Ling Shu*, which was coming together in the – 2nd and – 1st-centuries. Since this primary medical classic was the product of hundreds of years of previous clinical experience, the tracts must be of venerable antiquity in China, but there is evidence that the individual loci preceded them, for texts of the – 6th-century as well as the – 2nd give some of their specific names, which remained unaltered through subsequent ages.^a As has been said elsewhere,^b the Chinese system of the circulation of the *chhi* was modelled on a traffic nexus of hydraulic engineering, with its lock-gates and reservoirs, so it was a very natural development in that 'hydraulic-bureaucratic' civilisation.

The emphasis on the swallowing of saliva does not seem so striking in the Indian as it is in the Chinese literature, but it does occur. In the *khecari-mudrā* technique of Tantric Haṭhayoga, which aims at the immobilisation of breath, thought and semen, the tongue is turned back to obstruct the throat and so produce prolonged *kumbhaka* apnoea, while at the same time the saliva collects abundantly and is reverently swallowed in due course as an *amṛta* or 'athanasian nectar'. On the other hand the gymnastic of the postures (*āsana*) is more strongly emphasised in India.

To get some idea of these there is no better way than to look at the photographs given by several writers (Figs. 1626 to 1629).^c Perhaps the most characteristic is the lotus-posture (*padmāsana*), sitting 'cross-legged' or 'tailor-fashion', where the yogin sits on the ground with each leg bent at the knee and each foot resting on the opposite groin, having the soles turned upwards and the heels pressing against the lower side of the abdomen. The spine must be kept erect, and the hands have to rest on the knees or the heels, with the palms turned upwards. Behanan describes fourteen others. In one (*sarvāṅgāsana*) the yogin lies on his back and lifts legs and trunk in the air till only head, shoulders and elbows remain on the floor; the hands are then placed on the back ribs for support.^d In another (*matsyāsana*) he leans backwards with arched back from the *padmāsana* position till the top of his head touches the ground; in a third (*halāsana*) he lies prone and bends his legs and body over his head till the toes touch the ground some distance behind it; in a fourth (*dhamurāsana*) the adept lies 'on his face' and raises both the thorax and the legs, holding the ankles with both hands. Naturally this was called the position of the bow, and it had its close analogue in China, as several of the gymnastic books show, and as we see from one of the sets of pictures given by Cibot (his fig. 15). Other exercises keep the legs stretched straight out, and in one of these (*paścimottānāsana*) the yogin hooks his fingers round the toes and brings his body forward until his head rests between his knees. It is very obvious that in order to perform some of the *āsana* it is necessary that there be not an ounce of superfluous adipose tissue. In

^a Cf. Lu Gwei-Djen & Needham (5).

^b Needham (64), pp. 289 ff.

^c E.g. Behanan (1); Bernard (1); Woodroffe (1); Abegg, Jenny & Bing (1); Kerneiz (1, 2); Iyengar (1).

^d In the *śīrśāsana* position, however, the aim is to bear all the weight on the cranium, not aided by elbows and hands; or so it is taught in some schools.



Fig. 1626. Some of the yogic postures, from Behanan (1). Here the lotus-posture (*padmāsana*). Cf. the second of Chungli Chhüan's exercises in Fig. 1599. But like most of the Taoist techniques that involved movement, while the lotus-position was held in stillness for meditation.

most of the postures the spinal column is bent either backwards or forwards, but in one of those called after Matsyendranāth it is powerfully twisted. As Behanan (who himself practised many of these) describes it, the yogin sits on the floor with the legs outstretched. The right leg is bent, with the heel set against the perineum^a and the sole against the left thigh. Then the left leg is bent and the foot placed on the right side of the right thigh. The right hand is passed around the left knee to grasp the left toe, so that the shoulder keeps pressing against the knee and allows the body to be

^a Mem. p. 208 above, and the use of a similar heel position in *coitus thesauratus*. Perineal pressure with the heel is mentioned also in the texts translated by Woodroffe (2), p. 211.



Fig. 1627. The 'completeness' posture (*sarvāṅgāsana*).

twisted to the left. The maximum possible twist is effected by bringing the left hand behind the back to take hold of the right thigh below the groin. In yet another position, called after the peacock (*mayūrāsana*), the yogin balances his whole body horizontally on the two hands and forearms. This demands great expenditure of energy, but by contrast the 'corpse-position' is adopted to relax to the utmost all the muscles of the body. This is done lying flat on the back, and it is the one generally adopted by those yogins who demonstrate their capacity to survive prolonged periods of confinement in small closed spaces, 'buried alive'. In every one of the *āsana*



Fig. 1628. The 'plough' posture (*halāsana*).



Fig. 1629. The 'bow' posture (*dhanurāsana*). This was almost certainly used among the Taoists, since we find an attempt to depict it in Cibot's fig. 15.

positions there are various possibilities of *prāṇāyāma* breathing, and some are considered more suitable than others for the particular kind of meditation which it is desired to pursue.

The statuettes of Mohenjo-daro have already been mentioned, and also the appearance of the *āsana* in the *Śvetāśvatara Upanishad*, which is presumably of the -4th-century or somewhat earlier. The number of the positions increased of course as time went on, and more and more ingenuity was brought to bear on them by the yogistic physio-therapists, as one might call them. Thus the *Haṭhayoga Pradīpikā* of the early +15th-century describes 15, the *Gheraṇḍa Saṃhita* a century later 32, and the *Śiva Saṃhita* still later has as many as 84, though it considers only four of them important.

But the postures were only part of the physical exercises of *yogācāra*. There were

a considerable number of associated techniques which were classified as practices (*bandha*), gestures (*mudrā*) and purifications (*śauca*); and most of these required a prolonged neuro-muscular training, either to gain more complete control over certain voluntary muscles, or to acquire a control not normally possessed at all over certain involuntary muscles. The eye muscles were trained to assist in preserving concentration (*ekāgratā*) in meditation, staring fixedly (*trātaka*) at the tip of the nose (the nasal gaze), or directed crosswise to a point between the two eyebrows (the frontal gaze). These techniques were certainly known and practised in medieval China, for one finds many hints of them in Taoist texts. We have not however come across there the use of the 'chin lock' (*jālandhara*), i.e. the bending down of the head so that the chin fits into the jugular notch at the top of the sternum. The head was often held in this position during periods of breath retention, exerting an upward pull on the spinal column. Nor does it seem that anyone in China went to the length of cutting the frenulum of the tongue, as the yogins did (and still do) in India. In 'tongue-rolling' the tongue is directed backwards and upwards so as to occlude the posterior nasal cavities leading into the pharynx, but normally the tip of the tongue cannot reach this position, so the frenulum is transected in a number of successive minor surgical operations. This mastery over the tongue is considered a valuable help to the breathing exercises, especially those which involve long retention.

Muscle control for the 'purifications' (*śauca*) was mainly concerned with the diaphragm musculature, the two great recti of the abdominal wall, and the sphincter muscles of anus and bladder. In raising the diaphragm a complete expiration is followed by a 'vigorous mock inhalation' in which the ribs are raised and a deep depression of the abdomen brought about. In this way it is possible to increase greatly the intra-thoracic pressure. Similarly the yogic disciple practises violent and extreme contractions of the rectus abdomini muscles, both together and separately isolated (*nauli*); he may then contract and relax them rapidly and alternately. Behanan and Bernard reproduce some striking photographs of all these operations. But perhaps the strangest physiological feat is the high degree of control which may be gained over the sphincter muscles, first practising by repeatedly contracting and expanding them for minutes at a time, then doing so in phase with the respiratory rhythm. When the control has been established, the gases in the lower colon may be systematically expelled when the diaphragm is raised or the recti contracted, and when the abdominal muscles are relaxed, external air may be sucked in through the anus.

But just as if it were a matter of human technology, the yogins were not content with pumping gases about, they were also interested in pumping fluids, and the muscular control of cavity walls and sphincters gave them the opportunity of doing exactly this in the greater *śauca*. It was simply that if the necessary muscles could be contracted and relaxed at will, a partial vacuum could be produced in the various cavities, the walls corresponding to 'pistons' and the sphincter openings to 'valves'. Thus colonic and rectal irrigation (*basti*) could be practised, about a litre of water or milk being taken in, then churned about by the recti muscles before being

expelled.^a Similarly the diaphragm control gave mastery over the thorax, and with the aid of the abdominal muscles the stomach could be made to vomit its contents at will, usually after drinking a litre or so of water.^b This was called *dhāutī*, but an even more remarkable technique was (and still is) practised (*dhāutī-karma*), in which a strong but thick strip of cloth about 22ft. long and 3ins wide is swallowed into the stomach, churned there, and then withdrawn manually after twenty minutes or so. *Dhāutī* also comprised cleaning exercises for the teeth, while there was *neti* for the nose, using threads pulled back and forth through the nasal cavities, and a technique of inhaling water through the nose,^c associated with the form of respiration termed *kapālabhatī*. But perhaps the most interesting for us, in relation to all that has been said in this sub-section about sexual techniques, is that a partial vacuum could be developed in the bladder as well, and since the vesical sphincter was under conscious control too, it was possible to aspire fluids through the urethra, 'making the Yellow River flow backwards' in yet a further sense. As much as about 300 ccs. can be absorbed in this way, catheters of silver or lead being used in traditional usage to help.

In modern times attempts of great interest have been made to study the practices of *yogācāra* with modern physiological methods.^d Here a start can be made with the classical papers of Laubry & Brosse. They first became interested because they found (2) that certain normal human subjects were able voluntarily to accelerate or retard their heart rate, and that periods of meditation or concentration exerted a therapeutic effect in certain pathological arhythmias. Besides, there was an obvious psycho-somatic interest in exploring the possibilities of conscious control of functions normally involuntary.^e From the scientific point of view there was nothing incredible in what the yogins were able to perform, for the medical literature contains reports of unusual cases which can be considered in some sense parallel. For example, Abrami, Wallich & Bernal (1) had studied a case of voluntary reversible arterial hypertension, and McClure (1) afterwards recorded the quite non-yogistic instance of an aircraft mechanic who could deliberately bring about a slowing of the pulse until cessation of the heartbeat would occur. Just when he was about to lose consciousness he would take a deep breath and the heart would start beating again; these events never occurred spontaneously, and the phenomena were confirmed by the electrocardiograph. Then in 1936 Thérèse Brosse made extended field studies in India, the results being reported in Laubry & Brosse (1).^f In the *prāṇāyāma*

^a Behanan (1), Bernard (1) and many other observers have seen this done or done it themselves. If the sphincters were still not under full control, a bamboo tube could be used to introduce the liquid.

^b Indian roadside circus performers who have learnt the yogistic technique of voluntary oesophageal reflux can swallow 10 to 15 live snakes each measuring 2 to 3 ft. in length, with a good deal of water, and then after a short while regurgitate them. This has recently been studied with full physiological and radiological technique by Johnson & Johnson (1).

^c Cf. the story of the Flower-Intoxicated Taoist on p. 240 above.

^d This subject overlaps with the physiological changes occurring during meditation, which we have already discussed on p. 180 above. Apart from the reports described in the following paragraphs there are interesting papers by Henrotte (1); de Meuron (1); and du Puy-Sanières (1).

^e Cf. Ramamurthi (1).

^f More recent work is described by Brosse (1).

exercises there could be apnoea, she found, with lungs full or empty, lasting without difficulty up to 5 mins., there were all kinds of willed modifications of respiratory rate, accelerations of heart rate up to 150 beats per min. during the retention, and remarkable phenomena seen on the electrocardiograms. Corresponding with changes in the perceptible pulse waves, the ECG waves showed great abnormalities, sometimes disappearing almost completely, at other times mimicking patterns usually seen only in advanced states of heart disease, or again sometimes reminding the observer of the effects of digitalis and other cardiotonic drugs. The blood pressure, however, seemed always to be normal, while indications were that the basal metabolism during intense meditation was reduced. There was some evidence of a voluntary control of the peristaltic movements of the intestinal tract. A minute and persevering education in physical health, said Laubry & Brosse, could lead in the yogistic system to 'the voluntary mastery of purely vegetative functions'. 'The absolute authority of will-power possessed normally over the voluntary muscles is acquired by the yogin in equal measure over involuntary muscles'. And they went on to say: 'In spite of the rudimentary, if not erroneous, anatomical ideas of the yogins, one can scarcely deny the importance of the physiological results obtained. If they do not understand the structure of their organs they are indisputably the masters of their functions . . . A rigorous discipline has led to a complete control of (certain) vegetative activities'.^a

Laubry & Brosse (1) suspected that the yogins might be able to bring their bodies into a state of retarded life comparable to that of hibernating animals. More recent researches have not confirmed exactly this, but they have demonstrated that yogistic skill is able to effect a reduction of the basal metabolism. This was found during the investigation of the claims that yogins could live for considerable periods 'buried alive'. Generally under such conditions some air leaks in through the surrounding earth, even though the subject is completely relaxing in the 'corpse-posture', as Hoenig (1) and G. Rao *et al.* (1) have shown; but when the experiment was done under satisfactory conditions in a hermetically sealed experimental box, Anand, Chhina & Baldev Singh (1) found that the basal metabolism of a yogin was reduced from 19.5 l./h. to 13.3 l./h., even at one stage reaching a value of some 45% below the normal (cf. Fig. 1630). On the other hand, the alleged voluntary stoppage of the heart beat could not be confirmed. All observers, such as Anand & Chhina (1), Satyanarayanamurthi & Shastry (1) and Wenger & Bagchi (1), find that an extreme intra-thoracic pressure is set up, under which heart sounds and arterial pulse are both abolished, but the ECG records show that contraction is continuing. Behanan (1) found increases of up to 24.5% in oxygen-consumption during certain varieties of the breathing exercises such as *ujjayi*, *bhastrika* and *kapālabhatī*, and this has often been confirmed, as by Miles (1) and S. Rao (1). On the other hand Behanan observed falls of up to 10% in scores in mental tests^b made after periods

^a On this subject see further Filliozat (13).

^b These were as follows, adding test, code test, colour naming test, co-ordination test, and Chinese puzzle test, all well known in experimental psychology.



Fig. 1630. A yogin co-operating in oxygen-consumption experiments (from Behanan, 1).

of *ujjayi* breathing and meditation. He concluded therefore that the yogistic techniques tended to decrease the sharpness of the intellectual faculties, possibly strengthening others less measurable, and aiding detachment from the phenomenal world. S. Rao (2) carried out *ujjayi* breathing tests at different altitudes, observing an increase of 7.7% in the oxygen-consumption at 1800 ft. and 9.9% at 12,500 ft.; the interest of this is (as we said at an earlier stage in connection with the Taoists, p. 145 above), that altitude anoxaemia is to some degree imitated in the yogistic and Taoist respiratory exercises, especially when long retention is performed. Rao thought that they might be of interest in the acclimatisation process. For the rest, modern physiological methods have been used to study subjective heat sensations like those so commonly described in Tantric and Taoist texts, as in the work of Rieckert (1), which revealed some of the changes occurring in the peripheral circulation. Perspiration induced purposively was considered by Wenger, Bagchi & Anand (1) to be brought about as the autonomic response to powerful mental visualisation. And in another interesting experiment by Bagchi & Wenger (1) the EEG record showed that mild and continuous pain could be completely ignored by the meditating yogin. Thus there is no reason for doubting the reality of many of

the effects produced in yogistic physiological practices.^a How valuable they were is quite a different question.

With gymnastics, *āsana* postures, purification feats and the like we have now done, and before going further must say a few words about the subjects of heliotherapy and meditation—since we are following through the techniques in approximately the same order as on pp. 179 ff. above. Doubtless owing to the fierceness of the Indian sunlight, there was little or nothing, so far as we can see, corresponding to the photo-receptive practices of the Chinese on their mountains. On the other hand the meditation techniques were still more highly developed, though we need not give much space to them on account of their primarily psychological and even psychiatric interest. *Yoga cittavṛttinirodha*, the suppression of conscious states in order to contemplate the essences (*tattva*) of all things, their 'suchness' in fact, was one of the fundamental and most ancient yogistic objectives. The subtly differentiated states of *pratyāhāra*, *dhāraṇā*, *dhyāna* and *samādhi* we have mentioned already, and do not propose to go into further here; one might only point to a work of great interest remaining to be done, namely the precise comparative study of Indian and Chinese conceptions and definitions of the contemplative states of mind, united as it ought to be with the results of modern psychology, psychopathology and experimental psychology,^b and not forgetting the possible connections with hypnosis, self-hypnosis, states of cataleptic trance (*turiya*), and tranquilising or hallucinogenic drugs. The electro-encephalograph has already been applied, as we have seen, to yogins practising their techniques, and there is a wide scope for all such researches. A distinction was made between *samādhi* 'with support' (*samprajñāta samādhi*), achieved by concentrating on some visualisable thing (*kaśina*), much followed in Buddhism, and *samādhi* 'without support' (*asamprajñāta samādhi*), where no such object of thought was used.^c Sometimes colour sensations were given much prominence, as is found in certain Taoist texts. Since in China the same word stands for both colour and sex (*se*¹), this will be a convenient point at which to approach the last of our divisions, that of sexuality.

^a Enhanced control over normally involuntary muscles has now been found to be possible in animal experiments also. Di Cara (1) describes 'trial-and-error' learning techniques according to which rats can be trained by means of mid-brain pleasure-centre stimulation and mild electric shock avoidance to increase or decrease their heart-rate, raise or lower their blood-pressure, intensify or relax peristaltic intestinal contractions, and accelerate or retard urine secretion. Even electro-encephalographic characteristics could be learned in this way, and the heart responses were accompanied, it could be shown, by changes in the metabolism of catecholamines and noradrenalin. Animals can also learn glandular and visceral responses that quickly restore deviations from the homeostasis of the internal environment. In fact under the experimental quietude brought about by curarisation they do much better than human beings, but it is not now so surprising that man too is capable of such apparently remarkable things. All this animal learning in the autonomic nervous system may well be paralleled by phenomena like hibernation, where it would be automatically effected under endocrine control.

^b Cf. the review of Malhotra (1). Certain modern psychological interpretations of Tantric Yoga are of fascinating interest, e.g. Zimmer (3), who shows its continuing relevance to the human condition. Zimmer describes the remarkable case of Staudenmeier (1), who worked out a kind of yoga system on his own and successfully overcame his formidable psychological difficulties thereby.

^c Eliade (6), pp. 92, 103.

¹ 色

On this we have touched several times already, for example in connection with the goddesses of the Indus Valley cultures and the 'principle of contrariness' which characterised all yogism from the beginning. 'Yoga', wrote Eliade,^a 'accorded a capital importance to the "secret forces of the generative faculty" which, when expended, disperse the most precious energy, debilitate the cerebral capacity and make concentration difficult; but if, on the contrary, they are mastered and reined in, they facilitate the ascent into contemplation'. This therefore was a keynote in the oldest phases, but (as we also saw) Tantrism and then Haṭṭhayoga brought immense accessions of emphasis to the spiritual significance of the physical union of man and woman here below. By the +2nd-century sexual yoga was in full swing, for the *Maitrāyaṇī Upanishad* has mentioned the *suṣumṇā* vessel, and the *Yoga-tattva Upanishad* gives us the satisfactory information that 'by the retention of the semen the yogin's whole body develops an agreeable perfume'. *Kuṇḍalinī* appears here also, together with the first accounts of the *khecarī-mudrā* and the *vajrolī-mudrā*. What exactly these were we know from later texts. The former essayed to accomplish the simultaneous immobilisation of breath, thought and semen, obstructing the throat with the tongue in *kumbhaka* apnoea, secreting copious saliva, and (as the *Dhyānabindu Upanishad* says, followed by the *Gorakṣa Saṃhita*) never emitting semen, even in the embrace of a woman.^b If a partner was optional here, it was not so with the *vajrolī-mudrā*, where the yogin should ejaculate, but after having done so he should positively regain this *medhra* (the *bindu* or semen emitted), and 'having done so by a pumping process, the yogin must conserve it, for by the loss of the *bindu* comes death, and by its retention, life.'^c Thus we seem here to be in the presence of a veritable seminal aspiration, the muscles of the abdomen creating a partial vacuum in the bladder and so permitting the absorption of part at least of the vaginal contents. It comes irresistibly to mind that this procedure may perhaps have been utilised in medieval China also, in the light, for example, of the passage translated on p. 196 above. The *Dhyānabindu Upanishad* must be speaking of the same practice when it says that if the *bindu* should be lost, a *yonī-mudrā* (vagina-gesture) will bring it, or send it, back. This +2nd-century text also says, interestingly, that the *bindu* is of two kinds, a red sort (*mahārajas*) which the female produces, and a white sort (*śukra*) which is produced by the male—here again is the Aristotelian theory of generation (not necessarily derived)^d passing under the aegis of Śakti and Śiva.^e

That the method of perineal pressure in *coitus thesauratus* was also used in India seems likely from expressions such as that used in the *Mahāyāna-sūtrālaṃkāra Śāstra*, which speaks of *maithumasya parāvṛttau*, the 'returning' or 're-routing' of

^a (6), p. 63.

^b Eliade (6), pp. 249 ff.

^c Ibid, pp. 250 ff.

^d Cf. Needham (2), pp. 24-5, 60. The 'white-red' antithesis must be world-wide. Among the Ashanti, says Turner (1), p. 42, white symbolises water, semen and saliva; and again (p. 61) the Ndembu make a ritual use of white and red clays representing the semen and the menstrual blood respectively.

^e Exactly how the *yoginī* benefited remains the same puzzle in Tantrism as it was in Taoism, but one can see that it was not a far cry to the thought of conservation of the menstrual blood, and she was also supposed to perform some parallel act of aspiration during intercourse (Eliade (6), p. 250).

the semen, closely analogous to the Chinese idea (*huan ching*¹). *Maithuna* was the word for sexual intercourse undertaken as a religious rite,^a and the Taoist atmosphere is strikingly encountered in all kinds of Tantric statements about it. Yoga had used it for its purposes, Tantrism transformed it into an 'instrument of salvation'. It was accompanied of course by prayers and sacrifices, very reminiscent of the Taoist rite which we gave on pp. 205–6 above. For the religious spirit every girl and woman was an incarnation of *prakṛti* (Nature), and the ritual nakedness of the *yoginī* was an important revelation of the cosmic mystery. As Eliade wrote:^b

Si, devant la femme nue, on ne découvre pas dans son être le plus profond la même émotion terrifiante qu'on ressent devant la révélation du Mystère cosmique—il n'y a pas de rite, il n'y a qu'un acte profane, avec toutes les conséquences que l'on sait (renforcement de la chaîne karmique, etc.).^c

The companion of the rite becomes a goddess, an incarnation of Śakti, she, the *nāyikā*, being first consecrated (*adhiṣṭhitā*) by invocations of the *nyāsa* kind (cf. p. 261 above). When the *śukra* and the *rajas* are both immobilised, there occurs at the climax of the act, which symbolises the *mysterium conjunctionis* of all opposites, a condition called *samarasa*, an identity of emotion in the perfection of unity (*yuganatha*). Further troubling parallels with the Chinese patterns follow. Just as, for example, by the very same actions which bring common men down to death, Huang Ti and Phêng Tsu were able to mount up into the sky as immortals or to roam on earth for ever, so also, in the Indian version: 'by the same actions which send certain men to burn in hell for aeons of time, the yogin obtains his eternal salvation'.^d But this is because the yogin is following the way of *bodhicittaṃ notsṛjet*, the semen must never be emitted;^e it must take the negative backward way (*ujāna-sādhana*, *ulṭā-sādhana*, *parāvṛtti*). And again, the emphasis on the equality of all men and women in sexual union, irrespective of class-distinctions and social position, strikes a note that we have clearly heard in the early Taoist liturgical assemblies.^f In sum, therefore, the resemblances between Tantrism, Haṭhayoga and Taoism are distinctly close; what remains (and that is not an easy matter) is to find out which most influenced the other.^g

^a Hence the wonderful sculptures covering the walls of certain great temples such as Konarak and Khajuraho. These have a considerable literature on their own, and we shall only refer at random to the books and albums of Anand (1); Anand & Kramrisch (1); Kramrisch (1); Gichner (1); Mitter (1).

^b (6), p. 260.

^c On Indian sexology in general there is a wealth of literature and many of the classical texts have been learnedly translated; see e.g. Basu (1); R. Schmidt (1, 2, 3); T. Ray (1); Tatorjaya (1).

^d From the *Jñānasiddhi* of Indrabhūti, but there are many other statements of the same idea (cf. Eliade (6), pp. 264, 395).

^e The phrase is found in the *Subhāṣita-saṃgraha* (see Bendall, 1) and many other writings (cf. Eliade (6), p. 268).

^f Vol. 2, p. 151. The yogin was to venerate the humble washerwoman (*dombī*) and the prostitute (*lulī*, perhaps also *devā-dāsi*). There might be more than one economic explanation of this, but it did involve a flouting of caste barriers, always so important in India, though in China unknown. The sociology of extra-structural equalitarian communities has been discussed by Turner (1) and Dimock (1, 2). In a piquant comparison the Spiritual Franciscans join with the Sahajīyā Vaishnavas of Bengal.

^g To say, with Chattopadhyaya (1), that Indian śakti Tantrism and Chinese Taoism both have a deep connection with primitive agrarian matriarchal society, is indeed acceptable, but the mutual interrelations still remain intriguing.

Some help towards this may be given by turning now to consider a few more general ideas, since we have finished passing in review the chief components both of Chinese *nei tan* physiological alchemy and of its Indian counterpart. First, it is rather striking that the three primary vitalities, the *san yuan*,¹ have rather similar analogues in India. That *chhi*² means (more or less) *prāṇa* is obvious, but clearly also *ching*³ is paralleled by *bindu* and *shen*⁴ by *citta*. At the same time we do not know of any Indian texts which say the kind of things about these three that are met with in the *hsiu chen*⁵ literature; some doctrine of original youthful perfection may be implicit, but not spelt out quite as in China. There is further similarity between the Chinese cycles of operation, the *chhi fan*,⁶ the *chiu huan*,⁷ or the 'fire-times', *huo hou*,⁸ and the relations which texts such as the *Kālacakra Tantra* set up between the periods of breathing exercises and the cyclical calendrical recurrences which break time into its specific blocks.⁹ 'Transcending day and night', in Indian thought, means the reconquest of the fullness which preceded all creation, in other words, the regaining of the *thai i*¹⁰ or *hsü wu*,¹⁰ the womb of all potentialities before time began.

Next comes a point that may be especially significant. In India the fundamental purpose of the operations seems to have changed in the early middle ages. 'Neither classical Yoga', wrote Eliade,^b 'nor in general any other main stream of Indian thought pursued "immortality"; India preferred deliverance and liberty to any indefinitely prolonged existence.' This was *jīvan-mukti*, the liberation of the individual while still in this present life from the dominion of time, space and things. Yet in Tantrism and still more in Haṭhayoga, after a certain point, the texts begin to proclaim the 'destruction of old age and death', and to say that the techniques 'conquer death' (*mṛtyum-jayati*).^c Haṭhayoga set about the alchemical aim of forging and re-casting an 'incorruptible diamond body' (*chin kang shen*,¹¹ as we should say). Some other river seems to have flowed here into the mainstream of Indian conceptions. If the health and strength of the microcosmic temple declared itself unhesitatingly in Tantrism, the goals of longevity and (perhaps material?) immortality were quite explicitly formulated in Haṭhayoga. This means a steady trend from the +4th to the +14th-centuries. And alchemy was involved throughout.

All historians of Indian alchemy and chemistry are agreed that there was a close association between proto-chemical alchemy (*rasayana*) and the Tantric movement, though its birth and origins were older than that. Though never perhaps enlisted under banners so closely similar as the *wai tan* and *nei tan* of China, the relations of yoga and alchemy were not at all distant. Tantra and Haṭhayoga aimed to turn the 'raw body' (*apakva*) into the 'ripe body' (*pakva*)^d an incorruptible 'diamond body' (*vajra-deha*), a magic body (*siddha-deha*) or a body illuminated by true knowledge (*jñāna-deha*); just as the alchemists sought to prepare gold, potable

^a Cf. Eliade (6), p. 271.

^c Ibid. pp. 233 ff., 271, 301, 336, 359.

^b (6), p. 337.

^d Eliade (6), p. 315.

¹ 三元

² 氣

³ 精

⁴ 神

⁵ 修真

⁶ 七返

⁷ 九還

⁸ 火候

⁹ 太一

¹⁰ 虛無

¹¹ 金剛身

gold, and the external elixir, from other less valuable substances.^a Moreover, auration was itself one of the magic powers (*siddhi*);^b which is almost reminiscent of the saying that 'if the enchyomoma is not achieved, the elixir will never be perfected'. For Ray 'Indian alchemy very largely derived its colour, flavour, and in fact nourishment, from the Tantric cult'.^c And Eliade wrote: 'In India the tendency of Yoga to assimilate all kinds of concrete techniques could hardly neglect so precise an experimental system as alchemy. The osmosis between these two spiritual sciences was at times perfect; both were opposed to the purely speculative and the purely metaphysical, both worked upon "living" matter in order to transmute it, i.e. to change its ontological status, both pursued the goal of deliverance from the law of Time, i.e. the deconditioning of existence, the conquest of liberty and the attainment of blessedness, in a word, of immortality.'^d

The connection with Tantrism is already crystal clear in alchemical tractates of the +6th-century such as the *Vāsavadatta* and the *Daśakumāra-carita*, which centre, like all others of the Indian tradition, upon the preparation and properties of mercury. The *Kubjika Tantra* of about this time speaks of mercury (*parada*) as the generative principle (*bindu*) of Śiva himself. The *Rasaratna-samuccaya*, which may be of the +8th-century in essence, but reached its present form in the +13th, has a rite of worshipping Śiva in the form of a phallus (lingam) made of gold-mercury amalgam. Tenth-century books like the *Siddhayoga* (significant title) of Vṛnda, and the *Cakradatta* of Cakrapāni, or a +12th-century one like the anonymous *Rasārṇava Tantra*, all continue the same traditions. The 'death and resurrection' motif is also found, as in the various ways of 'killing' mercury and other metals.^e One of the great centres of Indian alchemy was in Tamilnad, the great non-Sanskritic region of the South, where it was practised by adepts known as *sittars* (*siddhas*), and we shall have to say something more about them in a few moments.

Another striking parallelism between the Indian and Chinese situations lies in the fact that Tantrism, like *nei tan* Taoism, had a so-called 'secret language', though it did not cloak its meanings so systematically and persistently in the speech of the alchemical elaboratory. This 'intentional' or 'oblique reference' terminology (*sandhāya-bhāṣā*) was certainly designed to hide the esoteric doctrine from the uninitiated, and Eliade might have been thinking of the Chinese physiological alchemists when he remarked, with a certain weariness: 'dans le Tantrisme nous

^a Cf. Chattopadhyaya (4), pp. 356ff.

^b Already the *Yogatattva Upanishad* (+2nd-century) says that by a *siddhi* one can transmute iron into gold by treating it with excrement (Eliade (6), p. 138).

^c (1), rev. ed., p. 113.

^d (6), p. 291. This last formulation might seem to confuse the ideals of *jīvan-mukti* and *mṛtyuṃ-jayati* (pp. 261, 276 above), but one can see how easily they might have been combined, for if immortality could not be added to deliverance, the adept would not have very long to enjoy the blessedness of his detachment. Of course in a sense a mystic might consider himself immortal if he could be exempted from the dominion of time even for a few (objective) minutes. One remembers the Christian formulation: 'eternal life in the midst of time'.

^e Cf. Vol. 1, p. 212, and the present volume, pt. 3, pp. 7-8, pt. 4, pp. 4, 5, 7. But it is noteworthy that the 'death and resurrection' motif is not present in the idea of 'killing' mercury in China. *Ssu*¹ usually means *ssu tu*,² to kill the toxicity, the raw *chhi*, of a metal. The life that results eventually is the adept's, not the mercury's.

sommes en présence de tout un système de chiffrage, fortement élaboré...^a A Tantric text can be read in several different keys, as it were, the yogic, the liturgical, the sexual, the alchemical, depending on what knowledge and interest the reader himself brings to it. This is exactly the problem already encountered with alchemical texts in China: *wai* or *nei*? Or both? So, here, for example, *bodhi-citta* can mean 'the thought of awakening' but also the semen (*śukra*); *padma*, the lotus, can mean also *bhaga* the uterus or *yoni* the vagina; *vajra*, both diamond and thunderbolt, can stand for *linga* the penis, but also for *sūnyatā*, emptiness, vacuity (of all things). At this point two further expectations are perfectly fulfilled. First, it is often extremely difficult, just as in China, to differentiate physiological or erotic imagery from actual practice of the techniques. The personal guidance of a guru (*guruvaktrataḥ*, corresponding to *chüeh*¹) was absolutely necessary if one was not to go astray. And secondly, the ambiguous intention lent itself powerfully to poetical expression, so that exactly like *nei tan* Taoists, most Tantrists were poets. There is, for example, a story of Kukkurīpāda who chanted a poem in the presence of a thousand people but was understood by only a single one.^b

Soon we shall approach our penultimate summaries, a survey of the intricate (and at present probably insoluble) problem of Chinese-Indian transmissions and influences, then our conclusions about the similarities and differences between Yoga and *nei tan* alchemy. And we shall end by a consideration of what place the latter could be considered to take in the universal history of science and proto-science. But first there is one more general aspect to be looked at, namely what for want of a better word may be called 'antinomianism'. In India this took some very extreme forms, almost paranoiac in character, the central idea of which, one might perhaps say, was the conviction that in order to acquire perfection it was necessary to destroy completely all the natural affections and aversions, all the normal likes and dislikes. There are reasonable expressions of this trend of thought—the realisation in *Chuang Tzu* that the Tao is as much present in a mass of dung as anywhere else in the universe,^c the Christian affirmation 'That which the Lord hath made call not thou common nor unclean',^d the attitude of the mind of modern science which can banish aversion and look with equanimity upon anything under heaven, no matter how seemingly horrifying or disgusting. But in India there were 'followers of the left-hand way' (*vāmācārī*) who systematically set out to destroy normal feelings as part of a mystical way of salvation.^e Already the Upanishads know of groups of frightening ascetics called *kāpālīka*, and in later times there were the euphemistically named *aghorī* (a-ghori, non-terrific), which was as good as calling the Furies the Eumenides. There was necrophilia and necrophagy, the frequenting of cemeteries (*śmaśāna*), the drinking out of skulls and the eating of faeces or other filth, as described for instance in the +17th-century *Dabistan* of

^a (6), p. 252.

^b Some elderly people may feel that all modern poets have become Tantrists in this sense. ^e Vol. 2, p. 47.

^d Acts, 10, 9-16.

^c Cf. Eliade (6), pp. 293ff.

Mobed Shah.^a Hsüan-Chuang had met with some of these people a thousand years before, and he duly recorded his opinion of them; there are also allusions in the *Dasakumāra-carita* just mentioned. Besides this 'nostalgie de la boue' there were also things worse still, by which we certainly do not mean the sexual 'orgies' and promiscuity in which the *aghorī* fakirs engaged, but rather something like that strange association of sex with sadism from which we suffer at the present day in the popular pulp literature. Thus there were ritual cruelties, not stopping at human sacrifice, mutilations and the like, hence the determination with which early British colonial rule set out to liquidate these antinomian sects. It is not our custom to employ exaggerated language, but what Ray called the 'gross superstitions and hideous incantations'^b of this fringe aspect of Tantrism certainly did go on. Its only endearing aspect, perhaps, was its complete rejection of all the social and nutritional prohibitions of the caste system—the *vāmācarī* certainly walked 'outside society' with a vengeance.

Was there any counterpart to this in China? So far as we can see there was not, presumably because the instinctive sense of decorum and traditional this-worldly ethic so greatly discouraged religious fanaticism. Nevertheless Pokora (4), in an interesting paper, has brought forward a number of examples from Chinese literature which suggest that there were occasional parallels to the attempt to destroy natural human feelings. Since we do not feel that his instances prove the point, it is worth while to examine them briefly. In his *Hsin Lun*¹ about +20, Huan Than² tells how he went out with a friend, the Court Gentleman Lêng Hsi,³ and saw a horrible old man whom Lêng thought might be an immortal, but Huan certainly not.^c The words *fên shang shih shih*⁴ must surely mean that he was collecting food from a dungheap, probably through poverty, and not at all that he was eating dung. Again, Wang Chhung,⁵ in the *Lun Hêng*⁶ about +83 speaks of a Taoist named Liu Chhun⁷ at the court of Liu Ying,⁸ prince of Chhu, the patron of the Buddhists, who 'led the Prince of Chhu astray by making him eat unclean things (*shih shih pu chhing*)'.^d But there is no proof that this was *aghorī* antinomianism, it is at least equally likely to have been the recommendation of some kind of 'Dreck-apotheke', quite possibly the consumption of urine or placenta for pharmacological (sex hormone) purposes, a quite well-known technique in the Han (cf. p. 308).^e It is true that whatever it was Wang Chhung did not approve of it, for he says 'and yet Liu Chhun was not struck down by lightning'. Maspero also refers to Liu Chhun, and says, without giving any evidence, that the Taoist masters often imposed ordeals of the *aghorī* kind on their disciples,^f instancing Fei Chhang-Fang¹⁰ who was indeed told by his thaumaturgical master to eat some excrement (*shih shih fên*¹¹).^g But Fei

^a Tr. Shea & Frazer (1).

^b (1), rev. ed., p. 114.

^c *TPYL*, ch. 382, p. 6a, *CSHK* (Hou Han sect.), ch. 15, p. 6b.

^d Ch. 23, tr. Forke (4), vol. 1, p. 290.

^e It could even have been nothing more than the eating of foods not permitted to pious patrons of Buddhism—meat, onions, etc.

^f (20), p. 90.

^g *Hou Han Shu*, ch. 112B, p. 13a.

¹ 信論

² 桓譚

³ 冷喜

⁴ 糞上拾食

⁵ 王充

⁶ 論衡

⁷ 劉春

⁸ 劉英

⁹ 使食不清

¹⁰ 費長房

¹¹ 使食糞

refused, and yet the master passed him. Maspero also instanced Kan Shih¹ and the famous passage about drinking urine, which is undoubtedly connected with endocrine pharmacology (cf. p. 308), and hanging upside down, which perhaps was an effort to 'make the *ching*² return'.³ Thus the evidence for any real existence of the fringe aspects of Tantrism in China seems exceedingly weak, and moreover, if such activities as those of the *aghorī* had gone on it would be quite impossible to miss them in the usual historical writings and the popular literature.

(i) *Originalities and influences; similarities and differences*

We can now attempt to take stock of the situation in the form of one single panorama.^b Is it possible to descry at all in what ways China and India influenced one another in these matters? And what can one say of the chief differences between Chinese physiological alchemy and Indian tantric yoga?

The first thing to realise is that both religious sexuality and the respiratory-meditational complex are extremely old in China as well as in India. It seems quite impossible that China could have been in need of much information about *prāṇāyāma* at the turn of the era, since there is evidence from archaeological inscriptions (H. Wilhelm, 6) that the control of the *chhi*, and even breath-retention, was being taken very seriously already in the - 6th-century.^c Such practices were perfectly well known to Chuang Chou in the - 4th,^d and just about - 300 comes the celebrated conversation between Mêng Kho³ and Kungsun Chhou⁴ about the importance of stimulating, accumulating and preserving an abundance of *chhi*.^e When Mêng Kho says that he is 'good at nourishing my vast ocean of *chhi* (*wo shan yang wu hao-jan chi chhi*⁵)' it is clear from the context that the question is one of hygiene and mental hygiene, for ataraxy, quiet balanced calm and self-possession are at the basis of it, and respiratory exercises of one kind or another are implicit in it. Anyone who might be in doubt about the capital importance of *chhi* in Chinese medical and physiological thought during the Late Chou and Warring States periods need only look at the records of clinical consultations in the *Tso Chuan*,^f and at the opening chapters of the *Huang Ti Nei Ching*, *Su Wên*, that great 'Hippocratic' corpus which in the - 2nd and - 1st-centuries summarised the thoughts and experiences of the physicians during the previous four or five hundred years. Here the first chapter is entitled Shang Ku Thien Chen Lun,⁶ 'What the Ancients said about (the *chhi* of) the Natural Endowment'. In this the interlocutor Chhi Po⁷ is speaking. He says:^g

^a *Hou Han Shu*, ch. 112B, p. 18a.

^b We recognise our inability to clarify all this properly. We have no direct access to the Indian primary sources. We know the serious difficulties of dating Indian texts with any degree of precision. But some kind of tentative and interim sketch imposes itself.

^c See Vol. 2, p. 143 and p. 142 above.

^d Cf. p. 154 above.

^e *Mêng Tzu*, II, i, ii, 8-16, tr. Legge (3), pp. 64 ff.

^f See Sect. 44 in Vol. 6, and meanwhile Needham (64), pp. 265, 267.

^g Ch. 1, (p. 3), tr. auct.

¹ 甘始

² 精

³ 孟軻

⁴ 公孫丑

⁵ 我善養吾浩然之氣

⁶ 上古天真論

⁷ 岐伯

The sages of high antiquity taught their disciples, all saying that there are times when one must avoid injurious pneumatic influences (*tsei fêng*¹) and malign debility (*hsü hsieh*²). If one practises quietness, ataraxy and unworldly meditation, the *chhi* of the primary vitality (*chen chhi*³) will respond to this, and at the same time the *ching*⁴ and the *shen*⁵ (primary vitalities) will be preserved. How could any illness then arise?

Here would certainly be one of the collateral roots of the Taoist sense of perspective, seeing Nature whole and unflinchingly, avoiding all excesses of the emotions and the body. Elsewhere, Huang Ti himself says:^a

From of old those who could communicate with Nature knew that the Yin and the Yang are the basis of all life. This holds good everywhere in heaven and earth within the six cardinal points of space. The *chhi* of the primary vitality (*chen chhi*³) (circulates within) the nine divisions of the body (*chiu chou*⁶), the nine orifices (*chiu chhiao*⁷), the five Yin viscera (*tsang*⁸) and the twelve tracts. All are in communication with the natural *chhi* . . . Therefore the sages of old taught their disciples (to conserve) their *ching*⁴ and their *shen*,⁵ and at the same time to inhale and circulate the *chhi* of the primary vitality (*chen chhi*³). In this way they would acquire a mysterious understanding (of the Tao).

This comes in the chapter entitled Shêng Chhi Thung Thien Lun,⁹ 'On the Communication of the *chhi* of the Life-Force with all Nature'. Although the antiquity of the doctrines of *chhi* in China really needs no advocacy, we are glad to place these passages here because they add a significant element to the dénouement of this whole sub-section. The reader will be struck by the appearance in this most ancient medical text of precisely the *san yuan*,¹⁰ the 'three primary vitalities', about which we have said so much in earlier paragraphs (pp. 26, 46-7).

Exactly the same is true about the position of sex in religion and its hopes for material immortality. The early sexual interpretations of the - 4th-century *Tao Tê Ching* have already been discussed (pp. 132 ff.), but there is reason to think that the prominence of sex in Chinese religion goes much further back. Arising out of the exegesis of some of the early - 3rd-century poetry in the *Chhu Tzhu*, it has been shown, as by Waley (23) and Hawkes (1, 2),^b that certain of the chants and songs in this famous southern collection, the beauty of which can still be felt today, concern liturgically stylised love meetings between shamanic priests or priestesses and goddesses or gods respectively. In earlier times the divine spouse would doubtless have been represented by a human hierophant, as in the funeral rites where the living 'Impersonator of the Dead' lingered on till very late observance. Then one must remember the whole section of books on sex in the bibliography of the *Chhien Han Shu*, and while we may take these as certainly having been current in the - 2nd-century, it is highly unlikely that they originated only then, so that it must be more reasonable to place the initial stages of that literature among the Warring States philosophers of the - 4th-century if not at the Chou court in the - 6th.

^a Ch. 3, (pp. 20, 21), tr. auct.

^b Esp. (1), pp. 35 ff.

¹ 賊風

² 虛邪

³ 眞氣

⁴ 精

⁵ 神

⁶ 九州

⁷ 九竅

⁸ 臟

⁹ 生氣通天論

¹⁰ 三元

This kind of situation is one that we have met with before; beginnings so early in both China and India that one is driven to search for some common source of those first building-stones with which they created their rather different intellectual architectures. Babylonia and the Fertile Crescent immediately spring to mind, even if all too often the assyriologists have so far failed to find the origins which we need. A typical example here is that of the lunar mansions or *hsiu*,^a so important in all ancient East Asian astronomy,^a but there are many others, such as the duo-decimal system which modified an autochthonous Chinese tendency to decimalisation,^b or certain aspects of State astrology, for which chapter and verse correspondences were long ago given,^c or indeed for the whole conception of *chhi* itself.^d

The great difficulty about priority and diffusion is that close relations between the two cultures do not seem to have started soon enough to encourage the idea that either derived these basic attitudes from the other. At a much earlier stage of this work a sketch was given of the routes and cultural contacts between China and India, and since then not much has accrued to change the picture.^e There is some evidence for overland trade by way of Yunnan and Burma in the late — 2nd-century, though on a very minor scale;^f but rather more for extensive Chinese sea voyages in the — 1st, when official merchants certainly reached Indo-China and possibly also the south-eastern coasts of India.^g Heavy tribute from those parts (e.g. rhinoceroses) reached the Chinese court in +2, +84 and +94, a fact which gives us some idea of the capacity of the vessels engaged in the trade. Then we have the undoubted appearance of Buddhism in China between +70 and +160, probably travelling both by sea and overland through the Himalayas and Sinkiang. Certainly during the +1st-century the region of Khotan and Kucha was a great meeting-place of the Indian, Persian, Greek and Chinese cultures.^h After the +3rd-century, however, relations between China and India became intense for many hundreds of years, especially with the continual 'brain drain' of Indian theologians and linguists, matched by the pious studies and pilgrimages of Chinese monks in the opposite direction. Usually they went home, but a great number of the Indians did not, with the incidental result that by the +7th and +8th-centuries we find families of expert astronomers of Indian descent occupying positions in the government Astronomical Bureau at the Thang capital.ⁱ From the +4th to the +14th-centuries we have to deal, in the case of religion, alchemy and physiology, with a

^a Cf. Vol. 3, pp. 242 ff., 252 ff. The subject is still under discussion (cf. Filliozat, 7, 8).

^b Vol. 4, pt. 2, p. 440, and more fully in Needham, Wang & Price (1).

^c Vol. 2, p. 353, describing the work of Bezold in 1919.

^d Vol. 1, p. 239.

^e Vol. 1, pp. 206 ff. We must also refer to the useful book of Bagchi (1), who deals mainly with the Buddhist evangelisation of China, and to the excellent survey of S. K. Chatterji (1).

^f Cf. Vol. 1, p. 174.

^g Vol. 4, pt. 3, pp. 442 ff., with translations of the crucial passages.

^h Cf. Lévi (4), and Cammann (4) who recognised the nature of a Chinese bronze crossbow-trigger which had been excavated at Sirkap and is now preserved in the Archaeological Museum at Taxila; it must have come from some Chinese outpost in Central Asia.

ⁱ See Vol. 3, pp. 202 ff. One remembers also the numerous books with Po-lo-mên² (Brahmin) in their titles, on astronomy, mathematics, calendrical science, medicine and pharmacy, which circulated from the late +6th-century, in Sui and Thang times (Vol. 1, p. 128). These Chinese translations of Sanskrit texts all long lost, alas, are far too much overshadowed by the vast number of Buddhist *sūtras* that were also put into Chinese.

¹ 宿

² 婆羅門

situation much the same as in the mathematics, where we could demonstrate a continual give and take throughout the same period, with China contributing greatly.^a But before the +1st-century contacts must have been very limited. Thus all in all Debiprasad Chattopadhyaya (1) may be right in seeing an independent origin of both the Taoist and the Yoga–Tantra–Haṭhayoga complexes in primitive agrarian matriarchal and communalist society. But it is not easy to see why their practical aspects developed in so parallel a way if there had not been strong influences on both China and India from the more ancient cultures of Western Asia.

On the precise question we are facing, the relations between *nei tan* physiological alchemy and the yogistic movements in India, there have in the past been several speculations. More than sixty years ago Conrady (1) attempted to prove that there had been Yoga influence on China in the –4th-century, but there is nothing in his arguments that carries conviction now.^b Nevertheless there has been a persisting impression that 'from the +1st-century the resemblances between the two systems are too frequent and too striking to be merely of an incidental nature'.^c In an important paper Filliozat (3), examining this question, took the view that Yoga must have been imported to China en bloc about the same time as Buddhism (+1st and +2nd-centuries), but this was chiefly based upon the faulty argument that previous Chinese medicine had not contained a well-developed theory of the *chhi*. We think that in fact it did. For the later periods, conversely, Filliozat saw a movement in the other direction, Tantrism being deeply indebted to Chinese influences. Here we agree. This picture must be filled out more completely in a moment, but it is for the early stages that the greatest difficulty continues. The considered opinion of Maspero was that one should not look southwards for the origins of the Taoist techniques. 'In my opinion' he wrote,^d 'it has been quite wrong to look for the origins of ancient Taoist mysticism in India. The facts of mysticism are the facts of psychology, facts which may not make their appearance frequently, but which do so universally, whatever may be the stage of culture and civilisation reached. The ecstatic trances of Lao Tzu, Chuang Tzu and Lieh Tzu are surely the same trances as those of the *hsi wu*¹ wizards and sorceresses of ancient China, but in refined form and provided with philosophical interpretations.' Of course Yoga must have come in with Buddhism; the trouble is that something very like it was already there.

But everyone is agreed that from the +4th-century the situation changes. If Yoga may be regarded as purely Indian, Tantrism can hardly be, and Haṭhayoga even less so.^e Sex as a way of salvation has something suspiciously Chinese about it. Of course, the Indian forms of Tantrism were flooding back into China by the +8th-century, as has been shown in the valuable paper of Chou I-Liang (1), but where did it come from in the first place? It has often been observed that Tantrism

^a Vol. 3, pp. 146ff.

^b Pokora (4) concurring. Cf. also the papers of Creel (7) and Chang Chung-Yuan (1).

^c Ibid. (4), p. 71.

^d (14), p. 46.

^e We already expressed this view in Vol. 2, p. 427.

¹ 覓巫

appears initially at several of the phase boundaries of Indian civilisation—in the north-east, in Assam (Kāmarūpa) and East Bengal, 'les pays Tantriques par excellence';^a in the north-west, Gandhāra and the borders of modern Afghanistan, near the passes leading to and from Sinkiang; and in the south-east, in Tamilnad, the region of Madras, where the language was Tamil and the port cities were those which had first seen visitors from Mahācīna, the great land of the Chinese.^b One significant indication here is that the king of Kāmarūpa, Bhāskara Kumāra, requested in +644 that a translation should be made of the *Tao Tê Ching* into Sanskrit.^c From this story, which has been told by Pelliot (8), we know that the translation (ordered by imperial edict) was duly completed, but the sanskritist chairman of the committee, none other than Hsüan-Chuang himself, had great dispute with the leading Taoists, Tshai Huang¹ and Chhêng Ying² over the sanskrit equivalents of the technical terms.^d It certainly shows what interest there was in Assam at this time in obtaining access to the Taoist scriptures and technical manuals. Gradually a whole series of Buddhist Tantras grew up describing and recommending *cīnācāra*, i.e. the practices of religious sexuality current in Great China (Mahācīna)^e and this can only have meant in the mixed milieu of Taoists and Taoicised Buddhists. Tārā was one of the greatest goddesses they worshipped, Mahācīna-Tārā, Kuan-shih-yin-mu,³ the *śakti*, it appears, of the *bodhisattva* Avalokiteśvara.^f The *Mahācīna-kramācāra Tantra* (also called *Cīnācāra Sāra Tantra*) is a characteristic product of this phase of Tantrism; it tells how the semi-legendary sage Vaśiṣṭha travelled to China to learn the rites of Tārā from Vishnu or some avatar of the Buddha. He was horrified to find a Buddha surrounded by thousands of lovers in erotic ecstasy, but accepted the preaching that the union of sex was the most perfect way to achieve union with God, the Tao, or the universe, and took to heart the adjuration: 'Women are the incarnations of the gods, the principle of life, and the beauty that adorns the world; a true adept must always be spiritually in the midst of them'.^g A further straw which shows which way the wind was blowing at this time comes from the work of Cammann (10), who in examining the *maṇḍala* paintings of Tibet found suggestive evidences of origin from the TLV-mirrors of Han China.^h Although at first loth to accept this, Tucci (5) in the later editions of his standard work on the *maṇḍalas*, has recognised it as probably well-founded. The whole question is bound up with the identification of the position of a country called Oḍḍiyāna, the presumed original home of the Tantras, and much more remains to be done, but the dominant influence of Taoism on Tantrism seems clearly established.

^a Eliade (6), pp. 207, 303.

^b Cf. Vol. 1, pp. 176ff., Vol. 4, pt. 3, pp. 442ff.

^c The request was transmitted by the Chinese ambassadors Li I-Piao⁴ and Wang Hsüan-Tshê⁵ (cf. Vol. 1, pp. 211 ff.).

^d Hsüan-Chuang insisted that Tao should be *mārga*, 'the way', but the Taoists wanted *bodhi*, 'illumination'. Significantly Hsüan-Chuang refused to allow the 'preface' of Ho Shang Kung (cf. p. 130 above) to be translated.

^e Chatterji (1); Bhattacharya (2); Eliade (6), p. 264; Bagchi (1), p. 199; Woodroffe (1), pp. 179ff. On the word Mahācīna see Lévi (9).

^f Cf. p. 260 above.

^g Lévi (6), vol. 1, pp. 346ff.; S. Chattopadhyaya (1), p. 11 *et passim*.

^h Cf. Vol. 3, pp. 303ff.

¹ 蔡晃

² 成英

³ 觀世音母

⁴ 李義表

⁵ 王玄策

So far we have been thinking of the period from the +4th to the +8th-centuries, and we have now to think also of that from the +9th to the +13th, the time of development of the Hathayoga movement, and an age of vigorous activity in Indian alchemy. It is in connection with this that the Tamil literature of South India has particular relevance. Although there is a wealth of Tamil MSS on alchemy, yogism and Tantrism in Indian libraries almost nothing has been done to publish the texts and unravel the complications.^a It is known, however, that the Tamil Tantrists venerated eighteen magician-chemists (*sittars*, the equivalent of *siddhas* and *rasa-siddhas*), of whom two were recognised as having come from China.^b The oldest name, Agastya, may be legendary or assumed,^c but the others are considered to be historical, and one of them, Bogar, was apparently a Chinese who came to India in the +3rd-century and lived in Madras after studying at Patna and Bodh-gaya. It is interesting that unlike the majority of other Chinese intellectual travellers to India Bogar was not Buddhist (therefore probably Taoist), and in the writings that go under his name there are few references to Buddhism. A further part of the legend (if legend it be) is that Bogar returned to China with a group of Tamil disciples for a period of study before finally settling down in Tamilnad. A second *sittar* was also Chinese, though we know him only by his Tamil name, Pulipani; his date is uncertain but probably a little later than Bogar. According to tradition all the other *sittars* were Tamil, but the whole pattern testifies of the close relations between Taoism and South Indian Tantrism between the +3rd-century, when the lists of *sittars* begin, and the +10th, when their succession reached its apogee. It is interesting that in the later writings there is polemic against the monistic idealism (*advaita vedānta*) of the great +8th-century philosopher Śaṅkara. As for alchemy, the Tamil texts resemble the Sanskrit ones in using an array of reagents fairly similar to those of the Chinese. But they also contain what the others do not, a very Chinese classification of metals and numerals into male and female (Yin-Yang) categories.^d These are some of the fascinating aspects of contacts and transmissions in proto-chemistry and proto-physiology along the length of the maritime trade-routes between China and India.^e

^a Some valuable information has been presented by Subbarayappa (2), (3), pp. 315, 335 ff., 345-6.

^b Ray (1), rev. ed. pp. 125 ff.; D. Chattopadhyaya (4), pp. 353 ff. One of the few original papers on this subject is that of Iyer (1). The *Rasaratna-samuccaya* has a list of 27 *sittars*.

^c And there is also the even more legendary Thirumūlar.

^d Filliozat (3).

^e Cf. again Vol. 1, pp. 176 ff., 206 ff., Vol. 4, pt. 3, pp. 442 ff. In Vol. 5, pt. 4, pp. 388 ff. we gave an elaborate survey of the influence of Chinese laboratory alchemy on Arabic culture. The relations between India, China and Islam in matters of physiological alchemy would also be an enthralling subject. For example, a Sanskrit text entitled *Amṛitkuṇḍa*, perhaps of the +12th-century, was translated into Arabic (and later into Persian) in the +13th as the *Bahr al-Ḥayat* (or *Ḥawā al-Ḥayat*; Ocean, or Water, of Life), and has been published with a précis in French by Yusuf Husain (1). The original translator was an Assamese yogin, a follower of Goraknāth, who became a Muslim. Ibn 'Arabī in Spain (+1165 to +1240), the great mystic, seems to have known of this work and practised its exercises, which became a permanent part of sufism. We are grateful to Professor Habibullah of Dacca University for a knowledge of these affairs.

On an earlier page (p. 152) we recalled the adoption by the sufis in their *dhihr* liturgies of some of the respiratory exercises of East Asia, whether from China or India received. We also recalled the Hesychast school of Byzantine Christian monastic spirituality, which flourished in the +14th-century, and was influenced by Hindu and Buddhist yogism, if not also by Chinese self-cultivation practices. But to what extent specifically alchemical ideas entered into any of these transmissions and acceptances remains still to be investigated.

The probability of such contacts is much strengthened by evidence of strangely close political and cultural relations between China and India, especially South India,^a in the early +8th-century, evidence not already referred to in Section 7. For a few decades, between about +680 and +730, the curtain lifts and we can see some remarkable comings and goings. In a single year, +692, missions from five Indian countries (Thien-Chu¹), as well as Kucha (Kuei-Tzu²) in Central Asia, converged on the Chinese capital carrying tribute; the representatives were said to be 'kings' but probably these ambassadors were royal princes.^b In +710 an ambassador of South India came again to render homage and exchange presents, together with one from Tibet (Thu-Fan³), one from Zābulistān^c (Hsieh-Yu⁴) and a fourth from Kāpīśa^d (Chi-Pin⁵).^e Yet another mission arrived from South India in +719.^f Then we read that in +720 there was contact with a different king in South India, Shih-Li Na-Lo-Sêng-Chia Pao-To-Pa-Mo,^g i.e. Srī Navasiṃha Potavarman, who ruled the State of Kāñci (mod. Conjeeveram, S.W. of Madras).^g This king 'sought imperial Chinese authority for using his elephants, troops and cavalry against the Arabs, Tibetans and others. He asked also that a name should be given to his army. The emperor praised him warmly and conferred the title of "Virtue-Cherishing Army" (Huai-Tê Chün⁷) upon it.' Still more curious was it that the king erected a special temple in honour of China or for the worship of some Chinese divinity—could this not have been Tārā herself? The *Chiu Thang Shu* relates^h that the King of Kāñci in +720 'built a temple devoted to China, and asked the emperor for an inscription giving a name to it. The emperor thereupon decreed the donation of an ornamental plaque with the characters Kuei-Hua Ssu⁸ (Conversion-to-Civilisation Temple). This the King placed over the entrance'. The same year saw another ambassador from South India (Kāñci) in Chhang-an, named apparently Mi-Chun-Na,⁹ and after he had presented his tribute 'it was ordered that the greatest care should be taken about his return journey, and that his highest expectations should be fulfilled. He was therefore given a robe of flowered silk, a golden girdle, a pouch for the fish-shaped insignia (of rank), and (the usual) seven objects; and so departed.'^j Finally, towards the end of the year, a Chinese ambassador was sent out following in his footsteps to present a brevet of kingship to

^a Much information for many periods is contained in the book of Majumdar (3), especially vols. 2, 3, and 4.

^b *Tshê Fu Yuan Kuei*, ch. 970, p. 17b, tr. Chavannes (17), p. 24, cf. Mahler (1), p. 90. East India was Mo-Lo-Pa-Mo¹⁰ (unidentified), West India was Shih-Lo-I-To¹¹ (certainly Śīlāditya), North India was Na-Na¹² (unidentified), Central India was Ti-Mo-Hsi-Na¹³ (unidentified), and South India was Chê-Lou-Chhi Pa-Lo-Pho¹⁴ (certainly Calukya Vallabha, a dynasty of the Deccan with its capital near Mysore).

^c Ancient Arachosia centered on Ghazna, part of mod. Afghanistan.

^d Gandhāra or to the north of it; cf. Vol. 1, pp. 191 ff.

^e *TFYK*, ch. 970, p. 19b, tr. Chavannes (17), p. 28, cf. Mahler (1), p. 90.

^f *TFYK*, ch. 971, pp. 3b, 4a, tr. Chavannes (17), p. 41.

^g *TFYK*, ch. 973, pp. 13b, 14a, tr. auct., adjuv. Chavannes (17), p. 44, cf. Mahler (1), p. 90.

^h Ch. 198, p. 13a, tr. auct., adjuv. Chavannes (17), p. 44; Mahler (1), p. 90.

ⁱ Cf. Ho Ping-Yü & Needham (2).

^j *TFYK*, ch. 974, p. 21a, tr. auct. adjuv. Chavannes (17), p. 45; Mahler (1), p. 90.

¹ 天竺

² 龜茲

³ 吐蕃

⁴ 謝麗

⁵ 罽賓

⁶ 尸利那羅僧伽寶多拔摩

⁷ 懷德軍

⁸ 歸化寺

⁹ 米淮那

¹⁰ 摩羅拔摩

¹¹ 尸羅逸多

¹² 那那

¹³ 地摩西那

¹⁴ 遮婁其拔羅婆

Srī Narasiṃha.^a Thus over a certain period we can glimpse the intensity of the relations between China and South India. Further evidence of it is the fact that Mi-Chun-Na's party had been accompanied by the eminent mahāyanist monk Vajrabodhi (Chin-Kang-Chih¹)—and if Buddhist thaumaturgists could come, Taoist alchemists and *nei tan* adepts could also go.^b

Besides all this, there are two other general features in the Indian situation which we have been detailing which seem to speak clearly of transmissions or at least stimuli from China. First there is that uncanny resemblance between the system of the *nadī* and the *cakra* on the one hand, and the tracts, acu-points and larger spatial entities ('pools', 'fields', domains, Courts, etc.) of ancient Chinese medicine on the other. A great opportunity lies open here for some future student of comparative medicine able to handle both the Chinese and the Sanskrit material. Secondly, there is that very striking transition from *jīvan-mukti*, spiritual liberation or 'eternal life in the midst of time', and *mṛtyum-jayati*, the conquest of death, presumably in the interest of some kind of material immortality. If it is true that in India this second goal tended to replace the first one, or at any rate to take an equal place beside it, between the +4th and the +14th-centuries, it is rather difficult to avoid the impression that this was an influence from those who believed in the 'holy immortals'.^c

Let us now turn to the other great question which has already been asked. What were the outstanding differences between Chinese physiological alchemy and Indian tantric yoga? By now it will have become obvious that there were great similarities—and yet both systems were unmistakably themselves. Our feeling is that one could characterise the Chinese complex as showing greater sobriety and a much more materialist tendency. For example, although the Chinese physiological alchemists worked away at their gymnastic exercises there is hardly any evidence that they put into practice the more extreme contortionist *āsana* of their yogistic colleagues, and it also seems clear that in China massage and self-massage played a relatively more important part. Nor, so far as we can see, did the Chinese pursue the determined and successful attempts of the Indians to control the involuntary muscles for the purposes of the 'purifications' of developed Haṭhayoga. As for the antinomian *vāmācāri* tendencies which, as has been said, could go as far as human sacrifice,^d with a concentration on everything loathsome for the breaking of natural desire, this was exceedingly un-Chinese; and if there was any sadism associated with sex it occurred in the families protected by Confucian relationships rather than in the temples of the Tao. What to us is far more important is the materialism, seen, apart from anything else, in the conviction of the possibility of material, even

^a *TFYK*, ch. 964, p. 15a, tr. Chavannes (17), p. 45, cf. Mahler (1), p. 90.

^b See Lévi (1, 2, 10); Bagchi (1), p. 219. Vajrabodhi was of royal birth in Central India, studied at Nālanda and brought rain (one of his specialities) for the King of Kāñci before leaving for Ceylon and China. He died in +732.

^c Cf. the answer of Ray (1), rev. ed., p. 116, and D. Chattopadhyaya (4), pp. 356–7, to the question, how did the Tantras become the repositories of chemical knowledge? It was precisely because Tantrists (like Taoists) believed that physical immortality, or at least extreme longevity, was really attainable.

^d P. 278.

¹ 金剛智

if etherealised, immortality here on this earth or in these heavens. Correspondingly, the formation of the 'elixir within', the enchymoma, was thought of in a fully material sense; it was in fact an exercise in what we do not refrain from calling a proto-biochemistry—and this was something which (so far as we can see) no group of Indian texts ever adumbrated. The 'principle of contrariness' (*ni*,¹ *pratiloman*) took the form in Chinese thought of a great quasi-scientific adventure, the attempt to accomplish nothing less than the reversal of the ageing process, to return to the perfection of infancy, the time before growth has ceased, the time when (as we now know) the biochemical changes accompanying senescence have hardly begun to take place. However much mysticism, magic, religion and poetry was bound up with the proceedings of the Taoist adepts, they were in fact engaged in a quest essentially scientific, the re-mounting of the growth-rate curve, the re-establishment of the enzymic and hormonal situation of the organism at the beginning of life, the re-gaining, restoring and maintaining of the faultless chemical and physiological constitution with which every child is endowed. 'The primary *ching*' we heard Sun I-Khuei say,^a 'changes (by the wear and tear of emotions) into the seminal essence of sexual intercourse, the primary *chhi* changes into the respiratory pneuma, and the primary *shen* is "sicklied o'er by the pale cast of thought"'. Eliade has appreciated something of the distinction we are making. 'The embryonic respiration (of the Chinese)', he wrote:^b 'was not, therefore, like *prāṇayāma*, an exercise preliminary to meditation, nor an auxiliary technique, but sufficed in itself . . . to set in motion and bring to completion a "mystical physiology" which led to the indefinite prolongation of life of the material body.' The fact that the Taoists could not in truth perform what they claimed for their methods does not mean that no one will ever be able to do so, and it can be said in their favour that their adepts acquired a great deal of benefit by their hygienic living on the way. So much for the likenesses and differences between Chinese *nei tan* and Indian tantric yoga.

(8) CONCLUSIONS; *NEI TAN* AS PROTO-BIOCHEMISTRY

At the end of this long elucidation of *nei tan* alchemy the question naturally occurs to us, what did it all amount to in terms comprehensible to the historian of science? Was it just 'medieval superstition', or the aberrant gropings of proto-science, the work of minds which might have been capable of true natural science if that had been possible in their time? We think that these questions can reasonably be asked. We also think that there was rather more value in the enchymoma ideology than some may have been inclined to conclude when reading of the saliva-swallowing and the breath- and semen-retention, the gods, the holy immortals, and the archaei of the organs of the body. It remains to explain why.

By way of recapitulation let us quote a passage from Chhen Ko-Fu on the rise and decline of Taoist technology.^c

^a Pp. 46-7 above.

^b (6), p. 71.

^c (r), 1st. ed., p. 280, tr. auct. Cf. 2nd ed., vol. 2, pp. 386, 438, 444-5.

¹ 逆

In the Chin period (+ 3rd and + 4th-centuries) there were the arts of the golden elixirs (*chün tan*¹), drugs of immortality (*hsien yao*²), metallurgical alchemy (*huang pai*³), the sexual techniques (*hsüan su*⁴),^a respiratory exercises (*thu na*⁵), gymnastics and massage (*tao yin*⁶), apotropaic incantations (*chün chou*⁷) and talismanic charms (*fu lu*⁸); such were the Taoist crafts, and those who practised them were called Taoists (*tao shih*⁹).

But, as Fang Wei-Tien¹⁰ says in the preface to his edition of the *Pao Phu Tzu, Nei Phien*, when it came to the (Thang), Sung and Yuan periods, (scholars) considered that the *Tshan Thung* (*Chhi*) and the furnace fire should be interpreted in the sense of the enchymoma (*nei tan*¹¹), for re-casting and nourishing (*lien yang*¹²) the Yin and the Yang (of the body), and fusing and uniting (them to recover the) *chhi* of the primary vitality (*hun ho yuan chhi*¹³). They said that the absorption (*fu shih*¹⁴) (of *chhi*) in embryonic respiration (*thai hsi*¹⁵) was a minor art (*hsiao tao*¹⁶), and that inorganic alchemy (*chin shih*¹⁷) and charms and incantations were mere side-tracks (*phang mên*¹⁸), while metallic elixir-making and sexual techniques were unorthodox skills (*hsieh shu*¹⁹); holding moreover that nothing mattered but regenerating and uniting (the Yang and Yin) of the mind-body organism (*hsing ming*²⁰), preaching the immortality of the 'Valley Spirit',^b and handing down the traditional techniques by which the perfected immortals ascended on high. All this was influenced by the Chhan school of Buddhism, and by the mutationists and Neo-Confucians, making everything highly mysterious, and even tending to a fusion with Confucianism and Buddhism. Thus the Han and Chin doctrines of the holy immortals were transformed almost out of all recognition. And so at the present day people only know the Taoists (*tao shih*⁹) as priests who chant sūtras and conduct temple worship—not at all the same as the scientific technologists (*shu shih*²¹) who mastered metallurgical alchemy and all the other crafts.

This suffices to remind us of the road we have travelled over, and raises several points each demanding a word or two. As we said earlier on, the rise of the *nei tan* system must have been related to a double failure of proto-chemical *wai tan* alchemy. First, its elixirs proved dangerous, indeed deadly, for many emperors, high officials, and also the alchemists themselves,^c so it was natural that a widespread méfiance concerning metallic and mineral preparations should have arisen. But secondly the empirical chemistry of the Han and Liu Chhao periods made little further progress after the end of the Thang, and since a thousand years had yet to elapse before modern chemistry could arise even in the more favourable conditions of Europe, it was natural that men should seek to break out of an apparently circular path which was not leading them anywhere further. Hence came the great assertion that the human body was the true laboratory, not the *tan fang*²² of pestles and mortars, pots and crucibles, stills and sublimatories, which had been the workplace of so many generations since Li Shao-Chün. Furthermore, there was an unmistakable class aspect of the new direction. Many a text shows (cf. pt. 3, pp. 200–1) that the

^a I.e. the techniques of the Mysterious Girl (Hsüan Nü) and the Immaculate Girl (Su Nü), cf. p. 187 above.

^b Cf. the discussion of the *Tao Tê Ching* on pp. 132, 199 above.

^c Cf. Ho Ping-Yü & Needham (4).

¹ 金丹	² 仙藥	³ 黃白	⁴ 玄素	⁵ 吐納
⁶ 導引	⁷ 禁呪	⁸ 符籙	⁹ 道士	¹⁰ 方惟句
¹¹ 內丹	¹² 鍊養	¹³ 混合元氣	¹⁴ 服食	¹⁵ 胎息
¹⁶ 小道	¹⁷ 金石	¹⁸ 旁門	¹⁹ 邪術	²⁰ 性命
²¹ 術士	²² 丹房			

manual operations of the alchemical elaboratory had always been distasteful for the 'gentlemen', though in the earlier times dedicated religious Taoists such as Ko Hung had been able to overcome that particular inhibition. But evidently it was much more refined to sit meditating on a mat, or to practice the gymnastic and the sexual exercises, than to be soiled with the dirt and undergo the discomforts of the *tan fang* with its smoke and fume. Probably it would be profitless to search for particular social causes of the change in Thang, Sung, Yuan and Ming; one suspects that the Confucian literati had always been like this, and the only surprising thing was that Taoist practical proto-chemical alchemy had got as far as it did before it came, in some sense, to a standstill. It is interesting to note the continuity, however, between *wai tan* and *nei tan* in some respects, as for example the sexuality which was common to both. The mating of opposites, the *mysterium conjunctionis*, was just as important in the *tan fang* as in the body, for surely the idea of sexual union, as of the Yin with the Yang, has been fundamental in the earliest thinking of all proto-chemists and proto-physiologists concerned with the reactions of substances, whether in the crucible or the body.^a The oldest conceptions of chemical affinity are involved here (cf. pt. 4, pp. 305 ff., 363 ff.), and the very idea of chemical reaction itself, with its offspring of products different from either the mother or the father.

So there were similarities, almost identities, between the *wai tan* and the *nei tan* in their several ways, but there were also differences. One point which impresses when both are contemplated is that each was centred upon a different chemical process, for while the reactions of mercury and sulphur were the outstanding feature of *wai tan*, the formation of the amalgam of mercury and lead was the dominant conception in *nei tan*.^b We have no explanation for this, but the correlation seems to hold good very widely; sulphur hardly ever appears in *nei tan* writings, and when a variety of metals and minerals are mentioned, the text is likely to be a *wai tan* one, or at least on the borderline. Again, one senses a difference between the objectives defined. In proto-chemical alchemy the accent was mainly on permanence, longevity, and material immortality by etherealisation; while in physiological alchemy the theme of rejuvenation, of recapturing the three primary vitalities, is much more prominent. Immortality by perpetual youth would follow. One could not say that there was no overlap between these approaches, and they may have been characteristic of different historical periods, but they do seem clearly associated with the *wai* and the *nei* doctrines respectively. Thirdly, although *wai tan* alchemy was intimately connected with religious Taoism all through the great periods of its activity, the *nei tan* texts have a much more religious character, though not necessarily less 'scientific'. This was partly no doubt because what they

^a This is one of the great themes of course in the penetrating book of Eliade (5) on metal-workers and alchemists throughout the ages and cultures.

^b At the same time it is interesting that certain more or less *wai tan* books specify lead and mercury as the essential elixir ingredients, saying that the 'four yellows' (sulphur, orpiment, realgar and arsenious acid) are all poisonous, as also are the 'eight minerals' (the same with the addition of gold, silver, copper and iron). This is found in the *Chih Kuei Chi* (cf. p. 34) and the *Tan Lun Chieh Chih Hsin Chien* (cf. p. 226), of the mid + 12th and the + 9th-centuries respectively.

said lent itself so much more to poetic expression, but I myself have vividly experienced the numinous quality of Taoist symbols such as the 'Yellow Court', the 'white snow', the 'metallous radiance' and so on. It grows on one, and this is not surprising when one remembers that the charge of emotional affect must surely come from the fact that these matters directly concerned life, health, disease and death. It is not at all difficult to imagine the hopes and fears which the Taoist *nei tan* adepts had for their companions (*lü*¹) in the quest, and those that they loved—the idea of the Taoist 'monk' as bereft of human feelings and thinking only of his own salvation is quite untenable. We have no further need to emphasise the place of physical love in the Taoist world, and even so austere a celibate as Chhiu Chhang-Chhun was devoted to his circle of disciples and friends.

This sub-section began with some discussion of psychological 'individuation' or self-realisation (pp. 2, 6, 13), and it would only be fitting to refer to it again towards the end. In spite of the contrast between the allegorical-mystical enterprise of the West and the psycho-physiological system of China, did not the Taoists also in their way achieve some kind of personality integration? Surely they did. The Chinese search for the means of material immortality was of course just as much following a will-o'-the-wisp as the aurifaction of Europe, but the point is that it had a discipline at least as purifying. It meant 'walking outside society' just as the Taoist philosophers of old had done, and seeking the transcendence of all opposites in withdrawal from worldly affairs, whether this meant at some periods the renunciations of a refugee in mountain fastnesses, or at others the pursuit in remote temples of a way of life recognised by society as legitimate. The mind was calmed and organised by meditation, the body healed by diet and exercises. The enchymoma might not be achieved, but the Taoists found things even more precious on the way.^a Of course as usual, every movement is liable to turn into its opposite, as Yang must yield to Yin, and it was paradoxical that what started as a plan for the perpetual continuance of sense-perceptions in the literally endless contemplation of Nature ended under Buddhist influence in the attempt to isolate oneself altogether from the external world. Equally paradoxical was it that India seems to have gone just the other way, beginning with *jīvan-mukti* and ending with *mṛtyum-jayati* (p. 276). Still, acquaintance with many Taoist texts generates the firm impression that if modern psychologists could meet some of the medieval Taoist adepts in the flesh they would recognise them as among the 'secret kings' of integrated personality, men and women of serenity, inner clarity, wisdom and goodness;^b people who had faced the archetypal images and mastered them, withdrawn their projections, assimilated their complexes, enlarged their consciousness, and developed their true Self.

Next comes an important point. One's whole attitude to the quality of Chinese reaction to the natural world may be affected by an understanding of the 'principle of contrariness' as it was conceived in that civilisation. The idea of going 'counter-

^a Including doubtless great longevity, as is pointed out in the thoughtful paper of Li Hsin-Hua (1).

^b Goldbrunner (1), pp. 132 ff.

¹ (p)

current' (*ni*),^a not merely in the re-routing of semen or saliva, but in the whole quixotic enterprise of 'returning to the state of infancy', re-acquiring the primary vitalities that bring about the perfection of youth, all this was (in a way) going against Nature, not simply following her normal course. It was therefore entirely congruent with modern science and technology, which in so many ways have had to convince these later centuries that it is not always necessary to proceed 'in the way that God intended'—whether regarding gunpowder and crossbows, or child-birth anaesthesia, or food hygiene and packing, or organ transplants, or flight in aircraft. This observation is not in accord with a conception of the Chinese mind which has been sedulously encouraged by many popular writers,^b namely that the Chinese always passively accepted Nature, reconciled himself with Nature, and adapted himself to Nature. It has often been said that it was not Nature over which the Chinese wished to acquire control, but rather himself; in calmness and resignation to fate. Yet this is contradicted by so many statements of the physiological alchemists,^c where we find repeated again and again: 'The length of one's life-span is not in the hands of Heaven, it is in one's own (*wo ming tsai wo pu tsai yü thien*)'.^d And on p. 46 above we noted the saying of the physician Sun I-Khuei: 'One cannot entirely attribute events to fate; on the contrary man can act in such a way as to conquer Nature.' True aggressiveness was contrary to all Taoist philosophy. But as the *Kuan Tzu* book of the late 4th-century says: 'The sage follows after things—in order that he may control them (*shêng jen yin chih, ku nêng chang chih*).'^e Receptive observation is the necessary preliminary of the scientific manipulation of Nature in the interests of man. Yoga also went against the natural course of things all along the line, and it ended in mystical liberation, but when the Chinese read out of the same book, it ended in a theory and practice that was strikingly similar to the insight and achievements of modern science, even though they could not find the success that still eludes our biochemical knowledge. The determination which the Chinese displayed in the quest for rejuvenation was, in our view, an anticipation of endocrine physiology, and although we can tell no more than they what geriatrics may yet be able to do, we know enough to be sure that there is a biochemistry of ageing, that it is already partially understood, that the future will bring unheard-of

^a The good sense of this word in the whole field that we have been exploring is all the more striking because in Chinese law from ancient times onward it was highly pejorative. Crimes in the Han were *ni o*,⁴ privy conspiracy and sedition *ni mou*.⁵ All these were thought of as going against the course of Nature (cf. Vol. 2, p. 571). But *ni* also had a neutral meaning in astronomy, where it signified planetary retrogradations (Vol. 3, p. 398).

^b And by no means only Westerners; cf. Needham (47), p. 301.

^c Cf. Vol. 5, pt. 2, pp. 83-4.

^d E.g. *Yang Shêng Yen Ming Lu*, quoting 'the manuals of the immortals' (*YCCC*, ch. 32, p. 9a). Also in *Chen Chhi Huan Yuan Ming*, p. 3a,b. But the phrase is much older and must have been proverbial for centuries. Ko Hung quotes it, c. +300, in *Pao Phu Tzu* ch. 16, p. 5b (cf. Ware (5), p. 269), from a Taoist book called *Kuei Chia Wên*⁶ (Divination Tortoiseshell Writings), which might or might not be the same as the *Kuei Wên Ching*⁷ cited in his bibliography, ch. 19, p. 3b. It is (or they are) otherwise unknown.

^e Cf. Vol. 2, p. 60.

¹ 逆

² 逆謀

³ 我命在我不在於天

⁴ 龜甲文

⁵ 聖人因之故能掌之

⁶ 龜文經

⁷ 逆惡

possibilities of longevity, and that human society will have to find some way of managing this for the greatest benefit of all. The *nei tan* adepts were in on the ground floor.

It is extraordinarily interesting that all through Chinese history we find a set of conflicting attitudes to the manipulation of Nature in the interests of man. This was thought of frankly in terms of theft, just like Prometheus bringing from Olympus the gift of fire to humanity. And this mythological parallel is appropriate in more ways than one, for Prometheus (the 'fore-thinker') was essentially a trickster-figure,^a himself one of the lesser gods; he stole the art of fire-making from heaven,^b and was therefore condemned by Zeus to eternal torment, from the which however Heracles released him. Aeschylus gave him high moral dignity as the friend of man against celestial tyranny. But more, according to Greek legend great in craftsmanship, Prometheus was also a plasticator, able to animate images of clay,^c so he too understood the secret of life,^d that life which the Taoists sought ever to prolong, or even indefinitely extend. Among our Chinese texts some rejoice at this cosmic brigandage while others deplore it; alchemists, practical botanists and other proto-scientists gloried in it, while Neo-Confucian philosophers felt it to be evil. It is well worth looking at some of the things that different writers said.

We have already encountered a good example in our present field of alchemy and early chemistry. First we read a text of +945 which said^e that 'in preparing the elixir one's Tao is the same as that of the Shaping Forces of Nature'.^f Then on another page, in a text of +1163, we found the following:

The sages cycle Water and Fire, following the model of the operation of the *chhi* of Yin and Yang, in order to bring to completion the virtue (of the elixir). This is what is called 'the robbery of the mechanisms of the Shaping Forces of Nature (and making them work for human benefit), (to *tê tsao hua chi ché yeh*)'.^g

But alchemists were by no means the only people who talked like this, horticulturists used the same expressions. In +1630 Wang Hsiang-Chin² wrote a thesaurus of botany and garden-craft called *Chhiin Fang Phu*³ (Assembly of Perfumes), which dealt, among other things, with grafting techniques and the artificial production of new varieties. Speaking of tree-peonies (*mu-tan*,⁴ *Paeonia suffruticosa*)

^a Cf. Vol. 5, pt. 4, pp. 413-4.

^b Hesiod (c. -700), *Theog.*, 562ff.

^c Apollodorus (c. -115), *Bib.* 1 and 2; Horace (-65 to -8), *Carm.*, 1.16.13ff.; Ovid (-43 to +17), *Metamorph.*, 1.81; Pausanias (c. +150), *Descr. Gr.*, 10.4.4.

^d On ideas about animation of the lifeless in the ancient world, cf. Vol. 5, pt. 4, pp. 488-9.

^e Vol. 5, pt. 4, p. 249.

^f This phrase translates the expressions *tsao hua ché*⁵ or *tsao wu ché*,⁶ literally 'the founder of change' or 'the founder of things'. Since creation *ex nihilo* was never part of Chinese cosmogony or theology, the implication of personality in this context is to be avoided. See our previous discussions of this in Vol. 2, p. 564; Vol. 3, p. 599; Vol. 5, pt. 2, pp. 93, 208, pt. 3, p. 210.

^g Vol. 5, pt. 4, p. 234. The physiological alchemists, with their love of equivocal paradoxes, were particularly inclined to talk like this. For instance on p. 68 above, we read the words of Hsiao Tao-Tshun about +1100: *Nei tan* practices 'can rob the power of the natural order of things' and turn it to the advantage of the practitioner.

¹ 奪得造化機者也

² 王象晉

³ 羣芳譜

⁴ 牡丹

⁵ 造化者

⁶ 造物者

he tells of flowers nearly a foot in diameter with as many as seven hundred petals, a double variety, with other marvellous combinations of forms and colours, and he ends by saying:^a

This phenomenon is indeed due to the exertions of man, capturing the powers of Nature (for his purposes), (*tshu tsê i jen li to thien kung chê yeh*¹).

But let it not be thought that this locution arose only in the seventeenth century, for we find exactly the same phrase in a work of +1075, the *Yang-Chou Shao Yao Phu*² (Monograph on the Herbaceous Peonies of Yangchow), where Wang Kuan³ is discussing some wonderful new varieties of the *shao-yao* (*Paonia lactiflora*). Many other examples could be adduced, and it would not be going too far to say that statements like these were *loci communes*, even clichés, at least from the beginning of the Thang onwards.

But there came a time when the philosophers looked closely at them, and disliked very much what they saw. There is an instructive passage in the *Chin Ssu Lu*⁴ (Summary of Systematic Thought), compiled by Chu Hsi⁵ & Lü Tsu-Chhien⁶ in +1175; it relates a discussion which took place between one of the earlier Neo-Confucians, Chhêng I⁷ (Chhêng I-Chhuan,⁸ +1033 to +1108) and other gentlemen. It runs as follows:^b

Someone asked whether there was any truth in the (Taoist) statements about the holy immortals? He answered that such things as flying up to heaven in broad daylight were obviously impossible. 'But if it is said that the adepts can lengthen their life-spans and prolong their years by dwelling in remote mountains and forests, preserving their bodily forms and transmuting their *chhi*, then indeed there is some truth in that. It is like a fiery stove, which will quickly burn all its fuel if given a strong draught, but if it is placed in a close room it will take much more time to exhaust its supplies and go out. The same principle (*li*⁹) applies here.'

Someone else remarked: 'Yang Tzu says that the sages never took the immortals as teachers because their arts (of prolonging life) were heterodox (*i*¹⁰). Were the sages right to eschew such beliefs and techniques?' He replied: 'To be an adept is to be a robber in the (workshops of) Nature (*thien ti chüen i tsei*¹¹). If the adepts did not steal the secret mechanisms of the Shaping Forces in the world (*fei chhieh tsao hua chih chi*¹²) how could they achieve immortal life? If the sages had thought it right to do such things, the (Duke of) Chou and Confucius would certainly have done them'.

The Yang Tzu referred to here was Yang Hsiung,¹³ who wrote his *Fa Yen*¹⁴ (Admonitory Sayings) in +5, and the passage is easily found in that book.^c It was again part of a discussion.

^a Hua Phu, ch. 2, p. 1 aff.

^b Ch. 13, p. 2b (para. 10), tr. auct., adjuv. Graf (2), pp. 716-7; Chhen Jung-Chieh (11), p. 285. A passage textually identical is found in *Honan Chhêng Shih I Shu*, ch. 18, p. 10a.

^c Ch. 9, pp. 9b, 10a, tr. auct.

¹ 此則以人力奪天工者也	² 揚州芍藥譜	³ 王觀	⁴ 近思錄	⁵ 朱熹
⁶ 呂祖謙	⁷ 程頤	⁸ 程伊川	⁹ 理	¹⁰ 異
¹¹ 天地間一賊	¹² 非竊造化之機	¹³ 揚雄	¹⁴ 法言	

Someone said: 'The sages did not go to school with the immortals because their arts were heterodox. The sages were ashamed if they found a single thing in the world that they did not understand; the immortals were ashamed if they lost a single day of life.' 'Life indeed, life indeed' said the philosopher, 'life is but a name, but death is a fact'.

The discussion with Chhêng I-Chhuan would have taken place late in the + 11th-century. The commentary of Yeh T'shai,¹ written some 150 years later, is a little less dogmatic. He says that man's body is made of very fine components, and when they disperse, death ensues. But perhaps some Taoist adepts did by chance get a peep into the workshop of the Agents of Change, and secretly used such knowledge to bind more tightly together their organic constituents, so that they could attain longevity or immortality.² If so, it was due to an understanding of the binding forces and not to any magical elixirs. But this was an encroachment upon the dispositions of Heaven, and therefore an art of little merit renounced by the wise. Other commentators quote here a poem of Chu Hsi's entitled *Kan Hsing*,³ well worth translating:

Borne on the wind they sought to be companions of the *hsien*,
 Leaving the world they ranged among the mountains and the clouds,
 Like stealthy bandits broke open the seals of mysterious fate (*tao chhi hsüan ming pi*)⁴
 And ravish'd the keys of the portal of life and death (*chhieh tang shêng ssu kuan*).
 In the golden reaction-vessel, with dragon and tiger coiled⁵
 For three whole years they nurtured the divine elixir;
 At last by the aid of a knife-point dose in the mouth
 Wings sprouted in full daylight, and off they soared—
 I also once half wished to follow their example,
 To take off one's shoes would not be difficult;⁶
 But to go against the Tao of Nature was what frightened me (*tan khung ni thien tao*)⁷.
 Even if I snatch'd a few more years of life, how could I be at peace? (*thou shêng chü nêng an*)⁸

Other Sung philosophers had just the same attitude. In + 1060 Chang Tsai⁹ wrote his *Chêng Mêng*¹⁰ (Right Teaching for Youth), and this was commented upon about + 1650 by Wang Chhuan-Shan¹¹ in *Chêng Mêng Chu*.¹² The passage is worth giving.¹³

¹ Cf. our argument in Vol. 2, pp. 153-4. In classical Chinese thought the souls were strung together like a necklace on the thread of the body.

² Cf. the scepticism of that Gnostic quatrain of 'Umar al-Khayyāmī, who died the year after Chu Hsi was born:
 'Up from earth's centre to the Seventh Gate,
 I rose, and on the throne of Saturn sate,
 And many a knot unravelled by the way,
 But not the skein of destiny and fate.' (Fitzgerald (1), 1st ed., no. 31)

³ A reference to the chemical substances used in the elixir-making.

⁴ I.e. the abandoning of worldly desires. Only three paragraphs earlier than the one which we have translated someone asks Chu Hsi whether he practices any method like the Taoist 'circulation of the *chhi*' (*tao chhi*)¹¹. He replies that he wears light vine-cloth gowns in summer and furs in winter, he eats when he is hungry and drinks when he is dry, he restrains his desires and calms his mind and vital force—that is all. In other words the Neo-Confucian philosophers despised the elaborate techniques of physiological alchemy. Graf (2), p. 714; Chhen Jung-Chieh (11), p. 284. ¹¹ Ch. 6, p. 14a, tr. auct. The book is included in the *Chhuan-Shan I Shu*¹² collection.

¹ 葉采

² 惑興

³ 盜斂玄命秘

⁴ 竊當生死關

⁵ 但恐逆天道

⁶ 偷生詎能安

⁷ 張載

⁸ 正蒙

⁹ 王船山

¹⁰ 正蒙注

¹¹ 導氣

¹² 船山遺書

To be old, yet not to die, may be called a robbery (*tsei*,¹ of Nature). To be young, and refuse education, so that when grown up one has no appreciation or understanding of traditional cultural values, and in the end cannot die peacefully—these are three ways of robbing natural life (*chieh tsei shêng chih tao yeh*²).

[Comm.] To be educated and to know one's duties is according to the principle of the fullness of human life (*chhüan shêng lí*³). To die peacefully is according to the nature of the *chhi* of life. But to be old and not die peacefully, seeking to tranquillise the spirits (*ning shen*⁴) and quieten the *chhi* (*ching chhi*⁵), hoping never to die at all and depart from this world (is not a natural thing). As for the (Taoist) disciples of Lao Tzu, they cultivate techniques for distancing death, and they bend and stretch the principles of Nature (*chhü shen tzu-jan chih lí*⁶), that is to say, the Tao of the life-cycle itself. To wish to interfere with the (natural) changes of Heaven (*yü kan thien ti hua*⁷) is to be a burglar of life (*thou shêng*⁸), (living on without meaning or purpose). If they did not bend things they could not stretch them. Hence all this is called 'theft of life' (*tsei shêng*⁹).

Once again we have the characteristic horror of all attempts to break through the curtain of human ignorance in the interests of knowledge of Nature and the power that it brings. It is truly remarkable that one should find in the non-theistic Chinese tradition parallels so close to the theological hesitations of the West. And as we saw at an earlier point,^a there was a certain conflict within Taoism itself, where the ataraxy of the philosophers contrasted with the activism of the clergy and the alchemists.

Sometimes the monotheism of the People of the Book seems to have done rather better, as when Moshe ben Maimōn, an almost exact contemporary of Chu Hsi, averred that the longevity techniques of physicians were in no way an infringement of divine authority, because God, being omniscient, would already have foreseen the intention and the action.^b But broadly speaking all the history of science and technology in the Western world was summed up in the question 'to pry or not to pry'. The impiety of stealing Nature's secrets, which God had not intended that man should know, the offence at '*turpis curiositas*', the boldness and determination of Renaissance Man—infinite are the ramifications.^c Let us read a passage, still with the dew on it, from the exuberance of the Scientific Revolution. In +1699 John Edwards wrote:^d

Chymistry is all new; there was no such thing known to the Generations of old. This Spagyrick Art, which was set on foot by Paracelsus and Helmont, and some other searching heads, hath had prodigious additions made to it lately.^e The Alchymists' retort and Alem-bick never were furnished with such rare and excellent secrets as they are now; the Laboratories and Furnaces never afforded the like Inventions. It is indeed a rough and violent way

^a Vol. 5, pt. 2, p. 83.

^b This was in his *Responsum de Longaeuitate*, ed. Weil (1). We mentioned it already in Vol. 5, pt. 4, p. 478.

^c One very striking example of this is the corpus of legend, both Jewish and Christian, centering on the *Book of Enoch*; cf. Vol. 5, pt. 4, pp. 341 ff.

^d (1), vol. 2, p. 631.

^e Who stood behind them we have seen abundantly in Vol. 5, pt. 4, cf. esp. p. 491.

¹ 賊

² 皆賊生之道也

³ 全生理

⁴ 寧神

⁵ 靜氣

⁶ 屈伸自然之理

⁷ 欲干天地化

⁸ 偷生

⁹ 賊生

of philosophising, it is an hectoring as it were of Nature, of putting her upon the Rack, and on the fiery Trial, to make her confess what she never did before. And truly she hath made a very ample confession and discovery, whereby the knowledge of Natural Philosophy is much increased and embellished, very Noble and Precious Medicaments (consisting of Oyls, Spirits, Tinctures, Salts, etc.) are produced, and the Healthfulness of Men's Bodies, and their Longaevity, are procured, and the Almighty Creator thereby Exalted and Honoured.

So the bending and stretching, the stealing and plundering, brought real results at last. Yet so long as mankind has not achieved efficacious ethical and social control over the applications of his knowledge, many will be inclined to say that we know too much for our own good. Material immortality still eludes us, and perhaps it is just as well that it does, for we have not yet ended war, hunger and social inequality, nor mastered the management of nuclear power, nor regulated genetic manipulation, nor solved the problems of oecological pollution and resources exhaustion. Artificial intelligence and space voyaging are only just over the horizon, and man must gain authority over them too. That mankind will do all these things remains an article of our faith.

Here a curious consideration obtrudes itself. Why was there nothing in Christendom corresponding to Indian yoga and Chinese physiological alchemy? This might admit of a wide solution, but one obvious factor was the very different conceptions of immortality. In so far as it was solely thought of as a life 'after' death, in some entirely different 'place', there could be no envisagement of a preparation of the present physical body for indefinite continuance, however etherealised the form. Besides, the body tended to be despised by transcendental theology, undervalued and associated with the earthy downward pull of 'sin'. In the same way there was the anti-sexuality of Manichaeism and a Christianity all-too-Manichaeic, pursuing its way from Pauline asceticism to Victorian prudery.^a Only among the Hesychastic saints of Eastern Orthodoxy did anything of a yogistic nature penetrate the Western world, and even then it was restricted to meditation techniques as a means of prayer, and breathing exercises of the *prāṇāyāma* type.^b

^a Nevertheless a search through the byways of European literature might bring to light some unexpected things. For example in +1742, J. H. Cohausen, an eminent Münster physician, published a tractate in which he asserted that man's life could be extended to at least 115 years by the regular absorption of the breath (the *chhi*) of young girls. This was in a direct line of descent from Roger Bacon's *fumus juventutis*, already discussed in pt. 4, pp. 496-7. As we saw, this +13th-century friar and alchemical visionary was the first of Europeans to talk like a Taoist. Reading between the lines, it would seem that something a little more than *chhi* may have been involved in Cohausen's techniques, though just how serious he was is not clear. Internal evidence suggests Turkish influence, hence perhaps something from further east. There is a biography of him by Paal (1).

A full treatment of the traces of Asian attitudes to sex within the European culture-area would be of much interest, but it might be a distasteful task, for the records of the 'Holy' Inquisition would have to be drawn on as well as the less sombre activities of the Brethren and Sisters of the Free Spirit (cf. Fränker, 1). Within Gnosticism, as we have noted (pp. 3, 15, 237, 243 above), there are certain parallels with the Taoists to be found too, remarkable both for the similarity of practice and the exact contemporaneity of date (+2nd to +5th-centuries). On this Foerster (1), vol. 1, pp. 313 ff. can again be consulted.

Much later, after the +15th-century, changes in the European appreciation of Indian art, especially the erotic-religious temple sculptures, raise another relevant question. This can be followed in the interesting recent book of Mitter (1).

^b This was in the +13th and +14th-centuries, with Nicephoras the Solitary, Simeon the New Theologian, Gregory Palamas and others. The studies of Hausherr (1) and Bloom (1, 2) may be consulted, and a summary is given in Eliade (6), pp. 75 ff.

The parallel question which comes to mind is what influence *wai tan* or *nei tan* alchemy had upon the development of science and technology in the West. If one confines attention to specific details of chemical apparatus and operations, the answer would be, for the first case, relatively little, since Western and Arabic alchemy and then chemistry developed more or less in parallel with China in a continuous line of evolution from the proto-chemistry of the Hellenistic period. But if we think of the broader objectives, then the influence was tremendous, for as we argue elsewhere (pt. 2, pp. 9 ff. pt. 4, pp. 490 ff.) no system has the right to be called alchemy until the idea of the elixir of life is present in it; before that all is aurification or aurifaction—and the Arabs, who transmitted to Europe the idea of the elixir, were in this profoundly influenced by China. Since Europe was unreceptive to yogistic technique of any kind, the second stream, that of the *nei tan* ideas, had no radiation westwards until much later, when one part of it, the physio-therapeutic techniques, influenced the founders of modern medical gymnastics such as P. H. Ling (cf. p. 173 above). This however was only incidental, and the general line of macrobiotic physiological alchemy remained quite strange to European minds; were this not so, we should not have had to unravel it at such length in the present sub-section.

But it deserves a measure of appreciation all the same. The great justification of it seems to us to be that it was nothing less than a chapter in the pre-natal history of biochemistry. The *nei tan* theory of the enchymoma was a recognition, almost instinctive perhaps, of the fact that very powerful biologically active substances are indeed prepared by metabolic processes within the bodies of living things. Although partaking of the nature of a hygiene as such, and having the intimate connections which we have traced with the rather different traditions of Indian yoga, it was much more fundamentally and distinctively biochemical, since it vividly visualised the actions of organs and secretions upon one another, and the elaboration of an actual life-giving and life-prolonging substance, the enchymoma, by the reactions of what we should call biochemical factors somewhere near the centre of the human body. It is a striking thought that the question of the efficacy of chemistry versus biochemistry had already been posed about + 300, when the form it took was whether a like or unlike thing would have the greater effect upon a reactant body.^a In Sect. 16 we already saw a good example of this, in part of the wonderful discussion in the third chapter of the *Pao Phu Tzu* book between Ko Hung and his interlocutors.^b

Someone said: 'Life and death are predetermined by fate, and the length of the life-span is usually fixed. Life is not something that any external medicine can shorten or lengthen. . . . If the medicine were of the same category as one's own body it might be efficacious, but I shall never believe in the value of things of totally different categories (*i lei*¹) such as the seeds of the pine or the cypress.'

Pao Phu Tzu replied: 'According to your argument, a thing can be beneficial only if it belongs to the same category (*thung lei*²) as that which is to be treated. If that were so, why

^a For an extended treatment of Chinese category and chemical affinity theory see Vol. 5, pt. 4, pp. 305 ff.

^b Vol. 2, p. 439. The passage was there abbreviated, and we give it here in less free form.

¹ 異類

² 同類

could not a lost finger be stuck on again? Why should one not consume the blood lost from a wound? After all, they belonged originally to the same body, and not to some different species. . . Benefit from things of a different category (*i wu chih i*¹), however, is not to be denied. If we followed your opinion, and mistrusted things of different nature, we should be obliged to powder flesh and melt or liquefy bone to prepare medicines for wounds, or to drink boiled extracts of skin or hair to cure baldness. Water and earth are not at all of the same substance (*thung thi*²) as the hundred plants and vegetables, yet they all rely on them for growth. The five cereal grains are not of the same category as living men, yet men need them in order to live their lives. Oil is not of the same species (*chung*³) as fire, water is not of the same class (*shu*⁴) as fish, yet when there is no more oil the fire dies, and when there is no more water the fish perish. Cut down a tree and the epiphytes dry up, mow the grass and the dodder dies. . . The point can be made crystal-clear by hundreds of examples. . . Therefore when we consume (all kinds of different) things which are able to benefit our bodies and conduce to longevity, why should we be surprised if some can give us immortality?'.^a

Here Ko Hung was stating the *wai tan* case and his critic was the representative of the tendency that eventually led to the *nei tan*.

Of course both were quite right. The pharmaceutical industry of today knows both 'chemicals' and 'biologicals'. And to crown all, the recognition of this duality was also accomplished in China before the days of modern science. For there occurred in that culture what might almost be called a synthesis of the *wai tan* and the *nei tan* traditions, namely the iatro-chemical movement starting from about the + 11th-century onwards. This we deal with in detail elsewhere,^b but here we must point out that it did combine the two ancient traditions, since it applied *wai tan* laboratory methods to *nei tan* substances, the secretions, excretions, juices and tissues of the body itself. As we shall find in the following pages,^c this led to one of the greatest triumphs of medieval and pre-modern scientific technology in any civilisation, namely the quasi-empirical preparation in purified though not isolated form of the steroid sex-hormones.^d These were actively and successfully used in medical practice, and they were not by any means the only endocrine preparations which Chinese iatro-chemistry produced.^e Thus in all our excursions into the quasi-yogistic land of the *nei tan* tradition, we have been rather less far away from the history of science as ordinarily understood than we ourselves have sometimes been tempted to suppose. And the enchymoma deserves to be celebrated as one of the landmarks in the pre-history of biochemistry just as much as all the elixirs which contributed to the development of the technology and science of chemistry itself.

Before turning, however, to our account of what might be termed 'the enchymoma in the test-tube' we may take a brief look at a late manifestation of Ko Hung's argument about 'like' and 'unlike' materia medica. A far-off echo of this

^a *PPT/NP*, ch. 3, p. 6a, b, tr. auct., adjuv. Ware (5), pp. 61 ff.

^b Vol. 5, pt. 3, p. 219-20, and in Vol. 6, Sects. 44, 45.

^c And still further in Sect. 45 below.

^d Meanwhile see Lu Gwei-Djen & Needham (3).

^e The following passages will be discussed in detail later: *Wan Ping Hui Chhun* (+ 1615), ch. 4, pp. 7a ff.; *Chih Shui Hsüan Chu* (+ 1596), ch. 10, pp. 20a ff.; *I Hsüeh Ju Mên* (+ 1575), ch. 2, pp. 101a ff.; *Pên Tshao Chhiu Chen* (+ 1773), ch. 6, pp. 30a ff. We say no more about these here, recording them in advance only for convenience.

controversy resonated in the early nineteenth century when Samuel Hahnemann (+ 1755 to 1843) founded the medical system known as 'homoeopathy'.^a After the disappearance of the Galenic doctrine of 'peccant humours', rooted in the Greek conception of *krasis* or balance between the constituents of the body,^b and especially after the great discoveries of bacteriology, Western medicine concentrated more and more on specific drugs for particular disorders, and took them freely from all the natural kingdoms. In spite of side-effects and side-reactions, iatrogenic illness, the placebo effect,^c the uncontrolled promotion of new drugs by the pharmaceutical industry under capitalism, and dangerous disturbances of the balance of Nature, including the production of antibiotic-resistant strains of bacteria, medical orthodoxy has remained faithful to this conception down to the present day.

But like Ko Hung's interlocutor, the homoeopathic followers of Hahnemann believed that the body ought to be allowed to take care of itself, and they called mainstream medicine 'allopathy', because it set out to cure diseases by things other than body constituents, whether of plants, animals or man. They agreed with the words of Thomas Sydenham (+ 1666): 'how prejudicial soever the cause of a disease may be to the body, it is no more than a vigorous effort of Nature to throw off the morbid matter and thus recover the patient.'^d In other words, they put their faith in the *vis medicatrix naturae*. Furthermore, contrary to the accepted medical principle of giving contrary or counter-acting drugs, they believed in the old dictum *similia similibus curantur*;^e and since fever was, they thought, the body's way of fighting malaria, for example, a pyretic drug should be given, not an anti-pyretic one. But at the same time they used doses of single drugs only in the most extreme dilutions, and since it was never possible to justify this rationale by experimental pharmacology the homoeopathic system has never had scientific support.^f However, its concentration on the natural healing powers of the body, and its strongly psycho-somatic approach in diagnosis, give it a not dishonourable place in the history of medicine, and if today a movement of which the force is largely spent, it certainly has some theoretical relevance to the questions raised in the China of the Chin period a millennium and a half ago.

^a Cf. Inglis (1), pp. 74 ff.

^b Cf. Needham (64), p. 412; Lu Gwei-Djen & Needham (5), p. 8. As we also saw (Vol. 5, pt. 4, pp. 477, 481), the Arabic alchemists believed that perfect *krasis* meant immortality, and that was what the elixirs brought about. Alas, it was not so for Brutus, of whom Mark Antony says in the concluding lines of *Julius Caesar* (Act V, sc. 5):

His life was gentle, and the elements
So mix'd in him, that Nature might stand up
And say to all the world "This was a Man!".

^c Cf. Lu Gwei-Djen & Needham (5), pp. 239 ff.

^d 'Methodus curandi Febres, propriis Observationibus superstructa' (Works, Syd. Soc., i, 29).

^e Cf. Vol. 5, pt. 4, pp. 321 ff., where we considered the age-long hesitations of philosophers and proto-chemists as to whether 'like' reacts with 'like', or on the other hand only with 'unlike'.

^f Oligo-dynamic actions are of course known, but only for a relatively restricted number of chemical substances—copper and plant growth, for example, or trace elements, or certain poisons such as botulinus toxin or ricin, or various hallucinogens.

(k) THE ENCHYMOMA IN THE TEST-TUBE;
MIEVEAL PREPARATIONS OF URINARY STEROID AND
PROTEIN HORMONES

All through this volume we have been contrasting *wai tan* with *nei tan* practice, and tracing out how the laboratory alchemy of metals, oxides, sulphides and other salts was paralleled, and eventually almost superseded, by a physiological alchemy which dealt with the fluids and tissues of the human body itself, and sought to construct from their interactions a medicine of immortality. The elixir gave place more and more to the enchymoma. If that was antithetical, how could a synthesis ever have come about? Simply because the iatro-chemists or pharmacists, at least from the Sung onwards, started to apply *wai tan* laboratory techniques to organic mixtures of *nei tan* character, especially urine, but also the placenta, menstrual blood, semen, and even glands of internal secretion. This was to lead them to new discoveries and inventions still of much interest today.

Our knowledge of the endocrine functions of the sexual organs of man and mammals is an acquisition of comparatively recent date. Endocrinology as a whole indeed does not go back beyond the beginning of the present century. By the end of the twenties a great deal of important knowledge about the endocrine secretions of the testis and ovary, the placenta and the adrenals, had been attained, as may be seen in the collective work 'Sex and Internal Secretions' edited by Edgar Allen in 1932. The same period had seen the establishment of the correct formula of the steroid ring system by Wieland, Windaus, Diels, Bernal, Rosenheim and King; and this opened the way for the sweeping advances in the field of androgens and oestrogens which have taken place since then.^a We are now familiar with a large number of substances of androgenic and oestrogenic activity naturally occurring in the body, and we are also able to make use of derivatives of these substances which do not naturally occur in Nature but which may have very useful properties for our purposes.

Since the knowledge of the steroid sex hormones is thus such a characteristic achievement of modern science, it seems hardly believable that in any phase of ancient or medieval science it should have been possible to make purified preparations which possessed activity of this kind.^b Nevertheless there exists a corpus of material which indicates that just this was accomplished by Chinese iatro-chemists between the +10th and the +16th-centuries.^c Guided by theories of tradition,¹ Chinese type, not of course the same as those of modern science, and using urine as their starting-point, they succeeded in preparing mixtures of androgens and oestrogens in relatively purified form and employing them in medicine. The classical discovery of Aschheim & Zondek in 1927 that pregnancy urine contains rich amounts of steroid sex hormones,^d and the subsequent discoveries of the presence of

^a On the androgens see especially Dorfman & Shipley (1).

^b Earlier and briefer versions of the material here presented will be found under Lu Gwei-Djen & Needham (3).

^c And in cruder form, much earlier still.

^d It very soon became the chief source of supply for biochemists; cf. Veler & Doisy's paper (1), and Allen (1), pp. 440, 483; also Brooks *et al.* (1) p. 111.

similar substances in urine from other sources was thus anticipated by many centuries in these Chinese quasi-empirical preparations. In the present sub-section we shall set forth the evidence which we have found.^a

(1) THE SEXUAL ORGANS IN CHINESE MEDICINE

Before proceeding further it will be desirable to say a few words about the sexual organs in Chinese medical thought and practice. The secondary sexual characteristics were recognised as connected with the testis in quite ancient times. As in all other civilisations, castration was undertaken very early, in man for social reasons (eunuchism), and in animals both for medicinal purposes and for gastronomy, because gelded animals were found to put on fat and to give a more tender meat. The simple physiological experiment of castration thus taught the Chinese very early that the beard and other characters of virility were connected in some way with the presence of the testes. Intersexes also aroused much interest and were catalogued in the *Hsi Yuan Lu*¹ of Sung T'zhu,² the founder of forensic medicine, in +1247. This book, entitled 'The Washing away of Wrongs (i.e. False Charges)' is the oldest treatise on legal medicine in any civilisation, and it was natural that attention should be paid in it to various forms of hermaphroditism.^b By the +16th-century, Li Shih-Chen³ in his great pharmaceutical natural history, the *Pên Tshao Kang Mu*⁴ (+1596), has an elaborate discussion of ten principal forms of this condition.^c The interest of the Chinese was also aroused very early in sex-reversals. From the beginning of the Former Han dynasty (–3rd-century) cases are reported, for example in the *Lun Hêng*⁵ (Discourses Weighed in the Balance)^d of the famous sceptic Wang Chhung,⁶ written about +80. These sex-reversals, where persons predominantly male turned into persons mainly female in character and vice versa, were taken note of naturally for prognostication purposes, like other unusual phenomena, celestial or terrestrial. For this reason many cases of similar change in animals as well as man were recorded in the dynastic histories under the heading of 'strange events';^e and there are plenty of case reports in the memorabilia of private scholars.^f

So far as we know, the Chinese were not particularly early in the use of testicular tissue as a therapeutic agent in cases of hypo-gonadism, sexual debility, impotence, spermatorrhoea, and female affections such as dysmenorrhoea, leucorrhoea, etc.

^a We are greatly indebted to Dr Roger Short of the Department of Veterinary Science at Cambridge and to Dr Hal Dixon of the Biochemical Department, for much kind help and valuable advice.

^b Ch. 1, pp. 32 *aff.* The material was in part older, since Sung T'zhu based his work on three still earlier books now lost.

^c Ch. 52, pp. 43 *aff.* Study continues today in China on modern lines; cf. Liu Pên-Li *et al.* (1).

^d Ch. 7 (Förke tr. (4), vol. 1, p. 327).

^e E.g. *Chhien Han Shu*,⁷ ch. 27BA, pp. 20 *aff.*; ch. 27CA, p. 18b; *Hou Han Shu*,⁸ ch. 27, p. 8a; *Hsin Tang Shu*,⁹ chs. 34 to 36 *passim*.

^f Cf. Laufer (40). Further references will be given in Vol. 6.

¹ 洗冤錄

² 宋慈

³ 李時珍

⁴ 本草綱目

⁵ 論衡

⁶ 王充

⁷ 前漢書

⁸ 後漢書

⁹ 新唐書

The practice was first emphasized in a book entitled *Lei Chêng Phu Chi Pên Shih Fang*¹ (Classified Fundamental Prescriptions of Universal Benefit) printed in +1253, and attributed to an eminent physician, Hsü Shu-Wei,² who flourished in +1132. The testes of animals such as the sheep, pig and dog were used either desiccated, raw or comminuted with hot wine. Other +13th-century books describe the treatment, e.g. the *Chi Shêng Fang*³ (Prescriptions for the Preservation of Health), written by Yen Yung-Ho⁴ about +1267; after that time it became a current method in Chinese therapeutics.⁵ The use of testis tissue as a drug goes back far in medical history; it appears in the Hippocratic corpus, in Dioscorides (*ca.* +60),⁶ and among the Indian writings, especially the *Susruta-samhita*, some time between the +2nd and +5th-centuries.⁷ As early as -135 Nicander recommended the use of the testes of hippopotamus.⁸ There is no reason to think that such medication would have been valueless. Although testosterone is inactivated in the liver, administration *per os* may have been reasonably effective, provided sufficient quantities were given to the patient.

Chinese medicine was perhaps more original in its use of the human placenta for therapy; after all the richest source of oestrogens.⁹ How far back this goes we are not quite sure, but Li Shih-Chen tells us¹⁰ that the use of human placenta was first mentioned in the *Pên Tshao Shih I*⁵ written by Chhen Tshang-Chhi⁶ about +725. At first it was not greatly used, but during the Ming period (+14th-century onwards) it came into prominence, and was prescribed habitually for all such affections as are considered to benefit by the administration of oestrogens at the present day. The placenta was much studied by Wu Chhiu⁷ towards the end of the +15th-century in his *Chu Chêng Pien I*⁸ (Resolution of Diagnostic Doubts); he, like other physicians of the Yuan and the Ming, invariably prescribed placental tissue, desiccated or boiled down in wine,⁹ combined with a variety of plant drugs. Some of these are known today to have quite powerful effects on smooth muscle, blood pressure, etc.¹⁰ The oral route is often considered inefficient for oestrogens, but there can be no doubt that real effects would have been produced if enough material was given.¹¹ As in the case of the testis, placentas of animals, especially the horse and cat, were also employed.¹²

¹ See *PTKM*, ch. 50A, pp. 13a, 21a,b, 30b, 43a.

² Gunther ed. (1) p. 102; Berendes, (3) vol. 1, pp. 194, 294; Brooks *et al.* (1), p. 23.

³ Bhishagratna ed., vol. 2, pp. 512ff.

⁴ Berendes (1), vol. 1, p. 274.

⁵ Allen (1), p. 456. A helpful summary of the most recent state of knowledge is that of Gröschel-Stewart (1).

⁶ *PTKM*, ch. 52, pp. 36a,b, 37a,b.

⁷ Such a treatment, like refluxing with aqueous alcohol, would liberate the steroid hormones, both free and conjugated, from the cells.

⁸ E.g. *tu-chung*⁹ (*Eucommia ulmoides*), and *tang-kuei*¹⁰ (*Angelica polymorpha*).

⁹ Oestrogenic components can in certain circumstances be well absorbed *per os* (cf. Allen (1), pp. 908, 910); progesterone not so. The famous experiments of Brown-Séquard in 1889, so often regarded as the foundation of endocrinology, sought to overcome the difficulties of the oral route by the injection of glycerol extracts of testis tissue; they were thus distinctly less subtle than the ancient Chinese methods of fractionating urine, and indeed also less convincing, since 'the validity of the results has not been substantiated' (Allen (1), p. 881), while the Chinese preparations were in widespread use.

¹⁰ *PTKM* ch. 50B, p. 20a; ch. 51A, p. 36b.

¹¹ 類證普濟本事方

¹² 許叔微

¹³ 濟生方

¹⁴ 嚴用和

¹⁵ 本草拾遺

¹⁶ 陳藏器

¹⁷ 吳球

¹⁸ 諸證辨疑

¹⁹ 杜仲

²⁰ 當歸

One little indication occurs here which links the use of the placenta with the iatro-chemical studies on urine which concerns us in this sub-section. In discussing the placenta, Li Shih-Chen quotes first from a *Tan Shu*¹ concerning the theory of the use of the placenta and the choice of the best specimens for the purpose. It is possible that *Tan Shu* here is a generic term meaning books on iatro-chemical medicines,² and not the name of a specific work, for it cannot be found in Li Shih-Chen's own bibliography.³ If this is so, there is here an interesting link with the iatro-chemists, descendants of the alchemists of the Thang and Sung who developed the urinary fractionation methods now to be discussed.

(2) PROTO-ENDOCRINOLOGY IN MEDICAL THEORY

Elsewhere we give a thorough study of the theories of Chinese physiology, pathology, and medicine throughout antiquity and the Middle Ages.⁴ These are the basis of the characteristic conceptions of traditional Chinese medicine to this day. Our conviction is that extended study will demonstrate how congruent the Chinese medical theory-structure was with the fundamental conception of endocrinology, namely that the organs of the body exert important effects upon one another.⁵

In the first place, the principal viscera were analogised with the elements. As is now generally known, Chinese natural philosophy from the —4th-century onwards thought in terms of Five Elements (unlike the Greek four): Metal, Water, Wood, Fire and Earth.⁶ The whole of Nature was considered as being the theatre of a continual succession of changes in the Five Elements, changes which proceeded according to certain systems of mutual inter-relations. One such system was the Mutual Production Order, a particular succession according to which each element generated the next one in a series. Similarly, another cyclical succession was that known as the Mutual Conquest Order, in which in a different succession each element conquered or destroyed its neighbour, according to a particular succession. Since the viscera were analogised with the Five Elements, then the conception of constant interactions between them lay very near to the physiological thought of the ancients.

Besides the Five Elements, however, there were also the two fundamental forces in the universe, Yin and Yang, originally correspondingly to brightness and darkness, the male and the female, etc., but here particularly relevant in that the physiological thinkers used them so often in a sense very similar to that which we have in

¹ Or of course any treatise on *wai tan*, or *nei tan*, methods in general.

² A search in the catalogues of the Taoist Patrology (*Tao Tsang*²) which contains so many alchemical books, reveals only one which contains both these characters in its title, a *Tan Tao Pi Shu*³ (Secret Book of the Tao of Elixirs); but this is not in either of the main collections, and we have not been able to see it. We suspect that it is in any case a late work, and not what Li Shih-Chen was referring to. ³ Vol. 6, Sects. 43 and 44.

⁴ A discussion of the theoretical foundations of the medieval preparations of urinary derivatives has also been given by Fêng Lu-Chuan (1).

⁵ See Vol. 2, pp. 232 ff., 253 ff. We are well aware of the unsatisfactory nature of the term 'elements', but we continue to follow tradition in using it. Cf. Major (2); Kunst (1); Needham & Lu Gwei-Djen (9).

¹ 丹書

² 道藏

³ 丹道秘書

mind when we speak of stimulus and inhibition. Thus the medieval Chinese physicians had no difficulty in conceiving of a stimulatory action of one organ on another and also an inhibitory one.

Furthermore, there was another feature in classical Chinese physiological thought which helped the conception of interactions within the body as a whole. This is what one might call a circulation-mindedness. Although medieval Chinese physiology had a less accurate estimate of the blood circulation time than that which has been reached since the time of William Harvey,^a it never conceived of air in the arteries or tidal oscillations in the veins. Chinese thought envisaged a steady circulation throughout the body of *chhi*¹ ('pneuma') and blood.^b The distinction between arterial and venous blood had even been appreciated to some extent as early as the Former Han period, when the *Huang Ti Nei Ching*,² the earliest medical classic, was compiled.^c Consequently it was not only sensible on general element-theory to imagine the action of one organ upon another, but it was also easy to see how it could come about because of the perpetual circulation going on within the body.

In 1849 A. A. Berthold^d made his classical experiment of transplanting the testis in the cock to the abdominal cavity; he found that it was vascularised but not innervated in its new position, and he was thus able to prove that the caponised cock would remain a cock, a fully male animal, when the testis was able only to contribute something to the blood-stream. The thought behind Berthold's experiment—the foundation of modern endocrinology, though not followed up for sixty years afterwards^e—has been investigated by Forbes (1), but it still remains somewhat obscure. It probably originated from the old Greek theory of pangenesis, according to which particles from all the organs of the body went to form the corresponding organs in the embryo.^f As interpreted in the +18th-century by men such as Maupertuis, Buffon and de Bordeu,^g this theory supposed that every organ (even if it had an obviously external secretion also) contributed specifically and characteristically to the blood-stream, not only for the purpose of forming the sexual products but also for all kinds of purposes. This then was probably the mainspring of Berthold's experiment. Knowing the relation of the testes to the secondary sexual characteristics, he thought it might be possible to demonstrate that their action was mediated by the blood-stream alone. And it was. From what has been said above it will be clear that the implicit content of the medieval Chinese medical conceptions

^a It was actually assessed as only sixty times slower. See on the whole subject Lu Gwei-Djen & Needham (5).

^b As yet there is no adequate treatment of this subject in a Western language, but we intend to give one in Vol. 6; meanwhile the reader may be referred to the papers of Liang Po-Chiang (1); Kapferer (1); and Huard & Huang Kuang-Ming (1).

^c The *locus classicus* is *Ling Shu*,¹ ch. 39; cf. also *Su Wen*,² chs. 27, 39.

^d Biography by Rush (1).

^e The converse demonstration with the ovary was due to Knauer (1) and Halban (1)—but not till 1900.

^f Cf. Needham (2), pp. 39 ff.; A. W. Meyer (1), pp. 86 ff.; E. S. Russell (2). The theory, characteristic of the Hippocratic and Democritean schools, was combated by Aristotle.

^g See Neuburger (1); Rolleston (1).

was rather similar, in that the Five Viscera were in constant communication with each other through the circulatory systems of the body.^a

What was particularly remarkable about the Chinese practices from the +10th-century onwards was the fact that they based themselves on the belief that these contributed 'virtues' of the blood were in part transmitted to the urine. The urine could therefore be regarded as a valuable source of some of these precious qualities. The traditional doctrine of Chinese medicine is summed up by Li Shih-Chen in his *Pên Tshao Kang Mu* (+1596) where he says that the nutrient essentials of the vital forces (*jen chih ching chhi*)^b circulating in the body divide into two fractions, the lighter fraction (*chhing chê*)^c forms the blood, and the grosser fraction (*cho chê*)^d forms the *chhi*; then the grosser part of the lighter fraction forms the urine, while the lighter part of the grosser fraction forms the secretions. For this reason the urine must be considered as 'of the same category as' (*thung lei*)^e the blood.^e This was a fundamental doctrine, for the conception of categories was of wide-ranging implication in Chinese medieval natural philosophy. Something has already been said about it in connection with the older *wai tan* alchemy, where it was also highly important.^d Essentially it provided a further cross-classification other than the basic division of all things and events in the world into Yin and Yang. A multitude of texts bear witness that particular processes will only occur if the reacting substances are either of the same or of a different category, but knowledge of the categories one must have.

The use of the urine as a starting-point for medicinal preparations can therefore in no way be dismissed as merely superstitious 'Dreck-apotheke'.^e On the contrary there was good theoretical ground for it in medieval Chinese eyes, and it is remarkable to reflect how far this intuition has been justified by the assured findings of modern biochemical science. Moreover, it is clear that what the Chinese were looking for in urine was a substance or substances which would give the kind of results that the androgens and oestrogens give when administered today. The former are used in the male for hypogonadism (whether systemic or local), pituitary dwarfism, prostatic hypertrophy, impotence, gynaecomastia and the sexual neuroses or psychoses of ageing; in the female for dysmenorrhoea, uterine bleeding, frigidity, menopause neuroses or psychoses, and certain neoplasms such as mammary carcinoma. The latter are given for amenorrhoea, dysmenorrhoea, uterine hypertrophy, kraurosis vulvae, etc. Though the Chinese books mention the use of urinary preparations for quite other affections, one can often recognise such conditions as these under the veil of the traditional terminology.

^a For the wider aspects of medieval Chinese proto-endocrinology, see Vol. 6, Sect. 45; meanwhile Needham & Lu Gwei-Djen (3).

^b Cf. pp. 46ff. above. It will be noted that *ching chhi* does not always mean the *chhi* of the semen.

^c *PTKM*, ch. 52, p. 16 a, (p. 91).

^d Cf. Vol. 5, pt. 4, pp. 307ff., based on Ho Ping-Yü & Needham (2); also pp. 92, 298-9 above.

^e The classical term for the pharmaceutical use of excrements and ordure, a practice encountered in many ancient cultures, and among contemporary primitive peoples. On human urine as *materia medica* there is a special monograph by Krebs (1).

(3) THE EMPIRICAL BACKGROUND

The use of urine as a medicament, especially for sexual debility and related disorders, goes back a very long way in Chinese history. The *Hou Han Shu* (History of the Later Han Dynasty) has a short biography of three Taoist adepts who lived towards the end of the +2nd-century. It must again be remembered that the attitude of ancient Taoism to sex was philosophical and medico-scientific rather than ascetic in the ordinary sense. Among the paths to the attainment of material immortality, sexual techniques took their place, as we have seen, beside diet, gymnastic exercises, control of the breathing, heliotherapy, and asceticism as understood in the West. The passage is as follows:^a

Kan Shih¹ and Tungkuo Yen-Nien²

[*Comm.* The *Han Wu Nei Chuan*³ (Secret History of (Emperor) Wu of the Han) says that his (Tungkuo's) style was Kung-Yu⁴.]

and Fêng Chün-Ta;⁵ these three were all adepts (or magicians, *fang shih*⁶). They were all expert at following the techniques of Jung Chhêng⁷ in commerce with women.^b They could also drink urine, and sometimes used to hang upside down. They were careful and sparing of their seminal essence and (inherited) *chhi*, and they did not boast with great words of their powers. What Kan Shih, (Tso) Yuan-Fang^{8c} and (Tungkuo) Yen-Nien could do was recorded by (Tshao) Tshao⁹ who asked them about their art and tried to practise it.^d

[*Comm.* Tshao Chih's^{10e} *Pien Tao Lun*¹¹ (On Taoism, True and False)^f says: 'Although Kan Shih was old, yet he looked young. All magicians and adepts flocked to him, but he talked much and showed them little. His words were unorthodox and strange. I myself once dismissed my retainers and talked alone with him, asking him with kindness and courtesy what exactly it was that he practised. He said "My teacher's name was Han Ya.¹² With this master I once made gold in the southern regions; on four occasions we threw away into the sea several tens of thousands of cattles of gold." He also said "In the time of (Shen) Chu-Liang¹³ (i.e. -500)^g barbarians came from the western regions bringing tribute of incense, Kashmir cloth belts and jade-cutting knives; I often regretted that I did not get some of them." He also said: "In the countries west of the Chhê-Shih¹⁴ kingdom, people cut open the backs of new-born children and take out their spleens in the hope that they will eat less and be more aggressive."^h He

^a Ch. 112B, p. 18a, tr. auct. Written by Fan Yeh about +450.

^b A semi-legendary figure associated both with sexual physiology and calendrical science. Cf. van Gulik (8) and Fig. 1631.

^c Alchemist and thaumaturgist, +155 to +220 or a little later. Like the other three, a frequenter of the court of the founder of the (San Kuo) Wei Kingdom.

^d The founder, and posthumously the first emperor, of the (San Kuo) Wei Kingdom; celebrated as a military leader, and interested in many aspects of technology.

^e Third son of Tshao Tshao, famous writer and poet, much inclined to Taoism and interested in natural history. Cf. Vol. 4, p. 3, p. 649.

^f This passage is also quoted at the end of the biography of Hua Tho in *San Kuo Chih* (*Wei Shu*), ch. 29, p. 7a,b.

^g A sympathetic feudal lord with whom Confucius once conversed when on his travels, builder of one of the most ancient of Chinese reservoir dams for irrigation water. Cf. Vol. 4, pt. 3, p. 271.

^h The Han histories describe two Chhê-Shih kingdoms, one anterior and one ulterior (from the Chinese point of view), the former centered on Turfan, the latter on Guchen, but both in modern Sinkiang. See Teggart (1), p. 212; McGovern (1), (under Gūshī).

¹ 甘始

² 東郭延年

³ 漢武內傳

⁴ 公游

⁵ 封君達

⁶ 方士

⁷ 容成

⁸ 元放

⁹ 曹操

¹⁰ 曹植

¹¹ 辨道論

¹² 韓雅

¹³ 沈諸梁

¹⁴ 車師



Fig. 1631. Drawing of Jung Ch'êng, from *Lieh Hsien Ch'üan Chuan*, ch. 1, p. 9a; legendary Chou sage famed for his understanding of sexual techniques.

also said: "If you take a pair of carp (fishes) five inches long, put certain drugs into one of them and throw it into boiling fat, the drug will make it violently move its tail and gills and leap about wildly up and down as if it were sporting in the abyss. But by this time the other one will be cooked and can be eaten." I often asked him whether (these things) could be tested. He said that this drug was found ten thousand miles away and one must go beyond the frontiers to obtain it. "If you don't go yourself", said he, "you won't get it."^a (Kan Shih) said many other things but I cannot recall them all; I mention only the strangest. If he had lived in the time of Chhin Shih Huang¹ or Han Wu Ti² he would have been counted among (the great adepts such as) Hsü Fu^{3,4} and Luan Ta^{5,7}]^b

Fêng (Chün-Ta) was called the Blue Ox Master (Chhing Niu Shih⁶).

[*Comm.* The *Han Wu Nei Chuan* says that he was a Kansu man. He began by eating *huang-lien*^{7c} and after more than fifty years he entered the Niao-Chü Mountains⁸ and consumed metallic mercury. After more than a hundred years he returned to his native village looking like a young man of twenty. He always rode on a blue ox, which was why he was called the Blue Ox Taoist. If he heard of anyone who was ill or dying, whether he knew him or not, he quickly gave him drugs, which he kept in a tube of bamboo tied to his waist. Sometimes he practised acupuncture on the patients, who incontinently recovered, but he never revealed his names. He heard that Lu Nü-Shêng⁹ had got hold of the Five-Mountains Map, and year after year he asked for it but he could never obtain it.^d (Lu)^e would only counsel moderation. When he was over 200 years old, he (Fêng) went away into the Yuan-Chhiu Mountains.]

The association of urine with sexual activity therefore goes back to a very early time in Chinese history, and if here we find it towards the end of the +2nd-century it is highly probable that it was a Taoist art which could be found in the -2nd also. Jung Chhêng, the semi-legendary master of the arts of sex and hygiene applied to longevity, was considered a man of this time if not of the Warring States period (-5th to -3rd-centuries). The connection with aurifactive alchemy is here of course evident and impressive. The curious legendary adumbration of endocrinological operations is entertaining in the context of Berthold's discovery, but hardly relevant, except in so far as it may indicate physiological experimentation on the part of the Han Taoists. The case of Fêng Chün-Ta also illuminates again the intimate relations between Taoism and medicine.

A thousand years later one comes across the same belief and practice. Chu Chen-Hêng¹⁰ says in his *Pên Tshao Yen I Pu I*¹¹ (Revision and Amplification of the *General Ideas of the Pharmacopoeia*) written about +1350:^f

^a Might this not have been camphor from the South Seas?

^b Chhin Shih Huang Ti was the first emperor of China unified under the first dynasty, the Chhin (r. -221 to -210); he sent Hsü Fu to find the isles of the immortals in the Eastern Ocean (cf. Vol. 4, pt. 3, pp. 551 ff.). Han Wu Ti was the greatest of the Han emperors (r. -141 to -87); he was served by many Taoist adepts, among whom Luan Ta is remembered for his connection with the history of magnetical science. Cf. Vol. 4, pt. 1, pp. 315 ff.

^c *Coptis teeta*, a very bitter herb. R534; CC1413; Burkill (1), vol. 1, p. 654.

^d On this religious cosmography and cartography see Vol. 3, pp. 546, 566.

^e Another of Tshao Tshao's thaumaturgical experts.

^f Chu Chen-Hêng (+1281 to +1358) was one of the 'four famous physicians of Chin and Yuan'.

¹ 秦始皇

² 漢武帝

³ 徐市

⁴ 徐福

⁵ 樂大

⁶ 青牛師

⁷ 黃連

⁸ 鳥舉山

⁹ 魯女生

¹⁰ 朱震亨

¹¹ 本草衍義補遺

I once attended an old woman over 80 years of age who gave an appearance of being about half that seniority. In reply to my questioning she explained why she thought that she had had such good health. She had once suffered from a severe illness and had been instructed to take human urine, and this she had done for more than forty years. Who could maintain therefore the old belief that the property of urine is algorific, and that it could not be taken for a long time? All such cases of *yin hsü*¹ (impotence, sexual debility, eremosis, excess Yang of burning feverish type, etc.) which no medicine can benefit will take a turn for the better if urine is administered.^a

An intermediate date is represented by Chhu Chhêng,² a physician who died in +501. In his remaining writings^b we read that the urine is valuable because it has styptic properties.

When the throat has lesions, the patient coughs up blood and this may lead to death. The throat will not tolerate anything on its walls, so that an object as tiny as a hair will cause a severe cough. The more the coughing continues the worse the breathing will be, so that it is essential to stop it. If urine is taken the condition is nearly always cured, but if algorific drugs are given none of the patients get better.^c

We do not know what property of urine such anti-tussive effects could be due to,^d but there can be no doubt that throughout the centuries between Kan Shih and Chu Chen-Hêng urine was used medicinally. Li Shih-Chen says that it has the property of leading forth from the body pathological influences.

Human urine is moderately calorigenic and not algorific. Urine entering the stomach is absorbed, carried upwards to the lungs along with the *pneuma* of the spleen (*phi chih chhi*³), and downwards to the 'water-passage' (*shui tao*⁴) to enter the urinary bladder.^e This is the same route through which it passed once before. For this reason it can lead the (undue) heat (*yin huo*⁵), the cause of the illness, downwards to be excreted.^f

In the light of all this it was perfectly natural that the sediments and natural precipitates of the urine should arouse great interest among the Chinese medical naturalists at an early time. While it seems that the appearance of the urine was never rated so highly for the purposes of diagnosis as it was in the West,^g neverthe-

^a Quoted in *PTKM*, ch. 52, p. 15a. Some of the technical terms in this passage (and in those which follow) have been developed by us to aid in the translation of medieval Chinese medical texts, and will be fully explained in Vol. 6.

^b It is now considered that these were greatly remodelled, if not entirely re-written, by one or more physicians of the Sung period (cf. Chang Hsin-Chhêng (1), vol. 2, p. 997; Hsieh Sung-Mu (1), p. 55).

^c *Chhu Chhêng I Shu*,⁶ cit. *PTKM*, ch. 52, p. 16a.

^d But see p. 324 below, on the prostaglandins.

^e On p. 15a the 'water passage' is identified with the *lan mén*,⁷ a structure which we recognise as the colic valve at the junction of the ileum with the caecum and colon. Here the intestinal contents were thought to separate into two portions, the aqueous part passing to the kidneys and the bladder, while the solid residues continued towards the anus. The work of concentration of the contents was thus symbolically located at a particular place. ^f Loc. cit.

^g For a brief account of ancient and medieval urinoscopy see Mettler (1), pp. 293 ff. The earliest extant Western treatises on it were written by the Salernitan physicians Maurus and Urso, c. +1160; whose work has been discussed by Meyer-Steinig & Sudhoff (1), pp. 103, 129, 138 and figs. 72, 79. It should not be thought, however, that Chinese medieval physicians paid no attention to the urine. As Lai Tou-Yen (1) has pointed out, the *Wai Tai Pi Yao* of +752 quotes an important statement from an earlier *Ku Chin Lu Yen Fang*⁸ on the urine of diabetics. It says: 'All those who pass a urine that tastes sweet but has no fatty flakes (floating on it) are suffering from diabetes (*hsiao khor*)'; ch. 11, (p. 310.1).

¹ 陰虛

² 褚澄

³ 脾之氣

⁴ 水道

⁵ 引火

⁶ 褚澄遺書

⁷ 蘭門

⁸ 古今錄驗方

⁹ 消渴

less it was thought that the sediments might contain very important substances. The naturally occurring sediment was called *niao pai yin*¹ or *jen chung pai*² and the first evidence of it in the medical literature occurs in the Thang period. Li Shih-Chen says that it was first mentioned in the *Thang Pên Tshao*,³ and though this is not fully extant today, we can confirm what he says by the manuscript of the *Hsin Hsiu Pên Tshao*⁴ (Newly Reorganised Pharmacopoeia)^a of +659, which was conserved in Japan. The reference to *niao pai yin* is there very clear. Possibly the earliest account of its use, in this case for curing severe diarrhoea in infants, occurs in the *Chhien Chin Yao Fang*⁵ (Thousand Golden Remedies) by the great Sui and Thang physician Sun Ssu-Mo about +650. In the +14th-century Chu Chen-Hêng said that the

urinary precipitate has the property of leading out the (undue) heat affecting the liver, the three coctive regions (*san chiao*^b), and the bladder, by way of the urine. This is because it was itself originally excreted through the bladder and urino-genital tract.^b

Li Shih-Chen in the +16th-century repeats the statement.^c He says that

jen chung pai makes the *hsiang huo*^d (primary heat) descend, and disperses static blood. This is because of its saline property, which enables it to benefit the *hsia* (*chiao*^e) (lower coctive region) and to travel along with the blood.

Thus we have another principle, that of *yin tao*,⁹ leading something out by the same way that it previously came itself. This brings us to the purification of the urinary precipitates. Who would guess that one would have to look for them in the Chinese pharmaceutical natural histories under the names of *chhiu shih*¹⁰ (autumn mineral) and *chhiu ping*¹¹ (autumn ice, i.e. crystals)?^e

Before going into this however we must pause a moment to recognise that as Krebs showed in 1942 the use of urine as a medicament goes back continuously a long way in the cultures of the Western world. What has not so far been done is to trace it systematically in Asia. But one comes across examples of it from time to time. For instance, a +13th-century Japanese scroll-painting^f entitled *Mabutsu Ichinyo Ekotoba*¹² shows the urine of the famous Buddhist priest Ippen¹³ (+1239 to +1289), founder of the Jishū¹⁴ sect, being distributed by nuns from a bamboo tube

^a Ch. 15, p. 189.

^b Cit. *PTKM*, ch. 52, p. 19a.

^c Loc. cit.

^d This term usually refers to the heat of the cardiac region, but it is also applied to that of the urino-genital system (cf. Vol. 4, pt. 1, p. 65). In Chinese medical literature, heat, fire and Yang are interchangeable.

^e There can be little doubt that the name derives from the fact that a long process gave rise to a white product, for autumn is the climax of the yearly cycle of life and white was the colour of autumn in the system of symbolic correlations (cf. Vol. 2, pp. 262, 263, and Vol. 4, pt. 1, p. 11). We shall have more to say later on (p. 328) about the origin of this strange name.

^f We cannot refrain from recalling here, in a kind of *arrière-pensée*, the fact mentioned in Vol. 5, pt. 2, p. 116, that certain psychotropic substances pass out in the urine unchanged. But probably in this case the intent was purely medicinal.

¹ 溺白涎

² 人中白

³ 唐本草

⁴ 新修本草

⁵ 千金要方

⁶ 三焦

⁷ 相火

⁸ 下焦

⁹ 引薄

¹⁰ 秋石

¹¹ 秋冰

¹² 魔佛一如繪詞

¹³ 一遍

¹⁴ 時宗



Fig. 1632. Urine as a medicament; part of a +13th-century Japanese scroll-painting showing the urine of the Buddhist priest Ippen being distributed by nuns to kneeling believers, in the belief that it would cure blindness and illnesses of the gastro-intestinal tract. A kneeling nun is receiving a fresh supply in a bamboo tube. From the *Mabutsu Ichinyo Ekotoba* reproduced by Umezu Jirō(1).

to kneeling believers with the assurance that it would cure gastro-intestinal ailments and blindness,^a (Fig. 1632). And the drinking of urine as medicine or prophylactic continues in India to this day.^b In the West it lives on as one of the more eccentric cults of fringe medicine. It was still recommended in 1949 by Armstrong (1), and he was only continuing a tradition stemming from medieval times and studded with milestones like the 'English Physician' (+1695) of William Salmon,^c and the anonymous 'Thousand Notable Things'^d published in many editions between +1579 and 1815.

(4) THE MAIN IATRO-CHEMICAL PREPARATIONS

Writing about +1586, Li Shih-Chen tells us^e that urinary precipitate can keep the blood in motion, greatly help sexual debility, bring down heat, kill parasites, and disperse poisons; but the princes and wealthy patricians disliked using it because they considered it

^a The scroll-painting, discovered in 1941, has been published by Umezu Jirō (1). We owe our knowledge of it to the kindness of Dr Barbara Ruch and Dr John M. Potter.

^b As by the prime minister Mr Morarji Desai, according to a recent interview (*New Statesman*, 27 Oct 1978, p. 546).

^c See Ferguson (1), vol. 2, pp. 318ff. Salmon's dates were +1644 to +1713.

^d The original compiler was the Elizabethan writer Thomas Lupton.

^e *PTKM*, ch. 52, p. 20b (p. 94).

unhygienic. So the iatro-chemists (*fang shih*¹) began to purify the sediment, making first *chhiu shih* (and later on *chhiu ping*). . . For this they used two methods, the *Yang lien*² and the *Yin lien*³.^a

According to Li Shih-Chen the term *chhiu shih* was first mentioned in the *Pên Tshao Mêng Chhiüan*⁴ (Ignorance about the Pharmacopoeia Dissipated) produced by Chhen Chia-Mo⁵ in +1565.^b Chhen Chia-Mo emphasised the value of the product in many sexual and systemic disorders. However, Li goes on to say:

The term was really first used by the Prince of Huai-Nan.^c (Liu An⁶) named one of his *tan* (elixirs) *chhiu shih*, to express its white colour and its solidity. Recently people have purified the urinary precipitates (*jen chung pai*) to a white substance which is also called *chhiu shih*, to indicate that like the urine itself it is derived from the excess of the nutrient essentials of the vital forces (*ching chhi*).^d The iatro-chemists repeat the process of sublimation (*shêng ta*⁸), and the best product is called *chhiu ping*. The idea (of the initial concentration) was derived from the evaporation of sea-water in the production of salt. Indeed there are adepts who place (certain) salts in a reaction-vessel and apply heat to obtain a substitute or imitation product. It is important to know the difference between the real product and the false one.^e

One of our most notable sources for the preparation of the hormones in relatively purified form is a book called the *Shui Yün Lu*⁹ (Water and Clouds Record) by a famous scholar, Yeh Mêng-Tê¹⁰ (+1077 to +1148). Another work of about the same time refers to the preparations, namely the *So Sui Lu*¹¹ (Sherds, Orts and Unconsider'd Fragments) by an unknown author, probably of the late +11th-century. This text says:

The property of *chhiu shih* is saline; it travels (in the body) along with the blood. When taken it has the effect of reducing the (normal) equilibrium of Water over Fire (i.e. it weakens the renal-urinogenital system so that it cannot balance the cardiac-respiratory system). So continual use of the substance gives rise to pathological thirst.

After quoting this,^f Li Shih-Chen goes on to say:

This is because it is a processed product with properties verging on the calorific. It is often taken by lascivious people, who use it to further their unrestrained desires; the result is that eremotic heat (*hsü Yang*⁹) is set at large, and the renal-urinogenital system and the

^a As we shall shortly see, the former involved sublimation or at least evaporation by heating, the latter only precipitations in the cold.

^b This seems to have been strictly true for the *Pên Tshao* literature, but descriptions in medical and other works go back much earlier.

^c The work that goes under his name, *Huai Nan Tzu*,¹² is one of the great classics in the history of Chinese science; it was compiled about -125 by a group of naturalists gathered by Liu An,¹³ the Prince of Huai-Nan. There is no mention of *chhiu shih* in the text as we have it today; a solitary reference to 'autumn drugs' occurs in ch. 19, p. 14b, but it has to do with something else. See further p. 333 below.

^d Cf. pp. 248, 281 above.

^e We shall see the full force of this remark on p. 331 below, when considering the unashamed faking that went on in the Chhing period.

^f Cit. *PTKM*, ch. 52, p. 20b, 21a; cf. p. 314.

¹ 方士

² 陽鍊

³ 陰鍊

⁴ 本草蒙筌

⁵ 陳嘉謨

⁶ 劉安

⁷ 精氣

⁸ 升打

⁹ 水雲錄

¹⁰ 葉夢得

¹¹ 瓊碎錄

¹² 虛陽

¹³ 淮南子

seminal secretion (*chen shui*^a) quite exhausted.^a How could there not be thirst in such conditions? Besides, people sometimes add Yang (calorific) drugs to intensify the aphrodisiac effect (*hsieh huo*^b). Therefore only those who suffer from internal eremotic algor in the lower region of vital heat,^b and impotence (*tan thien hsü lêng*^c) should take it. Look at those suffering from urinary gravel and stone; in such patients the element of Water is weak and Fire is very strong, so naturally there is evaporation and precipitation with the formation of calculi. This occurs by exactly the same principle as is used in making *chhiu shih* from urine.

Here we have a strong indication that the products which were available in Li Shih-Chen's time, as also apparently in the Sung, were of considerable hormonal activity, even though perhaps this was difficult to control. His acute account of the formation of urinary calculi is worth notice in passing.^c The *Shui Yün Lü* says that the best preparations are the products of two different processes of purification, one Yin and one Yang. The *Yang lien*^d process is designed to obtain the Yin concealed in the Yang, for it condenses as heat is applied (in evaporation). It dissolves in water (a Yin entity) and returns to formlessness (*yu thi*^e), yet it retains its special properties (*wei*^f).^e It is like the broken line in the *kua Li*.^{6f}

The *Yin lien*^g process is designed to obtain the Yang concealed in the Yin, for it precipitates when water is added to it. When dried in the sun it becomes glossy and changes no more. In this case the (original) special properties (*wei*) are lost and the substance (*chih*^h) remains. It is like the solid line in the *kua Khan*.^{8h}

Both substances came originally from the heart and the renal-urinogenital system (including the sex organs) yet had once been flowing in the small intestine . . . To take these substances can be beneficial for those two systems (or organs); indeed they are the essentials for the maintenance of a healthy life. . .ⁱ

We come now to a description of the six main preparation methods given in the *Pên Tshao Kang Mu*.^j

Method 1

This method is the simplest as it is the oldest. It is quoted by Li Shih-Chen from a *Ching Yen Liang Fang*⁹ (Valuable Tried and Tested Prescriptions). There were several books of this name in the Yuan and early Ming periods (+ 14th and + 15th-

^a Cf. Fig. 1558 and p. 73 above.

^b Cf. pp. 38 ff.

^c Gall-stones and bezoars had been instanced as examples of the concretionary or aggregative forces in Nature by the Neo-Confucian philosophers in Sung times, when discussing the formation and dissipation of 'souls'; cf. Wiegner, (2) p. 215. Li Shih-Chen's words show that he was very conscious of the dissolved substances in urine. Might he not thus count as a worthy forerunner of those urinary analysis methods, codified by Neubauer & Vogel (1) in 1860, which played so fundamental a part in the development of modern diagnostic medicine?

^d The text says *huo lien*,¹⁰ but the meaning is the same.

^e Lit. sapidities.

^f See pp. 61 ff. and Vol. 2, p. 313.

^g The text says *shui lien*,¹¹ but the meaning is the same.

^h See pp. 63 ff. and Vol. 2, p. 313.

ⁱ Cit. *PTKM*, ch. 52, p. 21 a, b.

^j It may be worth noting that this material was reproduced in *TSCC*, *Jen shih tien*, ch. 22, pp. 3b ff., 9a ff.

¹ 眞水

² 邪火

³ 丹田虛冷

⁴ 無體

⁵ 味

⁶ 卦離

⁷ 質

⁸ 卦坎

⁹ 經驗良方

¹⁰ 火鍊

¹¹ 水鍊

centuries), one by Lü Shang-Chhing,¹ and we do not know from which of them Li Shih-Chen took his account. However it is possible to show that the method goes back much earlier than this, because the *Chung Hsiu Chêng-Ho Ching-Shih Chêng Lei Pei- Yung Pên Tshao*² (Reorganised Pharmacopoeia) of + 1249 quotes it^a from a *Ching Yen Fang*³ (Tried and Tested Prescriptions) of still earlier date. Although this book is lost, the details of its publication are known.^b Its preface dates it at + 1025 and its author was Chang Shêng-Tao.⁴ Other prescriptions of this physician, restorative for people on the point of death, are quoted in various editions of the *Hsi Yuan Lu*. Since Chang Shêng-Tao flourished at the beginning of the + 11th-century, it is very probable that his method for making *chhiu shih* was already quoted in the first edition of the *Chêng Lei Pên Tshao* issued by Thang Shen-Wei⁵ in + 1083.

The title of the method is Chhiu Shih Huan Yuan Tan.⁶ Its description is as follows:

... Collect ten *tan*⁷ or more (over 150 gallons)^c of male urine and set up a large evaporating pan (*kuo*⁸) in an empty room. Fix on top of it a deep earthenware still (*shen wa tsêng*⁹), luting the edges together with paper-pulp and lime so that when it has dried no steam can escape. Fill the evaporating basin 70 to 80 % full with urine, and heat strongly from below [setting a man to watch it].^d If it froths over, add small amounts of cold urine. [It must not be allowed to overflow.] The dry (residue) is *jen chung pai*. Put some of this, [finely powdered,] into a good earthenware jar (*ju hao kuan tzu nei*¹⁰) and proceed according to the method of sealing and subliming (*ju fa ku chi*¹¹) by placing the whole in a stove and heating with charcoal. About two or three ounces (of sublimate) will be obtained. Grind this to a powder, and mix with date-flesh to make pills the size of a mung bean (*lu tou*¹²).^e For each dose take 5 to 7 pills with warm wine or soup before breakfast. . . .^f

Here then the entire dried solids of the urine were used. Besides the obvious urates, uric acid, phosphates, sulphates and other inorganic salts,^g there would be the steroid glucuronides and sulphates. After the simple procedure of evaporation,^h the entire fatty powder is placed in the sublimatory and the active steroids carefully sublimed. It is now a well-known fact that hormones of the steroid class sublime unchanged below their melting-points, at temperatures varying between 130° and

^a Ch. 15, (p. 365.2).

^b See Okanishi Tameto, (2) pp. 972, 1138.

^c Weights and measures changed considerably through Chinese dynastic history, but their movements are well enough charted. The volume measure *tou*, sometimes translated peck, has often been loosely rendered gallon (as in Giles' dictionary) because it comprised ten *shêng*¹³ or 'pints', but in fact the absolute value of the 'pint' varied greatly in different centuries (see Wu Chhêng-Lo (1), table 13, p. 58). Here we are concerned with the Sung and Ming periods; in the former the *tan* of ten *tou* was equivalent to 14.5 of our gallons, in the latter to 23.6 gallons.

^d Square brackets indicate words in *CLPT* text only.

^e *Phaseolus mungo*, the mung bean, or gram. R400; CC1029.

^f Cit. *PTKM*, ch. 52, p. 21a (p. 95).

^g On microcosmic salt see below, p. 328.

^h Done in a still, perhaps to make the vapours less offensive to the neighbourhood. There is no mention of any use of the distilled water.

¹ 呂上清

² 重修政和經史證類備用本草

³ 經驗方

⁴ 張聲道

⁵ 唐慎微

⁶ 秋石還元丹

⁷ 石

⁸ 鍋

⁹ 深瓦甑

¹⁰ 入好罐子內

¹¹ 如法固濟

¹² 綠豆

¹³ 升

210°C,^a and there can be no doubt that this was the technique employed, because the term *ku chi* is found in alchemical and technological writings with the meaning of tight luting and sublimation.^b

Since the entire solids of the evaporated urine were taken for sublimation, the process must have been rather a messy one, and it is not surprising that in the following centuries various methods of preparation were worked out which got rid of many of the urinary constituents before sublimation was attempted. This we shall see in the following examples.

Method 2

This method, together with the following one, derives from Yeh Mêng-Tê's *Shui Yün Lu*. This is clearly a Sung work, for Li Shih-Chen refers^c to its author both under his ordinary name and under his *hao* or courtesy name, Yeh Shih-Lin.¹ Since this scholar was living towards the end of the Northern Sung and through the years of re-establishment of the dynasty in the South after the fall of the capital, Khaifêng, to the Chin Tartars in +1126, one might be nearer the truth in dating his prescriptions about +1110. He must have been one of the younger members of the entourage of virtuosos of Hui Tsung, the last effective emperor of the Northern Sung, in a court very similar in many ways to that of Rudolf II at Prague later on, or Alfonso el Sabio in Castile at the end of the following century.^d The first method is entitled Yang Lien Fa.²

Use over 10 *tan* of urine (more than 150 gallons) in wooden buckets. For each *tan* (14.5 gallons) of urine add one bowlful of the juice of soap-beans (*tsao chia chih*³). Stir energetically with a bamboo stick hundreds of times. When the precipitate has settled, decant off the clear fluid and keep the precipitate (*niao pai yin*). Combine all the precipitates (with some liquid) into one bucket, stir as before and allow to settle. Take one or two *tou*⁴ of the concentrated mixture and filter. Place the precipitate in a *kuo* (large evaporating basin) and evaporate to dryness. Scrape it out, grind it fine, and take up as much as possible of it by boiling with water. Filter through paper over a bamboo sieve. Again evaporate to dryness and repeat these processes several times until the precipitate becomes as white as snow.

^a See Kassau (1); Breuer & Kassau (1); Breuer & Nocke (1). Up to 260° there is no decomposition at all, and many compounds will still sublime almost without loss up to 300°.

^b We have more to say on this expression elsewhere (Vol. 5, pt. 4, pp. 5-6). *Ku* means essentially 'secured', with the sense of being made tight, luted and cemented, so that no vapour or liquid can escape; *chi* (related to the *kua Chi Chi*, on which see pt. 4, pp. 70ff.) has the significance of upward or downward motion within a closed space, leading to equilibrium or perfection. In the *Thien Kung Khai Wu* (Exploitation of the Works of Nature) by Sung Ying-Hsing⁵ (+1637), the expression *ku chi* is used (ch. 16, p. 2b) to describe the sublimatory used for making vermilion, though it does not appear as a caption in the accompanying picture (p. 6a). On the other hand the phrase is found in the illustration of the mercury still (ch. 16, p. 5b, see Fig. 1453 in pt. 4, p. 78), but it is not used in the text describing it, which just says *yen ni ching ku*⁶—'lute it very tightly with salt mud' (i.e. the usual *liu i ni*,⁸ on which see pt. 4, pp. 79, 219). Thus one may say that the term *ku chi* has in general the meaning of a sublimation process carried on within a vessel, i.e. 'sealing-and-subliming'. To translate *ku chi* only as 'luting' is inadequate. Perhaps its appearance on the mercury still is intended to refer to the stove as being one also used for sublimation pots—or sublimation and distillation may have been loosely identified.

^c *PTKM*, ch. 52, pp. 20b, 22a. Chinese literature contains one other book of the same title, by a Ming pharmacist, Yang Po,⁹ but Li Shih-Chen could hardly have been mistaken in a matter of this kind.

^d See Vol. 4, pt. 2, pp. 501ff., or Needham, Wang & Price, (1) pp. 124ff.

¹ 葉石林

² 陽鍊法

³ 皂莢汁

⁴ 斗

⁵ 天工開物

⁶ 宋應星

⁷ 鹽泥緊固

⁸ 六一泥

⁹ 楊溥

Then put it into an earthenware container (*sha ho*¹), seal tightly and sublime (*ku chi*²), heating until the sublimate condenses. Take the substance out (and examine it). If the heating does not at first complete the sublimation, repeat the process once or twice more until the colour of the product is like that of lustrous jade. Grind this to a fine powder and place it in a similar container, seal tightly and sublime again, heating gently for seven days and seven nights. Then take it out and spread it (on paper) laid on the ground, to get rid of the noxious effects due to the heating. Finally mix the powder with date-flesh to make (small) pills the size of a *wu(-thung)*³ seed.^a Thirty pills should be taken daily with warm wine before breakfast.^b

Here we have an extraordinarily interesting procedure. A saponin-containing plant extract, the 'juice of soap-beans' (*tsao chia chih*), is used as a precipitant. It is hard to believe that the use of saponins for preparing steroids could anticipate by so many centuries, not merely decades, the classical discovery of Windaus in 1909 that digitonin precipitates many sterols quantitatively.^c One of those so precipitated, indeed, is an androgen, namely dehydro-*epi*-androsterone, and we know today that the saponins will precipitate all the 3β -hydroxy steroids. The precise action of digitonin is well known, but one cannot be so definite about the action of the various saponins contained in the soap-beans from *Gleditschia sinensis*, the characteristic vegetable detergents used in China for hygienic purposes all through the Middle Ages.^d All one can be sure of is that they would precipitate certain varieties of steroids.

These words were those of our original publication on this subject, and we leave them here unchanged because a good deal of laboratory research still remains to be done. When this medieval technique was first brought to modern notice almost nothing was known of the saponins of *Gleditschia*.^e But the work of Nguyen Dang Tâm (1) has demonstrated that the boketonosides, as they are now called, are indeed saponosides of classical type having triterpene genin (aglycone) components, and carbohydrate moieties including glucose, xylose, rhamnose and arabinose. The genin part is formed by the pentacyclic hydrocarbon echinocystic acid, or one of its very close relations, oleanolic acid. These saponins have sternutatory properties, froth abundantly, and show high haemolytic power.^f Most important for the present theme, combination with cholesterol occurs just as in the case of the digitonosides, though not quite so readily.

Besides the addition of the saponins in this method of Yeh Mêng-Tê, there was also the addition of proteins in the soap-bean juice. This is important because it is known that all urinary steroids will go down with the protein precipitate if one is

^a *Sterculia platanifolia* (R272; CC724), not to be confused with the thung-oil tree *Aleurites fordii*.

^b *PTKM*, ch. 52, p. 21 b.

^c The protective action of cholesterol in saponin haemolysis was thus explained; and the digitonin precipitation method was immediately applied (Windaus, 2) to the assay of free and esterified cholesterol in biological entities such as the normal or diseased kidney.

^d See Needham & Lu (1), pp. 458ff.; as also Vol. 6 below.

^e The species is apparently now more properly named *fera* (= *sinensis*, = *australis*, = *thorelii*).

^f As Guichard (1) had already shown.

present. This raises the question of the frequency of renal lesions in the population of medieval China. It seems very likely that in every collection of large amounts of urine as described in these preparations one at least of the donors in the batch would quite probably have been excreting some protein, and a small amount would be quite enough to produce the effects of the precipitation of steroids. We suspect that schistosomiasis was widespread in medieval China, and that in itself would be a possible cause of proteinuria. Then there is the extraction of the total precipitate with boiling water. A possible explanation would be that all the conjugated steroids were taken down in the precipitate, but when the protein present was denatured by the boiling water, all would come out in the solution except the 3β steroids which had been firmly combined with the saponin. We may be here in the presence of an ancient empirical method of partial separation of androgens from oestrogens.^a

Another feature of this method is of course the complete removal of soluble solids in the urine, such as urea, by the use only of the first precipitate. A great quantity of soluble salts will also be discarded at this stage. One notices too the gradual elimination of the urinary pigments. Finally the reference to the sublimate as resembling lustrous jade is, as already mentioned, a strong indication that the glittering pearly appearance of crystalline steroids was being observed.

Method 3

This is the second method of Yeh Mêng-Tê in his *Shui Yün Lu*, dating from about + 1110. It is called Yin Lien Fa,¹ and like the previous method refers back to the two types of separation, the theory of which was discussed in the same book (p. 314 above).

To 4 or 5 *tan* of urine (58 to 72.5 gallons) in large earthenware vats add half its volume of rain-water and stir a thousand times.^b Allow to settle. Discard the clear solution and keep the precipitate (*niao pai yin*). Repeatedly wash with rain-water, stir and allow to settle until no disagreeable odour remains and the precipitate resembles putty or face cream (*ni fên*).^c Let it dry in the sun, scrape it up and grind it. Then mix with milk from the mother of a male baby into a paste or fatty ointment (*kao*)³ and dry it in very hot sunshine. By this procedure one obtains the life-giving essentials of the sun (*thai yang chen chhi*). Repeat this nine times and then mix with date-flesh to make pills. Thirty of these should be taken at midday with warm wine.^d

This is one of the two methods which begins by diluting the urine. It might at first sight be thought possible that this would help to precipitate lipoidal or steroidal constituents, but since the steroids are all in the form of soluble conjugates, it seems unlikely that this would happen. We are not clear as to the purpose of the dilution, but at any rate it would have done no harm, since it would help to remove soluble substances such as urea and salts. In what way the conjugates were got into the

^a For modern knowledge on the conjugates of steroid hormones see the book of Hadd & Blickenstaff (1).

^b The use of what we should think of as distilled water is noteworthy here. Cf. p. 329.

^c This was one of the standard synonyms for calomel, 'glossy powder' (cf. pt. 3, p. 125).

^d Cit. *PTKM*, ch. 52, p. 21b.

precipitate in this method is not obvious, but perhaps the description accidentally omits some protein precipitant.^a In any case the important thing is that here no sublimation was involved. The fact that the precipitate was of a fatty consistency and taken up in milk fat is also appropriate enough if free steroids were present, but unless the urine sources had included cases of lipuria, such as may occur in diabetes, it is not easy to understand why the eventual precipitate should have been so fatty in nature. One thing at any rate is probable, namely that these two methods of Yeh Mêng-Tê would have yielded different groups of active urinary steroids, perhaps giving another separation of androgens from oestrogens. The fact that one of his methods was considered Yang and the other Yin gives us a rather strong hint that differences of just this sexual nature had in fact been observed by the physicians who used these preparations. This contrast between the heating and the cold-precipitation techniques runs through all the large-scale procedures for obtaining active principles from urine.

Method 4

The next two descriptions are taken from two books of formularies of the early Ming period (+ 15th-century). They both stem from local surgeries or pharmacies, exactly where in China we do not know. The first, entitled Chhiu Ping Ju Fên Wan,¹ from a book called *I Chen Thang Ching Yen Fang*² ('Tried and Tested Prescriptions of the True-Centenarian Hall') was the work of a writer known only to us by his family name, Mr (or Dr) Yang.³ The text is as follows:

One bucketful each of the collected sediment (*niao pai yin*) from the urine of boys and girls (*thung nan thung nü*⁴) is used.^b Heat the evaporating pan containing the sediment with mulberry firewood and evaporate until dry. Remove the residue and place it in one bucket of river-water. Mix well until as much as possible is dissolved. Filter and evaporate the filtrate. Repeat the same procedure seven times. By then the residue is as white as frost. Next it is usual to collect 1 catty of the frost-like residue and place it in an earthenware jar. Cover with an iron lid the shape of an oil lamp, and apply salt-mud lute to make it tight, then sublime (*yen ni ku chi*⁵). Heat the jar during the space of the burning of three bundles of incense-sticks to accomplish the sublimation (*shêng ta*⁶) of the substance. At this stage you will see that the *chhiu shih* has become as white as jade. Grind the product and repeat the procedure. Very gradually sponge cold water on to the cover, care being taken in the process, for with too much cooling the product will not volatilise, and with too little cooling it will not condense.^c Carry out the process from the *chhen* double-hour (7-9 a.m.) until the

^a Dr Miyashita Saburō (in correspondence, Oct. 1964) agrees with us in thinking this most likely, since descriptions of the cold (Yin) methods in later centuries (pp. 325 ff. below) so often mention such precipitants, both inorganic and organic.

^b This must mean an initial volume of at least 400 gallons. The age implied here would be, in the most natural acceptance of the text, under about 15, for the *Nei Ching* defines the marriageable age as 16 for boys and 14 for girls. But it may mean unmarried or virgin boys and girls in the sense of the usages of the writer's own time, i.e. up to about 18 or so.

^c An inversion in the text has been corrected here. Note the care taken.

¹ 秋冰乳粉丸

² 頤眞堂經驗方

³ 楊氏

⁴ 童男童女

⁵ 鹽泥固濟

⁶ 升打

wei double-hour (1-3 p.m.). Then take away the fuel and let the vessel cool. The substance which has collected under the cover is *chhiu ping*, ice-like (glossy), tasteless and pleasant-smelling. This substance is the (best) pure essence of the *chhiu shih*.^a When taken it is beneficial for the Water element corresponding to the renal-urinogenital system, restoring urinary and sexual normality; it fortifies the primary Yang vitality (*yuan Yang*¹) and also drives down the malign heat which produces phlegm (*than huo*²), (in the thoracic region). The residue is ordinary *chhiu shih*, saline and bitter in sapidity. In this, cooked with meat, there is some slight benefit when taken.^b

Here again we see processes of purification carried out so that the very soluble substances such as urea and some salts, together with the pigments, are first discarded; and the conjugates then progressively separated from urates, inorganic salts, denatured proteins, etc. less soluble than themselves. The sublimation process is more clearly described and directions are given that the sublimation should be repeated. Apparently some active substances remained in the residue which did not sublime. One assumes that the active steroid conjugates were carried down with small amounts of protein at the beginning of the operation and passed thereafter into the extracts of the successive residues until sublimation.

Method 5

This method comes from a book of about the same date as the previous formulary. It is entitled *Pao Shou Thang Ching Yen Fang*³ (Tried and Tested Prescriptions of the Protection of Longevity Hall), the author of which was Liu Sung-Shih.⁴ The name of the medicament prepared was Chhiu Shih Wu Ching Wan.⁵ The text runs as follows:

Select boys and girls^c free from any illness (as the donors of the urine). They should be bathed and their clothes changed. They should be provided with innocuous food and soup, but one should avoid giving them foods with rank and pungent smells, such as leeks, onions, garlic, ginger, etc., or other things which have an acrid property. When sufficient urine, about 1 *tan* (23.6 gallons) has been collected from each group in separate vats (*kang*⁶), add (half its own volume of) water, stir, and collect the precipitate (*jen chung pai*). Place this in an earthenware reaction vessel (*wa kuan*⁷) from Yang-chheng.⁸ Make the opening airtight with the lute (a mixture of salt and mud) and use iron wire to bind it, then sublime. Heat during the space of one bundle of incense-sticks, and repeat the heating seven times, securing with fresh wire each time. Then take weighed equal portions (of the sublimate) from the male and female urine precipitates thus treated. Mix and grind together. Dissolve the material in river-water and filter through seven layers of paper. Evaporate to dryness and obtain the *chhiu shih*, which is snow-white in colour. Add to this good sweet thick milk and mix. Leave it in the open air to absorb the sun during the daytime and the dew at night,

^a It will be noticed that the term *chhiu ping* seems to be reserved for preparations which have been sublimed repeatedly.

^b Cit. *PTKM*, ch. 52, p. 22 a. Note how the last sentence implies the value of steroid hormones adsorbed on all kinds of precipitates from urine.

^c See previous note on this subject.

¹ 元陽

² 痰火

³ 保壽堂經驗方

⁴ 劉松石

⁵ 秋石五精丸

⁶ 缸

⁷ 瓦罐

⁸ 陽城

in order to acquire the essence of the sun and the glory of the moon.^a After it has been dried further add more milk for 49 days. Preserve it as an ingredient for prescriptions.^b

Here the directions about the treatment of the urine donors are interesting, and the details of the sublimation are much the same as before. At first sight it seems surprising that the text should speak of dissolving the sublimate in water, for if this was composed of free steroids it could not go into solution. But it seems likely that while the sulphate conjugation would be broken by the heating, the glucuronide combination would not, and the sublimate would therefore be composed of two parts, one water-soluble and one insoluble. If specific differences existed between the hormones conjugated in different ways, this procedure may possibly have been yet another quasi-empirical fractionation, producing an end-product of highly specific properties.^c

Method 6

The following description, the last which we shall quote here, comes from the *Pên Tshao Méng Chhüan* of Chhen Chia-Mo already mentioned (p. 313) written in + 1565. His description says:

To make *chhiu shih*, specimens of the urine of boys^d should be collected in the autumn. Add to each earthenware vat (*kang*) 0.7 oz. of powdered calcium sulphate (gypsum, *shih kao mo*¹). Stir well with a mulberry stick and allow the precipitate to settle. Discard the clear supernatant fluid. Stir again and allow to settle. Repeat this two or three times. Then add to the precipitate one bucket of autumn dew water, stir and allow to settle. Repeat this again several times until the impurities are removed and the precipitate is quite free from any salty taste. Filter the precipitate on heavy paper placed over ashes, and allow it to dry in the sun. The light clear crystals forming the upper part of the precipitate are collected, and this is *chhiu shih*, while the lower, grosser layer is discarded.^e

This seems to be a return to the second or cold-precipitation (Yin) method of Yeh Méng-Tê (Method 3 above). No sublimation process is used, but it is interesting that calcium sulphate is added to begin with, an agent which would probably assist the precipitation of the proteins and the steroid conjugates absorbed upon them. The procedure seems to end with a manual separation of the lighter from the heavier part of the final precipitate. Chhen Chia-Mo has two curious observations. He says that for male patients specimens from female urine should be used and vice versa. He also criticises practising physicians (*shih i*²) of his own time (and earlier) who collect mixtures of all kinds of urine at any time and precipitate with soap-bean juice, then dry the product and call it *chhiu shih*. He regards this as a way of money-

^a This recalls the very ancient sun and moon (dew) mirrors; Vol. 4, pt. 1, p. 89.

^b Cit. *PTKM*, ch. 52, p. 22b, 23a. It looks as though here also mention of some protein precipitant has accidentally been omitted. Soluble steroid conjugates would hardly accompany relatively insoluble urates.

^c Cf. Hadd & Blickenstaff (1).

^d See previous note on this subject.

^e Cit. *PTKM*, ch. 52, p. 20a.

making which may have dangerous consequences. For us, however, it is interesting in that it suggests that the saponin method already introduced in the +11th-century must have been used a great deal through the time elapsing between Yeh Mêng-Tê and Chhen Chia-Mo. In fact, the use of the saponins, and the prejudice against it too, continued at least as late as the end of the +18th-century.³

(5) A CLASSIFICATION OF PROCESSES

From all the foregoing material it is fairly clear that from the +11th-century onwards the Chinese alchemists, physicians and iatro-chemists were earnestly looking in urine for substances of androgenic and oestrogenic property. They had recognised its connection with the blood, and they felt that within it could be found some of the virtues which the organs contributed to the blood circulation. In our opinion they were successful in medieval times in making quasi-empirical preparations of active substances with androgenic and oestrogenic properties. And thus the ancient *enchymoma doctrine of physiological alchemy* received what must have seemed an extraordinary practical verification.

Of the six methods described so far, four involve a carefully controlled sublimation at temperatures which would very probably have varied between 120° and 300°C., in other words, just those which would bring about a sublimation of the steroid hormones. Of course other substances would have sublimed too; for example, cyanuric acid derived from any urea which was still present. Cyanuric acid has no known effects in man, though it has been shown to be anti-malarial in birds. Uric acid itself would have decomposed, giving rise to ammonia and CO₂. The purification from urinary pigments preceded the sublimation, but other substances present in small quantities, such as indol, skatol, mercaptans, volatile fatty acids and non-steroidal phenols, would either have been washed away or may have sublimed with the steroids. Since none of them was in any way toxic that would not matter.

In two of the methods described there is a long series of precipitations and evaporations before the material is brought to the sublimatory. In two cases specific agents, soap-bean saponin and powdered calcium sulphate, are mentioned. The significance of these has already been pointed out, the use of saponin in particular being an extraordinary anticipation of modern practice. Beside these, however, it is highly probable that small amounts of protein were present in the urine, and the precipitation of these, whether by heat or by the gypsum added, would without doubt have carried down the conjugated steroids. The lipo-proteins of the soap-bean extract would have had a similar function. What the object was of the initial dilution recommended in some cases we do not know, but it could have done no harm. The final end-product was no doubt a very mixed one, consisting of steroids from the testis, ovary, adrenal cortex and placenta; and it must have varied a good deal in accordance with the exact method of fractionation used.

³ It should be understood that the criticism of saponin precipitation was never directed to its use in connection with sublimation (Yang lien, method 2 in Table 123), but only in the Yin lien or cold-precipitation techniques. Perhaps confusion arose because of oral transmission among the less educated.

Thus we are in presence of two main types of method into which all may be divided—Yang lien, involving evaporation by heating, and sublimation; Yin lien, only precipitations in the cold, and sometimes gentle reduction of volume at low temperature, often the heat of the sun being used. As we have already noted (p. 314), the former technique was aimed at extracting the Yin substance within the Yang, while the latter conversely was designed to extract the Yang substance within the Yin. It is important to realise that this was precisely the principle on which so much of the *nei tan* theory was based, for it was equivalent to the extraction of the central Yin line from the *kua* Li, and the extraction of the central Yang line from the *kua* Khan (cf. pp. 61, 63). Thus from the two types of method the medieval iatro-chemists would have expected the yield of two quite distinct sorts of active material. How right they were can be seen by the simple fact that the Yin lien type involved no protein denaturation. Consequently they made two remarkable discoveries, not one. If it was brightly intelligent to isolate mixtures of purified androgenic and oestrogenic steroids by saponin precipitation and carefully controlled sublimation, it was surely hardly less so to concentrate the protein hormones of the anterior pituitary gland, the gonadotrophins, and to use these also in the therapy of gonadal and glandular insufficiencies or disorders. As is well known, these protein hormones, three in number, have very widespread and complex stimulatory effects on many tissues in the body, including some which are themselves the producers of powerful steroid hormones.^a And the gonadotrophins, like the steroids, are indeed obtainable from urine—if you know how, and if you use enough.^b Thus the entire complex of techniques gives an impressive demonstration of the way in which theories of medieval character could yet lead to practical successes ‘dead on target’. It is not the only case of the kind.^c

Indeed, to set bounds to the physiological activities which the Chinese iatro-chemists could have got into their urinary preparations is quite difficult. During the past forty years knowledge has been steadily growing about a family of substances, neither steroids nor proteins, called prostaglandins,^d pentacyclic un-

^a The three chief gonadotrophins are (a) ICSH, the Interstitial Cell Stimulating Hormone = LH, the Luteinising Hormone (because it transforms mature ovarian follicles into corpora lutea) = chorionic gonadotrophin = metakentrin, (b) FSH, the Follicle Stimulating Hormone, also a powerful stimulator of spermatogenesis = thylakentrin, (c) LTH, the Luteotrophic or Lactogenic Hormone = Prolactin, which initiates lactation. See Li Cho-Hao & Evans (1), p. 633; Li Cho-Hao (1); Selye (1), p. 209.

On the physiology of the gonadotrophic hormones of the anterior pituitary see Austin & Short (1); Corner (1); Selye (1); Cowie & Folley (1); Maudgal (1); Young (1); Rosenberg (1), especially for the article by Pharriss, Wyngarden & Gutknecht (1).

On the chemistry of these hormones see Li & Evans (1); Li Cho-Hao (1); Hays & Steelman (1); Dixon (1); McKerns (1).

On the clinical applications see the symposium edited by Bettendorf & Insler (1).

^b The ideas contained in this paragraph were partly derived from stimulating discussions with Professor Timothy Chard and Dr G. M. Besser, both in correspondence and at the Endocrinological Club of St Bartholomew's Hospital Medical School in London.

^c Another example can be seen in Vol. 5, pt. 4 on p. 156, where we conjecture that the first knowledge of strong alcohol, obtained from the freezing-out method, stimulated the Sui and Thang alchemists to submit alcohol-containing beverages to the opposite extreme of heat, Yang conditions replacing Yin conditions.

^d Named by mistake, for they have little or nothing to do with the prostate gland. In 1930 it was reported that fresh human semen stimulated the motility of isolated human myometrium, and five years later the first steps were taken by Goldblatt (1) and von Euler (1) towards the purification and identification of the factor causing contraction of uterine smooth muscle and lowering blood-pressure.

saturated oxygenated 20-carbon fatty acids, many with powerful endocrine actions. The richest source for them is the semen and the vesiculae seminales, but they occur, and are probably produced, in many tissues of the body.^a They are certainly involved in numerous aspects of reproduction,^b but they also affect the circulatory system^c and other important functions.^d However, they are rather readily metabolised, so that the amounts normally appearing in urine are relatively small. Yet now, as if in another kind of dénouement, we can unexpectedly perhaps see a physiological reason for the age-old Taoist doctrine of seminal retention; it could have been an empirical recognition of an endocrinological fact, the marked loss of prostaglandins if this was not practised. Of course those societies which frowned on sexual activity of any kind had another way of dealing with this without knowing anything about it, but the Taoists, whose estimate of human psychological health and normality was much more justifiable, needed some protection of a different kind, and this may have been what it was.

Some interest attaches to the precise directions about the age and sex of the urine donors. We know today that androgen excretion reaches its maximum in men about the age of 25 and in women also, though they excrete a lesser amount. Conversely, maximum excretion of oestrogens occurs in girls before 20 and in boys about 18, the latter, however, excreting only about half as much as the former.^e The word *thung* in the descriptions, though originally meaning quite young boys and girls, may well mean here just unmarried youths and girls of about 18 or so. If maximum yields of the steroid sex hormones were sought, it would have been somewhat quixotic to insist on starting out with urine from boys and girls before puberty.^f

What is particularly striking is that in one at least of the methods the urine from male and female sources was actually worked up separately and the products later combined in equal proportions. From this it is reasonable to suppose that the Chinese physicians found, at least in later times, that quite different effects could be produced by using the sublimes in varying proportions, even wholly male or wholly female. One almost expects to find some reference to the urine of the mare,

^a There are general reviews by Bergström, Carlson & Weeks (1); Ramwell & Pharriss (1); Kottegoda (1); Pickles (1); Kadowitz (1); Hedqvist (1).

^b For example, apart from the oxytocic effect already mentioned, they bring on parturition; cf. Smith & Shearman (1); Batra & Bengtsson (1). Hence the traditional use in Africa of ingested semen to induce childbirth; cf. Harley (1). But this can be documented in China from +970 onwards, since it was recommended in the *Jih Hua Chu Chia Pên Tshao* for expelling placenta as well as foetus; *PTKM*, ch. 52, (pp. 91, 93).

Prostaglandins also seem to be involved in the spontaneous contraction and occlusion of the umbilical blood-vessels at birth, and they help fertility in some way, perhaps by facilitating spermatozoal transport, aiding implantation, or affecting Fallopian tube motility; emanating from the uterus they also destroy corpora lutea.

^c Their effect is hypotensive, with coronary vaso-dilation.

^d They bring about bronchial dilation, and diminish gastric secretion. For this reason semen was used in China as an anti-tussive, and also for controlling gastro-intestinal ailments which would have included peptic and duodenal ulcer, at least from +660 onwards, when it is mentioned in the *Thang Pên Tshao*; *PTKM*, ch. 52, (p. 91). Cooper & Sivin (1) missed both these points of Li Shih-Chen's, and took no account of the prostaglandins, though the potency of these was already well known in 1973.

^e Dorfman & Shipley (1), pp. 259, 396 ff., 400 ff.

^f Although the youthfulness of the donors is most often mentioned, it is possible that some operators worked up the urine of elderly people, and one can easily imagine reasoning which could have led to this. If so, they would have found an exceptionally rich source of gonadotrophins, post-menopausal urine being actually used for this purpose today.

that spectacular source of sex hormones.^a And indeed it may perhaps have been used for preparing sublimed *chhiu ping*, for it is in fact listed among the equine products of pharmaceutical value, though in connection with various other diseases.^b

So far, following our first survey, we have considered six methods taken from five books. But it is possible to find many further accounts in the pharmaceutical and medical literature, so that we can now present in Table 123 a set of ten methods taken from twenty-eight books ranging in date from +1025 to 1833.^c We quoted the first five in more or less chronological order, and the other twenty-three are placed in the table in the same way, but one can also arrange the whole series of preparations in a more logical manner. Before thus listing them, however, a word must be said about the four methods which were not in the main group. Method 7 prefaced the sublimation by a precipitation of proteins, conjugates and other constituents by gypsum (calcium sulphate);^d while method 10 worked up the male and female donor urines separately, using various precipitations, after which the two powders were laid in alternate layers in a lidded silver crucible and sublimed together. This would obviously give much scope for varying the end-products by adjusting the amounts of male and female powders used. The name for this method given in the *Wu Li Hsiao Shih* is Chi Chi Hsüan Shu Pi Fa,^e the Mysterious Enchymoma Method of the Chi Chi hexagram.^e These were both Yang lien² methods, because they employed heating both for the evaporation and the sublimation, but the other two were Yin lien³ methods, using only precipitation, filtration or slow unheated evaporation.^f Such general terms are found throughout the whole of this literature to designate the two types of method, hot and cold respectively. Method 8 used saponin precipitation, with or without another precipitation with alum, no sublimation following; but method 9 was really very strange. Urines were evaporated by the heat of the sun, and the concentrate absorbed in (or adsorbed upon) new dry bricks, then these were laid on the ground in a moist atmosphere and crops of efflorescent crystals harvested from them. The account in the *Chhih Shui Hsüan Chu* is worth giving in full.^g

^a Brooks *et al.* (1), p. 111; the classical paper is that of Häussler (1) in 1934.

^b *PTKM*, ch. 50B, p. 23b. Elsewhere there is mention also of the pharmacological use of the urine of the sheep and the cow.

^c Eleven further books, all after +1530, are considered in Miyashita Saburō (1), but they contain no significant variation from those in Table 123.

^d This may have been suggested by the age-old practice in the soya-bean curd (*tou fu*) industry; cf. Li Chhiao-Phing (1), p. 180, and Sect. 40 below.

^e *Hsüan Shu* (standing for *chu*,⁴ pearl) is one of the names for the enchymoma. On the significance of the *kua* Chi Chi, both for *wai tan* and *nei tan* alchemy, cf. pp. 63, 220.

^f Among new precipitants introduced in these later times there were not only alum but also plant extracts, notably from the composite *Atractylis ovata* or *Atractylodes* spp. (*pai shu*⁶), the roots of which abound in active chemical principles, including resinous pigments and bitter aromatic substances, perhaps also saponins. On these plants see p. 32 above. Pine and cypress needles are also mentioned, presumably as aqueous extracts. All these occur in the Yin methods of *Chhih Shui Hsüan Chu*.

^g Ch. 10, p. 24b, tr. auct. The name of the preparation was Shui Thien Chhiu Shih,⁷ sun-dried sweet autumn mineral. The importance of this book for the principles of physiological alchemy has been underlined elsewhere (p. 46).

¹ 既濟玄黍秘法 ² 陽煉 ³ 陰煉 ⁴ 豆腐 ⁵ 珠 ⁶ 白朮 ⁷ 晒甜秋石

Table 123. Urinary steroid sex-hormones preparation methods

	Methods									
	1	2	3	4	5	6	7	8	9	10
A <i>Ching Yen Fang</i> ¹ (quoted in CLPT, + 1249, prob, also + 1025 + 1083)	*	*	*	*	*	*	*	*	*	*
B <i>Shui Yün Lu</i> ² c. + 1110, (c. + 1130)										
C <i>I Chen Thang Ching Yen Fang</i> ³ c. + 1450										
D <i>Pao Shou Thang Ching Yen Fang</i> ⁴ c. + 1450										
E <i>Pên Tshao Mêng Chhüan</i> ⁵ + 1565										
F <i>Su Shen Liang Fang</i> ⁶ + 1061 (c. + 1120)		6/14bff. (65·2)	6/14bff. (65·2)							
G <i>Shêng Chi Tsung Lu</i> ⁷ c. + 1115		185/18bff.	185/19dff.							
H <i>Shih Pien Liang Fang</i> ⁸ + 1196		8/-	8/-							
I <i>Shih I Tê Hsiao Fang</i> ⁹ + 1337		222/-	222/-							
J <i>Phu Chi Fang</i> ¹⁰ c. + 1418		21/-	21/-							
K <i>Chhi Hsiao Liang Fang</i> ¹¹ c. + 1436 (+ 1470)		15/-	4/7aff.		4/7aff.		97/-	15/-		
L <i>Ku Chin I Thung</i> ¹² + 1556										
M <i>I Mên Pi Chih</i> ¹³ + 1578										
N <i>Wan Ping Hui Chhuan</i> ¹⁴ + 1587 (+ 1615)										
O <i>Tsun Shêng Pa Chien</i> ¹⁵ + 1591	17/20aff.									
P <i>Chhieh Shui Hsüan Chu</i> ¹⁶ + 1596	10/24a									10/24b
	sublimation from entire dry solids	purification and saponin precipitation before sublimation	precipitations but no sublimation	fractionation by solubility before sublimation	sublimation and fractionation of the sublimate	precipitation with calcium sulphate, no sublimation	precipitation with calcium sulphate, followed by sublimation	purification with saponin and/or alum precipitation, no sublimation	evaporation of whole urine in the sun, and absorption of the concentrate in new dry bricks, then the crystals forming on the surface in moist air collected, no sublimation	precipitation and purification of male and female urine separately, followed by sublimation of the two powders laid together in alternate layers in a covered silver crucible

W	Tung I Pao Chien ¹⁷	+ 1596 (+ 1610)	9/(600)	9/(600)	12/-	12/-	5/16b	5/16b
Q	Pên Tshao Yuan Shih ¹⁸	+ 1578 (+ 1612)	5/16a	5/16a	8/-	8/-	5/16b	5/16b
R	Wu Li Hsiao Shih ¹⁹	+ 1636 (+ 1664)	*					
S	Pên Tshao Hui Chien ²⁰	+ 1660 (+ 1666)	18/-	18/-	18/-	18/-	8/10b (317)	8/10b (317)
T	Pên Tshao Thung Hsuan ²¹	+ 1655 (+ 1667) + 1666 (+ 1668) + 1690						
Θ	Pên Tshao Hui ²²							
U	Pên Tshao Pei Yao ²³							
V	Pên Ching Fêng Yuan ²⁴	+ 1695	4/-	4/-				
W	Pên Tshao Shu ²⁵	+ 1665 (+ 1700)	*					
X	Pên Tshao Tshung Hsin ²⁶	+ 1757						
Y	Pên Tshao Chhiu Chen ²⁷	+ 1773						
Z	Pên Tshao Shu Kou Yuan ²⁸	1833	32/(657)					32/(658)

NOTES

- (1) Methods nos. 1, 2, 4, 5, 7 and 10, which involve one or more sublimation processes, were called Yang lien (see text).
 Methods nos. 3, 6, 8 and 9, involving only precipitation and filtration, were called Yin lien (see text).
 (2) References for the first five books are given in the text, therefore here represented only by asterisks.
 (3) References for the other books are given in the table itself, as precisely as possible. Asterisks among them indicate the description of a method, but chapter and page cannot be given as the book in question has not been available to us.
 (4) Brackets for dates indicate year of printing or publishing, where evidence exists that the material existed already at the earlier date given.
 (5) Brackets for page numbers indicate, as usual, the modern edition continuously paginated.

1 經驗方

2 水雲錄

3 頤真堂經驗方

4 保壽堂經驗方

5 本草蒙筌

6 蘇沈良方

7 聖濟總錄

8 十便良方

9 世醫得効方

10 普濟方

11 奇效良方

12 古今醫統

13 醫門秘旨

14 萬病回春

15 遵生八牋

16 赤水玄珠

17 東醫寶鑑

18 本草原始

19 物理小識

20 本草彙箋

21 本草通玄

22 本草匯

23 本草備要

24 本經逢原

25 本草述

26 本草從新

27 本草求真

28 本草述鈞元

Select a secluded spot to build a platform about 3.5 ft. high with emplacements to take five vats or earthenware basins (*kang*^a), each holding about 7 piculs and corresponding to one of the five elements. Urine from boys and girls is collected to fill the vats, and then exposed to the sunshine of summer for three ten-day periods,^a with provision for covering in case of rain. Combine the contents, as it goes down, into three vats, one for each of the three powers;^b and eventually, when only a third is left, into a single vat, which reflects the image of the Supreme Pole (*Thai Chi*).^c

Continue to evaporate this basin of much concentrated urine until only 2 or 3 'gallons' (*tou*) remain. Then put into it 12 new bricks which have not previously been exposed to water, the number 12 reflecting the twelve hours of soaking at night and of sunning during the day. When no liquid is left, stop the procedure. Make ready a quiet, clean and empty room, the floor of which has been sprinkled with water and covered with strips of bamboo. Then take the bricks and stand them up sideways across these strips, covering them over above with bamboo baskets. Then gradually collect the white frost-like substance which will form on the bricks, brushing it down with a goose feather into a silver container, and continue until no more of it is produced. This mineral product (*shih*^d) possesses even greater merit (than ordinary *chhiu shih*) since the original urine has come in contact neither with fire nor water. Thus its original (or primary) vitality has not been lost; and furthermore it has absorbed the essences of the sun and moon.

The analogy here, evidently, was with the collection of nitre or saltpetre from the ground rather than with the evaporation of brine for salt. One has to restrain oneself from speculating as to what could possibly have been produced, though the method seems strangely to foreshadow the adsorption and elution techniques of modern chromatography.^d Perhaps the salt which crystallised on the brick surfaces in this way was microcosmic salt, and just possibly the conjugated steroids, or more likely the gonadotrophins, might be associated with the crystallisation process so that a rather clean mixture was obtained.^e This is another of those tantalising techniques which cry out for experimental repetition and investigation—of course the product may have been quite inactive, valueless—but the writer, Sun I-Khuei, was a physician of profound learning and great perspicacity. Microcosmic salt is sodium ammonium hydrogen phosphate ($\text{NaNH}_4\text{HPO}_4 \cdot 4 \text{H}_2\text{O}$), and it got its name, of course, from the fact that it was first prepared from human urine.^f If this was not done by J. B. van Helmont c. +1644,^g it may have been accomplished by L. Thurneisser by +1583,^h and with Schockwitz' dissertation of +1699 the salt became well known.ⁱ These dates are singularly close to +1596, the time of publication of *Chhih Shui Hsüan Chu*.

^a Approximately mid-July to Mid-August.

^b Heaven, earth and man (*San Tshai*).

^c See Vol. 2, pp. 460 ff.

^d Consider the use of Bentonite in the separation and purification of gonadotrophins today.

^e Of course the more potent the hormones the less admixture with the efflorescent salt would be necessary.

^f See Partington (10), p. 312.

^g Partington (4), p. 53, (7), vol. 2, p. 234.

^h The sal urinae of his *Magna Alchymia*, published that year (Partington (7), vol. 2, p. 155).

ⁱ Partington (7), vol. 2, p. 698. In the +18th-century it was investigated and gradually identified by Marggraf and Proust.

It is now possible to list the various preparation methods in an approximate order of operational complexity. As can be seen from Table 124 one group of methods relied entirely on precipitations, filtrations and washings in the cold, evaporation taking place spontaneously at room temperature or by solar heat; while the other began by hot evaporation to concentrate, sometimes included precipitations, and came to a climax in sublimation, after which further fractionation of the sublimate or the unsublimed residue might be carried out. Perhaps a salient point to remember is that our oldest records of the processes date from the first half of the +11th-century, then already including sublimation, while the procedures carried out in the cold, avoiding sublimation, begin to appear rather later, in the first half of the +12th. Presently we shall try to trace back 'autumn mineral' as far as we can in history, but we shall not be able to pin-point the origins or inventions of these methods. Knowing only their first recorded statements, we cannot be sure how long they existed before +1020, but it would be hard to believe that they were unknown to the iatro-chemists of the Wu Tai period in the previous century, and perhaps one might be safe in referring their beginnings to the late Thang. Certainly the physicians of the +7th-century were taking much interest in urinary sediments and precipitates (cf. p. 311 above), so that although the 'cold' methods appear explicitly in the literature rather later than the 'hot' ones, this may be a paradox due to chance preservation of texts; one would certainly suppose on general grounds that the former preceded the latter. The really great discovery was that which was found again only in our own time, namely that the urinary steroids are stable at sublimation temperatures (cf. p. 315) and can thus be separated from accompanying inactive materials.

We may now take a last look at Table 123 to note a few circumstances of special interest regarding particular texts. Shen Kua's preparations of +1061 are very noteworthy^a in the light of his scientific eminence seen in so many other connections.^b But the techniques were not confined to very small circles of illuminati; many passing references indicate the existence of a literature much larger than the books we have quoted. For instance, the *Phu Chi Fang* of +1418 attributes sublimation method 2 to a Mr Wei,¹ otherwise unknown, while the *Wu Li Hsiao Shih* two centuries later attributes method 1 to an iatro-chemist named Fang Tuan.² Here, as in many other cases, there are references to the collection of the urine in the autumn months, or to the use of autumn dew for washings or resolutions of precipitates, but these were probably late developments deriving from a name really quite different in origin (p. 311). Nevertheless 'distilled water', from rain, dew or snow, was a good chemical practice, much emphasised in the +16th-century, as in the *Wan Ping Hui Chhun*, a text which recommends many of the precipitants already mentioned (p. 317) and like the others of its period pays particular attention to the age, sex and diet of the donors. At this time, e.g. in the *Tsun*

^a They were first reported by Miyashita Saburō (2).

^b Cf. Vol.s 3 and 4, pts. 1 and 2, *passim*.

¹ 危氏

² 方斷

Table 124. *Analysis of urinary steroid sex-hormone preparation methods according to complexity*

	Table 123 method
<i>Yin techniques</i>	
concentration of entire dry solids	—
concentrate of entire solids adsorbed in dry bricks and resulting efflorescent crystals collected	9
purification of the solids by precipitations and extractions	3
purification, with calcium sulphate precipitation	6
purification, with alum precipitation	8
purification, with saponin precipitation to separate types of steroids.	8
<i>Yang techniques</i>	
sublimation from entire dry solids	1
purification by precipitations and extractions before sublimation	4
purification by calcium sulphate precipitation before sublimation	7
purification and separation of steroids by saponin precipitation, and boiling water extraction, before sublimation	2
purification by precipitations of male and female donor urines separately, followed by sublimation of the two powder preparations in alternate layers (giving opportunity of adjustment of their respective amounts)	10
sublimation and subsequent fractionation of the sublimate (and/or the unsublimed residue)	5

Shêng Pa Chien, the name *lung hu shih*¹ became more used than *chhiu shih*, partly perhaps because physicians became more aware of what could be done by varying the proportions of steroids from the male and female urines. We also find a detail characteristic of the period, as in *Chhih Shui Hsüan Chu* (one of the most complete descriptions of many different methods), the advice to leave a small hole open in the sublimatory cover, closing it tight with lute as soon as steam ceases to come out. Books of this period also speak of repeated sublimations, which, especially if done at slightly different temperatures, would have given the Chinese iatro-chemists a remarkable control over the nature of the product, active steroids being thus separable at least as much as by saponin precipitation. Sun I-Khuei also discusses² the fractionation of the material which under his conditions did not sublime. The use of this was already mentioned under method 4 (p. 319 above), but he extracts it with boiling water, filters, evaporates to dryness and extracts again, doing this nine times in all; a process which might very well purify steroid conjugates from other material. Although he then places the product in a wax-stoppered porcelain container and sinks it in a well for three days to get rid of the 'poison due to the fire' (*huo tu*²), this meaningless step should not detract from the highly scientific character of

¹ *Chhih Shui Hsüan Chu*, ch. 10, p. 24a.

² 龍虎石 火毒

the preceding one (present also in many of the other descriptions), the almost quantitative repetition of extractions and evaporations. That he ended up with an active substance is indicated by his statement that it strengthens the semen production and restores man's primary vitality (*yuan chhi*¹), or (in the case of the Yang methods) gives rise to a youthful physique (*chi thi jun tsê*²). By the beginning of the +18th-century, the injunction against the use of *Gleditschia* saponin extracts in Yin lien methods manifests itself,^a and the term *chhiu shih*³ becomes stabilised as meaning only Yin lien products, while *chhiu ping*⁴ refers only to the sublimed steroid mixtures.^b

(6) THE HISTORY OF THE TECHNIQUES

This survey may best be concluded by a sketch of the general history of the preparation of steroid hormones from urine—beginning with an anti-climax and ending with a wild surmise. What we have to think of particularly are the late Chhing period, and the times before the first detailed records of the processes in the early Sung. First, then, the Chhing was an age of scientific decline in which various mixtures of inorganic salts (sodium chloride, sodium sulphate, potassium nitrate, calcium sulphate and aluminium sulphate) were passed off by unscrupulous practitioners as *chhiu shih*.^c Such 'spurious preparations' (*yen tsaou phin*⁵) were already described by Chang Lu in his *Pên Ching Fêng Yuan* of +1695,^d and we ourselves noted *en passant* above (e.g. p. 313) sundry warnings against these counterfeit practices. Indeed *hsien chhiu shih*⁶ and *phên chhiu shih*⁷ became names for roasted common salt, while *tan chhiu shih*⁸ came to mean the whole urinary solids (*jen chung pai*⁹) from which the urea had been washed away.^e Very probably other preparations consisted mainly of urea and urates. Modern Western students of Chinese materia medica have had a tradition of translating *chhiu shih* simply as 'urea', though our deeper study shows that for many of the old methods described in the literature this would have been quite untenable. Smith's explanation of 1871 made it clear that the product he knew was simply the total urinary solids,^f but Giles in his dictionary adopted the bald identification,^g and so did Read paraphrasing the *Pên Tshao Kang Mu*.^h Curiously, Smith added that the substance is 'often kept in kitchens, to soften fresh meat required for immediate use', for it is indeed true that strong urea solutions denature proteins and bring them into solution.

Secondly, it is of interest that we have one Jesuit account of *chhiu shih*, that by

^a *Pên Tshao Pei Yao* and *Pên Tshao Tshung Hsin*.

^b *Pên Tshao Chhiu Chen*.

^c Analyses of such mixtures in modern times have been quoted by Miyashita Saburō (1), pp. 5, 42.

^d Cf. Miyashita, *op. cit.*, pp. 31, 38.

^e Anon. (57), vol. 4, p. 261 (no. 28).

^f (1), p. 224.

^g (2), no. 2302.

^h (2), nos. 418, 419. He ought to have known better, having Li Shih-Chen's very explicit text before him. But modern Chinese authorities still support his definition, e.g. Anon. (57), *loc. cit.*; it must have originated in the nineteenth century, when the precipitations and sublimations had been forgotten.

¹ 元氣

² 肌體潤澤

³ 秋石

⁴ 秋冰

⁵ 賈造品

⁶ 鹹秋石

⁷ 盆秋石

⁸ 淡秋石

⁹ 人中白

d'Entrecolles (2), written in +1736. He compared it with the '*Pierre vulnérable simple*' of Geoffroy (presumably some styptic such as alum or ferric chloride),^a and though his description of the preparation seems rather garbled, one can guess by certain signs what his sources probably were. Evaporation of urine in large quantities from a healthy young male donor is carried out on a stove, rapeseed oil being added as an anti-frothing agent. Sublimation is performed in a box of 'tiles', with mention of a hole to let out steam.^b Then the sublimate is fractionated by boiling water extractions.^c D'Entrecolles knew that the name came from the symbolic correlations between autumn, whiteness, Metal and the West, not because the material was, or should be, made in the autumn, or with autumn dew; and he knew also the symbolic correlation with the lungs, which explained for him why the physicians gave it in phthisis, but he missed their more important use of it in gonadal insufficiency.

Pushing further back, an appearance of *chhiu shih* in the dynastic histories has to be recorded. Under the Ming emperor Shih Tsung (r. +1522 to +1566), who was very interested in longevity techniques (cf. pt. 3, p. 212 above), Ku Kho-Hsüeh¹ and Fang Ping-Kuo² introduced to the court one Yen Sung,³ who knew how to use the urine of boys and girls to make *chhiu shih* for the prolongation of youth and life. Ku was an official who was long out of office because of misappropriation of public funds by his subordinates, and this perhaps gave him time to investigate the more esoteric pharmaceutical arts, but afterwards he got good promotion becoming Minister of Works in +1545, perhaps as a reward for the effects which he had been able to bring about.^d It is interesting to have this historical confirmation of techniques described in so many +16th-century medical treatises.

When we get back to the Sung, the picture again changes radically, for while *chhiu shih* was certainly being produced from real urine as at other times, the name also figures in the terminology of *nei tan* physiological alchemy. An indication of the former fact is seen in the *Chin I Huan Tan Pai Wên Chüeh*⁴ (Questions and Answers on Potable Gold (Metallous Fluid) and Cyclically-Transformed Elixirs and Enchymomas) by Li Kuang-Hsüan,⁵ where there is mention of the use of large quantities of the urine of young people for preparing beneficial powders.^e As for the latter usage, it is clear from several texts, mostly assignable, if with some hesitations, to the +13th-century. For example, the *Chhin Hsüan Fu*⁶ (Rhapsodical Ode on Grappling with the Mystery), by an unknown writer, has a section headed Chhiu Shih, in which it explains that this is used as a parable name for the element Metal, hence for the metallous fluid (cf. p. 141), the saliva (because of its connection

^a Cf. Partington (7), vol. 3, pp. 49 ff.

^b Recalling *Wan Ping Hui Chün* and *Chih Shui Hsüan Chu*.

^c Recalling method 5, from *Pao Shou Thang Ching Yen Fang*, though that uses river-water in the cold; and even more method 2, from *Shui Yün Lu*, which extracts urinary precipitates before sublimation with boiling water.

^d *Ming Shih*, ch. 307, p. 29a.

^e *TT*/263, esp., p. 20a. Li's Taoist teacher, Hsüan-Shou,⁷ a very *nei tan* adept, was himself definitely not in favour of the process.

¹ 顧可學

² 方柄國

³ 嚴嵩

⁴ 金液還丹百問訣

⁵ 李光玄

⁶ 擒玄賦

⁷ 玄壽

with the lungs), one of the two components of the enchymoma itself.^a Another example is the *Ta Tan Chi*¹ (Record of the Great Enchymoma), also anonymous.^b This is set down as an oral instruction of Wei Po-Yang, but it can hardly be pre-Sung in date. It is certainly a *nei tan* text, and would be worth translating in full as one of those couched in very *wai tan* terminology.^c Although it ends by talking about 'true mercury' and 'true lead', it opens by an antithesis between mercury and silver. Mercury is the dragon hidden within cinnabar, silver the tiger hidden within lead; the Yang within the Yin, and the Yin within the Yang—when they are inspired by the *chhi* they issue forth. A description of making the Dragon-and-Tiger Enchymoma (Lung Hu Tan²)^d reads as follows:

What is necessary is to make cinnabar revert to mercury, and lead to silver.^e Therefore it is said that (our) lead is not lead, but mercury. Huang Ti saw a radiant golden colour in it, and called it 'beauteous gold radiance' (*mei chin hua*³). Similarly the Prince of Huai-Nan succeeded in preparing 'autumn mineral' (*chhiu shih*⁴) in the eighth month; now that season corresponds to Metal and the West, so seeing a white colour in it he called it autumn mineral. Seeing these yellow and white colours they thought that they looked like the sprouts of all things—hence the name 'yellow sprout' (*huang ya*⁵) . . .

These four names, *lung hu*, *mei chin hua*, *chhiu shih*, *huang ya*, are all very different, yet basically they are but one substance (i.e. the enchymoma, or its constituents). As the mnemonic rhyme says: 'Preparing silver from lead is a mysterious work yet a natural one; in the blazing molten bath of ash the lead sinks and the silver rises'.^f

Here then is a *nei tan* analogy with cupellation, that fundamental and highly ancient technique so important for alchemy discussed at length at an earlier stage (pt. 2, pp. 55 ff.). The first sentence suggests that, as in some other cultures, there were those who believed that the silver produced was an actual transmutation from the lead.^g This cupellation analogy also occurs in the *Thao Chen Jen Nei Tan Fu*⁶ (The Adept Thao's Rhapsodical Ode on the Physiological Enchymoma)^h attributed to Thao Chih,⁷ with a commentary by an unknown writer. In *nei tan* language, we are told, *yin*⁸ (silver) means white metal (*pai chin*⁹), i.e. *chen i*,¹⁰ the unity of the primary vitalities (*yuan chhi*¹¹), in other words, again the enchymoma. So much for *chhiu shih* as a *nei tan* term, but we must remember yet awhile the reference to the Prince of Huai-Nan.

^a TT/257, pp. 3b, 5a to 6a.

^b TT/892.

^c This was perhaps why it was included in the *Tao Tsang* in one *pên* with Wu Wu's *Tan Fang Hsü Chih* (cf. pt. 3, p. 198, pt. 4, *passim*), a work of +1163.

^d Note the echo of *lung hu shih* (p. 330 above).

^e The text has actually 'silver to gold', but we have amended.

^f Pp. 1b, 2a, tr. auct.; cf. pp. 4a ff., 6a. The physiological flavour of the last sentence is very obvious.

^g A good instance of this can be found in Taslimi (1), pp. 6–7, where he translates Ibn Aidamur al-Jildakī's *Nihāyat al-Ṭalab* (The End of the Search), c. +1342, a commentary on the 'Book of Acquired Knowledge in the Cultivation of Gold', *Kitāb al-'Ilm al-Muktasab* . . . by Abū'l-Qāsim al-Sīrawī al-Iraq, c. 1270. 'Lead may be converted into silver', says the Sheikh, 'for if you place a pound of lead in the fire it rectifies it and matures it, burning most of it away and leaving only a small part as silver. . .'

^h TT256, pp. 2b, 3a. And in *Chin Tan Chin Pi Chhiu Thung Chieh* (YCCC, ch. 73, p. 10a, b).

¹ 大丹記

² 龍虎丹

³ 美金華

⁴ 秋石

⁵ 黃芽

⁶ 陶真人內丹賦

⁷ 陶植

⁸ 銀

⁹ 白金

¹⁰ 眞一

¹¹ 元氣

We are now back in the Thang, before the appearance of any of the recipe texts, but at the time when physicians were very curious about the urinary constituents. In view of its later decline into common inorganic salts, one is rather startled to read in Mei Piao's glossary, *Shih Yao Erh Ya* (cf. p. 121), that *chhiu shih* was one of the synonyms of arsenolite (*yü shih*).^a This reference of +806 is the only connection with arsenical oxides that we have found, and the most likely explanation is that on account of its whiteness, *chhiu shih* became a cover-name for white arsenic.^b Another text gives it as a synonym of saltpetre, explaining that the efflorescent whiteness resembled autumn frost.^c Meanwhile, there is evidence that *chhiu shih* from urine was being prepared by some distinguished people. The great poet Pai Chü-I (+772 to +846) has a poem 'Thinking of Old Friendships' (Ssu Chiu Shih²),^d which includes the lines:

Thui-Chih³ took sulphur, yet once ill,
Never got well from that distemper of his;
Wei-Chih⁴ prepared the 'autumn mineral' drug,
Yet while still young encountered sudden death.^e

Now Thui-Chih was one of the names of the great Confucian scholar Han Yü⁵,^f while Wei-Chih was the *tsu*-name of another eminent poet, Yuan Chen⁶ (+779 to +831). It looks therefore as if we can carry back the urinary steroid preparations to the latter half of the +8th-century at any rate, though we have no means of telling how sophisticated were the steps in the preparation.

This is an early date, but we have to face a stranger thing, namely that *chhiu shih* is referred to in the mid +2nd-century *Tshan Thung Chhi* (cf. pt. 3, pp. 50ff.). Wei Po-Yang makes a mere mention of it, pairing it, in the manner of the *Ta Tan Chi* just above, with Huang Ti's making of some yellow product (possibly artificial gold). The line runs: 'Huang Ti (admired) the beauteous golden radiance, and (the Prince of) Huai-Nan prepared the autumn mineral',^g Many texts have, of course, *nei tan* commentaries which deprecate the idea that it was something real from urine. For example, Chhen Chih-Hsü about +1330 wrote:^h

People who hear of *chhiu shih* always think that it is made from urine. But all he¹ is talking about here is the anablastemic enchymoma, the primary *chhi* of the natural endowment, and the necessity of having things of the same category (to react together). When ordinary

^a *TT* 894, ch. 1, p. 3a.

^b Elsewhere in the same book there is a reference to a *Chhiu Shih Ya Fa*,⁷ but we do not know what the substance and method was.

^c *Yin Chen Chün Chün Shih Wu Hsiang Lei* (*TT* 899), perhaps contemporary with Iei Piao, perhaps rather earlier. Cf. pt. 4, p. 309.

^d Quoted in *Lei Shuo*, ch. 50, p. 9a, from Khung Phing-Chung's⁸ *Khung shih Tsa Shuo*,⁹ c. +1082.

^e Tr. auct.

^f A further reference to the sulphur and other drugs taken by Han Yü occurs in *Lei Shuo*, ch. 41, p. 11a.

^g Ch. 15, p. 34a, b: *HWT*S ed., ch. 14, p. 3b; Wu & Davis (1), p. 244. Their translation cannot stand: Huai Nan Tzu assays the 'autumn stone'; naturally they had no idea of what was behind the phrase.

^h *Wu Chen Phien Ssu Chu* ed., p. 10a, tr. auct.

¹ Chang Po-Tuan.

¹ 礬石

² 思舊詩

³ 退之

⁴ 微之

⁵ 韓愈

⁶ 元櫛

⁷ 秋石芽法

⁸ 孔平仲

⁹ 孔氏雜說

people hear about 'golden radiance' (*chin hua*¹) they guess it must be something to do with the five metals, and when they hear about 'yellow sprouts' (*huang ya*²) they naturally assume some connection with the eight minerals . . .

They do not realise that the sages of old established these names only for convenience.

But this was just one late interpretation, and there is no reason for thinking that Wei Po-Yang used the term solely in its allegorical-physiological sense. It is more likely that he had in mind, at least partly, a veritable and somewhat surprising preparation from urine which the adepts carried out already in the +2nd-century.

Is it possible that some form of it had already started in the -1st? The *Chhien Han Shu* (History of the Former Han Dynasty) contains a speech made by a high official, Ku Yung,^{3a} against all magicians and alchemists, about -25. This we have already quoted at the beginning of the present Section, but there is a passage in it couched in words so extraordinary that we must now look at it again under, as it were, the fine adjustment. It runs as follows:^b

(They say . . . that they are masters of) the transmutation into the yellow (*huang yeh pien hua*⁴)

[*Comm.*] Chin Shao⁵ says: 'Yellow here means of course the melting of yellow gold. The Taoists say that by fusing cinnabar they can transform it and make yellow gold.' and that from dark and muddy (i.e. concentrated) urine they can make a hard white ice-like (i.e. crystalline) substance (*chien ping nao niao*⁶).

[*Comm.*] Chin Shao says: 'The magicians (*fang shih*⁷) falsely say that they can prepare medicinal minerals (i.e. chemicals, *yao shih*⁸) like the 'ice-liquefying pill' (*hsien ping wan*⁹) which when thrown on to ice dissipates it, melting it to water. And they feign that this is brought about by the Tao of the holy immortals.'^c

Others say that it is intended to make gold edible and potable. But (Yen) Shih-Ku says that this last idea is nonsense.

As for *nao* (mud or slush) it implies 'very moist and shining'. The pronunciation is *ngao*.

From this several things clearly emerge. The transformation of foetid boiled-down urine into a salubrious powder must be referred to, and it is coupled with the transmutation of base metals into gold.^d But although something white and crystalline was being prepared by the adepts from 'dark and muddy urine', none of the commentators, neither Chin Shao in the +4th-century nor Yen Shih-Ku in the early +7th, had any idea of what it really was. Yet if we are prepared to envisage the close keeping of Taoist secrets down through the centuries, it is hard to believe that this

^a *Fl.* -36, d. -9. Between -29 and -12 he conducted a campaign against the proto- and pseudo-scientific adepts.

^b *CHS*, ch. 25B, p. 15a,b, tr. auct.

^c This must have depended on ancient observations of what we should describe as freezing-point depression caused by solutes. Almost any salt would do, but there are some substances such as camphor which have very high molecular f.p. depressions.

^d As in the passages from the *Tshan Thung Chhi* and the *Ta Tan Chi*, pp. 334, 333 above.

¹ 金華

² 黃芽

³ 谷永

⁴ 黃治變化

⁵ 晉灼

⁶ 堅冰淖溺

⁷ 方士

⁸ 藥石

⁹ 陷冰丸

reference can have concerned anything else than *chhiu shih*;^a and the disturbing feature is the phraseology used, so laconic yet pointing so strangely to a sublimate of cholesterol-like crystals rather than to an amorphous powder, even though white, representing the total solids (or the more or less insoluble solids) of urine concentrates. Perhaps we shall never know just what the Taoists of the Han were up to, but the wild surmise with which we have to end is the possibility that the basic invention, in some sort, goes back to an earlier time in the same dynasty, about the year - 125, when Liu An, the Prince of Huai-Nan—putative father of all *chhiu shih*, whatever it was, in later centuries—was conferring and experimenting with his Eight Venerable Adepts (Pa Kung, cf. pt. 3, p. 23, pt. 4, p. 168).^b How far exactly they got is something we would very much like to know.

All in all, the experimental preparation of mixtures of steroid sex hormones throughout the Chinese Middle Ages, and their purification by subliming from the + 11th-century onwards must surely stand as an extraordinary example of quasi-empirical anticipation of knowledge acquired only in very recent times. When one considers that the iatro-chemists totally lacked the powerful methods of separation available today which depend upon the use of many different organic solvents, one feels amazed at the ingenuity with which they mastered their problem. In view of their theoretical presuppositions one might suppose that it would have been more logical to use blood rather than urine as the starting-point, but here the difficulty of the presence of so much protein would have presented itself acutely, and one may reasonably suppose that while the handling of blood was beyond the powers of the medieval iatro-chemists, urine as a starting point was much more manageable. And so at it they went, with their 200 or 300 gallons, almost on a pharmaceutical manufacturing scale, their evaporating basins, and their clever sublimatories—a brilliant and courageous anticipation of the conscious biochemistry of our own time.

And from what had it all sprung? From one root of theory and two of practice. Without the ancient conviction that this life, in the body (even though ether-ealised), could (if one only knew the secret) be indefinitely prolonged, no alchemists anywhere would ever have started out on their quest. Without the 'outer' work of the *wai tan* practitioners with their metals and minerals the necessary apparatus and techniques would not have been invented. Without the 'inner' work of the *nei tan* adepts, convinced that the *chhi* and fluids of the living body were more important than all those inorganic substances, the idea of operating upon them chemically would not have arisen. Chinese iatro-chemistry was the synthesis of these two different traditions, and what it accomplished in the endocrinological field was only an earnest of the thousands of powerful biologically active substances

^a It will be seen at once that this striking reference in one of the dynastic histories goes far to disprove any idea that the ancients were only using one of the cover-names in physiological alchemy. If the sex-hormones were already being used at that early time for hypogonadic conditions, the misuse of them as aphrodisiacs for normal people would have lain ready to hand, and that would have been just the kind of thing that Ku Yung was inveighing against.

^b In considering the possibilities of the use of sublimation processes at such an early time one may recall what has been said on their antiquity elsewhere (pt. 4, pp. 44 ff.).

which modern biochemistry was destined to place at the service of mankind. So however strange the idea of the enchymoma, and the means that were taken to synthesise it, may seem to our eyes, looking back, today, they were eventually justified not only on hygienic, medical and psychological grounds, but even from the most strictly chemical point of view.

We have now come far, yet still our survey of chemical discovery and invention is not at an end. In the ceramic, mining and metallurgical arts, carried to such heights in Chinese culture, there was great use of chemistry, and those who would like to hear the story of them will find it in the other parts, the first and the last, of the present volume.

BIBLIOGRAPHIES

- A CHINESE AND JAPANESE BOOKS BEFORE +1800
 B CHINESE AND JAPANESE BOOKS AND JOURNAL ARTICLES SINCE +1800
 C BOOKS AND JOURNAL ARTICLES IN WESTERN LANGUAGES

In Bibliographies A and B there are two modifications of the Roman alphabetical sequence: transliterated *Chh-* comes after all other entries under *Ch-*, and transliterated *Hs-* comes after all other entries under *H-*. Thus *Chhen* comes after *Chung* and *Hsi* comes after *Huai*. This system applies only to the first words of the titles. Moreover, where *Chh-* and *Hs-* occur in words used in Bibliography C, i.e. in a Western language context, the normal sequence of the Roman alphabet is observed.

When obsolete or unusual romanisations of Chinese words occur in entries in Bibliography C, they are followed, wherever possible, by the romanisations adopted as standard in the present work. If inserted in the title, these are enclosed in square brackets; if they follow it, in round brackets. When Chinese words or phrases occur romanised according to the Wade-Giles system or related systems, they are assimilated to the system here adopted (cf. Vol. 1, p. 26) without indication of any change. Additional notes are added in round brackets. The reference numbers do not necessarily begin with (1), nor are they necessarily consecutive, because only those references required for this volume of the series are given.

Korean and Vietnamese books and papers are included in Bibliographies A and B. As explained in Vol. 1, pp. 21 ff., reference numbers in italics imply that the work is in one or other of the East Asian languages.

ABBREVIATIONS

See also p. |xix

<i>A</i>	<i>Archeion</i>	<i>AJPA</i>	<i>Amer. Journ. Physical Anthro- pology</i>
<i>AA</i>	<i>Artibus Asiae</i>		
<i>AAA</i>	<i>Archaeologia</i>	<i>AJSC</i>	<i>American Journ. Science and Arts (Silliman's)</i>
<i>AAAA</i>	<i>Archaeology</i>	<i>AM</i>	<i>Asia Major</i>
<i>A/AIHS</i>	<i>Archives Internationales d'Histoire des Sciences (continuation of Archeion)</i>	<i>AMA</i>	<i>American Antiquity</i>
<i>AAN</i>	<i>American Anthropologist</i>	<i>AMH</i>	<i>Annals of Medical History</i>
<i>AAPWM</i>	<i>Archiv. f. Anat., Physiol., and Wiss. Med. (Joh. Müller's)</i>	<i>AMS</i>	<i>American Scholar</i>
<i>ABAW/PH</i>	<i>Abhandlungen d. bayr. Akad. Wiss. München (Phil.-Hist. Klasse)</i>	<i>AMY</i>	<i>Archaeometry (Oxford)</i>
<i>ACASA</i>	<i>Archives of the Chinese Art Soc. of America</i>	<i>AN</i>	<i>Anthropos</i>
<i>ACF</i>	<i>Annuaire du Collège de France</i>	<i>ANATS</i>	<i>Anatolian Studies (British School of Archaeol. Ankara)</i>
<i>ADVC</i>	<i>Advances in Chemistry</i>	<i>ANS</i>	<i>Annals of Science</i>
<i>ADVS</i>	<i>Advancement of Science (British Assoc., London)</i>	<i>ANT</i>	<i>Antaios (Stuttgart)</i>
<i>AEM</i>	<i>Anuario de Estudios Medievales (Barcelona)</i>	<i>ANTY</i>	<i>Antiquaries Journal</i>
<i>AEPHE/SHP</i>	<i>Annuaire de l'Ecole Pratique des Hautes Études (Sect. Sci. Hist. et Philol.)</i>	<i>AP</i>	<i>Aryan Path.</i>
<i>AEPHE/SSR</i>	<i>Annuaire de l'Ecole Pratique des Hautes Études (Sect. des Sci. Religieuses)</i>	<i>APH</i>	<i>Actualités Pharmacologiques</i>
<i>AESC</i>	<i>Aesculape (Paris)</i>	<i>AP/HY</i>	<i>Historical Journal, National Pei- ping Academy</i>
<i>AEST</i>	<i>Annales de l'Est (Fac. des Lettres, Univ. Nancy)</i>	<i>APAW/PH</i>	<i>Abhandlungen d. preuss. Akad. Wiss. Berlin (Phil.-Hist. Klasse)</i>
<i>AF</i>	<i>Ärztliche Forschung</i>	<i>APHL</i>	<i>Acta Pharmaceutica Helvetica</i>
<i>AFG</i>	<i>Archiv. f. Gynäkologie</i>	<i>APNP</i>	<i>Archives de Physiol. normale et pathologique</i>
<i>AFGR/CINO</i>	<i>Atti della Fondazione Giorgio Ronchi e Contributi dell'Istituto Nazionale di Ottica (Arcetri)</i>	<i>AQ</i>	<i>Antiquity</i>
<i>AFP</i>	<i>Archivum Fratrum Praedicatorum</i>	<i>AR</i>	<i>Archiv. f. Religionswissenschaft</i>
<i>AFRA</i>	<i>Afrasian (student Journal of London Inst. Oriental & Afri- can Studies)</i>	<i>ARB</i>	<i>Annual Review of Biochemistry</i>
<i>AGMN</i>	<i>Archiv. f. d. Gesch. d. Medizin u. d. Naturwissenschaften (Sud- hoff's)</i>	<i>ARLC/DO</i>	<i>Annual Reports of the Librarian of Congress (Division of Orientalia)</i>
<i>AGMW</i>	<i>Abhandlungen z. Geschichte d. Math. Wissenschaft</i>	<i>ARMC</i>	<i>Ann. Reports in Medicinal Chem- istry</i>
<i>AGNT</i>	<i>Archiv. f. d. Gesch. d. Naturwiss. u. d. Technik (cont. as AGMNT)</i>	<i>ARO</i>	<i>Archiv Orientalni (Prague)</i>
<i>AGP</i>	<i>Archiv. f. d. Gesch. d. Philosophie</i>	<i>ARQ</i>	<i>Art Quarterly</i>
<i>AGR</i>	<i>Asahigraph</i>	<i>ARSI</i>	<i>Annual Reports of the Smithsonian Institution (Washington, D.C.)</i>
<i>AGWG/PH</i>	<i>Abhdl. d. Gesell. d. Wiss. Z. Göttingen (Phil.-Hist. Kl.)</i>	<i>AS/BIHP</i>	<i>Bulletin of the Institute of History and Philology, Academia Sinica</i>
<i>AHES/AHS</i>	<i>Annales d'Hist. Sociale</i>	<i>AS/CJA</i>	<i>Chinese Journal of Archaeology, Academia Sinica</i>
<i>AHOR</i>	<i>Antiquarian Horology</i>	<i>ASEA</i>	<i>Asiatische Studien; Études Asia- tiques</i>
<i>AIENZ</i>	<i>Advances in Enzymology</i>	<i>ASN/Z</i>	<i>Annales des Sciences Naturelles; Zoologie (Paris)</i>
<i>AIP</i>	<i>Archives Internationales de Physio- logie</i>	<i>ASSF</i>	<i>Acta Societatis Scientiarum Fen- nicæ (Helsingfors)</i>
<i>AJA</i>	<i>American Journ. Archaeology</i>	<i>AT</i>	<i>Atlantis</i>
<i>AJOP</i>	<i>Amer. Journ. Physiol.</i>	<i>ATOM</i>	<i>Atomes (Paris)</i>
		<i>AX</i>	<i>Ambix</i>
		<i>BABEL</i>	<i>Babel; Revue Internationale de la Traduction</i>
		<i>BCGS</i>	<i>Bull. Chinese Geological Soc.</i>
		<i>BCP</i>	<i>Bulletin Catholique de Pékin</i>
		<i>BSC</i>	<i>Bulletin of Chinese Studies (Chhêngtu)</i>
		<i>BDCG</i>	<i>Ber. d. deutsch. chem. Gesellschaft.</i>
		<i>BDP</i>	<i>Blätter f. deutschen Philosophie</i>

BE AMG	<i>Bibliographie d'Études (Annales du Musée Guimet)</i>	CHIM	<i>Chimica (Italy)</i>
BEC	<i>Bulletin de l'École des Chartes (Paris)</i>	CHIND	<i>Chemistry and Industry (Journ. Soc. Chem. Ind. London)</i>
BEFED	<i>Bulletin de l'École Française de l'Extrême Orient (Hanoi)</i>	CHJ	<i>Ching-Hua Hsüeh Pao (Ching-Hua (Ts'ing-Hua) University Journal of Chinese Studies)</i>
BGSC	<i>Bulletin of the Chinese Geological Survey</i>	CHJ T	<i>Ching-Hua (Ts'ing-Hua) Journal of Chinese Studies (New Series, publ. Taiwan)</i>
BGTI	<i>Beiträge z. Gesch. d. Technik u. Industrie (continued as Technik Geschichte—see BGTI TG)</i>	CHWSLT	<i>Chung-Hua Wên-Shih Lun Tshung (Collected Studies in the History of Chinese Literature)</i>
BGTI TG	<i>Technik Geschichte</i>	CHYM	<i>Chymia</i>
BHMZ	<i>Berg und Hüttenmännische Zeitung</i>	CHZ	<i>Chemiker Zeitung</i>
BIHM	<i>Bulletin of the (Johns Hopkins) Institute of the History of Medicine (cont. as Bulletin of the History of Medicine)</i>	CIBA M	<i>Ciba Review (Medical History)</i>
Bj	<i>Biochemical Journal</i>	CIBA MZ	<i>Ciba Zeitschrift (Medical History)</i>
BjRL	<i>Bull. John Rylands Library (Manchester)</i>	CIBA S	<i>Ciba Symposia</i>
BK	<i>Bunka (Culture), Sendai</i>	CIBA T	<i>Ciba Review (Textile Technology)</i>
BLSOAS	<i>Bulletin of the London School of Oriental and African Studies</i>	CIMC MR	<i>Chinese Imperial Maritime Customs (Medical Report Series)</i>
BM	<i>Bibliotheca Mathematica</i>	CIT	<i>Chemie Ingenieur Technik</i>
BMFEA	<i>Bulletin of the Museum of Far Eastern Antiquities (Stockholm)</i>	Cj	<i>China Journal of Science and Arts</i>
BMFj	<i>Bulletin de la Maison Franco-Japonaise (Tokyo)</i>	CjFC	<i>Chin Jih Fo Chiao (Buddhism Today), Taiwan</i>
BMj	<i>British Medical Journal</i>	CLINR	<i>Clinical Radiology</i>
BNj	<i>British Numismatic Journ.</i>	CLR	<i>Classical Review</i>
BOE	<i>Boethius; Texte und Abhandlungen d. exakte Naturwissenschaften (Frankfurt)</i>	CMj	<i>Chinese Medical Journal</i>
BR	<i>Biological Reviews</i>	CN	<i>Chemical News</i>
BS	<i>Behavioural Science</i>	CNRS	<i>Centre National de la Recherche Scientifique</i>
BSAA	<i>Bull. Soc. Archéologique d'Alexandrie</i>	COCj	<i>Coin Collectors' Journal</i>
BSAB	<i>Bull. Soc. d'Anthropologie de Bruxelles</i>	COPS	<i>Confines of Psychiatry</i>
BSCF	<i>Bull. de la Société Chimique de France</i>	CP	<i>Classical Philology</i>
BSGF	<i>Bull. de la Société Géologique de France</i>	CQ	<i>Classical Quarterly</i>
BSjR	<i>Bureau of Standards Journ. of Research</i>	CR	<i>China Review (Hongkong and Shanghai)</i>
BSPB	<i>Bull. Soc. Pharm. Bordeaux</i>	CRAS	<i>Comptes Rendus hebdomadaires de l'Acad. des Sciences (Paris)</i>
BUA	<i>Bulletin de l'Université de l'Aurore (Shanghai)</i>	CREC	<i>China Reconstructs</i>
BV	<i>Bharatiya Vidya (Bombay)</i>	CRESC	<i>Crescent (Surat)</i>
CA	<i>Chemical Abstracts</i>	CRR	<i>Chinese Recorder</i>
CALM	<i>California Medicine</i>	CRRR	<i>Chinese Repository</i>
CBH	<i>Chūgoku Bungaku-hō (Journ. Chinese Literature)</i>	CS	<i>Current Science</i>
CCj	<i>Chung-Chi Journal (Chhung-Chi Univ. Coll. Hongkong)</i>	CUNOB	<i>Cunobelin; Yearbook of the British Association of Numismatic Societies</i>
CDA	<i>Chinesisch-Deutschen Almanach (Frankfort a/M)</i>	CUP	<i>Cambridge University Press</i>
CEM	<i>Chinese Economic Monthly (Shanghai)</i>	CUQ	<i>Columbia University Quarterly</i>
CEN	<i>Centaurus</i>	CURRA	<i>Current Anthropology</i>
CHA	<i>Chemische Apparatur</i>	CVS	<i>Christiania Videnskabselskabet Skrifter</i>
CHEMC	<i>Chemistry in Canada</i>	CW	<i>Chemische Weekblad</i>
CHI	<i>Cambridge History of India</i>	CWR	<i>China Weekly Review</i>
		DAZ	<i>Deutscher Apotheke Zeitung</i>
		DB	<i>The Double Bond</i>
		DI	<i>Die Islam</i>
		DK	<i>Dōkyō Kenkyū (Researches in the Taoist Religion)</i>
		DMAB	<i>Abhandlungen u. Berichte d. Deutsches Museum (München)</i>
		DS	<i>Desalination (International Journ. Water Desalting) (Amsterdam and Jerusalem, Israel)</i>

DV	<i>Deutsche Vierteljahrschrift</i>	HRASP	<i>Histoire de l'Acad. Roy. des Sciences, Paris</i>
DVN	<i>Dan Viet Nam</i>	HSS	<i>Hsüeh Ssu (Thought and Learning)</i> , Chhêngtu
DZZ	<i>Deutsche Zahnärztlichen Zeit.</i>	HU BML	<i>Harvard University Botanical Museum Leaflets</i>
EARLH	<i>Earlham Review</i>	HUM	<i>Humanist (RPA, London)</i>
EECN	<i>Electroencephalography and Clinical Neurophysiology</i>	IA	<i>Iron Age</i>
EG	<i>Economic Geology</i>	IBK	<i>Indogaku Bukkyōgaku Kenkyū (Indian and Buddhist Studies)</i>
EHOR	<i>Eastern Horizon (Hongkong)</i>	IC	<i>Islamic Culture (Hyderabad)</i>
EHR	<i>Economic History Review</i>	ID	<i>Idan (Medical Discussions)</i> , Japan
EI	<i>Encyclopaedia of Islam</i>	IEC AE	<i>Industrial and Engineering Chemistry; Analytical Edition</i>
EMJ	<i>Engineering and Mining Journal</i>	IEC I	<i>Industrial and Engineering Chemistry; Industrial Edition</i>
END	<i>Endeavour</i>	IHQ	<i>Indian Historical Quarterly</i>
EPJ	<i>Edinburgh Philosophical Journal (continued as ENPJ)</i>	IJE	<i>Indian Journ. Entomol.</i>
ERE	<i>Encyclopaedia of Religion and Ethics</i>	IJHM	<i>Indian Journ. History of Medicine</i>
ERYB	<i>Eranos Jahrbuch</i>	IJHS	<i>Indian Journ. History of Science</i>
ERYB	<i>Eranos Yearbook</i>	IJMR	<i>Indian Journ. Med. Research</i>
ETH	<i>Ethnos</i>	IMIN	<i>Industria Mineraria</i>
EURR	<i>Europäische Revue (Berlin)</i>	IMW	<i>India Medical World</i>
EXPED	<i>Expedition (Magazine of Archaeology and Anthropology)</i> , Philadelphia	INDQ	<i>Industria y Quimica (Buenos Aires)</i>
FCON	<i>Fortschritte d. chemie d. organischen Naturstoffe</i>	INM	<i>International Nickel Magazine</i>
FER	<i>Far Eastern Review (London)</i>	IPEK	<i>Ipek; Jahrb. f. prähistorische u. ethnographische Kunst (Leipzig)</i>
FF	<i>Forschungen und Fortschritte</i>	IQB	<i>Iqbal (Lahore)</i> , later <i>Iqbal Review (Journ. of the Iqbal Academy or Bazm-i Iqbal)</i>
FMNHP AS	<i>Field Museum of Natural History (Chicago) Publications; Anthropological Series</i>	IRAQ	<i>Iraq (British Sch. Archaeol. in Iraq)</i>
FP	<i>Federation Proceedings (USA)</i>	ISIS	<i>Isis</i>
FPNJ	<i>Folia Psychologica et Neurologica Japonica</i>	ISTC	<i>I Shih Tsa Chih (Chinese Journal of the History of Medicine)</i>
FRS	<i>Franziskanischen Studien</i>	IVS	<i>Ingeniørvidenskabelje Skrifter (Copenhagen)</i>
GBA	<i>Gazette des Beaux-Arts</i>	J _A	<i>Journal Asiatique</i>
GBT	<i>Global Technology</i>	J _{AC}	<i>Jahrb. f. Antike u. Christentum</i>
GEW	<i>Geloof en Wetenschap</i>	J _{ACS}	<i>Journ. Amer. Chem. Soc.</i>
GJ	<i>Geographical Journal</i>	J _{AHIST}	<i>Journ. Asian History (International)</i>
GR	<i>Geographical Review</i>	J _{AIMH}	<i>Pratibha; Journ. All-India Instit. of Mental Health</i>
GRM	<i>Germanisch-Romanische Monatschrift</i>	J _{ALCHS}	<i>Journal of the Alchemical Society (London)</i>
GUJ	<i>Gutenberg Jahrbuch</i>	J _{AN}	<i>Janus</i>
HCA	<i>Helvetica Chimica Acta</i>	J _{AOS}	<i>Journal of the American Oriental Society</i>
HE	<i>Hesperia (Journ. Amer. Sch. Class. Stud. Athens)</i>	J _{AP}	<i>Journ. Applied Physiol.</i>
HEJ	<i>Health Education Journal</i>	J _{AS}	<i>Journal of Asian Studies (continuation of Far Eastern Quarterly, FEQ)</i>
HERM	<i>Hermes; Zeitschr. f. Klass. Philol.</i>	J _{ATBA}	<i>Journal d'Agriculture tropicale et de Botanique appliqué</i>
HF	<i>Med Hammare och Fackla (Sweden)</i>	J _{BC}	<i>Journ. Biol. Chem.</i>
HHS	<i>Hua Hsüeh (Chemistry)</i> , Ch. Chem. Soc.	J _{BFIGN}	<i>Jahresber. d. Forschungsinstitut f. Gesch. d. Naturwiss. (Berlin)</i>
HHSTH	<i>Hua Hsüeh Tung Hsün (Chemical Correspondent)</i> , Chekiang Univ.	J _C	<i>Jimnin Chūgoku (People's China)</i> , Tokyo
HITC	<i>Hsüeh I Tsa Chih (Wissen und Wissenschaft)</i> , Shanghai	J _{CE}	<i>Journal of Chemical Education</i>
HJAS	<i>Harvard Journal of Asiatic Studies</i>	J _{CP}	<i>Jahrb. f. class. Philologie</i>
HMSO	<i>Her Majesty's Stationery Office</i>		
HOR	<i>History of Religion (Chicago)</i>		
HOSC	<i>History of Science (annual)</i>		

JCS	<i>Journal of the Chemical Society</i>	JUB	<i>Journ. Univ. Bombay</i>
JEA	<i>Journal of Egyptian Archaeology</i>	JUS	<i>Journ. Unified Science</i> (continuation of <i>Erkenntnis</i>)
JEGP	<i>Journal of English and Germanic Philology</i>	JWCBRS	<i>Journal of the West China Border Research Society</i>
JEH	<i>Journal of Economic History</i>	JWCI	<i>Journal of the Warburg and Courtauld Institutes</i>
JEM	<i>Journ. Exper. Med.</i>	JWH	<i>Journal of World History</i> (UNESCO)
JFI	<i>Journ. Franklin Institute</i>	KHS	<i>Kho Hsiieh (Science)</i>
JGGBB	<i>Jahrbuch d. Gesellschaft f. d. Gesch. u. Bibliographie des Brauwesens</i>	KHSC	<i>Kho-Hsiieh Shih Chi-Khan (Ch. Journ. Hist. of Sci.)</i>
JGMB	<i>Journ. Gen. Microbiol.</i>	KHTP	<i>Kho Hsiieh Thung Pao (Science Correspondent)</i>
JHI	<i>Journal of the History of Ideas</i>	KHVL	<i>Kungliga Humanistiska Vetenskapsamfundet i Lund Årskriftelse (Bull. de la Soc. Roy. de Lettres de Lund)</i>
JHMAS	<i>Journal of the History of Medicine and Allied Sciences</i>	KKD	<i>Kiuki Daigaku Sekai Keizai Kenkyūjo Hokoku (Reports of the Institute of World Economics at Kiuki Univ.)</i>
JHS	<i>Journal of Hellenic Studies</i>	KKTH	<i>Khao Ku Thung Hsün (Archaeological Correspondent), cont. as Khao Ku</i>
JJ	<i>Jissen Igaku (Practical Medicine)</i>	KKTS	<i>Ku Kung Thu Shu Chi Khan (Journal of the Imperial Palace Museum and Library), Taiwan</i>
JJM	<i>Journ. Institute of Metals (UK)</i>	KSV A/H	<i>Kungl. Svenska Vetenskapsakad. Handlingar</i>
JJMA	<i>Journ. Indian Med. Assoc.</i>	KVSUA	<i>Kungl. Vetenskaps Soc. i Uppsala Årsbok (Mem. Roy. Acad. Sci. Uppsala)</i>
JJKRS	<i>Journ. Kalinga Historical Research Soc. (Orissa)</i>	KW	<i>Klinische Wochenschrift</i>
JMBA	<i>Journ. of the Marine Biological Association (Plymouth)</i>	LA	<i>Annalen d. Chemie (Liebig's)</i>
JNMD	<i>Journ. Nervous & Mental Diseases</i>	LCHIND	<i>La Chimica e l'Industria (Milan)</i>
JMS	<i>Journ. Mental Science</i>	LEC	<i>Lettres Édifiantes et Curieuses écrites des Missions Étrangères (Paris, 1702-1776)</i>
JNPS	<i>Journ. Neuropsychiatr.</i>	LH	<i>L'Homme; Revue Française d'Anthropologie</i>
JOP	<i>Journ. Physiol.</i>	LIN	<i>L'Institut (Journal Universel des Sciences et des Sociétés Savantes en France et à l'Étranger)</i>
JOSHK	<i>Journal of Oriental Studies (Hongkong Univ.)</i>	LN	<i>La Nature</i>
JP	<i>Journal of Philology</i>	LP	<i>La Pensée</i>
JPB	<i>Journ. Pathol. and Bacteriol.</i>	LSYC	<i>Li Shih Yen Chiu (Journal of Historical Research), Peking</i>
JPC	<i>Journ. f. prakt. Chem.</i>	LSYKK	<i>Li Shih yü Khao Ku (History and Archaeology; Bulletin of the Shenyang Museum), Shenyang</i>
JPCH	<i>Journ. Physical Chem.</i>	LT	<i>Lancet</i>
JPH	<i>Journal de Physique</i>	LYCH	<i>Lychnos (Annual of the Swedish Hist. of Sci. Society)</i>
JPHS	<i>Journ. Pakistan Historical Society</i>	MAAA	<i>Memoirs Amer. Anthropological Association</i>
JPHST	<i>Journ. Philos. Studies</i>	MAI/NEM	<i>Mémoires de l'Académie des Inscriptions et Belles-Lettres, Paris (Notices et Extraits des MSS)</i>
JPOS	<i>Journal of the Peking Oriental Society</i>	MAIS/SP	<i>Mémoires de l'Acad. Impériale des Sciences, St Pétersbourg</i>
JRAI	<i>Journal of the Royal Anthropological Institute</i>		
JRAS	<i>Journal of the Royal Asiatic Society</i>		
JRAS B	<i>Journal of the (Royal) Asiatic Society of Bengal</i>		
JRAS BOM	<i>Journ. Roy. Asiatic Soc., Bombay Branch</i>		
JRAS KB	<i>Journal (or Transactions) of the Korea Branch of the Royal Asiatic Society</i>		
JRAS M	<i>Journal of the Malayan Branch of the Royal Asiatic Society</i>		
JRAS NCB	<i>Journal (or Transactions) of the Royal Asiatic Society (North China Branch)</i>		
JRAS P	<i>Journ. of the (Royal) Asiatic Soc. of Pakistan</i>		
JRIBA	<i>Journ. Royal Institute of British Architects</i>		
JRSA	<i>Journal of the Royal Society of Arts</i>		
JS	<i>Journal des Savants (1665-1778) and Journal des Savants (1816-)</i>		
JSA	<i>Journal de la Société des Américanistes</i>		
JSCI	<i>Journ. Soc. Chem. Industry</i>		
JSHS	<i>Japanese Studies in the History of Science (Tokyo)</i>		

MAS/B	<i>Memoirs of the Asiatic Society of Bengal</i>	MS	<i>Monumenta Serica</i>
MB	<i>Monographiae Biologicae</i>	MSAF	<i>Mémoires de la Société (Nat.) des Antiquaires de France</i>
MBLB	<i>May and Baker Laboratory Bulletin</i>	MSGVK	<i>Mitt. d. Schlesische Gesellschaft f. Volkskunde</i>
MBPB	<i>May and Baker Pharmaceutical Bulletin</i>	MSIV/MF	<i>Memoire di Mat. e. Fis della Soc. Ital. (Verona)</i>
MCB	<i>Mélanges Chinois et Bouddhiques</i>	MSOS	<i>Mitteilungen d. Seminar f. orientalischen Sprachen (Berlin)</i>
MCE	<i>Metallurgical and Chemical Engineering</i>	MSP	<i>Mining and Scientific Press</i>
MCHSAMUC	<i>Mémoires concernant l'Histoire, les Sciences, les Arts, les Mœurs et les Usages, des Chinois, par les Missionnaires de Pékin (Paris 1776-)</i>	MUJ	<i>Museum Journal (Philadelphia)</i>
MDGNVO	<i>Mitteilungen d. deutsch. Gesellsch. f. Natur. u. Volkskunde Ostasiens</i>	MUSEON	<i>Le Muséon (Louvain)</i>
MDP	<i>Mémoires de la Délégation en Perse</i>	N	<i>Nature</i>
MED	<i>Medicus (Karachi)</i>	NAGE	<i>New AGE (New Delhi)</i>
MEDA	<i>Medica (Paris)</i>	NAR	<i>Nutrition Abstracts and Reviews</i>
METL	<i>Metallen (Sweden)</i>	NARSU	<i>Nova Acta Reg. Soc. Sci. Upsaliensis</i>
MGG	<i>Monatsschrift f. Geburtshilfe u. Gynäkologie</i>	NC	<i>Numismatic Chronicle (and Journ. Roy. Numismatic Soc.)</i>
MGGW	<i>Mitteilungen d. geographische Gesellschaft Wien</i>	NCDN	<i>North China Daily News</i>
MGSC	<i>Memoirs of the Chinese Geological Survey</i>	NCGH	<i>Nihon Chūgoku Gakkai-hō (Bulletin of the Japanese Sino-logical Society)</i>
MH	<i>Medical History</i>	NCH	<i>North China Herald</i>
MI	<i>Metal Industry</i>	NCR	<i>New China Review</i>
MIE	<i>Mémoires de l'Institut d'Égypte (Cairo)</i>	NDI	<i>Niigata Daigaku Igakubu Gakushikai Kaihō (Bulletin of the Medical Graduate Society of Niigata University)</i>
MIFC	<i>Mémoires de l'Institut Français d'Archéol. Orientale (Cairo)</i>	NFR	<i>Nat. Fireworks Review</i>
MIK	<i>Mikrochemie</i>	NHK	<i>Nihon Heibon Keisha (publisher)</i>
MIMG	<i>Mining Magazine</i>	NIZ	<i>Nihon Ishigaku Zasshi (Jap. Journ. Hist. Med.)</i>
MIT	<i>Massachusetts Institute of Technology</i>	NN	<i>Nation</i>
MJ	<i>Mining Journal, Railway and Commercial Gazette</i>	NQ	<i>Notes and Queries</i>
MJA	<i>Med. Journ. Australia</i>	NR	<i>Numismatic Review</i>
MJPGA	<i>Mitteilungen aus Justus Perthes Geogr. Anstalt (Petermann's)</i>	NRRS	<i>Notes and Records of the Royal Society</i>
MKDUS/HF	<i>Meddelelser d. Kgl. Danske Videnskabernes Selskab (Hist.-Filol.)</i>	NS	<i>New Scientist</i>
MM	<i>Mining and Metallurgy (New York, contd. as Mining Engineering)</i>	NSN	<i>New Statesman and Nation (London)</i>
MMN	<i>Materia Medica Nordmark</i>	NU	<i>The Nucleus</i>
MMVKH	<i>Mitteilungen d. Museum f. Völkerkunde (Hamburg)</i>	NUM/SHR	<i>Studies in the History of Religions (Supplements to Numen)</i>
MMW	<i>Münchener Medizinische Wochenschrift</i>	NW	<i>Naturwissenschaften</i>
MOULA	<i>Memoirs of the Osaka University of Liberal Arts and Education</i>	OAZ	<i>Ostasiatische Zeitschrift</i>
MP	<i>Il Marco Polo</i>	ODVS	<i>Oversigt over det k. Danske Videnskabernes Selskabs Forhandlinger</i>
MPMH	<i>Memoirs of the Peabody Museum of American Archaeology and Ethnology, Harvard University</i>	OE	<i>Oriens Extremus (Hamburg)</i>
MRASP	<i>Mémoires de l'Acad. Royale des Sciences (Paris)</i>	OLZ	<i>Orientalische Literatur-Zeitung</i>
MRDTB	<i>Memoirs of the Research Dept. of Tōyō Bunko (Tokyo)</i>	ORA	<i>Oriental Art</i>
MRS	<i>Mediaeval and Renaissance Studies</i>	ORCH	<i>Orientalia Christiana</i>
		ORD	<i>Ordance</i>
		ORG	<i>Organon (Warsaw)</i>
		ORR	<i>Orientalia (Rome)</i>
		ORS	<i>Orientalia Suecana</i>
		OSIS	<i>Osiris</i>
		OUP	<i>Oxford University Press</i>
		OUSS	<i>Ochanomizu University Studies</i>
		OX	<i>Oxoniensia</i>

PAAAS	<i>Proceeding of the British Academy</i>	RBS	<i>Revue Bibliographique de Sinologie</i>
PAAQS	<i>Proceedings of the American Antiquarian Society</i>	RDM	<i>Revue des Mines</i> (later <i>Revue Universelle des Mines</i>)
PAI	<i>Paideuma</i>	RGVV	<i>Religionsgeschichtliche Versuche und Vorarbeiten</i>
PAKJS	<i>Pakistan Journ. Sci.</i>	RHR/AMG	<i>Revue de l'Histoire des Religions</i> (<i>Annales du Musée Guimet, Paris</i>)
PAKPJ	<i>Pakistan Philos. Journ.</i>	RHS	<i>Revue d'Histoire des Sciences</i>
PAPS	<i>Proc. Amer. Philos. Soc.</i>	RHSID	<i>Revue d'Histoire de la Sidérurgie</i> (Nancy)
PCASC	<i>Proc. Cambridge Antiquarian Soc.</i>	RIN	<i>Rivista Italiana di Numismatica</i>
PEW	<i>Philosophy East and West</i> (Univ. Hawaii)	RKW	<i>Repertorium f. Kunst. wissenschaft</i>
PF	<i>Psychologische Forschung</i>	RMY	<i>Revue de Mycologie</i>
PHI	<i>Die Pharmazeutische Industrie</i>	ROC	<i>Revue de l'Orient Chrétien</i>
PHREV	<i>Pharmacological Reviews</i>	RP	<i>Revue Philosophique</i>
PHY	<i>Physis</i> (Florence)	RPA	Rationalist Press Association (London)
PJ	<i>Pharmaceut. Journal</i> (and <i>Trans. Pharmaceut. Soc.</i>)	RPCHG	<i>Revue de Pathologie comparée et d'Hygiène générale</i> (Paris)
PKAWA	<i>Proc. Kon. Akad. Wetensch. Amsterdam</i>	RPLHA	<i>Revue de Philol., Litt. et Hist. Ancienne</i>
PKR	<i>Peking Review</i>	RR	<i>Review of Religion</i>
PM	<i>Presse Medicale</i>	RSCI	<i>Revue Scientifique</i> (Paris)
PMG	<i>Philosophical Magazine</i>	RSH	<i>Revue de Synthèse Historique</i>
PMLA	<i>Publications of the Modern Language Association of America</i>	RSI	<i>Reviews of Scientific Instruments</i>
PNHB	<i>Peking Natural History Bulletin</i>	RSO	<i>Rivista di Studi Orientali</i>
POLYJ	<i>Polytechnisches Journal</i> (Dingler's)	RUB	<i>Revue de l'Univ. de Bruxelles</i>
PPHS	<i>Proceedings of the Prehistoric Society</i>	S	<i>Sinologica</i> (Basel)
PRGS	<i>Proceedings of the Royal Geographical Society</i>	SA	<i>Sinica</i> (originally <i>Chinesische Blätter f. Wissenschaft u. Kunst</i>)
PRIA	<i>Proceedings of the Royal Irish Academy</i>	SAEC	<i>Supplemento Annuale all'Enciclopedia di Chimica</i>
PRPH	<i>Produits Pharmaceutiques</i>	SAEP	Soc. Anonyme des Études et Pub. (publisher)
PRSA	<i>Proceedings of the Royal Society</i> (Series A)	SAM	<i>Scientific American</i>
PRSB	<i>Proceedings of the Royal Society</i> (Series B)	SB	<i>Shizen to Bunka</i> (<i>Nature and Culture</i>)
PRSM	<i>Proceedings of the Royal Society of Medicine</i>	SBE	<i>Sacred Books of the East</i> series
PSEBM	<i>Proc. Soc. Exp. Biol. and Med.</i>	SBK	<i>Seikatsu Bunka Kenkyū</i> (<i>Journ. Econ. Cult.</i>)
PTRS	<i>Philosophical Transactions of the Royal Society</i>	SBM	<i>Svenska Bryggareföreningens Månadsblad</i>
QSGNM	<i>Quellen u. Studien z. Gesch. d. Naturwiss. u. d. Medizin</i> (continuation of <i>Archiv. f. Gesch. d. Math., d. Naturwiss. u. d. Technik, AGMNT</i> , formerly <i>Archiv. f. d. Gesch. d. Naturwiss. u. d. Technik, AGNT</i>)	SC	<i>Science</i>
QSKMR	<i>Quellenschriften f. Kunstgeschichte und Kunsttechnik des Mittelalters u. d. Renaissance</i> (Vienna)	SCI	<i>Scientia</i>
RA	<i>Revue Archéologique</i>	SCIS	<i>Sciences; Revue de la Civilisation Scientifique</i> (Paris)
RAA/AMG	<i>Revue des Arts Asiatiques</i> (<i>Annales du Musée Guimet</i>)	SCISA	<i>Scientia Sinica</i> (Peking)
RAAAS	<i>Reports, Australasian Assoc. Adv. of Sci.</i>	SCK	<i>Smithsonian Contributions to Knowledge</i>
RAAO	<i>Revue d'Assyriologie et d'Archéologie Orientale</i>	SCM	Student Christian Movement (Press)
RALUM	<i>Revue de l'Aluminium</i>	SCON	<i>Studies in Conservation</i> (<i>Journ. Internat. Institut. for the Conservation of Museum objects</i>)
RB	<i>Revue Biblique</i>	SET	<i>Structure et Evolution des Techniques</i>
RBPH	<i>Revue Belge de Philol. et d'Histoire</i>	SGZ	<i>Shigaku Zasshi</i> (<i>Historical Journ. of Japan</i>)
		SHA	<i>Shukan Asahi</i>
		SHAW/PH	<i>Sitzungsber. d. Heidelberg. Akad. d. Wissensch.</i> (Phil.-Hist. Kl.)

SHST/T	<i>Studies in the History of Science and Technol.</i> (Tokyo Univ. Inst. Technol.)	TIMM	<i>Transactions of the Institution of Mining and Metallurgy</i>
SI	<i>Studia Islamica</i> (Paris)	TJSL	<i>Transactions (and Proceedings) of the Japan Society of London</i>
SIB	<i>Sibrium</i> (Collana di Studi e Documentazioni, Centro di Studi Preistorici e Archeologici Varese)	TLTC	<i>Ta Lu Tsa Chih</i> (Continent Magazine), Taipei
SILL	<i>Sweden Illustrated</i>	TMIE	<i>Travaux et Mémoires de l'Inst. d'Ethnologie</i> (Paris)
SK	<i>Seminarium Kondakovianum</i> (Recueil d'Études de l'Institut Kondakov)	TNS	<i>Transactions of the Newcomen Society</i>
SM	<i>Scientific Monthly</i> (formerly <i>Popular Science Monthly</i>)	TOCS	<i>Transactions of the Oriental Ceramic Society</i>
SN	<i>Shirin</i> (<i>Journal of History</i>), Kyoto	TP	<i>T'oung Pao</i> (<i>Archives concernant l'Histoire, les Langues, la Géographie, l'Ethnographie et les Arts de l'Asie Orientale</i>), Leiden
SNM	<i>Sbornik Nauknych Materialov</i> (Erivan, Armenia)	TQ	<i>Tel Quel</i> (Paris)
SOS	<i>Semitic and Oriental Studies</i> (Univ. of Calif. Publ. in Semitic Philol.)	TR	<i>Technology Review</i>
SP	<i>Speculum</i>	TRAD	<i>Tradition</i> (<i>Zeitschr. f. Firmengeschichte und Unternehmerbiographie</i>)
SPAW/PH	<i>Sitzungsber. d. preuss. Akad. d. Wissenschaften</i> (Phil.-Hist. Kl.)	TRSC	<i>Trans. Roy. Soc. Canada</i>
SPCK	Society for the Promotion of Christian Knowledge	TS	<i>Tōhō Shūkyō</i> (<i>Journal of East Asian Religions</i>)
SPMSE	<i>Sitzungsberichte d. physik. med. Soc. Erlangen</i>	TSFFA	<i>Techn. Studies in the Field of the Fine Arts</i>
SPR	<i>Science Progress</i>	TTT	<i>Theoria to Theory</i> (Cambridge)
SSIP	<i>Shanghai Science Institute Publications</i>	TYG	<i>Tōyō Gakuhō</i> (<i>Reports of the Oriental Society of Tokyo</i>)
STM	<i>Studi Medievali</i>	TYGK	<i>Tōyōgaku</i> (<i>Oriental Studies</i>), Sendai
SWAW/PH	<i>Sitzungsberichte d. k. Akad. d. Wissenschaften Wien</i> (Phil.-Hist. Klasse), Vienna	TYKK	<i>Thien Yeh Khao Ku Pao Kao</i> (<i>Archaeological Reports</i>)
TAFSA	<i>Transactions of the American Foundrymen's Association</i>	UCC	<i>University of California Chronicle</i>
TAIME	<i>Trans. Amer. Inst. Mining Engineers</i> (continued as <i>TAIMME</i>)	UCR	<i>University of Ceylon Review</i>
TAIMME	<i>Transactions of the American Institute of Mining and Metallurgical Engineers</i>	UNASIA	<i>United Asia</i> (India)
TAPS	<i>Transactions of the American Philosophical Society</i> (cf. <i>MAPS</i>)	UNESC	<i>Unesco Courier</i>
TAS/J	<i>Transactions of the Asiatic Society of Japan</i>	UNESCO	United Nations Educational, Scientific and Cultural Organisation
TBKK	<i>Tōhoku Bunka Kenkyūshitsu Kiyō</i> (<i>Record of the North-Eastern Research Institute of Humanistic Studies</i>), Sendai	UUA	<i>Uppsala Univ. Årsskrift</i> (<i>Acta Univ. Upsaliensis</i>)
TCS	<i>Trans. Ceramic Society</i> (formerly <i>Trans. Engl. Cer. Soc.</i> , contd as <i>Trans. Brit. Cer. Soc.</i>)	VBA	<i>Visva-Bharati Annals</i>
TCULT	<i>Technology and Culture</i>	VBW	<i>Vorträge d. Bibliothek Warburg</i>
TFTC	<i>Tung Fang Tsa Chih</i> (<i>Eastern Miscellany</i>)	VK	<i>Vijnan Karmee</i>
TGAS	<i>Transactions of the Glasgow Archaeological Society</i>	VKAWA/L	<i>Verhandelingen d. Koninklijke Akad. v. Wetenschappen te Amsterdam</i> (Afd. Letterkunde)
TG/T	<i>Tōhō Gakuhō, Tōkyō</i> (<i>Tokyo Journal of Oriental Studies</i>)	VMAWA	<i>Verlagen en Meded. d. Koninklijke Akad. v. Wetenschappen te Amsterdam</i>
TH	<i>Thien Hsia Monthly</i> (Shanghai)	VVBGP	<i>Verhandlungen d. Verein z. Beförderung des Gewerbestreßes in Preussen</i>
THG	<i>Tōhōgaku</i> (<i>Eastern Studies</i>), Tokyo	WA	<i>Wissenschaftliche Annalen</i>
TICE	<i>Transactions of the Institute of Chemical Engineers</i>	WKW	<i>Wiener klinische Wochenschrift</i>
		WS	<i>Wên Shih</i> (<i>History of Literature</i>), Peking
		WWTK	<i>Wên Wu</i> (formerly <i>Wên Wu Tshan Khao Tzu Liao</i> , <i>Refer-</i>

ABBREVIATIONS

	<i>ence Materials for History and Archaeology)</i>	ZAC	<i>Zeitschr. f. angewandte chemie</i>
		ZAC/AC	<i>Angewandte Chemie</i>
WZNHK	<i>Wiener Zeitschr. f. Nervenheilkunde</i>	ZAES	<i>Zeitschrift f. Aegyptische Sprache u. Altertumskunde</i>
		ZASS	<i>Zeitschr. f. Assyriologie</i>
YCHP	<i>Yenching Hsüeh Pao (Yenching University Journal of Chinese Studies)</i>	ZDMG	<i>Zeitschrift d. deutsch. Morgenländischen Gesellschaft</i>
		ZGEB	<i>Zeitschr. d. Gesellsch. f. Erdkunde (Berlin)</i>
YJBM	<i>Yale Journal of Biology and Medicine</i>	ZMP	<i>Zeitschrift f. Math. u. Physik</i>
YJSS	<i>Yenching Journal of Social Studies</i>	ZPC	<i>Zeitschr. f. physiologischen Chemie</i>
		ZS	<i>Zeitschr. f. Semitistik</i>
Z	<i>Zalmoxis; Revue des Études Religieuses</i>	ZVSF	<i>Zeitschr. f. vergl. Sprachforschung</i>

ADDENDA TO ABBREVIATIONS

This list is Conflated with that on p. 271 of SCC, Vol. 5, part 3. The items which appeared in that list are indicated here by an asterisk.

AAS	<i>Arts Asiaticques</i>		Health and Tibbi Research, Karachi)
*ACTAS	<i>Acta Asiatica (Bull. of Eastern Culture, Tôhō Gakkai, Tokyo)</i>	JARCHS	<i>Journ. Archaeol. Science</i>
ADR	<i>American Dyestuff Reporter</i>	JJHS	<i>Japanese Journ. History of Science</i>
AGMNT	<i>Archiv f. d. Geschichte d. Mathematik, d. Naturwiss. u. d. Technik</i>	JPMA	<i>Journ. Pakistan Med. Assoc.</i>
AIND	<i>Ancient India (Bull. Archaeol. Survey of India)</i>	MAGW	<i>Mitt. d. Anthropol. Gesellschaft in Wien</i>
AOAW/PH	<i>Anzeiger d. Österr. Akad. d. Wiss. (Vienna, Phil.-Hist. Klasse)</i>	MARCH	<i>Mediaeval Archaeology</i>
BCED	<i>Biochemical Education</i>	MLJ	<i>Mittel-Lateinisches Jahrbuch</i>
*BILCA	<i>Boletim do Instituto Luis de Camoes (Macao)</i>	MMLPS	<i>Memoirs of the Manchester Literary and Philosophical Soc.</i>
BIOL	<i>The Biologist</i>	NAMSL	<i>Nouvelles Archives des Missions Scientifiques et Littéraires</i>
BJHOS	<i>Brit. Journ. History of Science</i>	*NGM	<i>National Geographic Magazine</i>
BSAC	<i>Bull. de la Soc. d'Acupuncture</i>	NT	<i>Novum Testamentum</i>
*CFC	<i>Cahiers Franco-Chinois (Paris)</i>	NTS	<i>New Testament Studies</i>
*CHEM	<i>Chemistry (Easton, Pa.)</i>	PAKARCH	<i>Pakistan Archaeology</i>
CLMED	<i>Classica et Mediaevalia</i>	PAR	<i>Parabola</i>
*COMP	<i>Comprendre (Soc. Eu. de Culture, Venice)</i>	PBM	<i>Perspectives in Biol. and Med.</i>
*CR/MSU	<i>Centennial Review of Arts and Science (Michigan State University)</i>	PHYR	<i>Physical Review</i>
DZA	<i>Deutsche Zeitschr. f. Akupunktur</i>	PIH	<i>Pharmacy in History</i>
EB	<i>Encyclopaedia Britannica</i>	*POLREC	<i>Polar Record</i>
*ECB	<i>Economic Botany</i>	POPST	<i>Population Studies</i>
ENZ	<i>Enzymologia</i>	PRPSG	<i>Proc. Roy. Philos. Soc. Glasgow</i>
EPI	<i>Episteme</i>	*PV	<i>Pacific Viewpoint (New Zealand)</i>
ESSOM	<i>Esso Magazine</i>	RIAC	<i>Revue Internationale d'Acupuncture</i>
GERI	<i>Geriatrics</i>	RTS	<i>Religious Tract Society</i>
GESN	<i>Gesnerus</i>	SCRM	<i>Scriptorium</i>
HAHR	<i>Hispanic American Historical Review</i>	SHM	<i>Studies in the History of Medicine</i>
HAM	<i>Hamdard Voice of Eastern Medicine (Organ of the Inst. of</i>	SOB	<i>Sobornost</i>
		TCP	<i>Transactions and Studies of the College of Physicians of Philadelphia</i>
		ZGNTM	<i>Zeitschr. f. Gesch. d. Naturwiss., Technik u. Med.</i>

A. CHINESE AND JAPANESE BOOKS BEFORE +1800

Each entry gives particulars in the following order:

- (a) title, alphabetically arranged, with characters;
- (b) alternative title, if any;
- (c) translation of title;
- (d) cross-reference to closely related book, if any;
- (e) dynasty;
- (f) date as accurate as possible;
- (g) name of author or editor, with characters;
- (h) title of other book, if the text of the work now exists only incorporated therein; or, in special cases, references to sinological studies of it;
- (i) references to translations, if any, given by the name of the translator in Bibliography C;
- (j) notice of any index or concordance to the book if such a work exists;
- (k) reference to the number of the book in the *Tao Tsang* catalogue of Wiegner (6), if applicable;
- (l) reference to the number of the book in the *San Tsang* (Tripitaka) catalogues of Nanjio (1) and Takakusu & Watanabe, if applicable.

Words which assist in the translation of titles are added in round brackets.

Alternative titles or explanatory additions to the titles are added in square brackets.

It will be remembered (p. 305 above) that in Chinese indexes words beginning *Chh-* are all listed together after *Ch-*, and *Hs-* after *H-*, but that this applies to initial words of titles only.

A-Nan Ssu Shih Ching 阿難四事經.

Sūtra on the Four Practices spoken to Ānanda.

India.

Tr. San Kuo, betw. +222 and +230 by Chih-Chhien 支謙.

N/696; TW/493.

A-Phi-Thau-Phi Po-Sha Lun 阿毘曇

毘婆沙論.

Abhidharma Mahāvibhāṣā.

India (this recension not much before +600).

Tr. Hsüan-Chuang, +659 玄奘.

N/1263; TW/1546.

Chang Chen-Yen Chin Shih Ling Sha Lun.

See *Chin Shih Ling Sha Lun*.

Chao Fei-Yen Pieh Chuan 趙飛燕別傳.

[= *Chao Hou I Shih*.]

Another Biography of Chao Fei-Yen [historical novelette].

Sung.

Chhin Shun 秦醇.

Chao Fei-Yen Wai Chuan 趙飛燕外傳.

Unofficial Biography of Chao Fei-Yen

(d. -6, celebrated dancing-girl, consort and empress of Han Chhêng Ti).

Ascr. Han, +1st.

Attrib. Ling Hsüan 伶玄.

Chao Hou I Shih 趙后遺事.

A Record of the Affairs of the Empress Chao (-1st century).

See *Chao Fei-Yen Pieh Chuan*.

Where there are any differences between the entries in these bibliographies and those in Vols. 1-4, the information here given is to be taken as more correct.

An interim list of references to the editions used in the present work, and to the *tshung-shu* collections in which books are available, has been given in Vol. 4, pt. 3, pp. 913 ff., and is available as a separate brochure.

ABBREVIATIONS

C/Han	Former Han.
E/Wei	Eastern Wei.
H/Han	Later Han.
H/Shu	Later Shu (Wu Tai).
H/Thang	Later Thang (Wu Tai).
H/Chin	Later Chin (Wu Tai).
S/Han	Southern Han (Wu Tai).
S/Phing	Southern Phing (Wu Tai).
J/Chin	Jurchen Chin.
L/Sung	Liu Sung.
N/Chou	Northern Chou.
N/Chhi	Northern Chhi.
N/Sung	Northern Sung (before the removal of the capital to Hangchow).
N/Wei	Northern Wei.
S/Chhi	Southern Chhi.
S/Sung	Southern Sung (after the removal of the capital to Hangchow).
W/Wei	Western Wei.

Chao Hun 招魂.

The Summons of the Soul [ode].

Chou (Chhu), c. -240.

Prob. Ching Chhai 景差.

Tr. Hawkes (1), p. 103.

Chen Chhi Huan Yuan Ming 真氣還元銘.

The Inscription on the Regeneration of the Primary Chhi.

Thang or Sung, must be before the mid +13th century.

Writer unknown.

TT/261.

Chen Chung Chi 枕中記.

[= *Ko Hung Chen Chung Shu*.]

Pillow-Book (of Ko Hung).

Ascr. Chin, c. +320, but actually not earlier than the +7th century.

Attrib. Ko Hung 葛洪.

TT/830.

Chen Chung Chi 枕中記.

See *Shê Yang Chen Chung Chi*.

Chen-Chung Hung-Pao Yuan-Pi Shu 枕中鴻寶苑祕書.

The Infinite Treasure of the Garden of Secrets; (Confidential) Pillow-Book (of the Prince of Huai-Nan).

See *Huai-Nan Wang Wan Pi Shu*.

Cf. Kaltenmark (2), p. 32.

Chen Hsi 眞系.

The Legitimate Succession of Perfected, or Realised, (Immortals).

Thang, +805.

Li Po 李膺.

In YCCC, ch. 5, pp. 1a ff.

- Chen Kao* 眞誥.
Declarations of Perfected, or Realised, (Immortals) [visitations and revelations of the Taoist pantheon].
Chin and S/Chhi. Original material from +364 to +370, collected from +484 to +492 by Thao Hung-Ching (+456 to +536), who provided commentary and postface by +493 to +498; finished +499.
Original writers unknown.
Ed. Thao Hung-Ching 陶弘景.
TT/1004.
- Chen Yuan Miao Tao Hsiu Tan Li Yen Chhao* 眞元妙道修丹歷驗抄.
[= *Hsiu Chen Li Yen Chhao Thu.*]
A Document concerning the Tried and Tested (Methods for Preparing the) Restorative Enchymoma of the Mysterious Tao of the Primary (Vitalities) [physiological alchemy].
Thang or Sung, before +1019.
Tung Chen Tzu (ps.) 洞眞子.
In *YCCC*, ch. 72, pp. 17b ff.
- Chen Yuan Miao Tao Yao Lüeh* 眞元妙道要畧.
Classified Essentials of the Mysterious Tao of the True Origin (of Things) [alchemy and chemistry].
Ascr. Chin, +3rd, but probably mostly Thang, +8th and +9th, at any rate after +7th as it quotes Li Chi.
Attrib. Cheng Ssu-Yuan 鄭思遠.
TT/917.
- Chêng I Fa Wên (Thai-Shang) Wai Lu I* 正一法文太上外籙儀.
The System of the Outer Certificates, a Thai-Shang Scripture.
Date unknown, but pre-Thang.
Writer unknown.
TT/1225.
- Chêng Lei Pên Tshao* 證類本草.
See *Ching-Shih Chêng Lei Pei-Chi Pên Tshao* and *Chhung-Hsiu Chêng-Ho Ching-Shih Chêng Lei Pei-Yung Pên Tshao*
- Chêng Tao Pi Shu Shih Chung* 證道秘書十種.
Ten Types of Secret Books on the Verification of the Tao.
See Fu Chin-Chhüan (6)
- Chi Hsiao Hsin Shu* 紀效新書.
A New Treatise on Military and Naval Efficiency.
Ming, c. +1575.
Chhi Chi-Kuang 戚繼光.
- Chi Hsien Chuan* 集仙傳.
Biographies of the Company of the Immortals.
Sung, c. +1140.
Tsêng Tshao 曾慥.
- Chi I Chi* 集異記.
A Collection of Assorted Stories of Strange Events.
Thang.
Hstieh Yung-Jo 薛用弱.
- Chi Ni Tzu* 計倪子.
[= *Fan Tzu Chi Yan* 范子計然.]
The Book of Master Chi Ni.
Chou (Yüeh), -4th century.
Attrib. Fan Li 范蠡, recording the philosophy of his master Chi Jan 計然.
- Chi Shêng Fang* 濟生方.
Prescriptions for the Preservation of Health.
Sung, c. +1267.
Yen Yung-Ho 嚴用和.
- Chi Than Lu* 劇談錄.
Records of Entertaining Conversations.
Thang, c. +885.
Khang Phien 康駢 or 駢.
- Chi Yün* 集韻.
Complete Dictionary of the Sounds of Characters [cf. *Chhieh Yün* and *Kuang Yün*].
Sung, +1037.
Compiled by Ting Tu 丁度 *et al.*
Possibly completed in +1067 by Ssuma Kuang 司馬光.
- Chia-Yu Pên Tshao* 嘉祐本草.
See *Chia-Yu Pu-Chu Shen Nung Pên Tshao*.
- Chia-Yu Pu-Chu Shen Nung Pên Tshao* 嘉祐補註神農本草.
Supplementary Commentary on the *Pharmacopoeia of the Heavenly Husbandman*, commissioned in the Chia-Yu reign-period.
Sung, commissioned +1057, finished +1060.
Chang Yü-Hsi 掌禹錫,
Lin I 林億,
& Chang Tung 張洞.
- Chiang Huai I Jen Lu* 江淮異人錄.
Records of (Twenty-five) Strange Magician-Technicians between the Yangtze and the Huai River (during the Thang, Wu and Nan Thang Dynasties, c. +850 to +950).
Sung, c. +975.
Wu Shu 吳淑.
- Chiang Wên-Thung Chi* 江文通集.
Literary Collection of Chiang Wên-Thung (Chiang Yen).
S/Chhi, c. +500.
Chiang Yen 江淹.
- Chiao Chhuang Chiu Lu* 蕉窗九錄.
Nine Dissertations from the (Desk at the) Banana-Grove Window.
Ming, c. +1575.
Hsiang Yuan-Pien 項元汴.
- Chien Wu Chi* 漸悟集.
On the Gradual Understanding (of the Tao).
Sung, mid +12th century.
Ma Yü 馬鈺.
TT/1128.
- Chih Chen Tzu Lung Hu Ta Tan Shih* 至眞子龍虎大丹詩.
Song of the Great Dragon-and-Tiger Enchymoma of the Perfected-Truth Master.

- Chi Chen Tzu Lung Hu Ta Tan Shih* (cont.)
Sung, +1026.
Chou Fang (Chih Chen Tzu) 周方.
Presented to the throne by Lu Thien[-Chi]
盧天賦, c. +1115.
TT/266.
- Chih-Chhuan Chen-Jen Chiao Cheng Shu* 稚川
真人校證術.
Technical Methods of the Adept (Ko) Chih-
Chhuan (i.e. Ko Hung), with Critical
Annotations [and illustrations of al-
chemical apparatus].
Ascr. Chin, c. +320, but probably later.
Attrib. Ko Hung 葛洪.
TT/895.
- Chih Chih Hsiang Shuo San Chheng Pi Yao* 直
指詳說三乘秘要.
See *Wu Chen Phien Chih Chih Hsiang Shuo*
San Chheng Pi Yao.
Cf. Davis & Chao Yün-Tshung (6).
- Chih-Chou hsien-sêng Chin Tan Chih Chih* 紙舟
先生金丹直指.
Straightforward Indications about the
Metallic Enchymoma by the Paper-
Boat Teacher.
Sung, prob. +12th.
Chin Yüeh-Yen 金月巖.
TT/239.
- Chih Hsüan Phien* 指玄篇.
A Pointer to the Mysteries [psycho-physio-
logical alchemy].
Sung, c. +1215.
Pai Yü-Chhan 白玉蟾.
In *Hsiu Chen Shih Shu* (TT/260), chs. 1-8.
- Chih Kuei Chi* 指歸集.
Pointing the Way Home (to Life Eternal); a
Collection.
Sung, c. +1165.
Wu Wu 吳悞.
TT/914.
Cf. Chhen Kuo-Fu (1), vol. 2, pp. 389,
390.
- Chih Tao Phien* 旨道篇 (or 綱).
A Demonstration of the Tao.
Sui or just before, c. +580.
Su Yuan-Ming (or -Lang) 蘇元明 (朗)
= Chhing Hsia Tzu 青霞子.
Now extant only in quotations.
- Chih Tshao Thu* 芝草圖.
See *Thai-Shang Ling-Pao Chih Tshao Thu*.
- Chin Hua Chhung Pi Tan Ching Pi Chih* 金華
冲碧丹經秘旨.
Confidential Instructions on the Manual of
the Heaven-Piercing Golden Flower
Elixir [with illustrations of alchemical
apparatus].
Sung, +1225.
Phêng Ssu 彭耜 & Mêng Hsü 孟煦
(pref. and ed. Mêng Hsü).
Received from Pai Yü-Chhan 白玉蟾 and
Lan Yuan-Lao 闕元老.
TT/907.
- The authorship of this important work is
obscure. In his preface Mêng Hsü says
that in +1218 he met in the mountains
Phêng Ssu, who transmitted to him a
short work which Phêng himself had re-
ceived from Pai Yü-Chhan. This is ch. 1
of the present book. Two years later Mêng
met an adept named Lan Yuan-Lao, who
claimed to be an avatar of Pai Yü-Chhan
and transmitted to Mêng a longer text;
this is the part which contains descriptions
of the complicated alchemical apparatus
and appears as ch. 2 of the present work.
The name of the book is taken from that
of the alchemical laboratory of Lan Yuan-
Lao, which was called Chin Hua Chhung
Pi Tan Shih 金華冲碧丹室.
- Chin Hua Tsung Chih* 金華宗旨
[= *Thai-I Chin Hua Tsung Chih*, also entitled
Chhang Shêng Shu; former title: *Lü*
Tsu Chhuan Shou Tsung Chih.]
Principles of the (Inner) Radiance of the
Metallic (Enchymoma) [a Taoist *nei tan*
treatise on meditation and sexual tech-
niques, with Buddhist influence].
Ming and Chhing, c. +1403, finalised
+1663, but may have been transmitted
orally from an earlier date. Present title
from +1668.
Writer unknown. Attrib. Lü Yen 呂岳
(Lü Tung-Pin) and his school, late
+8th.
Commentary by Tan Jan-Hui 澹然憲
(1921).
Prefaces by Chang San-Fêng 張三峯
(c. +1410) and several others, some per-
haps apocryphal.
See also *Lü Tsu Shih Hsien-Thien Hsü Wu*
Thai-I Chin Hua Tsung Chih.
Cf. Wilhelm & Jung (1).
- Chin Hua Yü I Ta Tan* 金華玉液大丹.
The Great Elixir of the Golden Flower (or,
Metallic Radiance) and the Juice of
Jade.
Date unknown, probably Thang.
Writer unknown.
TT/903.
- Chin Hua Yü Nü Shuo Tan Ching* 金華玉女
說丹經.
Sermon of the Jade Girl of the Golden
Flower about Elixirs and Enchymomas.
Wu Tai or Sung.
Writer unknown.
In YCCC, ch. 64, pp. 1 a ff.
- Chin I Huan Tan Pai Wên Chieh* 金液還丹百
問訣.
Questions and Answers on Potable Gold
(Metallic Fluid) and Cyclically-
Transformed Elixirs and Enchymomas.
Sung.
Li Kuang-Hsüan 李光玄.
TT/263.

- Chin I Huan Tan Yin Cheng Thu* 金液還丹印證圖.
Illustrations and Evidential Signs of the Regenerative Enchymoma (constituted by, or elaborated from) the Metallous Fluid.
Sung, prob. +12th, perhaps c. +1218, date of preface.
Lung Mei Tzu (ps.) 龍眉子.
TT/148.
- Chin Ku Chhi Kuan* 今古奇觀.
Strange Tales New and Old.
Ming, c. +1620; pr. betw. +1632 and +1644.
Fêng Mêng-Lung 馮夢龍.
Cf. Pelliot (57).
- Chin Mu Wan Ling Lun* 金木萬靈論.
Essay on the Tens of Thousands of Efficacious (Substances) among Metals and Plants.
Ascr. Chin, c. +320. Actually prob. late Sung or Yuan.
Attrib. Ko Hung 葛洪.
TT/933.
- Chin Pi Wu Hsiang Lei Tshan Thung Chhi* 金碧五相類參同契.
Gold and Caerulean Jade Treatise on the Similarities and Categories of the Five (Substances) and the Kinship of the Three [a poem on physiological alchemy].
Ascr. H/Han, c. +200.
Attrib. Yin Chhang-Shêng 陰長生.
TT/897.
Cf. Ho Ping-Yü (12).
Not to be confused with the *Tshan Thung Chhi Wu Hsiang Lei Pi Yao*, q.v.
- Chin Shih Ling Sha Lun* 金石靈砂論.
A Discourse on Metals, Minerals and Cinnabar (by the Adept Chang).
Thang, between +713 and +741.
Chang Yin-Chü 張隱居.
TT/880.
- Chin Shih Pu Wu Chiu Shu Chüeh* 金石簿五九數訣.
Explanation of the Inventory of Metals and Minerals according to the Numbers Five (Earth) and Nine (Metal) [catalogue of substances with provenances, including some from foreign countries].
Thang, perhaps c. +670 (contains a story relating to +664).
Writer unknown.
TT/900.
- Chin Shih Wu Hsiang Lei* 金石五相類.
[= *Yin Chen Chün Chin Shih Wu Hsiang Lei*.]
The Similarities and Categories of the Five (Substances) among Metals and Minerals (sulphur, realgar, orpiment, mercury and lead) (by the Deified Adept Yin).
Date unknown (ascr. +2nd or +3rd century).
- Attrib. Yin Chen-Chün 陰真君 (Yin Chhang-Shêng).
TT/899.
- Chin Tan Chen Chuan* 金丹眞傳.
A Record of the Primary (Vitalities, regained by) the Metallous Enchymoma.
Ming, +1615.
Sun Ju-Chung 孫汝忠.
- Chin Tan Cheng Li Ta Chhuan* 金丹正理大全.
Comprehensive Collection of Writings on the True Principles of the Metallous Enchymoma [a florilegium].
Ming, c. +1440.
Ed. Han Chhan Tzu 涵韓子.
Cf. Davis & Chao Yün-Tshung (6).
- Chin Tan Chieh Yao* 金丹節要.
Important Sections on the Metallous Enchymoma.
Part of *San-Fêng Tan Chüeh* (q.v.).
- Chin Tan Chih Chih* 金丹直指.
Straightforward Explanation of the Metallous Enchymoma.
Sung, prob. +12th.
Chou Wu-So 周無所.
TT/1058.
Cf. *Chih-Chou hsien-sêng Chin Tan Chih Chih*.
See Chhen Kuo-Fu (1), vol. 2, pp. 447 ff.
- Chin Tan Chin Pi Chhien Thung Chüeh* 金丹金碧潛通訣.
Oral Instructions explaining the Abscondite Truths of the Gold and Caerulean Jade (Components of the) Metallous Enchymoma.
Date unknown, not earlier than Wu Tai.
Writer unknown.
Incomplete in YCCC, ch. 73, pp. 7a ff.
- Chin Tan Fu* 金丹賦.
Rhapsodical Ode on the Metallous Enchymoma.
Sung, +13th.
Writer unknown.
Comm. by Ma Li-Chao 馬澄昭.
TT/258.
Cf. *Nei Tan Fu*, the text of which is very similar.
- Chin Tan Lung Hu Ching* 金丹龍虎經.
Gold Elixir Dragon and Tiger Manual.
Thang or early Sung.
Writer unknown.
Extant only in quotations, as in *Chu Chia Shen Phin Tan Fa*, q.v.
- Chin Tan Pi Yao Tshan Thung Lu* 金丹秘要參同錄.
Essentials of the Gold Elixir; a Record of the Concordance (or Kinship) of the Three.
Sung.
Mêng Yao-Fu 孟要甫.
In *Chu Chia Shen Phin Tan Fa*, q.v.
- Chin Tan Ssu Pai Tzu* 金丹四百字.
The Four-Hundred Word Epitome of the Metallous Enchymoma.

- Chin Tan Ssu Pai Tzu* (cont.)
Sung, c. +1065.
Chang Po-Tuan 張伯端.
In *Hsiu Chen Shih Shu* (TT/260), ch. 5,
pp. 1a ff.
TT/1067.
Comms. by Phêng Hao-Ku and Min I-Tê
in *Tao Tsang Hsi Pien* (*Chhu chi*), 21.
Tr. Davis & Chao Yün-Tshung (2).
- Chin Tan Ta Chheng* 金丹大成.
Compendium of the Metallous Enchymoma.
Sung, just before +1250.
Hsiao Thing-Chih 蕭廷芝.
In *TTCY* (*mao chi*, 4), and in *TT*/260,
Hsiu Chen Shih Shu, chs. 9-13 incl.
- Chin Tan Ta Yao* 金丹大要.
[= *Shang Yang Tzu Chin Tan Ta Yao*.]
Main Essentials of the Metallous Enchy-
moma; the true Gold Elixir.
Yuan, +1331 (pref. +1335).
Chhen Chih-Hsü 陳致虛
(Shang Yang Tzu 上陽子).
In *TTCY* (*mao chi*, 1, 2, 3).
TT/1053.
- Chin Tan Ta Yao Hsien Phai* (*Yuan Liu*) 金丹
大要仙派源流.
[= *Shang Yang Tzu Chin Tan Ta Yao
Hsien Phai*.]
A History of the Schools of Immortals
mentioned in the *Main Essentials of the
Metallous Enchymoma; the true Gold Elixir*.
Yuan, c. +1333.
Chhen Chih-Hsü 陳致虛
(Shang Yang Tzu 上陽子).
In *TTCY*, *Chin Tan Ta Yao*, ch. 3, pp.
40 ff.
TT/1056.
- Chin Tan Ta Yao Lieh Hsien Chih* 金丹大要
列仙誌.
[= *Shang Yang Tzu Chin Tan Ta Yao Lieh
Hsien Chih*.]
Records of the Immortals mentioned in the
*Main Essentials of the Metallous Enchy-
moma; the true Gold Elixir*.
Yuan, c. +1333.
Chhen Chih-Hsü 陳致虛
(Shang Yang Tzu 上陽子).
TT/1055.
- Chin Tan Ta Yao Pao Chüeh* 金丹大藥寶訣.
Precious Instructions on the Great Medi-
cines of the Golden Elixir (Type).
Sung, c. +1045.
Tshui Fang 崔昉.
Preface preserved in *Keng Tao Chi*, ch. 1,
p. 8b, but otherwise only extant in
occasional quotations.
Perhaps the same book as the *Wai Tan
Pên Tshao* (q. v.).
- Chin Tan Ta Yao Thu* 金丹大要圖.
[= *Shang Yang Tzu Chin Tan Ta Yao Thu*.]
Illustrations for the *Main Essentials of the
Metallous Enchymoma; the true Gold Elixir*.
Yuan, +1333.
Chhen Chih-Hsü 陳致虛
(Shang Yang Tzu 上陽子).
Based on drawings and tables of the +10th
century onwards by Phêng Hsiao 彭曉,
Chang Po-Tuan 張伯端 (hence the
name *Tzu Yang Tan Fang Pao Chien
Thu*), Lin Shen-Fêng 林神鳳 and
others.
In *TTCY* (*Chin Tan Ta Yao*, ch. 3,
pp. 26a ff.).
TT/1054.
Cf. Ho Ping-Yü & Needham (2).
- Ching Chhu Sui Shih Chi* 荆楚歲時記.
Annual Folk Customs of the States of
Ching and Chhu [i.e. of the districts cor-
responding to those ancient States;
Hupei, Hunan and Chiangsi].
Prob. Liang, c. +550, but perhaps partly
Sui, c. +610.
Tsong Lin 宗懔.
See des Rotours (1), p. cii.
- Ching-Shih Chêng Lei Pei-Chi Pên Tshao* 經史
證類備急本草.
The Classified and Consolidated Armament-
arium of Pharmaceutical Natural History.
Sung, +1083, repr. +1090.
Thang Shen-Wei 唐慎微.
Ching Shih Thung Yen 警世通言.
Stories to Warn Men.
Ming, c. +1640.
Fêng Mêng-Lung 馮夢龍.
- Ching Tien Shih Wên* 經典釋文.
Textual Criticism of the Classics.
Sui, c. +600.
Lu Tê-Ming 陸德明.
- Ching Yen Fang* 經驗方.
Tried and Tested Prescriptions.
Sung, +1025.
Chang Shêng-Tao 張聲道.
Now extant only in quotations.
- Ching Yen Liang Fang* 經驗良方.
Valuable Tried and Tested Prescriptions.
Yuan.
Writer unknown.
- Chiu Chêng Lu* 就正錄.
Drawing near to the Right Way; a Guide
[to physiological alchemy].
Chhing, prefs. +1678, +1697.
Lu Shih-Chhen 陸世忱.
In *Tao Tsang Hsi Pien* (*Chhu chi*), 8.
- Chiu Chuan Chhing Chin Ling Sha Tan* 九轉膏
金靈砂丹.
The Ninefold Cyclically Transformed
Caerulean Golden Numinous Cinnabar
Elixir.
Date unknown.
Writer unknown, but much overlap with
TT/886.
TT/887.
- Chiu Chuan Ling Sha Ta Tan* 九轉靈砂大
丹.

- Chiu Chuan Ling Sha Ta Tan (cont.)*
The Great Ninefold Cyclically Transformed
Numinous Cinnabar Elixir.
Date unknown.
Writer unknown.
TT/886.
- Chiu Chuan Ling Sha Ta Tan Tzu Shêng Hsüan*
Ching 九轉靈砂大丹資聖玄經.
Mysterious (or Esoteric) Sagehood-
Enhancing Canon of the Great Ninefold
Cyclically Transformed Numinous Cinna-
bar Elixir (or Enchymoma).
Date unknown, probably Thang; the text is
in sūtra form.
Writer unknown.
TT/879.
- Chiu Chuan Liu Chu Shen Hsien Chiu Tan Ching*
九轉流珠神仙九丹經.
Manual of the Nine Elixirs of the Holy
Immortals and of the Ninefold Cyclically
Transformed Mercury.
Not later than Sung, but contains material
from much earlier dates.
Thai-Chhing Chen Jen 太清真人.
TT/945.
- Chiu Huan Chin Tan Erh Chang* 九還金丹二章.
Two Chapters on the Ninefold Cyclically
Transformed Gold Elixir.
Alternative title of *Ta-Tung Lien Chen Pao*
Ching, *Chin Huan Chin Tan Miao Chüeh*
(q.v.).
In YCCC, ch. 68, pp. 8 a ff.
- Chiu Phu* 酒譜.
A Treatise on Wine.
Sung, +1020.
Tou Phing 饗萃.
- Chiu Shih* 酒史.
A History of Wine.
Ming, +16th (but first pr. +1750).
Fêng Shih-Hua 馮時化.
- Chiu Thang Shu* 舊唐書.
Old History of the Thang Dynasty [+618
to +906].
Wu Tai (H/Chin), +945.
Liu Hsü 劉昫.
Cf. des Rotours (2), p. 64.
For translations of passages see the index of
Frankel (1).
- Chiu Ting Shen Tan Ching Chüeh*
See *Huang Ti Chiu Ting Shen Tan Ching*
Chüeh.
- Cho Kêng Lu* 耒耕錄.
[Sometimes *Nan Tshun Cho Kêng Lu*.]
Talks (at South Village) while the Plough is
Resting.
Yuan, +1366.
Thao Tsung-I 陶宗儀.
- Chou Hou Pei Chi Fang* 肘後備急方.
[= *Chou Hou Tsu Chiu Fang*
or *Chou Hou Pai I Fang*
or *Ko Hsien Ong Chou Hou Pei Chi Fang*.]
Handbook of Medicines for Emergencies.
Chin, c. +340.
Ko Hung 葛洪.
- Chou Hou Pai I Fang* 肘後百一方
See *Chou Hou Pei Chi Fang*.
- Chou Hou Tsu Chiu Fang* 肘後卒救方
See *Chou Hou Pei Chi Fang*.
- Chou I Tshan Thung Chhi* 周易參同契.
See also titles under *Tshan Thung Chhi*.
- Chou I Tshan Thung Chhi Chieh* 周易參同契解.
The Kinship of the Three and the Book of
Changes, with Explanation.
Text, H/Han, c. +140.
Comm., Sung, +1234.
Ed. & comm. Chhen Hsien-Wei 陳顯微.
TT/998.
- Chou I Tshan Thung Chhi Chu* 周易參同契註.
The Kinship of the Three and the Book of
Changes, with Commentary.
Text, H/Han, c. +140.
Comm. ascr. H/Han, c. +160, but prob-
ably Sung.
Attrib., ed. and comm. Yin Chhang-Shêng
陰長生.
TT/990.
- Chou I Tshan Thung Chhi Chu* 周易參同契註.
The Kinship of the Three and the Book of
Changes, with Commentary.
Text, H/Han, c. +140.
Comm. probably Sung.
Ed. and comm. unknown.
TT/991.
- Chou I Tshan Thung Chhi Chu* 周易參同契註.
The Kinship of the Three and the Book of
Changes, with Commentary.
Text, H/Han, c. +140.
Comm. probably Sung.
Ed. and comm. unknown.
TT/995.
- Chou I Tshan Thung Chhi Chu* 周易參同契註.
The Kinship of the Three and the Book of
Changes, with Commentary.
Text, H/Han, c. +140.
Comm., Sung, c. +1230.
Ed. & comm. Chhu Hua-Ku 儲華谷.
TT/999.
- Chou I Tshan Thung Chhi Chu* (TT/992).
Alternative title for *Tshan Thung Chhi*
Khao I (Chu Hsi's) q.v.
- Chou I Tshan Thung Chhi Fa Hui* 周易參同契
發揮.
Elucidations of the Kinship of the Three and
the Book of Changes [alchemy].
Text, H/Han, c. +140.
Comm., Yuan, +1284.
Ed. & comm. Yü Yen 俞琰.
Tr. Wu & Davis (1).
TT/996.
- Chou I Tshan Thung Chhi Fên Chang Chu* (Chieh)
周易參同契分章註(解).
The Kinship of the Three and the Book of
Changes divided into (short) chapters,
with Commentary and Analysis.

- Chou I Tshan Thung Chhi Fên Chang Chu (Chieh)*
(cont.)
Text, Han, c. +140.
Comm., Yuan, c. +1330.
Comm. Chhen Chih-Hsü 陳致虛
(Shang Yang Tzu 上陽子).
TTCY pên 93.
- Chou I Tshan Thung Chhi Fên Chang Thung*
Chen I 周易參同契分章通真義.
The Kinship of the Three and the Book of
Changes divided into (short) chapters for
the Understanding of its Real Meanings.
Text, H/Han, c. +140.
Comm., Wu Tai +947.
Ed. & comm. Phêng Hsiao 彭曉.
Tr. Wu & Davis (1).
TT/993.
- Chou I Tshan Thung Chhi Shih I* 周易參同契
釋疑.
Clarification of Doubtful Matters in the
Kinship of the Three and the Book of
Changes.
Yuan, +1284.
Ed. & comm. Yü Yen 俞琰.
TT/997.
- Chou I Tshan Thung Chhi Su Lüeh* 周易參同
契疏略.
Brief Explanation of the Kinship of the Three
and the Book of Changes.
Ming, +1564.
Ed. & comm. Wang Wên-Lu 王文祿.
- Chou I Tshan Thung Chhi Ting Chhi Ko Ming*
Ching Thu 易周參同契鼎器歌明鏡
圖.
An Illuminating Chart for the Mnemonic
Rhymes about Reaction-Vessels in the
Kinship of the Three and the Book of
Changes.
Text, H/Han, c. +140 (Ting Chhi Ko
portion only).
Comm., Wu Tai, +947.
Ed. & comm. Phêng Hsiao 彭曉.
TT/994.
- Chu Chêng Pien I* 諸證辨疑.
Resolution of Diagnostic Doubts.
Ming, late +15th.
Wu Chhiu 吳球.
- Chu Chhüan Chi* 竹泉集.
The Bamboo Springs Collection [poems
and personal testimonies on physiological
alchemy].
Ming, +1465.
Tung Chhung-Li et al. 董重理.
In *Wai Chin Tan* (q.v.), ch. 3.
- Chu Chia Shen Phin Tan Fa* 諸家神品丹法.
Methods of the Various Schools for Magical
Elixir Preparations (an alchemical an-
thology).
Sung.
Mêng Yao-Fu 孟要甫
(Hsüan Chen Tzu 玄眞子) et al.
TT/911.
- Chu Fan Chih* 諸蕃志.
Records of Foreign Peoples (and their Trade),
Sung, c. +1225. (This is Pelliot's dating;
Hirth & Rockhill favoured between
+1242 and +1258.)
Chao Ju-Kua 趙汝适.
Tr. Hirth & Rockhill (1).
- Chu Yeh Thing Tsa Chi* 竹葉亭雜記.
Miscellaneous Records of the Bamboo Leaf
Pavilion.
Chhing, begun c. +1790 but not finished
till c. 1820.
Yao Yuan-Chih 姚元之.
- Chuan Hsi Wang Mu Wo Ku Fa* 傳西王母握
固法.
[= *Thai-Shang Chuan Hsi Wang Mu Wo
Ku Fa*.]
A Recording of the Method of Grasping
the Firmness (taught by) the Mother
Goddess of the West.
[Taoist heliotherapy and meditation. 'Grasp-
ing the firmness' was a technical term for
a way of clenching the hands during
meditation.]
Thang or earlier.
Writer unknown.
Fragment in *Hsiu Chen Shih Shu* (TT/260),
ch. 24, p. 1 a ff.
Cf. Maspero (7), p. 376.
- Chuang Lou Chi* 妝樓記.
Records of the Ornamental Pavilion.
Wu Tai or Sung, c. +960.
Chang Mi 張泌.
- Chün-Chai Tu Shu Chih* 郡齋讀書志.
Memoir on the Authenticities of Ancient
Books, by (Chhao) Chün-Chai.
Supg, +1151.
Chhao Kung-Wu 晁公武.
- Chün-Chai Tu Shu Fu Chih* 郡齋讀書附志.
Supplement to Chün-Chai's (Chhao Kung-
Wu's) *Memoir on the Authenticities of
Ancient Books*.
Sung, c. +1200.
Chao Hsi-Pien 趙希弁.
- Chün-Chai Tu Shu Hou Chih* 郡齋讀書後志.
Further Supplement to Chün-Chai's (Chhao
Kung-Wu's) *Memoir on the Authenticities
of Ancient Books*.
Sung, pref. +1151, pr. +1250.
Chhao Kung-Wu 晁公武, re-compiled by
Chao Hsi-Pien 趙希弁, from the edi-
tion of Yao Ying-Chi 姚應鑣.
- Chün Phu* 菌譜.
A Treatise on Fungi.
Sung, +1245.
Chhen Jen-Yü 陳仁玉.
- Chung Hua Ku Chin Chu* 中華古今注.
Commentary on Things Old and New in
China.
Wu Tai (H/Thang), +923 to +926.
Ma Kao 馬竊.
See des Rotours (1), p. xcix.

- Chung Huang Chen Ching* 中黃真經
[= *Thai-Chhing Chung Huang Chen Ching*
or *Thai Tsang Lun.*]
True Manual of the Middle (Radiance) of
the Yellow (Courts), (central regions of the
three parts of the body) [Taoist anatomy
and physiology with Buddhist influence].
Prob. Sung, +12th or +13th.
Chiu Hsien Chün (ps.) 九仙君.
Comm. Chung Huang Chen Jen (ps.) 中
黃真人.
TT/810.
Completing TT/328 and 329 (Wieger).
Cf. Maspero (7), p. 364.
- Chung Lü Chuan Tao Chi* 鍾呂傳道集.
Dialogue between Chungli (Chhüan) and
Lü (Tung-Pin) on the Transmission of
the Tao (and the Art of Longevity, by
Rejuvenation).
Thang, +8th or +9th.
Attrib. Chungli Chhüan 鍾離權 and Lü
Yen 呂岳.
Ed. Shih Chien-Wu 施肩吾.
In *Hsiu Chen Shih Shu* (TT/260), chs.14-16
incl.
- Chung Shan Yü Kuei Fu Chhi Ching* 中山玉
櫃服氣經.
Manual of the Absorption of the Chhi,
found in the Jade Casket on Chung-
Shan (Mtn). [Taoist breathing exercises.]
Thang or Sung, +9th or +10th.
Attrib. Chang Tao-Ling (Han) 張道陵 or
Pi-Yen Chang Tao-ché 碧巖張道者
or Pi-Yen hsien-sêng 碧巖先生.
Comm. by Huang Yuan-Chün 黃元君.
In *YCCC*, ch. 60, pp. 1a ff.
Cf. Maspero (7), pp. 204, 215, 353.
- Chungli Pa Tuan Chin Fa* 鍾離八段錦法.
The Eight Elegant (Gymnastic) Exercises of
Chungli (Chhüan).
Thang, late +8th.
Chungli Chhüan 鍾離權.
In *Hsiu Chen Shih Shu* (TT/260), ch. 19.
Tr. Maspero (7), pp. 418 ff.
Cf. Notice by Tsêng Tshao in *Lin Chiang
Hsien* (TT/260, ch. 23, pp. 1b, 2a) dated
+1151. This says that the text was in-
scribed by Lü Tung-Pin himself on stone
and so handed down.
- Chhang Chhun Tzu Phan-Hsi Chi* 長春子礪溪
集.
Chhiu Chhang-Chhun's Collected (Poems)
at Phan-Hsi.
Sung, c. +1200.
Chhiu Chhu-Chi 邱處機.
TT/1145.
- Chhang Shêng Shu* 長生術.
The Art and Mystery of Longevity and
Immortality.
Alternative title of *Chin Hua Tsung Chih* (q.v.).
- Chhen Wai Hsia Chü Chien* 塵外遐舉踐.
Examples of Men who Renounced Official
Careers and Shook off the Dust of the
World [the eighth and last part (ch. 19)
of *Tsun Shêng Pa Chien*, q.v.].
Ming, +1591.
Kao Lien 高濂.
Chhi Chü An Lo Chien 起居安樂踐.
On (Health-giving) Rest and Recreations in
a Retired Abode [the third part (Chs. 7,
8) of *Tsun Shêng Pa Chien*, q.v.].
Ming, +1591.
Kao Lien 高濂.
Chhi Fan Ling Sha Ko 七返靈砂歌.
Song of the Sevenfold Cyclically Trans-
formed Numinous Cinnabar (Elixir).
See *Chhi Fan Tan Sha Chüeh*.
Chhi Fan Ling Sha Lun 七返靈砂論.
On Numinous Cinnabar Seven Times
Cyclically Transformed.
Alternative title for *Ta-Tung Lien Chen Pao
Ching*, *Hsiu Fu Ling Sha Miao Chüeh*
(q.v.).
In *YCCC*, ch. 69, pp. 1a ff.
Chhi Fan Tan Sha Chüeh 七返丹砂訣.
[= *Wei Po-Yang Chhi Fan Tan Sha Chüeh*
or *Chhi Fan Ling Sha Ko.*]
Explanation of the Sevenfold Cyclically
Transformed Cinnabar (Elixir), (of Wei
Po-Yang).
Date unknown (ascr. H/Han).
Writer unknown (attrib. Wei Po-Yang).
Comm. by Huang Thung-Chün 黃童君.
Thang or pre-Thang, before +806.
TT/881.
- Chhi Hsiao Liang Fang* 奇效良方.
Effective Therapeutics.
Ming, c. +1436, pr. +1470.
Fang Hsien 方賢.
Chhi Kuo Khao 七國考.
Investigations of the Seven (Warring) States.
Ching, c. +1660.
Tung Yüeh 董說.
Chhi Lu 七錄.
Bibliography of the Seven Classes of Books.
Liang, +523.
Juan Hsiao-Hsü 阮孝緒.
Chhi Min Yao Shu 齊民要術.
Important Arts for the People's Welfare
[lit. Equality].
N/Wei (and E/Wei or W/Wei), between
+533 and +544.
Chia Ssu-Hsieh 賈思勰.
See des Rotours (1), p.c.; Shih Shêng-Han (1).
*Chhi Yün Shan Wu Yuan Tzu Hsiu Chen Pien
Nan* (*Tshan Chêng*) 棲雲山悟元子修
眞辨難參證.
See *Hsiu Chen Pien Nan* (*Tshan Chêng*).
Chhih Yün 切韻.
Dictionary of the Sounds of Characters
[rhyming dictionary].
Sui, +601.
Lu Fa-Yen 陸法言
See *Kuang Yün*.

- Chhien Chin Fang Yen I* 千金方衍義.
Dilations upon the *Thousand Golden Remedies*.
Chhing, +1698.
Chang Lu 張璠.
- Chhien Chin I Fang* 千金翼方.
Supplement to the *Thousand Golden Remedies* [i.e. Revised Prescriptions saving lives worth a Thousand Ounces of Gold].
Thang, between +660 and +680.
Sun Ssu-Mo 孫思邈.
- Chhien Chin Shih Chih* 千金食治.
A Thousand Golden Rules for Nutrition and the Preservation of Health [i.e. Diet and Personal Hygiene saving lives worth a Thousand Ounces of Gold], (included as a chapter in the *Thousand Golden Remedies*).
Thang, +7th (c. +625, certainly before +659).
Sun Ssu-Mo 孫思邈.
- Chhien Chin Yao Fang* 千金要方.
A Thousand Golden Remedies [i.e. Essential Prescriptions saving lives worth a Thousand Ounces of Gold].
Thang, between +650 and +659.
Sun Ssu-Mo 孫思邈.
- Chhien Han Shu* 前漢書.
History of the Former Han Dynasty [-206 to +24].
H/Han (begun about +65), c. +100.
Pan Ku 班固, and (after his death in +92) his sister Pan Chao 班昭.
Partial trs. Dubs (2), Pfizmaier (32-34, 37-51), Wylie (2, 3, 10), Swann (1).
Yin-Té Index, no. 36.
- Chhien Hung Chia Keng Chih Pao Chi Chhêng* 鉛汞甲庚至寶集成.
Complete Compendium on the Perfected Treasure of Lead, Mercury, Wood and Metal [with illustrations of alchemical apparatus].
On the translation of this title, cf. Vol. 5, pt. 3. Has been considered Thang, +808; but perhaps more probably Wu Tai or Sung. Cf. p. 276.
Chao Nai-An 趙耐菴.
TT/912.
- Chhien Khun Pi Yün* 乾坤秘蘊.
The Hidden Casket of Chhien and Khun (kua, i.e. Yang and Yin) Open'd.
Ming, c. +1430.
Chu Chhüan 朱權.
(Ning Hsien Wang 寧獻王, prince of the Ming.)
- Chhien Khun Shêng I* 乾坤生意.
Principles of the Coming into Being of Chhien and Khun (kua, i.e. Yang and Yin).
Ming, c. +1430.
Chu Chhüan 朱權.
- (Ning Hsien Wang 寧獻王, prince of the Ming.)
- Chhieh Shui Hsüan Chu* 赤水玄珠.
The Mysterious Pearl of the Red River [a system of medicine and iatro-chemistry].
Ming, +1596.
Sun I-Khuei 孫一奎.
- Chhieh Shui Hsüan Chu Chhüan Chi* 赤水玄珠全集.
The Mysterious Pearl of the Red River; a Complete (Medical) Collection.
See *Chhieh Shui Hsüan Chu*.
- Chhieh Shui Yin* 赤水吟.
Chants of the Red River.
See Fu Chin-Chhüan (1).
- Chhieh Sung Tzu Chou Hou Yao Chüeh* 赤松子肘後藥訣.
Oral Instructions of the Red-Pine Master on Handy (Macrobiotic) Prescriptions.
Pre-Thang.
Writer unknown.
Part of the *Thai-Chhing Ching Thien-Shih Khou Chüeh*.
TT/876.
- Chhieh Sung Tzu Hsüan Chi* 赤松子玄記.
Arcane Memorandum of the Red-Pine Master.
Thang or earlier, before +9th.
Writer unknown.
Quoted in TT/928 and elsewhere.
- Chhin Hsüan Fu* 禰玄賦.
Rhapsodical Ode on Grappling with the Mystery.
Sung, +13th.
Writer unknown.
TT/257.
- Chhing Hsiang Tsa Chi* 青箱雜記.
Miscellaneous Records on Green Bamboo Tablets.
Sung, c. +1070.
Wu Chhu-Hou 吳處厚.
- Chhing Hsiu Miao Lun Chien* 清修妙論淺.
Subtile Discourses on the Unsullied Restoration (of the Primary Vitalities) [the first part (chs. 1, 2) of *Tsun Shêng Pa Chien*, q.v.].
Ming, +1591.
Kao Lien 高謙.
- Chhing I Lu* 清異錄.
Records of the Unworldly and the Strange.
Wu Tai, c. +950.
Thao Ku 陶穀.
- Chhing-Ling Chen-Yen Phei Chün (Nei) Chuan* 清靈真人裴君內傳.
Biography of the Chhing-Ling Adept, Master Phei.
L/Sung or S/Chhi, +5th, but with early Thang additions.
Têng Yün Tzu 鄧雲子
(Phei Hsüan-Jen 裴玄仁 was a semi-legendary immortal said to have been born in -178).

- Chhing-Ling Chen-Jen Phei Chün (Nei) Chuan (cont.)* *Chhüan Ching* 拳經.
In YCCC, ch. 105.
Cf. Maspero (7), pp. 386 ff.
Chhing Po Tsa Chih 清波雜誌.
Green-Waves Memories.
Sung, +1193.
Chou Hui 周煇.
- Chhing Wei Tan Chüeh (or Fa)* 清微丹訣(法).
Instructions for Making the Enchymoma in
Calmness and Purity [physiological
alchemy].
Date unknown, perhaps Thang.
Writer unknown.
TT/275.
- Chhiu Chhang-Chhun Chhing Thien Ko* 邱長春
青天歌.
Chhiu Chhang-Chhun's Song of the Blue
Heavens.
Sung, c. +1200.
Chhiu Chhu-Chi 邱處機.
TT/134.
- Chhu Chhêng I Shu* 褚澄遺書.
Remaining Writings of Chhu Chhêng.
Chhi, c. +500, probably greatly remodelled
in Sung.
Chhu Chhêng 褚澄.
- Chhü Hsien Shen Yin Shu* 屢仙神隱書.
Book of Daily Occupations for Scholars in
Rural Retirement, by the Emaciated
Immortal.
Ming, c. +1430.
Chu Chhüan 朱權.
(Ning Hsien Wang 寧獻王, prince of
the Ming.)
- Chhu Hsüeh Chi* 初學記.
Entry into Learning [encyclopaedia].
Thang, +700.
Hsü Chien 徐堅.
- Chhü I Shuo Tsuan* 祛疑說纂.
Discussions on the Dispersal of Doubts.
Sung, c. +1230.
Chhu Yung 儲泳.
- Chhu Tzhu* 楚辭.
Elegies of Chhu (State) [or, Songs of the South].
Chou, Cf. -300 (with Han additions).
- Chhü Yuan* 屈原.
(& Chia I, Yen Chi, Sung Yü 賈誼 嚴忌 宋玉.
Huainan Hsiao-Shan, et al.) 淮南小山.
Printed tr. Waley (23); tr. Hawkes (1).
- Chhüan-Chen Chi Hsüan Pi Yao* 全真集玄秘要.
Esoteric Essentials of the Mysteries (of the
Tao), according to the Chhüan-Chen
(Perfect Truth) School [the Northern
School of Taoism in Sung and Yuan times].
Yuan, c. +1320.
Li Tao-Shun 李道純.
TT/248.
- Chhüan-Chen Tso Po Chieh Fa* 全真坐鉢捷法.
Ingenious Method of the Chhüan-Chen
School for Timing Meditation (and other
Exercises) by a (Sinking-) Bowl Clepsydra.
Sung or Yuan.
Writer unknown.
TT/1212.
- Chhing*, +18th.
Chang Khung-Chao 張孔昭.
Chhun Chhiu Fan Lu 春秋繁露.
String of Pearls on the *Spring and Autumn
Annals*.
C/Han, c. -135.
Tung Chung-Shu 董仲舒.
See Wu Khang (1).
Partial trs. Wiegier (2); Hughes (1);
d'Hormon (1) (ed.).
Chung-Fa Index no. 4.
- Chhun Chhiu Wei Yuan Ming Pao* 春秋緯元
命苞.
Apocryphal Treatise on the *Spring and
Autumn Annals*; the Mystical Diagrams
of Cosmic Destiny [astrological-
astronomical].
C/Han, c. -1st.
Writer unknown.
In *Ku Wei Shu*, ch. 7.
- Chhun Chhiu Wei Yün Tou Shu* 春秋緯運斗樞.
Apocryphal Treatise on the *Spring and
Autumn Annals*; the Axis of the Turning
of the Ladle (i.e. the Great Bear).
C/Han, -1st or later.
Writer unknown.
In *Ku Wei Shu*, ch. 9, pp. 4b ff. and
YHSF, ch. 55, pp. 22a ff.
- Chhun Chu Chi Wên* 春渚紀聞.
Record of Things Heard at Spring Island.
Sung, c. +1095.
Ho Wei 何薏.
Chhun-yang etc.
See *Shun-yang*.
- Chhung-Hsiu Chhêng-Ho Ching-Shih Chhêng Lei*
Pei-Yung Pên Tshao 重修政和經史證
類備用本草.
New Revision of the Pharmacopoeia of the
Chhêng-Ho reign-period; the Classified
and Consolidated Armamentarium.
(A Combination of the *Chhêng-Ho... Chhêng
Lei... Pên Tshao* with the *Pên Tshao Yen I*.)
Yuan, +1249; reprinted many times after-
wards, esp. in the Ming, +1468, with at
least seven Ming editions, the last in
+1624 or +1625.
Thang Shen-Wei 唐慎微.
Khou Tsung-Shih 寇宗奭.
Pr. (or ed.) Chang Tshun-Hui 張存惠.
Chhung-Yang Chhüan Chen Chi 重陽全
真集.
(Wang) Chhung-Yang's [Wang Chê's]
Records of the Perfect Truth (School).
Sung, mid +12th cent.
Wang Chê 王嘉.
TT/1139.
- Chhung-Yang Chiao Hua Chi* 重陽教化集.
Memorials of (Wang) Chhung-Yang's
[Wang Chê's] Preaching.
Sung, mid +12th cent.
Wang Chê 王嘉.
TT/1140.

- Chhung-Yang Chin-Kuan Yü-Suo Chieh* 重陽金闕王鎖訣.
(Wang) Chhung-Yang's [Wang's Chê's] Instructions on the Golden Gate and the Lock of Jade.
Sung, mid + 12th cent.
Wang Chê 王嘉.
TT/1142.
- Chhung-Yang Fên-Li Shih-Hua Chi* 重陽分梨十化集.
Writings of (Wang) Chhung-Yang [Wang Chê] (to commemorate the time when he received a daily Ration of Pears, and the Ten Precepts of his Teacher.
Sung, mid + 12th cent.
Wang Chê 王嘉.
TT/1141.
- Chhung-Yang Li-Chiao Shih-Wu Lun* 重陽立教十五論.
Fifteen Discourses of (Wang) Chhung-Yang [Wang Chê] on the Establishment of his School.
Sung, mid + 12th cent.
Wang Chê 王嘉.
TT/1216.
- Đai-Việt Sú-ký Toãn-thú* 大越史記全書.
The Complete Book of the History of Great Annam.
Vietnam, c. +1479.
Ngô Si-Liên 吳士連.
- Fa Yen* 法言.
Admonitory Sayings [in admiration, and imitation, of the *Lun Yü*].
Hsin, +5.
Yang Hsiung 揚雄.
Tr. von Zach (5).
- Fa Yuan Chu Lin* 法苑珠林.
Forest of Pearls from the Garden of the [Buddhist] Law.
Thang, +668, +688.
Tao-Shih 道世.
- Fan Tzu Chi Jan* 范子計然.
See *Chi Ni Tzu*.
- Fang Hu Wai Shih* 方靈外史.
Unofficial History of the Land of the Immortals, Fang-hu. (Contains two *nei tan* commentaries on the *Tshan Thung Chhi*, +1569 and +1573.)
Ming, c. +1590.
Lu Hsi-Hsing 陸西星.
Cf. Liu Tshun-Jen (1, 2).
- Fang Yü Chi* 方輿記.
General Geography.
Chin, or at least pre-Sung.
Hsü Chia 徐鍇.
- Fei Lu Hui Ta* 斐錄彙答.
Questions and Answers on Things Material and Moral.
Ming, +1636.
Kao I-Chih (Alfonso Vagnoni) 高一志.
Bernard-Maire (18), no. 272.
- Fên Thu* 粉圖.
See *Hu Kang Tzu Fên Thu*.
- Fêng Su Thung I* 風俗通義.
The Meaning of Popular Traditions and Customs.
H/Han, +175.
Ying Shao 應劭.
Chung-Fa Index, no. 3.
- Fo Shuo Fo I Wang Ching* 佛說佛醫王經.
Buddha Vaidyarāja Sūtra; or *Buddha-prokta Buddha-bhaiṣajyarāja Sūtra* (Sūtra of the Buddha of Healing, spoken by Buddha).
India.
Tr. San Kuo (Wu) +230.
Trs. Liu Yen (Vinayāṭapa) & Chih-Chhien 支謙.
N/1327; TW/793.
- Fo Tzu Li Tai Thung Tsai* 佛祖歷代通載.
General Record of Buddhist and Secular History through the Ages.
Yuan, +1341.
Nien-Chhang (monk) 念常.
- Fu Chhi Ching I Lun* 服氣精義論.
Dissertation on the Meaning of 'Absorbing the Chhi and the Ching' (for Longevity and Immortality), [Taoist hygienic, respiratory, pharmaceutical, medical and (originally) sexual procedures].
Thang, c. +715.
Ssuma Chhêng-Chên 司馬承貞.
In YCCC, ch. 57.
Cf. Maspero (7), pp. 364 ff.
- Fu Hung Thu* 伏汞圖.
Illustrated Manual on the Subduing of Mercury.
Sui, Thang, J/Chin or possibly Ming.
Shêng Hsüan Tzu 昇女子.
Survives now only in quotations.
- Fu Nei Yuan Chhi Ching* 服內元氣經.
Manual of Absorbing the Internal Chhi of Primary (Vitality).
Thang, +8th, probably c. +755.
Huan Chen hsien-sêng (Mr Truth-and-Illusion) 幻真先生.
TT/821, and in YCCC, ch. 60, pp. 106 ff.
Cf. Maspero (7), p. 199.
- Fu Shih Lun* 服石論.
Treatise on the Consumption of Mineral Drugs.
Thang, perhaps Sui.
Writer unknown.
Extant only in excerpts preserved in the *I Hsin Fang* (+982).
- Fu Shou Tan Shu* 福壽丹書.
A Book of Elixir-Enchymoma Techniques for Happiness and Longevity.
Ming, +1621.
Chêng Chih-Chhiao 鄭之僑 (at least in part).
Partial tr. of the gymnastic material, Dudgeon (1).

- Fusō Ryakuki* 扶桑畧記.
Classified Historical Matters concerning the Land of Fu-Sang (Japan) [from +898 to +1197].
Japan (Kamakura) +1198.
Kōen (monk).
- Genji Monogatari* 源氏物語.
The Tale of (Prince) Genji.
Japan, +1021.
Murasaki Shikibu 紫式部.
- Hai Yao Pên Tshao* 海藥本草.
[= *Nan Hai Yao Phu*.]
Materia Medica of the Countries Beyond the Seas.
Wu Tai (C/Shu), c. +923.
Li Hsün 李珣.
Preserved only in numerous quotations in *Chêng Lei Pên Tshao* and later pandects.
- Han Fei Tzu* 韓非子.
The Book of Master Han Fei.
Chou, early -3rd century.
Han Fei 韓非.
Tr. Liao Wên-Kuei (1).
- Han Kuan I* 漢官儀.
The Civil Service of the Han Dynasty and its Regulations.
H/Han +197.
Ying Shao 應劭.
Ed. Chang Tsung-Yuan 張宗源 (+1752 to 1800).
Cf. Hummel (2), p. 57.
- Han Kung Hsiang Fang* 漢宮香方.
On the Blending of Perfumes in the Palaces of the Han.
H/Han, +1st or +2nd.
Genuine parts preserved c. +1131 by Chang Pang-Chi 張邦基.
Attrib. Tung Hsia-Chou 董道周.
Comm. by Chêng Hsüan 鄭玄.
'Restored', c. +1590, by Kao Lien 高濂.
- Han Thien Shih Shih Chia* 漢天師世家.
Genealogy of the Family of the Han Heavenly Teacher.
Date uncertain.
Writers unknown.
With Pu Appendix, 1918, by Chang Yuan-Hsü 張元旭 (the 62nd Taoist Patriarch, Thien Shih).
TT/1442.
- Han Wei Tshung-Shu* 漢魏叢書.
Collection of Books of the Han and Wei Dynasties [first only 38, later increased to 96].
Ming, +1592.
Ed. Thu Lung 屠隆.
- Han Wu (Ti) Ku Shih* 漢武帝故事.
Tales of (the Emperor) Wu of the Han (r. -140 to -87).
L/Sung and Chhi, late +5th.
Wang Chien 王儉.
Perhaps based on an earlier work of the same kind by Ko Hung 葛洪.
Tr. d'Hormon (1).
- Han Wu (Ti) Nei Chuan* 漢武(帝)內傳.
The Inside Story of (Emperor) Wu of the Han (r. -140 to -87).
Material of Chin, L/Sung, Chhi, Liang and perhaps Chhen date, +320 to +580, probably stabilised about +580.
Attrib. Pan Ku, Ko Hung, etc.
Actual writer unknown.
TT/289.
Tr. Schipper (1).
- Han Wu (Ti) Nei Chuan Fu Lu* 漢武(帝)內傳附錄.
See *Han Wu (Ti) Wai Chuan*.
- Han Wu (Ti) Wai Chuan* 漢武(帝)外傳.
[= *Han Wu (Ti) Nei Chuan Fu Lu*.]
Extraordinary Particulars of (Emperor) Wu of the Han (and his collaborators), [largely biographies of the magician-technicians at Han Wu Ti's court].
Material of partly earlier date collected and stabilised in Sui or Thang, early +7th century.
Writers and editor unknown.
Introductory paragraphs added by Wang Yu-Yen 王游巖 (+746).
TT/290.
Cf. Maspero (7), p. 234, and Schipper (1).
- Hei Chhien Shui Hu Lun* 黑鉛水虎論.
Discourse on the Black Lead and the Water Tiger.
Alternative title of *Huan Tan Nei Hsiang Chin Yo Shih*, q.v.
- Ho Chi Chü Fang* 和劑局方.
Standard Formularies of the (Government) Pharmacies [based on the *Thai-Phing Shêng Hui Fang* and other collections].
Sung, c. +1109.
Ed. Chhen Chhêng 陳承, Phei Tsung-Yuan 裴宗元, & Chhen Shih-Wên 陳師文.
Cf. SIC, p. 974.
- Honan Chhen Shih Hsiang Phu* 河南陳氏香譜.
See *Hsiang Phu* by Chhen Ching.
- Honan Chhêng Shih I Shu* 河南程氏遺書.
Remaining Records of Discourses of the Chhêng brothers of Honan [Chhêng I and Chhêng Hao, +11th-century Neo-Confucian philosophers].
Sung, +1168, pr. c. +1250.
Chu Hsi (ed.) 朱熹.
In *Erh Chhêng Chhüan Shu*, q.v.
Cf. Graham (1), p. 141.
- Honan Chhêng Shih Tshui Yen* 河南程氏粹言.
Authentic Statements of the Chhêng brothers of Honan [Chhêng I and Chhêng Hao, +11th-century Neo-Confucian philosophers. In fact more altered and abridged than the other sources, which are therefore to be preferred.]

- Honan Chêng Shih Tshui Yen (cont.)*
Sung, first collected c. +1150, supposedly ed. +1166, in its present form by c. +1340.
Coll. Hu Yin 胡寅.
Supposed ed. Chang Shih 張栻.
In *Erh Chêng Chhüan Shu*, q.v., since +1606.
Cf. Graham (1), p. 145.
- Honzō-Wamyō* 本草和名.
Synonymic Materia Medica with Japanese Equivalents.
Japan, +918.
Fukano no Sukehito 深根輔仁.
Cf. Karow (1).
- Hou Han Shu* 後漢書.
History of the Later Han Dynasty [+25 to +220].
L/Sung, +450.
Fan Yeh 范曄.
The monograph chapters by Ssuma Piao 司馬彪 (d. +305), with commentary by Liu Chao 劉昭 (c. +510), who first incorporated them in the work.
A few chs. tr. Chavannes (6, 16); Pfizmaier (52, 53).
Yin-Tê Index, no. 41.
- Hou Tê Lu* 厚德錄.
Stories of Eminent Virtue.
Sung, early +12th.
Li Yuan-Kang 李元綱.
- Hu Kang Tzu Fên Thu* 狐剛子粉圖.
Illustrated Manual of Powders [Salts], by the Fox-Hard Master.
Sui or Thang.
Hu Kang Tzu 狐剛子.
Survives now only in quotations; originally in *TT* but lost. Cf. Vol. 4, pt. 1, p. 308.
- Hua Tho Nei Chao Thu* 怵怵內照圖.
Hua Tho's Illustrations of Visceral Anatomy.
See *Hsüan Mên Mo Chüeh Nei Chao Thu*.
Cf. Miyashita Saburo (1).
- Hua-Yang Thao Yin-Chü Chuan* 華陽陶隱居傳.
A Biography of Thao Yin-Chü (Thao Hung-Ching) of Huayang [the great alchemist, naturalist and physician].
Thang.
Chia Sung 賈嵩.
TT/297.
- Hua Yen Ching* 華嚴經.
Buddha-avatamsaka Sūtra; The Adornment of Buddha.
India.
Tr. into Chinese, +6th century.
TW/278, 279.
- Huai Nan Hung Lieh Chieh* 淮南鴻烈解.
See *Huai Nan Tzu*.
- Huai Nan Tzu* 淮南子.
[= *Huai Han Hung Lieh Chieh* 淮南鴻烈解.]
The Book of (the Prince of) Huai-Nan [compendium of natural philosophy].
C/Han, c. -120.
Written by the group of scholars gathered by Liu An (prince of Huai-Nan) 劉安. Partial trs. Morgan (1); Erkes (1); Hughes (1); Chatley (1); Wieger (2).
Chung-Fa Index, no. 5.
TT/1170.
- Huai-Nan (Wang) Wan Pi Shu* 淮南(王)萬畢術.
[Prob. = *Chen-Chung Hung-Pao Yuan-Pi Shu* and variants.]
The Ten Thousand Infallible Arts of (the Prince of) Huai-Nan [Taoist magical and technical recipes].
C/Han, -2nd century.
No longer a separate book but fragments contained in *TPYL*, ch. 736 and elsewhere
Reconstituted texts by Yeh Tê-Hui in *Kuan Ku Thang So Chu Shu*, and Sun Fêng-I in *Wên Ching Thang Tshung-Shu*.
Attrib. Liu An 劉安.
See Kaltenmark (2), p. 32.
It is probable that the terms *Chen-Chung* 枕中 Confidential Pillow-Book; *Hung-Pao* 鴻寶 Infinite Treasure; *Wan-Pi* 萬畢 Ten Thousand Infallible; and *Yuan-Pi* 苑祕 Garden of Secrets; were originally titles of parts of a *Huai-Nan Wang Shu* 淮南王書 (Writings of the Prince of Huai-Nan) forming the *Chung Phien* 中篇 (and perhaps also the *Wai Shu* 外書) of which the present *Huai Nan Tzu* book (q.v.) was the *Nei Shu* 內書.
- Huan Chen hsien-sêng*, etc. 幻真先生.
See *Thai Hsi Ching* and *Fu Nei Yuan Chhi Ching*.
- Huan Chin Shu* 還金述.
An Account of the Regenerative Metallous Enchymoma.
Thang, probably +9th.
Thao Chih 陶植.
TT/915, also excerpted, in *YCCC*, ch. 70, pp. 13 a ff.
- Huan Tan Chou Hou Chüeh* 還丹肘後訣.
Oral Instructions on Handy Formulae for Cyclically Transformed Elixirs [with illustrations of alchemical apparatus].
Ascr. Chin, c. +320.
Actually Thang, including a memorandum of +875 by Wu Ta-Ling 仵達靈, and the rest probably by other hands within a few years of this date.
Attrib. Ko Hung 葛洪.
TT/908.
- Huan Tan Chung Hsien Lun* 還丹衆仙論.
Pronouncements of the Company of the Immortals on Cyclically Transformed Elixirs.
Sung, +1052.
Yang Tsai 楊在.
TT/230.

- Huan Tan Fu Ming Phien* 還丹復命篇.
Book on the Restoration of Life by the
Cyclically Transformed Elixir.
Sung, +12th cent., c. +1175.
Hsüeh Tao-Kuang 薛道光.
TT/1074.
- Huan Tan Nei Hsiang Chin Yo Shih* 還丹內象
金鑰匙.
[= *Hei Chhien Shui Hu Lun* and *Hung
Chhien Huo Lung Lun*.]
A Golden Key to the Physiological Aspects
of the Regenerative Enchymoma.
Wu Tai, c. +950.
Phêng Hsiao 彭曉.
Now but half a chapter in *YCCC*, ch. 70,
pp. 1 a ff., though formerly contained in
the *Tao Tsang*.
- Huan Tan Pi Chieh Yang Chhieh-Tsu Shen
Fang* 還丹秘訣養赤子神方.
The Wondrous Art of Nourishing the
(Divine) Embryo (lit. the Naked Babe) by
the use of the secret Formula of the Re-
generative Enchymoma [physiological
alchemy].
Sung, probably late +12th.
Hsü Ming-Tao 許明道.
TT/229.
- Huan Yü Shih Mo* 寰宇始末.
On the Beginning and End of the World
[the Hebrew-Christian account of crea-
tion, the Four Aristotelian Causes,
Elements, etc.].
Ming, +1637.
Kao I-Chih (Alfonso Vagnoni) 高一志,
Bernard-Maitre (18), no. 283.
- Huan Yuan Phien* 還原篇.
Book of the Return to the Origin [poems on
the regaining of the primary vitalities in
physiological alchemy].
Sung, c. +1140.
Shih Thai 石泰.
TT/1077. Also in *Hsiu Chen Shih Shu*
(TT/260), ch. 2.
- Huang Chi Ching Shih Shu* 皇極經世書.
Book of the Sublime Principle which
governs All Things within the World.
Sung, c. +1060.
Shao Yung 邵雍.
TT/1028. Abridged in *Hsing Li Ta Chhüan*
and *Hsing Li Ching I*.
- Huang Chi Ho Pi Hsien Ching* 皇極闡關仙經.
[= *Yin Chen Jen Tung-Hua Cheng Mo Huang
Chi Ho Pi Cheng Tao Hsien Ching*.]
The Height of Perfection (attained by)
Opening and Closing (the Orifices of the
Body); a Manual of the Immortals [phys-
iological alchemy, *nei tan* techniques].
Ming or Chhing.
Attrib. Yin chen jen (Phêng-Thou)
尹真人 (蓬頭).
Ed. Min I-Tê 閔一得, c. 1830.
In *Tao Tsang Hsü Pien (Chhu chi)*, 2, from
a MS, preserved at the Blue Goat Temple
齊羊宮 (Chhêngtu).
- Huang Pai Ching* 黃白鏡.
Mirror of (the Art of) the Yellow and the
White [physiological alchemy].
Ming, +1598.
Li Wên-Chu 李文瀾.
Comm. Wang Chhing-Chêng 王清正.
In *Wai Chin Tan* coll., ch. 2 (*CTPS*, pên
7).
- Huang-Thien Shang-Chhing Chin Chhüeh Ti
Chün Ling Shu Tzu-Wên Shang Ching*
皇天上清金闕帝君靈書紫文上經.
Exalted Canon of the Imperial Lord of the
Golden Gates, Divinely Written in Purple
Script; a Huang-Thien Shang-Chhing
Scripture.
Chin, late +4th, with later revisions.
Writer unknown.
TT/634.
- Huang Thing Chung Ching Ching* 黃庭中景經.
[= *Thai-Shang Huang Thing Chung Ching
Ching*.]
Manual of the Middle Radiance of the
Yellow Courts (central regions of the
three parts of the body) [Taoist anatomy
and physiology].
Sui.
Li Chhien-Chhêng 李千乘.
TT/1382, completing TT/398-400.
Cf. Maspero (7), pp. 195, 203.
- Huang Thing Nei Ching Wu Tsang Liu Fu Pu
Hsieh Thu* 黃庭內景五臟六府補瀉圖
Diagrams of the Strengthening and Weaken-
ing of the Five Yin-viscera and the Six
Yang-viscera (in accordance with) the
(*Jade Manual of the Internal Radiance of
the Yellow Courts*).
Thang, c. +850.
Hu An 胡愔.
TT/429.
- Huang Thing Nei Ching Wu Tsang Liu Fu Thu*
黃庭內景五臟六府圖.
Diagrams of the Five Yin-viscera and the
Six Yang-viscera (discussed in the *Jade
Manual of the Internal Radiance of the
Yellow Courts* [Taoist anatomy and physi-
ology; no illustrations surviving, but much
therapy and pharmacy].
Thang, +848.
Hu An 胡愔 (title: Thai-pai Shan Chien
Su Nü) 太白山見素女.
In *Hsiu Chen Shih Shu* (TT/260), ch. 54.
Illustrations preserved only in Japan, MS, of
before +985.
SIC, p. 223; Watanabe Kozo (1), pp. 112 ff.
- Huang Thing Nei Ching Yü Ching* 黃庭內景
玉經.
[= *Thai-Shang Huang Thing Nei Ching Yü
Ching*.]
Jade Manual of the Internal Radiance of the
Yellow Courts (central regions of the

- Huang Thing Nei Ching Yü Ching (cont.)*
three parts of the body) [Taoist anatomy and physiology]. In 36 *chang*.
L/Sung, Chhi, Liang or Chhen, +5th or +6th. The oldest parts date probably from Chin, about +365.
Writer unknown. Allegedly transmitted by immortals to the Lady Wei (Wei Fu Jen), i.e. Wei Hua-Tshun 魏華存.
TT/328.
Paraphrase by Liu Chhang-Shêng 劉長生 (Sui), TT/398.
Comms. by Liang Chhiu Tzu 梁丘子 (Thang), TT/399, and Chiang Shen-Hsiu 蔣慎修 (Sung), TT/400.
Cf. Maspero (7), p. 239.
- Huang Thing Nei Ching Yü Ching Chu* 黃庭內景玉經註.
Commentary on (and paraphrased text of) the *Jade Manual of the Internal Radiance of the Yellow Courts*.
Sui.
Liu Chhang-Shêng 劉長生.
TT/398.
- Huang Thing Nei Ching (Yü) Ching Chu* 黃庭內景(玉)經註.
Commentary on the *Jade Manual of the Internal Radiance of the Yellow Courts*.
Thang, +8th or +9th.
Liang Chhiu Tzu (ps.) 梁丘子.
TT/399, and in *Hsiu Chen Shih Shu* (TT/260), chs. 55-57; and in YCCC, chs. 11, 12 (where the first 3 *chang* (30 verses) have the otherwise lost commentary of Wu Chhêng Tzu 務成子).
Cf. Maspero (7), pp. 239 ff.
- Huang Thing Nei Wai Ching Yü Ching Chieh* 黃庭內外景玉經解.
Explanation of the *Jade Manuals of the Internal and External Radiances of the Yellow Courts*.
Sung.
Chiang Shen-Hsiu 蔣慎修.
TT/400.
- Huang Thing Wai Ching Yü Ching* 黃庭外景玉經.
[= *Thai-Shang Huang Thing Wai Ching Yü Ching*.]
Jade Manual of the External Radiance of the Yellow Courts (central regions of the three parts of the body) [Taoist anatomy and physiology]. In 3 *chüan*.
H/Han, San Kuo or Chin, +2nd or +3rd. Not later than +300.
Writer unknown.
TT/329.
Comms. by Wu Chhêng Tzu 務成子 (early Thang) YCCC, ch. 12; Liang Chhiu Tzu 梁丘子 (late Thang), TT/260, chs. 58-60; Chiang Shen-Hsiu 蔣慎修 (Sung), TT/400.
Cf. Maspero (7), pp. 195 ff., 428 ff.
- Huang Thing Wai Ching Yü Ching Chu* 黃庭外景玉經註.
Commentary on the *Jade Manual of the External Radiance of the Yellow Courts*.
Sui or early Thang, +7th.
Wu Chhêng Tzu (ps.) 務成子.
In YCCC, ch. 12, pp. 30a ff.
Cf. Maspero (7), p. 239.
- Huang Thing Wai Ching Yü Ching Chu* 黃庭外景玉經註.
Commentary on the *Jade Manual of the External Radiance of the Yellow Courts*.
Thang, +8th or +9th.
Liang Chhiu Tzu (ps.) 梁丘子.
In *Hsiu Chen Shih Shu* (TT/260), chs. 58-60.
Cf. Maspero (7), pp. 239 ff.
- Huang Ti Chiu Ting Shen Tan Ching Chüeh* 黃帝九鼎神丹經訣.
The Yellow Emperor's Canon of the Nine-Vessel Spiritual Elixir, with Explanations. Early Thang or early Sung, but incorporating as ch. 1 a canonical work probably of the +2nd cent.
Writer unknown.
TT/878. Also, abridged, in YCCC, ch. 67, pp. 1a ff.
- Huang Ti Nei Ching, Ling Shu* 黃帝內經靈樞.
The Yellow Emperor's Manual of Corporeal (Medicine), the Vital Axis [medical physiology and anatomy].
Probably C/Han, c. -1st century.
Writers unknown.
Edited Thang, +762, by Wang Ping 王冰. Analysis by Huang Wên (1).
Tr. Chamfrault & Ung Kang-Sam (1).
Commentaries by Ma Shih 馬蒔 (Ming) and Chang Chih-Tshung 張志聰 (Chhing) in TSCC, *I shu tien*, chs. 67 to 88.
- Huang Ti Nei Ching, Ling Shu, Pai Hua Chieh* 黃帝內經素問.
See Chhen Pi-Liu & Chêng Cho-Jen (1).
- Huang Ti Nei Ching, Su Wên* 黃帝內經素問.
The Yellow Emperor's Manual of Corporeal (Medicine); Questions (and Answers) about Living Matter [clinical medicine].
Chou, remodelled in Chhin and Han, reaching final form c. -2nd century.
Writers unknown.
Ed. & comm., Thang (+762), Wang Ping 王冰; Sung (c. +1050), Lin I 林億. Partial trs. Hübotter (1), chs. 4, 5, 10, 11, 21; Veith (1); complete, Chamfrault & Ung Kang-Sam (1).
See Wang & Wu (1), pp. 28 ff.; Huang Wên (1).
- Huang Ti Nei Ching Su Wên I Phien* 黃帝內經素問遺篇.
The Missing Chapters from the *Questions and Answers of the Yellow Emperor's Manual of Corporeal (Medicine)*.
Ascr. pre-Han.
Sung, preface, +1099.

- Huang Ti Nei Ching Su Wên I Phien* (cont.)
Ed. (perhaps written by) Liu Wên-Shu
劉溫舒.
Often appended to his *Su Wên Ju Shih Yün Chhi Ao Lun* (q.v.) 素問入式運氣奧論.
- Huang Ti Nei Ching Su Wên, Pai Hua Chieh*
See Chou Fêng-Wu, Wang Wan-Chieh & Hsü Kuo-Chhien (1).
- Huang Ti Pa-shih-i Nan Ching Tsuan Thu Chü Chieh* 黃帝八十一難經纂圖句解.
Diagrams and a Running Commentary for the *Manual of (Explanations Concerning) Eighty-one Difficult (Passages) in the Yellow Emperor's (Manual of Corporeal Medicine)*.
Sung, +1270 (text H/Han, +1st).
Li Kung 李綱.
TT/1012.
- Huang Ti Pao Tsang Ching* 黃帝寶藏經.
Perhaps an alternative name for *Hsien-Yuan Pao Tsang (Chhang Wei) Lun*, q.v.
- Huang Ti Yin Fu Ching* 黃帝陰符經.
See *Yin Fu Ching*.
- Huang Ti Yin Fu Ching Chu* 黃帝陰符經註.
Commentary on the *Yellow Emperor's Book on the Harmony of the Seen and the Unseen*.
Sung.
Liu Chhu-Hsüan 劉處玄.
TT/119.
- Huang Yeh Fu* 黃冶賦.
Rhapsodic Ode on 'Smelting the Yellow' [alchemy].
Thang, c. +840.
Li Tê-Yü 李德裕.
In *Li Wên-jao Pieh Chi*, ch. 1.
- Huang Yeh Lun* 黃冶論.
Essay on the 'Smelting of the Yellow' [alchemy].
Thang, c. +830.
Li Tê-Yü 李德裕.
In *Wên Yuan Ying Hua*, ch. 739, p. 15a, and *Li Wên-jao Wai Chi*, ch. 4.
- Hui Ming Ching* 慧命經.
[= *Tsui-Shang I Chhêng Hui Ming Ching*, also entitled *Hsü Ming Fang*.]
Manual of the (Achievement of) Wisdom and the (Lengthening of the) Life-Span.
Chhing, +1794.
Liu Hua-Yang 柳華陽.
Cf. Wilhelm & Jung (1), editions after 1957.
- Hung Chhien Huo Lung Lun* 紅鉛火龍論.
Discourse on the Red Lead and the Fire Dragon.
Alternative title of *Huan Tan Nei Hsiang Chin Yo Shih*, q.v.
- Hung Chhien Ju Hei Chhien Chüeh* 紅鉛入黑鉛訣.
Oral Instructions on the Entry of the Red Lead into the Black Lead.
Probably Sung, but some of the material perhaps older.
Compiler unknown.
TT/934.
- Huo Kung Chhieh Yao* 火攻擊要.
Essentials of Gunnery.
Ming, +1643.
Chiao Hsü 焦勗.
With the collaboration of Thang Jo-Wang (J. A. Schall von Bell) 湯若瑟.
Bernard-Maitre (18), no. 334.
- Huo Lien Ching* 火蓮經.
Manual of the Lotus of Fire [physiological alchemy].
Ming or Chhing.
Attrib. Liu An, 劉安 (Han).
In *Wai Chin Tan*, coll., ch. 1 (CTPS, pên 6).
- Huo Lung Ching* 火龍經.
The Fire-Drake (Artillery) Manual.
Ming, +1412.
Chiao Yü 焦玉.
The first part of this book, in three sections, is attributed fancifully to Chuko Wu-Hou (i.e. Chuko Liang), and Liu Chi 劉基 (+1311 to +1375) appears as co-editor, really perhaps co-author.
The second part, also in three sections, is attributed to Liu Chi alone, but edited, probably written, by Mac Hsi-Ping 毛希秉 in +1632.
The third part, in two sections, is by Mao Yuan-I 毛元儀 (fl. +1628) and edited by Chuko Kuang-Jung 諸葛光榮 whose preface is of +1644, Fang Yuan-Chuang 方元壯 & Chung Fu-Wu 鍾伏武.
- Huo Lung Chüeh* 火龍訣.
Oral Instructions on the Fiery Dragon [proto-chemical and physiological alchemy].
Date uncertain, ascr. Yuan, +14th.
Attrib. Shang Yang Tsu Shih 上陽祖師.
In *Wai Chin Tan* (coll.), ch. 3 (CTPS, pên 8).
- Hupei Thung Chih* 湖北通志.
Historical Geography of Hupei Province.
Min Kuo, 1921, but based on much older records.
See Yang Chhêng-Hsi (ed.) (1) 楊承禧.
- Hsi Chhi Tshung Hua* 西溪叢話
(SKCS has Yu 語).
Western Pool Collected Remarks.
Sung, c. +1150.
Yao Kuan 姚寬.
- Hsi Chhing Ku Chien* 西清古鑑.
Hsi Chhing Catalogue of Ancient Mirrors (and Bronzes) in the Imperial Collection.
(The collection was housed in the Library of Western Serenity, a building in the southern part of the Imperial Palace).
Chhing, +1751.
Liang Shih-Chêng 梁詩正.
- Hsi Shan Chhun Hsien Hui Chen Chi* 西山羣仙會真記.
A True Account of the Proceedings of the Company of Immortals in the Western Mountains.
Thang, c. +800.
Shih Chien-Wu 施肩吾.
TT/243.

- Hsi Shang Fu Than* 席上腐談.
Old-Fashioned Table Talk.
Yuan, c. +1290.
Yü Yen 俞琰.
- Hsi Wang Mu Nü Hsiu Chêng Thu Shih Tsê*
西王母女修正途十則.
The Ten Rules of the Mother (Goddess)
Queen of the West to Guide Women
(Taoists) along the Right Road of
Restoring (the Primary Vitalities) [phy-
siological alchemy].
Ming or Chhing.
Attrib. Lü Yen 呂喆 (+8th century).
Shen I-Ping *et al.* 沈一炳.
Comm. Min I-Tê 閔一得 (c. 1830).
In *Tao Tsang Hsiü Pien* (*Chhu chi*), 19.
- Hsi-Yang Huo Kung Thu Shuo* 西洋火攻圖說.
Illustrated Treatise on European Gunnery.
Ming, before +1625.
Chang Tao 張燾 & Sun Hsüeh-Shih
孫學詩.
- Yo Hua-Shan Chih* 西嶽華山誌.
Records of Hua-Shan, the Great Western
Mountain.
Sung, c. +1170.
Wang Chhu-I 王處一.
TT/304.
- Yo Tou hsien-sêng Hsiu Chen Chih Nan*
西嶽饗先生修真指南.
Teacher Tou's South-Pointer for the
Regeneration of the Primary (Vitalities),
from the Western Sacred Mountain.
Sung, probably early +13th.
Tou hsien-sêng 饗先生.
In *Hsiu Chen Shih Shu* (TT/260), ch. 21,
pp. 1a to 6b.
- Hsi Yu Chi* 西遊記.
A Pilgrimage to the West [novel].
Ming, c. +1570.
Wu Chhêng-ên 吳承恩.
Tr. Waley (17).
- Hsi Yu Chi*.
See *Chhang-Chhun Chen Jen Hsi Yu Chi*.
- Hsi Yü Chiu Wên* 西域舊聞.
Old Traditions of the Western Countries [a
conflation, with abbreviations, of the
Hsi Yü Wên Chien Lu and the *Shêng Wu
Chi*, q.v.].
Chhing, +1777 and 1842.
Chhun Yuan Chhi-shih-i Lao-jen 椿園七
十一老人 & Wei Yuan 魏源.
Arr. Chêng Kuang-Tsu (1843) 鄭光祖.
- Hsi Yü Thu Chi* 西域圖記.
Illustrated Record of Western Countries.
Sui, +610.
Phei Chü 裴矩.
- Hsi Yü Wên Chien Lu* 西域聞見錄.
Things Seen and Heard in the Western
Countries.
Chhing, +1777.
Chhun Yuan Chhi-shih-i Lao-jen
椿園七十一老人.
[The 71-year-old Gentleman of the Cedar
Garden.]
Bretschneider (2), vol. 1, p. 128.
- Hsi Yuan Lu* 洗冤錄.
The Washing Away of Wrongs (i.e. False
Charges) [treatise on forensic medicine].
Sung, +1247.
Sung Tzhu 宋慈.
Partial tr., H. A. Giles (7).
- Hsiang Chhêng* 香乘.
Records of Perfumes and Incense [in-
cluding combustion-clocks].
Ming, betw. +1618 and +1641.
Chou Chia-Chou 周嘉青.
- Hsiang Chien* 香箋.
Notes on Perfumes and Incense.
Ming, c. +1560.
Thu Lung 屠隆.
- Huang Kuo* 香國.
The Realm of Incense and Perfumes.
Ming.
Mao Chin, 毛晉.
- Hsiang Lu* 香錄.
[= *Nan Fan Hsiang Lu*.]
A Catalogue of Incense.
Sung, +1151.
Yeh Thing-Kuei 葉廷珪.
- Hsiang Phu* 香譜.
A Treatise on Aromatics and Incense
[-Clocks].
Sung, c. +1073.
Shen Li 沈立.
Now extant only in the form of quotations
in later works.
- Hsiang Phu* 香譜.
A Treatise on Perfumes and Incense.
Sung, c. +1115.
Hung Chhu 洪刍.
- Hsiang Phu* 香譜.
[= *Hsin Tsuan Hsiang Phu*
or *Honan Chhen shih Hsiang Phu*.]
A Treatise on Perfumes and Aromatic Sub-
stances [including incense and combust-
ion-clocks].
Sung, late +12th or +13th; may be as late
as +1330.
Chhen Ching 陳敬.
- Hsiang Phu* 香譜.
A Treatise on Incense and Perfumes.
Yuan, +1322.
Hsiung Phêng-Lai 熊朋來.
- Hsiang Yao Chhao* 香藥抄.
Memoir on Aromatic Plants and Incense.
Japan, c. +1163.
Kuan-Yu (Kanyu) 觀祐. MS. preserved at
the 滋賀石山寺 Temple. Facsim. re-
prod. in Suppl. to the Japanese Tripitaka,
vol. 11.
- Hsieh Thien Chi* 泄天機.
A Divulcation of the Machinery of Nature
(in the Human Body, permitting the
Formation of the Enchymoma).

- Hsieh Thien Chi (cont.)*
Chhing, c. +1795.
Li Ong (Ni-Wan shih) 李翁 (Mr Ni-Wan).
Written down in 1833 by Min Hsiao-Kên
閔小艮.
In *Tao Tsang Hsü Pien (Chhu chi)*, 4.
- Hsien Lo Chi* 仙樂集.
(Collected Poems) on the Happiness of the
Holy Immortals.
Sung, late +12th cent.
Liu Chhu-Hsüan 劉處玄.
TT/1127.
- Hsien-Yuan Huang Ti Shui Ching Yao Fa* 軒轅
黃帝水經藥法.
(Thirty-two) Medicinal Methods from the
Aqueous (Solutions) Manual of Hsien-
Yuan the Yellow Emperor.
Date uncertain.
Writer unknown.
TT/922.
- Hsien-Yuan Pao Tsang Chhang Wei Lun* 軒轅
寶藏暢微論.
The Yellow Emperor's Expansive yet
Detailed Discourse on the (Contents of
the) Precious Treasury (of the Earth)
[mineralogy and metallurgy].
Alternative title of *Pao Tsang Lun*, q.v.
- Hsien-Yuan Pao Tsang Lun* 軒轅寶藏論.
The Yellow Emperor's Discourse on the
Contents of the Precious Treasury (of the
Earth).
See *Pao Tsang Lun*.
- Hsin Hsiu Pên Tshao* 新修本草.
The New (lit. Newly Improved) Pharma-
copoeia.
Thang, +659.
Ed. Su Ching (= Su Kung) 蘇敬 (蘇恭)
and a commission of 22 collaborators
under the direction first of Li Chi 李勣
& Yü Chih-Ning 于志寧, then of
Chhangsun Wu-Chi 長孫無忌. This
work was afterwards commonly but in-
correctly known as *Thang Pên Tshao*. It
was lost in China, apart from MS. frag-
ments at Tunhuang, but copied by a
Japanese in +731 and preserved in Japan
though incompletely.
- Hsin Lun* 新論.
New Discussions.
H/Han, c. +10 to +20, presented +25.
Huan Than 桓譚.
Cf. Pokora (9).
- Hsin Lun* 新論.
New Discourses.
Liang, c. +530.
Liu Hsieh 劉勰.
- Hsin Thang Shu* 新唐書.
New History of the Thang Dynasty
[+618 to +906].
Sung, +1061.
Ouyang Hsiu 歐陽修 & Sung Chhi
宋祁.
Cf. des Rotours (2), p. 56.
Partial trs. des Rotours (1, 2); Pfizmaier (66-
74). For translations of passages see the
index of Frankel (1).
Yin-Tê Index, no. 16.
- Hsin Tsuan Hsiang Phu* 新纂香譜.
See *Hsiang Phu* by Chhen Ching.
- Hsin Wu Tai Shih* 新五代史.
New History of the Five Dynasties [+907
to +959].
Sung, c. +1070.
Ouyang Hsiu 歐陽修.
For translations of passages see the index of
Frankel (1).
- Hsin Yü* 新語.
New Discourses.
C/Han, c. -196.
Lu Chia 陸賈.
Tr. v. Gabain (1).
- Hsing Li Ching I* 性理精義.
Essential Ideas of the Hsing-Li (Neo-
Confucian) School of Philosophers [a con-
densation of the *Hsing Li Ta Chhüan*, q.v.].
Chhing, +1715.
Li Kuang-Ti 李光地.
- Hsing Li Ta Chhüan (Shu)* 性理大全(書).
Collected Works of (120) Philosophers of
the Hsing-Li (Neo-Confucian) School
[*Hsing* = human nature; *Li* = the
principle of organisation in all Nature].
Ming, +1415.
Ed. Hu Kuang et al. 胡廣.
- Hsing Ming Kuei Chih* 性命圭旨.
A Pointer to the Meaning of (Human)
Nature and the Life-Span [physiological
alchemy; the *kuei* is a pun on the two
kinds of *thu*, central earth where the
enchymoma is formed].
Ascr. Sung, pr. Ming and Chhing, +1615,
repr. +1670.
Attrib. Yin Chen Jen 尹真人.
Written out by Kao Ti 高第.
Prefs. by Yü Yung-Ning et al. 余永寧.
- Hsing Shih Hêng Yen* 醒世恆言.
Stories to Awaken Men.
Ming, c. +1640.
Fêng Mêng-Lung 馮夢龍.
- Hsiu Chen Chih Nan* 修真指南.
South-Pointer for the Regeneration of the
Primary (Vitalities).
See *Hsi Yo Tou hsien-sêng Hsiu Chen Chih
Nan*.
- Hsiu Chen Li Yen Chhao Thu* 修真歷驗鈔圖.
[= *Chen Yuan Miao Tao Hsiu Tan Li Yen
Chhao*.]
Transmitted Diagrams illustrating Tried and
Tested (Methods of) Regenerating the
Primary Vitalities [physiological alchemy].
Thang or Sung, before +1019.
No writer named but the version in *YCCC*,
ch. 72, has Tung Chen Tzu (ps.) 洞真子.
TT/149.

- Hsiu Chen Nei Lien Pi Miao Chu Chüeh* 修真內煉秘妙諸訣.
Collected Instructions on the Esoteric Mysteries of Regenerating the Primary (Vitalities) by Internal Transmutation. Sung or pre-Sung.
Writer unknown.
Perhaps identical with *Hsiu Chen Pi Chüeh* (q.v.); now extant only in quotations.
- Hsiu Chen Pi Chüeh* 修真秘訣.
Esoteric Instructions on the Regeneration of the Primary (Vitalities).
Sung or pre-Sung, before +1136.
Writer uncertain.
In *Lei Shuo*, ch. 49, pp. 5a ff.
- Hsiu Chen Pien Nan (Tshan Chêng)* 修真辯難參證.
[*Chhi Yün Shan Wu Yuan Yzu Hsiu Chen Pien Nan Tshan Chêng.*]
A Discussion of the Difficulties encountered in the Regeneration of the Primary (Vitalities) [physiological alchemy]; with Supporting Evidence.
Chhing, +1798.
Liu I-Ming 劉一明 (Wu Yuan Tzu 悟元子).
Comm., Min I-Tê 閩一得 (c. 1830).
In *Tao Tsang Hsü Pien (Chhu chi)*, 23.
- Hsiu Chen Shih Shu* 修真十書.
A Collection of Ten Tractates and Treatises on the Regeneration of the Primary (Vitalities) [in fact, many more than ten].
Sung, c. +1250.
Editor unknown.
TT/260.
Cf. Maspero (7), pp. 239, 357.
- Hsiu Chen Thai Chi Hun Yuan Thu* 修真太極混元圖.
Illustrated Treatise on the (Analogy of the) Regeneration of the Primary (Vitalities) (with the Cosmogony of) the Supreme Pole and Primitive Chaos.
Sung, c. +1100.
Hsiao Tao-Tshun 蕭道存.
TT/146.
- Hsiu Chen Thai Chi Hun Yuan Chih Hsüan Thu* 修真太極混元指玄圖.
Illustrated Treatise Expounding the Mystery of the (Analogy of the) Regeneration of the Primary (Vitalities) (with the Cosmogony of) the Supreme Pole and Primitive Chaos.
Thang, c. +830.
Chin Chhüan Tzu 金全子.
TT/147.
- Hsiu Chen Yen I* 修真演義.
A Popular Exposition of (the Methods of) Regenerating the Primary (Vitalities) [Taoist sexual techniques].
Ming, c. +1560.
- Têng Hsi-Hsien 鄧希賢 (Tzu Chin Kuang Yao Ta Hsien 紫金光耀大仙).
See van Gulik (3, 8).
- Hsiu Hsien Pien Huo Lun* 修仙辨惑論.
Resolution of Doubts concerning the Restoration of Immortality.
Sung, c. +1220.
Ko Chhang-Kêng 葛長庚 (Pai Yü-Chhan 白玉蟾).
In *TSCC, Shen i tien*, ch. 300, *i wén*, pp. 11a ff.
- Hsiu Lien Ta Tan Yao Chih* 修鍊大丹要旨.
Essential Instructions for the Preparation of the Great Elixir [with illustrations of alchemical apparatus].
Probably Sung or later.
Writer unknown.
TT/905.
- Hsiu Tan Miao Yung Chih Li Lun* 修丹妙用至理論.
A Discussion of the Marvellous Functions and Perfect Principles of the Practice of the Enchymoma.
Late Sung or later.
Writer unknown.
TT/231.
Refers to the Sung adept Hai-Chhan hsien-sêng 海蟾先生 (Liu Tshao 劉操).
- Hsü Chen-Chün Pa-shih-wu Hua Lu* 許真君八十五化錄.
Record of the Transfiguration of the Adept Hsü (Hsün) at the Age of Eighty-five.
Chin, +4th cent.
Shih Tshên 施岑.
TT/445.
- Hsü Chen-Chün Shih Han Chi* 許真君石函記.
The Adept Hsü (Sun's) Treatise, found in a Stone Coffin.
Ascr. Chin, +4th cent., perhaps c. +370.
Attrib. Hsü Hsün 許遜.
TT/944.
Cf. Davis & Chao Yün-Tshung (6).
- Hsü Hsien Chuan* 續仙傳.
Further Biographies of the Immortals.
Wu Tai (H/Chou), between +923 and +936.
Shen Fên 沈汾.
In *YCCC*, ch. 113.
- Hsü Ku Chai Chi Suan Fa* 續古摘奇算法.
Choice Mathematical Remains Collected to Preserve the Achievements of Old [magic squares and other computational examples].
Sung, +1275.
Yang Hui 楊輝.
(In *Yang Hua Suan Fa*.)
- Hsü Kuang-Chhi Shou Chi* 徐光啓手跡.
Manuscript Remains of Hsü Kuang-Chhi [facsimile reproductions].
Shanghai, 1962.
- Hsü Ming Fang* 續命方.
Precepts for Lengthening the Life-span.
Alternative title of *Hui Ming Ching* (q.v.).

- Hsü Po Wu Chih* 續博物志.
Supplement to the *Record of the Investigation of Things* (cf. *Po Wu Chih*).
Sung, mid +12th century.
Li Shih 李石.
- Hsü Shen Hsien Chuan* 續神仙傳.
Supplementary Lives of the Hsien (cf. *Shen Hsien Chuan*).
Thang.
Shen Fên 沈汾.
- Hsü Shih Shih* 續事始.
Supplement to the *Beginnings of All Affairs* (cf. *Shih Shih*).
H/Shu, c. +960.
Ma Chien 馬鑑.
- Hsü Yen-Chou Shih Hua* 許彥周詩話.
Hsü Yen-Chou's Talks on Poetry.
Sung, early +12th, prob. c. +1111.
Hsü Yen-Chou 許彥周.
- Hsüan Chieh Lu* 懸解錄.
See *Hsüan Chieh Lu* 玄解錄.
- Hsüan Chieh Lu* 玄解錄.
The Mysterious Antidotarium [warnings against elixir poisoning, and remedies for it].
Thang, anonymous preface of +855, prob. first pr. between +847 and +850.
Writer unknown, perhaps Hokan Chi 乾千裏.
The first printed book in any civilisation on a scientific subject.
TT/921, and in *YCCC*, ch. 64, pp. 5a ff.
- Hsüan Fêng Chhing Hui Lu* 玄風慶會錄.
Record of the Auspicious Meeting of the Mysterious Winds [answers given by Chhiu Chhu-Chi (Chhang-Chhun Chen Jen) to Chingiz Khan at their interviews at Samarqand in +1222].
Sung, +1225.
Chhiu Chhu-Chi 邱處機.
TT/173.
- Hsüan-Ho Po Ku Thu Lu* 宣和博古圖錄.
[= *Po Ku Thu Lu*.]
Hsüan-Ho reign-period Illustrated Record of Ancient Objects [catalogue of the archaeological museum of the emperor Hui Tsung].
Sung, +1111 to +1125.
Wang Fu 王黼 or 黼 et al.
- Hsüan Kuai Hsü Lu* 玄怪續錄.
The *Record of Things Dark and Strange*, continued.
Thang.
Li Fu-Yen 李復言.
- Hsüan Mên Mo Chüeh Nei Chao Thu* 玄門脈訣內照圖.
[= *Hua Tho Nei Chao Thu*.]
Illustrations of Visceral Anatomy, for the Taoist *Sphygmological Instructions*.
Sung, +1095, repr. +1273 by Sun Huan 孫煥 with the inclusion of Yang Chieh's illustrations.
Attrib. Hua Tho 華佗.
First pub. Shen Chu 沈銖.
Cf. Ma Chi-Hsing (2).
- Hsüan Ming Fên Chuan* 玄明粉傳.
On the 'Mysterious Bright Powder' (purified sodium sulphate, Glauber's salt).
Thang, c. +730.
Liu Hsüan-Chen 劉玄眞.
- Hsüan Nü Ching* 玄女經.
Canon of the Mysterious Girl [or, the Dark Girl].
Han.
Writer unknown.
Only as fragment in *Shuang Mei Ching An Tshung Shu*, now conflated with *Su Nü Ching*, q.v.
Partial trs., van Gulik (3, 8).
- Hsüan Phin Lu* 玄品錄.
Record of the (Different) Grades of Immortals.
Yuan.
Chang Thien-Yü 張天雨.
TT/773.
Cf. Chhen Kuo-Fu (1), 1st ed., p. 260.
- Hsüan Shih Chih* 宣室志.
Records of Hsüan Shih.
Thang, c. +860.
Chang Tu 張讀.
- Hsüan Shuang Chang Shang Lu* 玄霜掌上錄.
Mysterious Frost on the Palm of the Hand; or, Handy Record of the Mysterious Frost [preparation of lead acetate].
Date unknown.
Writer unknown.
TT/938.
- I Chen Thang Ching Yen Fang* 頤眞堂經驗方.
Tried and Tested Prescriptions of the True-Centenarian Hall (a surgery or pharmacy).
Ming, prob. +15th, c. +1450.
Yang shih 楊氏.
- I Chi Khao* 醫籍考.
Comprehensive Annotated Bibliography of Chinese Medical Literature.
See Taki Mototane (1).
- I Chai Ta Fa* 醫家大法.
See *I Yin Thang I Chung Ching Kuang Wei Ta Fa*.
- I Chien Chih* 夷堅志.
Strange Stories from I-Chien.
Sung, c. +1185.
Hung Mai 洪邁.
- I Chin Ching* 易筋經.
Manual of Exercising the Muscles and Tendons [Buddhist].
Ascr. N/Wei.
Chhing, perhaps +17th.
Attrib. Ta-Mo (Bodhidharma) 達摩.
Author unknown.
Reproduced in Wang Tsu-Yuan (1).

- I Ching* 易經.
The Classic of Changes [Book of Changes].
Chou with C/Han additions.
Compilers unknown.
See *Li Ching-Chih* (1, 2); *Wu Shih-Chhang* (1).
Tr. R. Wilhelm (2); Legge (9); de Harlez (1).
Yin-Tê Index, no. (suppl.) 10.
- I Hsin Fang* (*Ishinhô*) 醫心方.
The Heart of Medicine [partly a collection of ancient Chinese and Japanese books].
Japan, +982 (not printed till 1854).
Tamba no Yasuyori 丹波康賴.
- I Hsüeh Yu Mên* 醫學入門.
Janua Medicinæ [a general system of medicine].
Ming, +1575.
Li Chhan 李梴.
- I Hsüeh Yuan Liu Lun* 醫學源流論.
On the Origins and Progress of Medical Science.
Chhing, +1757.
Hsü Ta-Chhun 徐大椿.
(In *Hsü Ling-Thai I Shu Chhüan Chi*.)
- Mên Pi Chih* 醫門秘旨.
Confidential Guide to Medicine.
Ming, +1578.
Chang Ssu-Wei 張四維.
- I Shan Tsa Tsuan* 義山雜纂.
Collected Miscellany of (Li) I-Shan [Li Shang-Yin, epigrams].
Thang, c. +850.
Li Shang-Yin 李商隱.
Tr. Bonmarchand (1).
- I Shih* 逸史.
Leisurely Histories.
Thang.
Lu Shih 盧氏.
- I Su Chi* 夷俗記.
Records of Barbarian Customs.
Alternative title of *Pei Lu Fêng Su*, q.v.
- I Thu Ming Pien* 易圖明辨.
Clarification of the Diagrams in the (*Book of*) *Changes* [historical analysis].
Chhing, +1706.
Hu Wei 胡渭.
- I Wei Chhüan Tso Tu* 易緯乾鑿度.
Apocryphal Treatise on the (*Book of*) *Changes*; a Penetration of the Regularities of Chhien (the first *kua*).
C/Han, -1st or +1st century.
Writer unknown.
- I Wei Ho Thu Shu* 易緯河圖數.
Apocryphal Treatise on the (*Book of*) *Changes*; the Numbers of the Ho Thu (Diagram).
H/Han.
Writer unknown.
- I Yin Thang I Chung Ching Kuang Wei Ta Fa*
伊尹湯液仲景廣爲大法.
[= *I Chia Ta Fa* or *Kuang Wei Ta Fa*.]
The Great Tradition (of Internal Medicine) going back to I Yin (legendary minister) and his Pharmacal Potions, and to (Chang) Chung-Ching (famous Han physician).
Yuan, +1294.
Wang Hao-Ku 王好古.
ICK, p. 863.
- Ishinhô*
See *I Hsin Fang*.
- Jih Chih Lu* 日知錄.
Daily Additions to Knowledge.
Chhing, +1673.
Ku Yen-Wu 顧炎武.
- Jih Hua Chu Chia Pên Tshao* 日華諸家本草.
The Sun-Rays Master's Pharmaceutical Natural History, collected from Many Authorities.
Wu Tai and Sung, c. +972.
Often ascribed by later writers to the Thang, but the correct dating was recognised by Thao Tsung-I in his *Cho Kêng Lu* (+1366) ch. 24, p. 17b.
Ta Ming 大明.
(*Jih Hua Tzu* 日華子 the Sun-Rays Master.)
(Perhaps Thien Ta-Ming 田大明.)
- Jih Yüeh Hsüan Shu Lun* 日月玄樞論.
Discourse on the Mysterious Axis of the Sun and Moon [i.e. Yang and Yin in natural phenomena; the earliest interpretation (or recognition) of the *Chou I Tshan Thung Chhi* (q.v.) as a physiological rather than (or, as well as) a proto-chemical text].
Thang, c. +740.
Liu Chih-Ku 劉知古.
Now extant only as quotations in the *Tao Shu* (q.v.), though at one time contained in the *Tao Tsang* separately.
- Ju Yao Ching* 入囊鏡.
Mirror of the All-Penetrating Medicine (the enchyronema), [rhyming verses].
Wu Tai, c. +940.
Tshui Hsi-Fan 崔希範.
TT/132, and in *TTCY* (*hsü chi*, 5).
With commentaries by Wang Tao-Yuan 王道淵 (Yuan); Li Phan-Lung 李攀龍 (Ming) & Phêng Hao-Ku 彭好古 (Ming).
Also in *Hsiu Chen Shih Shu* (*TT*/260), ch. 13, pp. 1a ff. with commentary by Hsiao Thing-Chih 蕭廷芝 (Ming).
Also in *Tao Hai Chin Liang*, pp. 35a ff., with comm. by Fu Chin-Chhüan 傅金銓 (Chhing).
See also *Thien Yuan Ju Yao Ching*.
Cf. van Gulik (8), pp. 224 ff.
- Kan Chhi Shih-liu Chuan Chin Tan* 感氣十六轉金丹.
The Sixteen-fold Cyclically Transformed Gold Elixir prepared by the 'Responding

- Kan Chhi Shih-liu Chuan Chin Tan* (cont.)
to the Chhi' Method [with illustrations of alchemical apparatus].
Sung.
Writer unknown.
TT/904.
- Kan Ying Ching* 感應經.
On Stimulus and Response (the Resonance of Phenomena in Nature).
Thang, c. +640.
Li-Shun-Fêng 李淳風.
See Ho & Needham (2).
- Kan Ying Lei Tshung Chih* 感應類從志.
Record of the Mutual Resonances of Things according to their Categories.
Chin, c. +295.
Chang Hua 張華.
See Ho & Needham (2).
- Kao Shih Chuan* 高士傳.
Lives of Men of Lofty Attainments.
Chin, c. +275.
Huangfu Mi 皇甫謐.
- Kêng Hsin Yü Tshê* 庚辛玉冊.
Precious Secrets of the Realm of Kêng and Hsin (i.e. all things connected with metals and minerals, symbolised by these two cyclical characters) [on alchemy and pharmaceuticals, Kêng-Hsin is also an alchemical synonym for gold].
Ming, +1421.
Chu Chhüan 朱權, (Ning Hsien Wang 寧獻王, prince of the Ming).
Extant only in quotations.
- Kêng Tao Chi* 庚道集.
Collection of Procedures of the Golden Art (Alchemy).
Sung or Yuan, date unknown but after +1144
Writers unknown.
Compiler, Mêng Hsien chü shih 蒙軒居士.
TT/946.
- Khai-Pao Hsin Hsiang-Ting Pên Tshao* 開寶新詳定本草.
New and More Detailed Pharmacopoeia of the Khai-Pao reign-period.
Sung, +973.
Liu Han 劉翰, Ma Chih 馬志, and 7 other naturalists, under the direction of Lu To-Hsün 盧多遜.
- Khai-Pao Pên Tshao* 開寶本草.
See *Khai-Pao Hsin Hsiang-Ting Pên Tshao*.
- Khun Yü Ko Chih* 坤輿格致.
Investigation of the Earth [Western mining methods based on Agricola's *De Re Metallica*].
Ming, +1639 to 1640, perhaps never printed.
Têng Yü-Han (Johann Schreck) 鄧玉函 & (or) Thang Jo-Wang 湯若望 (John Adam Schall von Bell).
- Khung Chi Ko Chih* 空際格致.
A Treatise on the Material Composition of the Universe [the Aristotelian Four Elements, etc.].
Ming, +1633.
Kao I-Chih (Alfonso Vagnoni) 高一志.
Bernard-Maitre (18), no. 227.
- Khung shih Tsa Shuo* 孔氏雜說.
Mr Khung's Miscellany.
Sung, c. +1082.
Khung Phing-Chung 孔平仲.
- Ko Chih Ching Yuan* 格致鏡原.
Mirror of Scientific and Technological Origins.
Chhing, +1735.
Chhen Yuan-Lung 陳元龍.
- Ko Chih Tshao* 格致草.
Scientific Sketches [astronomy and cosmology; part of *Han Yü Thung*, q.v.].
Ming, +1620, pr. +1648.
Hsiung Ming-Yü 熊明遇.
- Ko Hsien Ong Chou Hou Pei Chi Fang* 葛仙翁肘後備急方.
The Elder-Immortal Ko (Hung's) Handbook of Medicines for Emergencies.
Alt. title of *Chou Hou Pei Chi Fang* (q.v.).
TT/1287.
- Ko Hung Chen Chung Shu* 葛洪枕中書.
Alt. title of *Chen Chung Chi* (q.v.).
- Ko Ku Yao Lun* 格古要論.
Handbook of Archaeology, Art and Antiquarianism.
Ming, +1387, enlarged and reissued +1459.
Tshao Chao 曹昭.
- Ko Wu Tshu Than* 格物叢談.
Simple Discourses on the Investigation of Things.
Sung, c. +980.
Attrib. wrongly to Su Tung-Pho 蘇東坡.
Actual writer (Lu) Tsan-Ning (錄) 贊寧 (Tung-Pho hsien-sêng). With later additions, some concerning Su Tung-Pho.
- Konjaku Monogatari* 今昔物語.
Tales of Today and Long Ago (in three collections: Indian, 187 stories and traditions, Chinese, 180, and Japanese, 736).
Japan (Heian), +1107.
Compilers unknown.
Cf. Anon. (103), pp. 97 ff.
- Konjaku Monogatarishū* 今昔物語集.
See *Konjaku Monogatari*.
- Ku Chin I Thung* (Ta Chhüan) 古今醫統(大全).
Complete System of Medical Practice, New and Old.
Ming, +1556.
Hsü Chhun-Fu 徐春甫.
- Ku Thung Thu Lu* 鼓銅圖錄.
Illustrated Account of the (Mining), Smelting and Refining of Copper (and other Non-Ferrous Metals).
See Masuda Tsuna (1).
- Ku Wei Shu* 古微書.
Old Mysterious Books [a collection of the apocryphal Chhan-Wei treatises].
Date uncertain, in part C/Han.
Ed. Sun Chio 孫穀 (Ming).

- Ku Wên Lung Hu Ching Chu Su* 古文龍虎經
註疏 and *Ku Wên Lung Hu Shang Ching
Chu* 古文龍虎上經註.
See *Lung Hu Shang Ching Chu*.
- Ku Wên Tshan Thung Chhi Chi Chieh* 古文參
同契集解.
See *Ku Wên Chou I Tshan Thung Chhi Chu*.
- Ku Wên Tshan Thung Chhi Chien Chu Chi Chieh*
古文參同契箋註集解.
See *Ku Wên Chou I Tshan Thung Chhi Chu*
- Ku Wên Chou I Tshan Thung Chhi Chu* 古文
周易參同契註.
Commentary on the Ancient Script Version
of the *Kinship of the Three*.
Chhing, +1732.
Ed. and comm. Yuan Jen-Lin 袁仁林.
See Vol. 5, pt. 3.
- Ku Wên Tshan Thung Chhi San Hsiang Lei Chi
Chieh* 古文參同契三相類集解.
See *Ku Wên Chou I Tshan Thung Chhi Chu*.
- Kuan Khuei Pien* 管窺編.
An Optick Glass (for the Enchymoma).
See *Min I-Tê* (1).
- Kuan Yin Tzu* 關尹子.
[= *Wên Shih Chen Ching*.]
The Book of Master Kuan Yin.
Thang, +742 (may be Later Thang or Wu
Tai). A work with this title existed in the
Han, but the text is lost.
Prob. Thien Thung-Hsiu 田同秀.
- Kuang Chhêng Chi* 廣成集.
The Kuang-chhêng Collection [Taoist writ-
ings of every kind; a florilegium].
Thang, late +9th; or early Wu Tai, before
+933.
Tu Kuang-Thing 杜光庭.
TT/611.
- Kuang Wei Ta Fa* 廣爲大法.
See *I Yin Thang I Chung Ching Kuang Wei
Ta Fa*.
- Kuang Ya* 廣雅.
Enlargement of the *Erh Ya*; *Literary
Expositor* [dictionary].
San Kuo (Wei) +230.
Chang I 張揖.
- Kuang Yün* 廣韻.
Enlargement of the *Chhieh Yün*; *Dictionary
of the Sounds of Characters*.
Sung.
(A completion by later Thang and Sung
scholars, given its present name in +1011.)
Lu Fa-Yen *et al.* 陸法言.
- Kuei Chung Chih Nan* 規中指南.
A Compass for the Internal Compasses; or,
Orientations concerning the Rules and
Measures of the Inner (World) [i.e. the
preparation of the enchymoma in the
microcosm of man's body].
Sung or Yuan, +13th or +14th.
Chhen Chhung-Su 陳沖素 (Hsü Pai
Tzu 盧白子).
TT/240, and in *TTCY* (*shang mao chi*, 5).
- Kungyang Chuan* 公羊傳.
Master Kungyang's Tradition (or Com-
mentary) on the *Spring and Autumn
Annals*.
Chou (with Chhin and Han additions),
late -3rd and early -2nd centuries.
Attrib. Kungyang Kao 公羊高 but more
probably Kungyang Shou 公羊壽.
See Wu Khang (1); van der Loon (1).
- Kuo Shih Pu* 國史補.
Emendations to the National Histories.
Thang, c. +820.
Li Chao 李肇.
- Kuo Yü* 國語.
Discourses of the (ancient feudal) States.
Late Chou, Chhin and C/Han, containing
much material from ancient written
records.
Writers unknown.
- Lao Hsüeh An Pi Chi* 老學庵筆記.
Notes from the Hall of Learned Old Age.
Sung, c. +1190.
Lu Yu 陸游.
- Lao Tzu Chung Ching* 老子中經.
The Median Canon of Lao Tzu [on
physiological micro-cosmography].
Writer unknown.
Pre-Thang.
In *YCCC*, ch. 18.
- Lao Tzu Shuo Wu Chhu Ching* 老子說五厨經.
Canon of the Five Kitchens [the five
viscera] Revealed by Lao Tzu [respiratory
techniques].
Thang or pre-Thang.
Writer unknown.
In *YCCC*, ch. 61, pp. 5 b ff.
- Lei Chen Chin Tan* 雷震金丹.
Lei Chen's Book of the Metallous Ency-
moma.
Ming, after +1420.
Lei Chen (ps. ?) 雷震.
In *Wai Chin Tan*, ch. 5 (*CTPS*, *pên* 10).
- Lei Chen Tan Ching* 雷震丹經.
Alternative title of *Lei Chen Chin Tan*
(q.v.).
- Lei Chêng Phu Chi Pên Shih Fang* 類證普濟本
事方.
Classified Fundamental Prescriptions of
Universal Benefit.
Sung, +1253.
Attrib. Hsü Shu-Wei 許叔微 (*fl.* +1132)
- Lei Ching Fu I* 類經附翼.
Supplement to the Classics Classified; (the
Institutes of Medicine).
Ming, +1624.
Chang Chieh-Pin 張介賓.
- Lei Kung Phao Chih* 雷公炮製.
(Handbook based on the)Venerable Master
Lei's (*Treatise on*) the Preparation (*of
Drugs*).
L/Sung, c. +470.

- Lei Kung Phao Chi* (cont.)
Lei Hsiao 雷徽.
Ed. Chang Kuang-Tou 張光斗 (Chhing), 1871.
- Lei Kung Phao Chih Lun* 雷公炮炙論.
The Venerable Master Lei's Treatise on the Decoction and Preparation (of Drugs).
L/Sung, c. +470.
Lei Hsiao 雷徽.
Preserved only in quotations in *Chêng Lei Pên Tshao* and elsewhere, and reconstituted by Chang Chi 張臧.
LPC, p. 116.
- Lei Kung Phao Chih Yao Hsing* (Fu) Chieh 雷公炮製藥性(賦)解.
(Essays and) Studies on the Venerable Master Lei's (Treatise on) the Natures of Drugs and their Preparation.
First four chapters J/Chin, c. +1220.
Li Kao 李杲.
Last six chapters Chhing, c. 1650.
Li Chung-Tzu 李中梓.
(Contains many quotations from earlier Lei Kung books, +5th century onwards.)
- Lei Kung Yao Tui* 雷公藥對.
Answers of the Venerable Master Lei (to Questions) concerning Drugs.
Perhaps L/Sung, at any rate before N/Chhi.
Attrib. Lei Hsiao 雷徽.
Later attrib. a legendary minister of Huang Ti.
Comm. by Hsü Chih-Tshai 徐之才, N/Chhi +565.
Now extant only in quotations.
- Lei Shuo* 類說.
A Classified Commonplace-Book [a great florilegium of excerpts from Sung and pre-Sung books, many of which are otherwise lost].
Sung, +1136.
Ed. Tsêng Tshao 曾慥.
- Li Chi* 禮記.
[= *Hsiao Tai Li Chi*.]
Record of Rites [compiled by Tai the Younger].
(Cf. *Ta Tai Li Chi*.)
Ascr. C/Han, c. -70/-50, but really H/Han, between +80 and +105, though the earliest pieces included may date from the time of the *Analects* (c. -465 to -450).
Attrib. ed. Tai Shêng 戴聖.
Actual ed. Tshao Pao 曹褒.
Trs. Legge (7); Couvreur (3); R. Wilhelm (6).
Yin-Tê Index, no. 27.
- Li Hai Chi* 齋海集.
The Beetle and the Sea [title taken from the proverb that the beetle's eye view cannot encompass the wide sea—a biological book].
Ming, late +14th century.
Wang Khuei 王翬.
- Li Sao* 離騷.
Elegy on Encountering Sorrow [ode].
Chou (Chhu), c. -295, perhaps just before -300. Some scholars place it as late as -269.
Chhü Yuan 屈原.
Tr. Hawkes (1).
- Li Shih Chen Hsien Thi Tao Thung Chien* 歷世眞仙體道通鑑.
Comprehensive Mirror of the Embodiment of the Tao by Adepts and Immortals throughout History.
Prob. Yuan.
Chao Tao-I 趙道一.
TT/293.
- Li Tai Ming I Méng Chhiu* 歷代名醫蒙求.
Brief Lives of the Famous Physicians in All Ages.
Sung, +1040.
Chou Shou-Chung 周守忠.
- (*Li Tai*) *Shen Hsien* (*Thung*) *Chien* (歷代) 神仙(通)鑑.
(Cf. *Shen Hsien Thung Chien*.)
General Survey of the Lives of the Holy Immortals (in all Ages).
Chhing, +1712.
Hsü Tao 徐道 (assisted by Li Li 李理) & Chhêng Yü-Chhi 程誠奇 (assisted by Wang Thai-Su 王大素).
- Li Wei Tou Wei I* 禮緯斗威儀.
Apocryphal Treatise on the *Record of Rites*; System of the Majesty of the Ladle [the Great Bear].
C/Han, -1st or later.
Writer unknown.
- Li Wên-Jao Chi* 李文饒集.
Collected Literary Works of Li Tê-Yü (Wên-Jao), (+787 to +849).
Thang, c. +855.
Li Tê-Yü 李德裕.
- Liang Chhiu Tzu* (*Nei* or *Wai*) 梁丘子.
See *Huang Thing Nei Ching* (*Yü*) *Ching Chu* and *Huang Thing Wai Ching* (*Yü*) *Ching Chu*.
- Liang Ssu Kung Chi* 梁四公記.
Tales of the Four Lords of Liang.
Thang, c. +695.
Chang Yüeh 張說.
- Liao Yang Tien Wên Ta Pien* 寥陽殿問答編.
[= *Yin Chen Jen Liao Yang Tien Wên Ta Pien*.]
Questions and Answers in the (Eastern Cloister of the) Liao-yang Hall (of the White Clouds Temple at Chhing-chhêng Shan in Szechuan) [on physiological alchemy, *nei tan*].
Ming or Chhing.
Attrib. Yin Chen Jen 尹眞人 (Phêng-Thou 蓬頭).
Ed. Min I-Tê 閔一得, c. 1830.
In *Tao Tsang Hsü Pien* (*Chhu chi*), 3, from a MS, preserved at the Blue Goat Temple 青羊宮 (Chhêngtu).

- Lieh Hsien Chhuan Chuan* 列仙全傳.
Complete Collection of the Biographies of the Immortals.
Ming, c. +1580.
Wang Shih-Chên 王世貞.
Collated and corrected by Wang Yün-Phêng 汪雲鵬.
- Lieh Hsien Chuan* 列仙傳.
Lives of Famous Immortals (cf. *Shen Hsien Chuan*).
Chin, +3rd or +4th century, though certain parts date from about -35 and shortly after +167.
Attrib. Liu Hsiang 劉向.
Tr. Kaltenmark (2).
- Lin Chiang Hsien* 臨江仙.
The Immortal of Lin-chiang.
Sung, +1151.
Tsêng Tshao 曾慥.
In *Hsiu Chen Shih Shu* (TT/260), ch. 23, pp. 1a ff.
- Ling-Pao Chiu Yu Chhang Yeh Chhi Shih Tu Wang Hsüan Chang* 靈寶九幽長夜起尸度亡玄章.
Mysterious Cantrap for the Resurrection of the Body and Salvation from Nothingness during the Long Night in the Nine Underworlds; a Ling-Pao Scripture.
Date uncertain.
Writer unknown.
TT/605.
- Ling-Pao Chung Chen Tan Chüeh* 靈寶衆真丹訣.
Supplementary Elixir Instructions of the Company of the Realised Immortals, a Ling-Pao Scripture.
Sung, after +1101.
Writer unknown.
TT/416.
On the term Ling-Pao see Kaltenmark (4).
- Ling-Pao Wu Fu* (Hsü) 靈寶五符(序).
See *Thai-Shang Ling-Pao Wu Fu* (Ching).
- Ling-Pao Wu Liang Tu Jen Shang Phin Miao Ching* 靈寶無量度人上品妙經.
Wonderful Immeasurable Highly Exalted Manual of Salvation; a Ling-Pao Scripture.
Liu Chhao, perhaps late +5th, probably finalised in Thang, +7th.
Writers unknown.
TT/1.
- Ling Pi Tan Yao Chien* 靈秘丹藥箋.
On Numinous and Secret Elixirs and Medicines [the seventh part (chs. 16-18) of *Tsun Shêng Pa Chien*, q.v.).
Ming, +1591.
Kao Lien 高濂.
- Ling Piao Lu I* 嶺表錄異.
Strange Things Noted in the South.
Thang, c. +890.
Liu Hsün 劉恂.
- Ling Sha Ta Tan Pi Chüeh* 靈砂大丹秘訣.
Secret Doctrine of the Numinous Cinnabar and the Great Elixir.
Sung, after +1101, when the text was received by Chang Shih-Chung 張待中.
Writer unknown, but edited by a Chhan abbot Kuei-Yen Chhan-shih 鬼眼禪師.
TT/890.
- Ling Shu Ching*
See *Huang Ti Nei Ching, Ling Shu*.
- Ling Wai Tai Ta* 嶺外代答.
Information on What is Beyond the Passes (lit. a book in lieu of individual replies to questions from friends).
Sung, +1178.
Chou Chhü-Fei 周去非.
- Liu Shu Ching Yün* 六書精蘊.
Collected Essentials of the Six Scripts.
Ming, c. +1530.
Wei Hsiao 魏校.
- Liu Tzu Hsin Lun* 劉子新論.
See *Hsin Lun*.
- Lo-Fou Shan Chih* 羅浮山志.
History and Topography of the Lo-fou Mountains (north of Canton).
Chhing, +1716 (but based on older histories).
Thao Ching-I 陶敬益.
- Lu Hsing Ching* 顛顛經.
A Tractate on the Fontanelles of the Skull [anatomical-medical].
Late Thang or early Sung, +9th or +10th.
Writer unknown.
- Lu Huo Chien Chieh Lu* 爐火監戒錄.
Warnings against Inadvisable Practices in the Work of the Stove [alchemical].
Sung, c. +1285.
Yü Yen 俞琰.
- Lu Huo Pên Tshao* 爐火本草.
Spagyric Natural History.
Possible alternative title of *Wai Tan Pên Tshao* (q.v.).
- Lü Tsu Chhin Yuan Chhun* 呂祖沁園春.
The (Taoist) Patriarch Lü (Yen's) 'Spring in the Prince's Gardens' [a brief epigrammatic text on physiological alchemy].
Thang, +8th (if genuine).
Attrib. Lü Yen 呂岳.
TT/133.
Comm. by Fu Chin-Chhüan 傅金銓 (c. 1822).
In *Tao Hai Chin Liang*, p. 45a, and appended to *Shih Chin Shih* (*Wu Chen Ssu Chu Phien* ed.).
- Lü Tsu Chhuan Shou Tsung Chih* 呂祖傳授宗旨.
Principles (of Macrobiotics) Transmitted and Handed Down by the (Taoist) Patriarch Lü (Yen, Tung-Pin).
Orig. title of *Chin Hua Tsung Chih* (q.v.).

- Lü Tsu Shih Hsien-Thien Hsü Wu Thai-I Chin Hua Tsung Chih* 呂祖師先天虛無太一金華宗旨.
Principles of the (Inner) Radiance of the Metalloids (Enchymoma) (explained in terms of the) Undifferentiated Universe, and of all the All-Embracing Potentiality of the Endowment of Primary Vitality, taught by the (Taoist) Patriarch Lü (Yen, Tung-Pin).
Alternative name for *Chin Hua Tsung Chih* (q.v.), but with considerable textual divergences, especially in ch. 1.
Ming and Chhing.
Writers unknown.
Attrib. Lü Yen 呂岳 (Lü Tung-Pin) and his school, late +8th.
Ed. and comm. Chiang Yuan-Thing 蔣元庭 and Min I-Tê 閔一得, c. 1830.
In *TTCY* and in *Tao Tsang Hsü Pien* (*Chhu chi*), 1.
- Lü Tsu Shih San Ni I Shih Shuo Shu* 呂祖師三尼醫世說述.
A Record of the Lecture by the (Taoist) Patriarch Lü (Yen, Tung-Pin) on the Healing of Humanity by the Three Ni Doctrines (Taoism, Confucianism and Buddhism) [physiological alchemy in mutationist terms].
Chhing, +1664.
Attrib. Lü Yen 呂岳 (+8th cent.).
Pref. by Thao Thai-Ting 陶太定.
Followed by an appendix by Min I-Tê 閔一得.
In *Tao Tsang Hsü Pien* (*Chhu chi*), 10, 11.
- Lun Hêng* 論衡.
Discourses Weighed in the Balance.
H/Han, +82 or +83.
Wang Chhung 王充.
Tr. Forke (4); cf. Leslie (3).
Chung-Fa Index, no. 1.
- Lung Hu Chhien Hung Shuo* 龍虎鉛汞說.
A Discourse on the Dragon and Tiger, (Physiological) Lead and Mercury, (addressed to his younger brother Su Tzu-Yu).
Sung, c. +1100.
Su Tung-Pho 蘇東坡.
In *TSCC*, *Shen i tien*, ch. 300, *i wên*, pp. 6b ff.
- Lung Hu Huan Tan Chüeh* 龍虎還丹訣.
Explanation of the Dragon-and-Tiger Cyclically Transformed Elixir.
Wu Tai, Sung, or later.
Chin Ling Tzu 金陵子.
TT/902.
- Lung Hu Huan Tan Chüeh Sung* 龍虎還丹訣頌.
A Eulogy of the Instructions for (preparing) the Regenerative Enchymoma of the Dragon and the Tiger (Yang and Yin), [physiological alchemy].
Sung, c. +985.
Lin Ta-Ku 林太古
(Ku Shen Tzu 谷神子).
TT/1068.
- Lung Hu Shang Ching Chu* 龍虎上經註.
Commentary on the Exalted Dragon-and-Tiger Manual.
Sung.
Wang Tao 王道.
TT/988, 989.
Cf. Davis & Chao Yün-Tshung (6).
- Lung Hu Ta Tan Shih* 龍虎大丹詩.
Song of the Great Dragon-and-Tiger Enchymoma.
See *Chih Chen Tzu Lung Hu Ta Tan Shih*.
Lung-Shu Phu-Sa Chuan 龍樹菩薩傳.
Biography of the Bodhisattva Nāgārjuna (+2nd-century Buddhist patriarch).
Prob. Sui or Thang.
Writer unknown.
TW/2047.
- Man-Anpō* 萬安方.
A Myriad Healing Prescriptions.
Japan, +1315.
Kajiwara Shoen 梶原性全.
Manyōshū 萬葉集.
Anthology of a Myriad Leaves.
Japan (Nara), +759.
Ed. Tachibana no Moroe 橘諸兄.
or Ōtomo no Yakamochi 大伴家持.
Cf. Anon. (103), pp. 14 ff.
- Mao Shan Hsien Ché Fu Na Chhi Chüeh* 茅山賢者服內氣訣.
Oral Instructions of the Adepts of Mao Shan for Absorbing the Chhi [Taoist breathing exercises for longevity and immortality].
Thang or Sung.
Writer unknown.
In *YCCC*, ch. 58, pp. 3b ff.
Cf. Maspero (7), p. 205.
- Mao Thing Kho Hua* 茅亭客話.
Discourses with Guests in the Thatched Pavilion.
Sung, before +1136.
Huang Hsiu-Fu 黃休復.
Mei-Chhi Shih Chu 梅溪詩注.
(Wang) Mei-Chhi's Commentaries on Poetry.
Short title for *Tung-Pho Shih Chi Chu* (q.v.).
- Mêng Chhi Pi Than* 夢溪筆談.
Dream Pool Essays.
Sung, +1086; last supplement dated +1091.
Shen Kua 沈括.
Ed. Hu Tao-Ching (1); cf. Holzman (1).
- Miao Chieh Lu* 妙解錄.
See *Yen Mên Kung Miao Chieh Lu*.
Miao Fa Lien Hua Ching 妙法蓮花經.
Sūtra on the Lotus of the Wonderful Law

- Miao Fa Lien Hua Ching (cont.)*
India.
Tr. Chin, betw. +397 and +400 by Kumārajīva (Chiu-Mo-Lo-Shih 鳩摩羅什).
N/134; TW/262.
- Ming I Pieh Lu* 名醫別錄.
Informal (or Additional) Records of Famous Physicians (on Materia Medica).
Ascr. Liang, c. +510.
Attrib. Thao Hung-Ching 陶弘景.
Now extant only in quotations in the pharmaceutical natural histories, and a reconstitution by Huang Yü (1).
This work was a disentanglement, made by other hands between +523 and +618 or +656, of the contributions of Li Tang-Chih (c. +225) and Wu Phu (c. +235) and the commentaries of Thao Hung-Ching (+492) from the text of the *Shen Nung Pên Tshao Ching* itself. In other words it was the non-*Pên-Ching* part of the *Pên Tshao Ching Chi Chu* (q.v.). It may or may not have included some or all of Thao Hung-Ching's commentaries.
- Ming Shih* 明史.
History of the Ming Dynasty [+1368 to +1643].
Chhing, begun +1646, completed +1736, first pr. +1739.
Chang Thing-Yü 張廷玉 *et al.*
Ming Thang Hsüan Chen Ching Chüeh 明堂女真經訣.
[= *Shang-Chhing Ming Thang Hsüan Chen Ching Chüeh*.]
Explanation of the Manual of (Recovering the) Mysterious Primary (Vitalities of the) Cosmic Temple (i.e. the Human Body) [respiration and heliotherapy].
S/Chhi or Liang, late +5th or early +6th (but much altered).
Attrib. to the Mother Goddess of the West, Hsi Wang Mu 西王母.
Writer unknown.
TT/421.
Cf. Maspero (7), p. 376.
- Ming Thang Yuan Chen Ching Chüeh* 明堂元真經訣.
See *Ming Thang Hsüan Chen Ching Chüeh*.
- Ming Thung Chi* 冥通記.
Record of Communication with the Hidden Ones (the Perfected Immortals).
Liang, +516.
Chou Tzu-Liang 周子良.
Ed. Thao Hung-Ching 陶弘景.
- Mo Chuang Man Lu* 墨莊漫錄.
Recollections from the Estate of Literary Learning.
Sung, c. +1131.
Chang Pang-Chi 張邦基.
- Mo O Hsiao Lu* 墨娥小錄.
A Secretary's Commonplace-Book [popular encyclopaedia].
Yuan or Ming, +14th, pr. +1571.
Compiler unknown.
- Mo Tzu* (incl. *Mo Ching*) 墨子.
The Book of Master Mo.
Chou, -4th century.
Mo Ti (and disciples) 墨翟.
Tr. Mei Yi-Pao (1); Forke (3).
Yin-Tê Index, no. (suppl.) 21.
TT/1162.
- Montoku-fitsuroku* 文德實錄.
Veritable Records of the Reign of the Emperor Montoku [from +851 to +858].
Japan (Heian) +879.
Fujiwara Mototsune 藤原基經.
- Nan Fan Hsiang Lu* 南蕃香錄.
Catalogue of the Incense of the Southern Barbarians.
See *Hsiang Lu*.
- Nan Hai Yao Phu* 南海藥譜.
A Treatise on the Materia Medica of the South Seas (Indo-China, Malayo-Indonesia, the East Indies, etc.).
Alternative title of *Hai Yao Pên Tshao*, q.v. (according to Li Shih-Chen).
- Nan Tshun Cho Kêng Lu* 南村畷耕錄.
See *Cho Kêng Lu*.
- Nan Yo Ssu Ta Chhan-Shih Li Shih Yuan Wên* 南嶽思大禪師立誓願文.
Text of the Vows (of Aranyaka Austerities) taken by the Great Chhan Master (Hui-) Ssu of the Southern Sacred Mountain.
Chhen, c. +565.
Hui-Ssu 慧思.
TW/1933, N/1576.
- Nei Chin Tan* 內金丹.
[= *Nei Tan Pi Chih* or *Thien Hsien Chih Lun Chhang Shêng Tu Shih Nei Lien Chin Tan Fa*.]
The Metallous Enchymoma Within (the Body), [physiological alchemy].
Ming, +1622, part dated +1615.
Perhaps Chhen Ni-Wan 陳泥丸 (Mr Ni-Wan, Chhen), or Wu Chhung-Hsü 伍冲虛.
Contains a system of symbols included in the text.
CTPS, pên 12.
- Nei Ching*.
See *Huang Ti Nei Ching, Su Wên* and *Huang Ti Nei Ching, Ling Shu*.
- Nei Ching Su Wên*.
See *Huang Ti Nei Ching, Su Wên*.
- Nei Kung Thu Shuo* 內功圖說.
See Wang Tsu-Yuan (1).
- Nei Tan Chüeh Fa* 內丹訣法.
See *Huan Tan Nei Hsiang Chin Yo Shih*.
- Nei Tan Fu* 內丹賦.
[= *Thao Chen Yen Nai Tan Fu*.]
Rhapsodical Ode on the Physiological Enchymoma.

- Nei Tan Fu* (cont.)
Sung, +13th.
Thao Chih 陶植.
With commentary by an unknown writer.
TT/256.
Cf. *Chin Tan Fu*, the text of which is very similar.
- Nei Tan Pi Chih* 內丹秘指.
Confidential Directions on the Enchymoma.
Alternative title for *Nei Chin Tan* (q.v.).
- Nei Wai Erh Ching Thu* 內外二景圖.
Illustrations of Internal and Superficial Anatomy.
Sung, +1118.
Chu Hung 朱暉.
Original text lost, and replaced later; drawings taken from Yang Chieh's *Tshun Chen Huan Chung Thu*.
- Nêng Kai Chai Man Lu* 能改齋漫錄.
Miscellaneous Records of the Ability-to-Improve-Oneself Studio.
Sung, mid +12th century.
Wu Tshêng 吳曾.
- Ni-Wan Li Tsu Shih Nü Tsung Shuang Hsiu Pao Fa* 泥丸李祖師女宗雙修寶筏.
See *Nü Tsung Shuang Hsiu Pao Fa*.
- Nihon-Koki* 日本後記.
Chronicles of Japan, further continued [from +792 to +833].
Japan (Heian), +840.
Fujiwara Otsugu 藤原緒嗣.
- Nihon-Koku Ganzai-sho Mokuroku* 日本國見在書目錄.
Bibliography of Extant Books in Japan.
Japan (Heian), c. +895.
Fujiwara no Sukeyo 藤原佐世.
Cf. Yoshida Mitsukuni (6), p. 196.
- Nihon Sankai Meibutsu Zue* 日本山海各物圖會.
Illustrations of Japanese Processes and Manufactures (lit., of the Famous Products of Japan).
Japan (Tokugawa), Osaka, +1754.
Hirase Tessai 平瀬徹齋.
Ills. by Hasegawa Mitsunobu 長谷川光 & Chigusa Shinemon 千種屋新右衛門.
Facsim. repr. with introd. notes, Meicho Kankokai, Tokyo, 1969.
- Nihon-shoki* 日本書記.
See *Nihongi*.
- Nihon Ryo-iki* 日本靈異記.
Record of Strange and Mysterious Things in Japan.
Japan (Heian), +823.
Writer unknown.
- Nihongi* 日本記.
[= *Nihon-shoki*.]
Chronicles of Japan [from the earliest times to +696].
Japan (Nara), +720.
Toneri-shinnō (prince), 舍人親王,
Ono Yasumaro, 大安萬呂,
Ki no Kiyobito *et al.*
Tr. Aston (1).
Cf. Anon. (103), pp. 1 ff.
Nihongi Ryaku 日本記畧.
Classified Matters from the *Chronicles of Japan*.
Japan.
- Nitto-Guhō Junrei Gyōki* 入唐求法巡禮行記
Record of a Pilgrimage to China in Search of the (Buddhist) Law.
Thang, +838 to +847.
Ennin 圓仁.
Tr. Reischauer (2).
- Nü Kung Chih Nan* 女功指南.
A Direction-Finder for (Inner) Achievement by Women (Taoists).
[Physiological alchemy, *nei tan* gymnastic techniques, etc.]
See *Nü Tsung Shuang Hsiu Pao Fa*.
- Nü Tsung Shuang Hsiu Pao Fa* 女宗雙修寶筏.
[= *Ni-Wan Li Tsu Shih Nü Tsung Shuang Hsiu Pao Fa*, or *Nü Kung-Chih Nan*.]
A Precious Raft (of Salvation) for Women (Taoists) Practising the Double Regeneration (of the primary vitalities, for their nature and their life-span, *hsing ming*), [physiological alchemy].
Chhing, c. +1795.
Ni-Wan shih 泥丸氏, Li Ong (late +16th), 李翁, Mr Ni-Wan, the Taoist Patriarch Li.
Written down by Thai-Hsü Ong 太虛翁, Shen I-Ping 沈一炳, Ta-Shih (Taoist abbot), c. 1820.
In *Tao Tsang Hsü Pien* (*Chhu chi*), 20.
Cf. *Tao Hai Chin Liang*, p. 34a, *Shih Chin Shih*, p. 12a.
- Pai hsien-sêng Chin Tan Huo Hou Thu* 白先生金丹火候圖.
Master Pai's Illustrated Tractate on the 'Fire-Times' of the Metallous Enchymoma.
Sung, c. +1210.
Pai Yü-Chhan 白玉蟾.
In *Hsiu Chen Shih Shu* (TT/260), ch. 1.
- Pao Phu Tzu* 抱樸 (or 朴)子.
Book of the Preservation-of-Solidarity Master.
Chin, early +4th century, probably c. +320.
Ko Hung 葛洪.
Partial trs. Feifel (1, 2); Wu & Davis (2)
Full tr. Ware (5), *Nei Phien* chs. only.
TT/1171-1173.
- Pao Phu Tzu Shen Hsien Chin Shuo Ching* 抱朴子神仙金鈞經.
The Preservation-of-Solidarity Master's Manual of the Bubbling Gold (Potion) of the Holy Immortals.
Ascr. Chin c. +320. Perhaps pre-Thang, more probably Thang.

- Pao Phu Tzu Shen Hsien Chin Shuo Ching (cont.)*
Attrib. Ko Hung 葛洪.
TT/910.
Cf. Ho Ping-Yü (11).
- Pao Phu Tzu Yang Shêng Lun* 抱朴子養生論.
The Preservation-of-Solidarity Master's Essay on Hygiene.
Ascr. Chin c. +320.
Attrib. Ko Hung 葛洪.
TT/835.
- Pao Shêng Hsin Chien* 保生心鑑.
Mental Mirror of the Preservation of Life [gymnastics and other longevity techniques].
Ming, +1506.
Thieh Fêng chü-shih 鐵峰居士
(The Recluse of Iron Mountain, ps.).
Ed. c. +1596 by Hu Wên-Huan 胡文煥.
- Pao Shou Thang Ching Yen Fang* 保壽堂經驗方.
Tried and Tested Prescriptions of the Protection-of-Longevity Hall (a surgery or pharmacy).
Ming, c. +1450.
Liu Sung-shih 劉松石.
- Pao Tsang Lun* 寶藏論.
[=*Hsien-Yuan Pao Tsang Chhang Wei Lun.*]
(The Yellow Emperor's) Discourse on the (Contents of the) Precious Treasury (of the Earth), [mineralogy and metallurgy].
Perhaps in part Thang or pre-Thang; completed in Wu Tai (S/Han). Tsêng Yuan-jung (1) notes Chhao Kung-Wu's dating of it at +918 in his *Chhun Chai Tu Shu Chih*. Chang Tzu-Kao (2), p. 118, also considers it mainly a Wu Tai work.
Attrib. Chhing Hsia Tzu 青霞子.
If Su Yuan-Ming 蘇元明 and not another writer of the same pseudonym, the earliest parts may have been of the Chin time (+3rd or +4th); cf Yang Lieh-Yü (1).
Now only extant in quotations.
Cf. *Lo-fou Shan Chih*, ch. 4, p. 13a.
- Pao Yen Thang Pi Chi* 寶顏堂秘笈.
Private Collection of the Pao-Yen Library.
Ming, six collections printed between +1606 and +1620.
Ed. Chhen Chi-Ju 陳繼儒
- Pei Lu Fêng Su* 北虜風俗.
[=*I Su Chi.*]
Customs of the Northern Barbarians (i.e. the Mongols).
Ming, +1594.
Hsiao Ta-Hêng 蕭大亨.
- Pei Mêng So Yen* 北夢瑣言.
Fragmentary Notes Indited North of (Lake) Mêng.
Wu Tai (S/Phing), c. +950.
Sun Kuang-Hsien 孫光憲.
See des Rotours (4), p. 38.
- Pei Shan Chiu Ching* 北山酒經.
Northern Mountain Wine Manual.
Sung, +1117.
Chu Hung 朱肱.
- Pei Shih* 北史.
History of the Northern Dynasties [Nan Pei Chhao period, +386 to +581].
Thang, c. +670.
Li Yen-Shou 李延壽.
For translations of passages see the index of Frankel (1).
- Pên Ching Fêng Yuan* 本經逢原.
(Additions to Natural History) aiming at the Original Perfection of the *Classical Pharmacopoeia (of the Heavenly Husbandman)*.
Chhing, +1695, pr. +1705.
Chang Lu 張璐.
LPC, no. 93.
- Pên Tshao Chhiu Chen* 本草求真.
Truth Searched out in Pharmaceutical Natural History.
Chhing, +1773.
Huang Kung-Hsiu 黃宮璣.
- Pên Tshao Ching Chi Chu* 本草經集注.
Collected Commentaries on the *Classical Pharmacopoeia (of the Heavenly Husbandman)*.
S/Chhi, +492.
Thao Hung-Ching 陶弘景.
Now extant only in fragmentary form as a Tunhuang or Turfan MS., apart from the many quotations in the pharmaceutical natural histories, under Thao Hung-Ching's name.
- Pên Tshao Hui* 本草匯.
Needles from the Haystack; Selected Essentials of *Materia Medica*.
Chhing, +1666, pr. +1668.
Kuo Phei-Lan 郭佩蘭.
LPC, no. 84.
Cf. Swingle (4).
- Pên Tshao Hui Chien* 本草彙箋.
Classified Notes on Pharmaceutical Natural History.
Chhing, begun +1660, pr. +1666.
Ku Yuan-Chiao 顧元交.
LPC, no. 83.
Cf. Swingle (8).
- Pên Tshao Kang Mu* 本草綱目.
The Great Pharmacopoeia; or, The Pan-dects of Natural History (Mineralogy, Metallurgy, Botany, Zoology etc.), Arrayed in their Headings and Sub-headings.
Ming, +1596.
Li Shih-Chen 李時珍.
Paraphrased and abridged tr. Read & collaborators (2-7) and Read & Pak (1) with indexes. Tabulation of plants in Read (1) (with Liu Ju-Chhiang).
Cf. Swingle (7).

- Pên Tshao Kang Mu Shih I* 本草綱目拾遺.
Supplementary Amplifications for the
Pandects of Natural History (of Li Shih-
Chen).
Chhing, begun c. +1760, first prefaced
+1765, prolegomena added +1780, last
date in text 1803.
Chhing, first pr. 1871.
Chao Hsüeh-Min 趙學敏.
LPC, no. 101.
Cf. Swingle (11).
- Pên Tshao Mêng Chhüan* 本草蒙筌.
Enlightenment on Pharmaceutical Natural
History.
Ming, +1565.
Chhen Chia-Mo 陳嘉謨.
Pên Tshao Pei Yao 本草備要.
Practical Aspects of *Materia Medica*.
Chhing, c. +1690, second ed. +1694.
Wang Ang 汪昂.
LPC, no. 90; ICK, pp. 215 ff.
Cf. Swingle (4).
- Pên Tshao Phin Hui Ching Yao* 本草品彙精要.
Essentials of the Pharmacopoeia Ranked
according to Nature and Efficacy (Im-
perially Commissioned).
Ming, +1505.
Liu Wên-Thai 劉文泰, Wang Phan 王鶴
& Kao Thing-Ho 高廷和.
Pên Tshao Shih I 本草拾遺.
A Supplement for the Pharmaceutical
Natural Histories.
Thang, c. +725.
Chhen Tshang-Chhi 陳藏器.
Now extant only in numerous quotations.
- Pên Tshao Shu* 本草述.
Explanations of *Materia Medica*.
Chhing, before +1665, first pr. +1700.
Liu Jo-Chin 劉若金.
LPC, no. 79.
Cf. Swingle (6).
- Pên Tshao Shu Kou Yuan* 本草述鉤元.
Essentials Extracted from the *Explanations
of Materia Medica*.
See Yang Shih-Thai (1).
- Pên Tshao Thu Ching* 本草圖經.
Illustrated Pharmacopoeia; or, Illustrated
Treatise of Pharmaceutical Natural
History.
Sung, +1061.
Su Sung 蘇頌 *et al.*
Now preserved only in numerous quota-
tions in the later pandects of pharma-
ceutical natural history.
- Pên Tshao Thung Hsüan* 本草通玄.
The Mysteries of *Materia Medica* Un-
veiled.
Chhing, begun before +1655, pr. just
before +1667.
Li Chung-Tzu 李中梓.
LPC, no. 75.
Cf. Swingle (4).
- Pên Tshao Tshung Hsin* 本草從新.
New Additions to Pharmaceutical Natural
History.
Chhing, +1757.
Wu I-Lo 吳儀洛.
LPC, no. 99.
- Pên Tshao Yao Hsing* 本草藥性.
The Natures of the Vegetable and Other
Drugs in the Pharmaceutical Treatises.
Thang, c. +620.
Chen Li-Yen 甄立言 & (perhaps) Chen
Chhüan 甄權.
Now extant only in quotations.
- Pên Tshao Yen I* 本草衍義.
Dilations upon Pharmaceutical Natural
History.
Sung, pref. +1116, pr. +1119, repr. +1185,
+1195.
Khou Tsung-Shih 寇宗奭.
See also *Thu Ching Yen I Pên Tshao*
(TT/761).
- Pên Tshao Yen I Pu I* 本草衍義補遺.
Revision and Amplification of the *Dilations
upon Pharmaceutical Natural History*.
Yuan, c. +1330.
Chu Chen-Hêng 朱震亨.
LPC, no. 47.
Cf. Swingle (12).
- Pên Tshao Yuan Shih* 本草原始.
Objective Natural History of *Materia
Medica*; a True-to-Life Study.
Chhing, begun +1578, pr. +1612.
Li Chung-Li 李中立.
LPC, no. 60.
- Phan Shan Yü Lu* 盤山語錄.
Record of Discussions at Phan Mountain
[dialogues of pronouncedly medical
character on physiological alchemy].
Sung, prob. early +13th.
Writer unknown.
In *Hsiu Chen Shih Shu* (TT/260), ch. 53.
- Phêng-Lai Shan Hsi Tsao Huan Tan Ko* 蓬萊
山西靈還丹歌.
Mnemonic Rhymes of the Cyclically
Transformed Elixir from the Western
Furnace on Phêng-lai Island.
Ascr. c. -98. Probably Thang.
Huang Hsüan-Chung 黃玄鍾.
TT/909.
- Phêng Tsu Ching* 彭祖經.
Manual of Phêng 'Tsu [Taoist sexual tech-
niques and their natural philosophy].
Late Chou or C/Han, -4th to -1st.
Attrib. Phêng Tsu 彭祖.
Only extant as fragments in *CSHK*
(Shang Ku Sect.), ch. 16, pp. 5b ff.
- Phu Chi Fang* 普濟方.
Practical Prescriptions for Everyman.
Ming, c. +1418.
Chu Hsiao 朱禱 (Chou Ting Wang 周定王,
prince of the Ming).
ICK, p. 914.

- Pi Yü Chu Sha Han Lin Yü Shu Kuei* 碧玉朱砂寒林玉樹圖.
On the Caerulean Jade and Cinnabar Jade-Tree-in-a-Cold-Forest Casing Process.
Sung, early + 11th cent.
Chhen Ching-Yuan 陳景元.
TT/891.
- Pien Huo Pien* 辯惑編.
Disputations on Doubtful Matters.
Yuan, + 1348.
Hsieh Ying-Fang 謝應芳.
- Pien Tao Lun* 辨道論.
On Taoism, True and False.
San Kuo (Wei), c. + 230.
Tshao Chih (prince of the Wei), 曹植.
Now extant only in quotations.
- Po Wu Chi* 博物記.
Notes on the Investigation of Things.
H/Han, c. + 190.
Thang Mêng (b) 唐蒙.
- Po Wu Chih* 博物志.
Records of the Investigation of Things (cf. *Hsü Po Wu Chih*).
Chin, c. + 290 (begun about + 270).
Chang Hua 張華.
- Pu Wu Yao Lan* 博物要覽.
The Principal Points about Objects of Art and Nature.
Ming, c. + 1560.
Ku Thai 谷泰.
- Rokubutsu Shinshi* 六物新志.
New Record of Six Things [including the drug mumia]. (In part a translation from Dutch texts.)
Japan, + 1786.
Ôtsuki Gentaku 大槻玄澤.
- San Chen Chih Yao Yü Chüeh* 三真旨要玉訣.
Precious Instructions concerning the Message of the Three Perfected (Immortals), [i.e. Yang Hsi (fl. + 370) 楊羲; Hsü Mi (fl. + 345) 許謐; and Hsü Hui (d. c. + 370) 許翻].
Taoist heliotherapy, respiration and meditation.
Chin, c. + 365, edited probably in the Thang.
TT/419.
Cf. Maspero (7), p. 376.
- San-Fêng Chen Jen Hsüan Than Chhüan Chi* 三峯真人玄譚全集.
Complete Collection of the Mysterious Discourses of the Adept (Chang) San-Fêng [physiological alchemy].
Ming, from c. + 1410 (if genuine).
Attrib. Chang San-Fêng 張三峯.
Ed. Min I-Tê (1834) 閔一得.
In *Tao Tsang Hsü Pien* (*Chhu chi*), 17.
- San-Fêng Tan Chüeh* 三峯丹訣 (includes *Chin Tan Chieh Yao* and *Tshai Chen Chi Yao*, with the *Wu Kên Shu* series of poems, and some inscriptions).
Oral Instructions of (Chang) San-Fêng on the Enchymoma [physiological alchemy].
Ming, from c. + 1410 (if genuine).
Attrib. Chang San-Fêng 張三峯.
Ed., with biography, by Fu Chin-Chhüan 傅金銓 (Chi I Tzu 濟一子) c. 1820.
- San Phin I Shen Pao Ming Shen Tan Fang* 三品頤神保命神丹方.
Efficacious Elixir Prescriptions of Three Grades Inducing the Appropriate Mentality for the Enterprise of Longevity.
Thang, Wu Tai & Sung.
Writers unknown.
YCCC, ch. 78, pp. 1 a ff.
- San-shih-liu Shui Fa* 三十六水法.
Thirty-six Methods for Bringing Solids into Aqueous Solution.
Pre-Thang.
Writer unknown.
TT/923.
- San Tshai Thu Hui* 三才圖會.
Universal Encyclopaedia.
Ming, + 1609.
Wang Chhi 王圻.
- San Tung Chu Nang* 三洞珠囊.
Bag of Pearls from the Three (Collections that) Penetrate the Mystery [a Taoist florilegium].
Thang, + 7th.
Wang Hsüan-Ho (ed.) 王懸河.
TT/1125.
Cf. Maspero (13), p. 77; Schipper (1), p. 11.
- San Yen* 三言.
See *Hsing Shih Hêng Yen, Yü Shih Ming Yen, Ching Shih Thung Yen*.
- Setsuyō Yoketsu*.
See *Shê Yang Yao Chüeh*.
- Shan Hai Ching* 山海經.
Classic of the Mountains and Rivers.
Chou and C/Han, -8th to -1st.
Writers unknown.
Partial tr. de Rosny (1).
Chung-Fa Index, no. 9.
- Shang-Chhing Chi* 上清集.
A Literary Collection (inspired by) the Shang-Chhing Scriptures [prose and poems on physiological alchemy].
Sung, c. + 1220.
Ko Chhang-Kêng 葛長庚 (Pai Yü-Chhan 白玉蟾).
In *Hsü Chen Shih Shu* TT/260, chs. 37 to 44.
- Shang-Chhing Ching* 上清經.
[Part of *Thai Shang San-shih-liu Pu Tsun Ching*.]
The Shang-Chhing (Heavenly Purity) Scripture.
Chin, oldest parts date from about + 316.
Attrib. Wei Hua-Tshun 魏華存, dictated to Yang Hsi 楊羲.
In TT/8.

- Shang-Chhing Chiu Chen Chung Ching Nei Chüeh* 上清九真中經內訣.
Confidential Explanation of the Interior Manual of the Nine (Adepts); a Shang-Chhing Scripture.
Ascr. Chin, +4th, probably pre-Thang.
Attrib. Chhieh Sung Tzu 赤松子 (Huang Chhu-Phing 黃初平).
TT/901.
- Shang Chhing Han Hsiang Chien Chien Thu* 上清含象劍鑑圖.
The Image and Sword Mirror Diagram; a Shang-chhing Scripture.
Thang, c. +700.
Ssuma Chheng-Chên 司馬承貞.
TT/428.
- Shang-Chhing Hou Shêng Tao Chün Lieh Chi* 上清後聖道君列紀.
Annals of the Latter-Day Sage, the Lord of the Tao; a Shang-Chhing Scripture.
Chin, late +4th.
Revealed to Yang Hsi 楊羲.
TT/439.
- Shang-Chhing Huang Shu Kuo Tu I* 上清黃書過度儀.
The System of the Yellow Book for Attaining Salvation; a Shang-Chhing Scripture [the rituale of the communal Taoist liturgical sexual ceremonies, +2nd to +7th centuries].
Date unknown, but pre-Thang.
Writer unknown.
TT/1276.
- Shang-Chhing Ling-Pao Ta Fa* 上清靈寶大法.
The Great Liturgies; a Shang-Chhing Ling-Pao Scripture.
Sung, +13th.
Chin Yün-Chung 金允中.
TT/1204, 1205, 1206.
- Shang-Chhing Ming Thang Hsüan Chen Ching Chüeh* 上清明堂玄真經訣.
See *Ming Thang Hsüan Chen Ching Chüeh*.
Shang-Chhing San Chen Chih Yao Yü Chüeh 上清三真旨要玉訣.
See *San Chen Chih Yao Yü Chüeh*.
- Shang-Chhing Thai-Shang Pa Su Chen Ching* 上清太上八素真經.
Realisation Canon of the Eight Purifications (or Eightfold Simplicity); a Shang-Chhing Thai-Shang Scripture.
Date uncertain, but pre-Thang.
Writer unknown.
TT/423.
- Shang-Chhing Thai-Shang Ti Chün Chiu Chen Chung Ching* 上清太上帝君九真中經.
Ninefold Realised Median Canon of the Imperial Lord; a Shang-Chhing Thai-Shang Scripture.
Compiled from materials probably of Chin period, late +4th.
Writers and editor unknown.
TT/1357.
- Shang-Chhing Tung-Chen Chiu Kung Tzu Fang Thu* 上清洞真九宮紫房圖.
Description of the Purple Chambers of the Nine Palaces; a Tung-Chen Scripture of the Shang-Chhing Heavens [parts of the microcosmic body corresponding to stars in the macrocosm].
Sung, probably +12th century.
Writer unknown.
TT/153.
- Shang-Chhing Wo Chung Chüeh* 上清握中訣.
Explanation of (the Method of) Grasping the Central (Luminary); a Shang-Chhing Scripture [Taoist meditation and heliotherapy].
Date unknown, Liang or perhaps Thang.
Writer unknown.
Based on the procedures of Fan Yu-Chhung 范幼沖 (H/Han).
TT/137.
Cf. Maspero (7), p. 373.
- Shang Phün Tan Fa Chieh Tzhu* 上品丹法節次.
Expositions of the Techniques for Making the Best Quality Enchymoma [physiological alchemy].
Chhing.
Li Tê-Hsia 李德洽.
Comm. Min I-Tê 閔一德, c. 1830.
In *Tao Tsang Hsü Pien (Chhu chi)*, 6.
- Shang Shu Ta Chuan* 尚書大傳.
Great Commentary on the *Shang Shu* chapters of the *Historical Classic*.
C/Han, c. -185.
Fu Shêng 伏勝.
Cf. Wu Khang (1), p. 230.
- Shang-Tung Hsin Tan Ching Chüeh* 上洞心丹經訣.
An Explanation of the Heart Elixir and Enchymoma Canon; a Shang-Tung Scripture.
Date unknown, perhaps Sung.
Writer unknown.
TT/943.
Cf. Chhen Kuo-Fu (1), vol. 2, pp. 389, 435.
- Shang Yang Tzu Chin Tan Ta Yao* 上陽子金丹大要.
See *Chin Tan Ta Yao*.
- Shang Yang Tzu Chin Tan Ta Yao Hsien Phai* (Yuan Liu) 上陽子金丹大要仙派 (源流).
See *Chin Tan Ta Yao Hsien Phai (Yuan Liu)*.
- Shang Yang Tzu Chin Tan Ta Yao Lieh Hsien Chih* 上陽子金丹大要列仙誌.
See *Chin Tan Ta Yao Lieh Hsien Chih*.
- Shang Yang Tzu Chin Tan Ta Yao Thu* 上陽子金丹大要圖.
See *Chin Tan Ta Yao Thu*.
- Shao-Hsing Chiao-Ting Ching-Shih Cheng Lei Pei-Chi Pên Tshao* 紹興校定經史證類備急本草.

- Shao-Hsing Chiao-Ting Ching-Shih Cheng Lei Pei-Chi Pên Tshao (cont.)*
The Corrected Classified and Consolidated Armamentarium; Pharmacopoeia of the Shao-Hsing Reign-Period.
S/Sung, pres. +1157, pr. +1159, often copied and repr. especially in Japan.
Thang Shen-Wei 唐慎微 ed. Wang Chi-Hsien 王繼先 *et al.*
Cf. Nakao Manzō (1, 1); Swingle (11).
Illustrations reproduced in facsimile by Wada (1); Karow (2).
Facsimile edition of a MS. in the Library of Ryokoku University, Kyoto 龍谷大學圖書館.
Ed. with an analytical and historical introduction, including contents table and indexes (別冊) by Okanishi Tameto 岡西爲人 (Shunyōdō, Tokyo, 1971).
- Shē Ta Chhêng Lun Shih* 攝大乘論釋.
Mahāyāna-saṃgraha-bhāṣya (Explanatory Discourse to assist the Understanding of the Great Vehicle).
India, betw. +300 and +500.
Tr. Hsüan-Chuang 玄奘, c. +650.
N/1171 (4); TW/1597.
- (*Shē Yang*) *Chen Chung Chü* (or *Fang*) (攝養) 枕中記(方).
Pillow-Book on Assisting the Nourishment (of the Life-Force).
Thang, early +7th.
Attrib. Sun Ssu-Mo 孫思邈.
TT/830, and in YCCC, ch. 33.
- Shē Yang Yao Chüeh* (*Setsuyō Yoketsu*) 攝養要訣.
Important Instructions for the Preservation of Health conducive to Longevity.
Japan (Heian), c. +820.
Mononobe Kōsen (imperial physician) 物部廣成.
- Shen Hsien Chin Shuo Ching* 神仙金鈞經.
See *Pao Phu Tzu Shen Hsien Chin Shuo Ching*.
- Shen Hsien Chuan* 神仙傳.
Lives of the Holy Immortals.
(Cf. *Lieh Hsien Chuan* and *Hsü Shen Hsien Chuan*).
Chin, +4th century.
Attrib. Ko Hung 葛洪.
- Shen Hsien Fu Erh Tan Shih Hsing Yao Fa* 神仙服餌丹石行藥法.
The Methods of the Holy Immortals for Ingesting Cinnabar and (Other) Minerals, and Using them Medicinally.
Date unknown.
Attrib. Ching-Li hsien-sêng 京里先生.
TT/417.
- Shen Hsien Fu Shih Ling-Chih Chhang-Phu Wan Fang* 神仙服食靈芝菖蒲丸方.
Prescriptions for Making Pills from Numinous Mushrooms and Sweet Flag (*Calamus*), as taken by the Holy Immortals.
Date unknown.
- Writer unknown.
TT/837.
- Shen Hsien Lien Tan Tien Chu San Yuan Pao Ching Fa* 神仙鍊丹點鑄三元寶鏡法.
Methods used by the Holy Immortals to Prepare the Elixir, Project it, and Cast the Precious Mirrors of the Three Powers (or the Three Primary Vitalities), [magical].
Thang, +902.
Writer unknown.
TT/856.
- Shen Hsien Thung Chien* 神仙通鑑.
(Cf. *Li Tai*) *Shen Hsien (Thung) Chien*.
General Survey of the Lives of the Holy Immortals.
Ming, +1640.
Hsüeh Ta-Hsün 薛大訓.
- Shen I Chi* 神異記.
(Probably an alternative title of *Shen I Ching*, q.v.)
Records of the Spiritual and the Strange.
Chin, c. +290.
Wang Fou 王浮.
- Shen I Ching* 神異經.
Book of the Spiritual and the Strange.
Ascr. Han, but prob. +3rd, +4th or +5th century.
Attrib. Tungfang Shuo 東方朔.
Probable author, Wang Fou 王浮.
- Shen Nung Pên Tshao Ching* 神農本草經.
Classical Pharmacopoeia of the Heavenly Husbandman.
C/Han, based on Chou and Chhin material, but not reaching final form before the +2nd century.
Writers unknown.
Lost as a separate work, but the basis of all subsequent compendia of pharmaceutical natural history, in which it is constantly quoted.
Reconstituted and annotated by many scholars; see Lung Po-Chien (1), pp. 2 ff., 12 ff.
Best reconstructions by Mori Tateyuki 森立之 (1845), Liu Fu 劉復 (1942).
- Shen shih Liang Fang* 沈氏良方.
Original title of *Su Shen Liang Fang* (q.v.).
- Shen Thien-Shih Fu Chhi Yao Chüeh* 申天師服氣要訣.
Important Oral Instructions of the Heavenly Teacher (or Patriarch) Shen on the Absorption of the Chhi [Taoist breathing exercises].
Thang, c. +730.
Shen Yuan-Chih 申元之.
Now extant only as a short passage in YCCC, ch. 59, pp. 166 ff.
- Shêng Chi Tsung Lu* 聖濟總錄.
Imperial Medical Encyclopaedia [issued by authority].
Sung, c. +1111 to +1118.
Ed. by twelve physicians.

- Shêng Shih Miao Ching* 生尸妙經.
See *Thai-Shang Tung-Hsüan Ling-Pao Mieh Tu* (or *San Yuan*) *Wu Lien Shêng Shih Miao Ching*.
- Shêng Shui Yen Than Lu* 澗水燕談錄.
Fleeting Gossip by the River Shêng [in Shantung].
Sung, late +11th century (before +1094).
Wang Phi-Chih 王闢之.
- Shih Chin Shih* 試金石.
On the Testing of (what is meant by) 'Metal' and 'Mineral'.
See *Fu Chin-Chhüan* (5).
- Shih Han Chi* 石函記.
See *Hsü Chen Chün Shih Han Chi*.
- Shih I Chi* 拾遺記.
Memoirs on Neglected Matters.
Chin, c. +370.
Wang Chia 王嘉.
Cf. *Eichhorn* (5).
- Shih I Tê Hsiao Fang* 世醫得効方.
Efficacious Prescriptions of a Family of Physicians.
Yuan, +1337.
Wei I-Lin 危亦林.
- Shih Liao Pên Tshao* 食療本草.
Nutritional Therapy; a Pharmaceutical Natural History.
Thang, c. +670.
Mêng Shen 孟詵.
- Shih Lin Kuang Chi* 事林廣記.
Guide through the Forest of Affairs [encyclopaedia].
Sung, between +1100 and +1250; first pr. +1325.
Chhen Yuan-Ching 陳元靚.
(A unique copy of a Ming edition of +1478 is in the Cambridge University Library.)
- Shih Ming* 釋名.
Explanation of Names [dictionary].
H/Han, c. +100.
Liu Hsi 劉熙.
- Shih Pien Liang Fang* 十便良方.
Excellent Prescriptions of Perfect Convenience.
Sung, +1196.
Kuo Than 郭坦.
Cf. *SIC*, p. 1119; *ICK*, p. 813.
- Shih Wu Chi Yuan* 事物紀原.
Records of the Origins of Affairs and Things.
Sung, c. +1085.
Kao Chhêng 高承.
- Shih Wu Pên Tshao* 食物本草.
Nutritional Natural History.
Ming, +1571 (repr. from a slightly earlier edition).
Attrib. Li Kao 李杲 (J/Chin) or Wang Ying 汪穎 (Ming) in various editions; actual writer Lu Ho 盧和.
The bibliography of this work in its several different forms, together with the questions of authorship and editorship, are complex.
See *Lung Po-Chien* (1), pp. 104, 105, 106; *Wang Yü-Hu* (1), 2nd ed. p. 194; *Swingle* (1, 10).
- Shih Yao Erh Ya* 石藥爾雅.
The Literary Expositor of Chemical Physic; or, Synonymic Dictionary of Minerals and Drugs.
Thang, +806.
Mei Piao 梅彪.
TT/894.
- Shih Yuan* 事原.
On the Origins of Things.
Sung.
Chu Hui 朱繪.
- Shoku-Nihongi* 續日本記.
Chronicles of Japan, continued [from +697 to +791].
Japan (Nara), +797.
Ishikawa Natari 石川, Fujiwara Tsuginawa 藤原繼繩, Sugeno Sanemichi 菅野真道 *et al.*
- Shoku-Nihonkoki* 續日本後記.
Chronicles of Japan, still further continued [from +834 to +850].
Japan (Heian), +869.
Fujiwara Yoshifusa 藤原良房.
- Shou Yü Shen Fang* 壽域神方.
Magical Prescriptions of the Land of the Old.
Ming, c. +1430.
Chu Chhüan 朱權 (Ning Hsien Wang 寧獻王, prince of the Ming).
- Shu Shu Chi I* 數術記遺.
Memoir on some Traditions of Mathematical Art.
H/Han, +190, but generally suspected of having been written by its commentator Chen Luan 甄鸞, c. +570. Some place the text as late as the Wu Tai period (+10th. cent.), e.g. *Hu Shih*; and others such as *Li Shu-Hua* (2) prefer a Thang dating.
Hsü Yo 徐岳.
- Shu Yuan Tsa Chi* 菘園雜記.
The Bean-Garden Miscellany.
Ming, +1475.
Lu Jung 陸容.
- Shuang Mei Ching An Tshung Shu* 雙梅景閣叢書.
Double Plum-Tree Collection [of ancient and medieval books and fragments on Taoist sexual techniques].
See *Yeh Tê-Hui* (1) 葉德輝 in *Bib. B.*
- Shui Yün Lu* 水雲錄.
Record of Clouds and Waters [iatro-chemical].
Sung, c. +1125.
Yeh Mêng-Tê 葉夢得.
Extant now only in quotations.

- Shun Yang Lü Chen-jen Yao Shih Chih* 純陽
呂真人藥石製.
The Adept Lü Shun-Yang's (i.e. Lü
Tung-Pin's) Book on Preparations of
Drugs and Minerals [in verses].
Late Thang.
Attrib. Lü Tung-Pin 呂洞賓.
TT/896.
Tr. Ho Ping-Yü, Lim & Morsingh (1).
- Shuo Wên*.
See *Shuo Wên Chieh Tzu*.
- Shuo Wên Chieh Tzu* 說文解字.
Analytical Dictionary of Characters (lit.
Explanations of Simple Characters and
Analyses of Composite Ones).
H/Han, +121.
Hsü Shen 許慎.
- So Sui Lu* 瑣碎錄.
Sherds, Orts and Unconsidered Fragments
[iatro-chemical].
Sung, prob. late +11th.
Writer unknown.
Now extant only in quotations. Cf. *Winter's
Tale*, iv, iii, *Timon of Athens*, iv, iii, and
Julius Caesar, iv, i.
- Sou Shen Chi* 搜神記.
Reports on Spiritual Manifestations.
Chin, c. +348.
Kan Pao 干寶.
Partial tr. Bodde (9).
- Sou Shen Hou Chi* 搜神後記.
Supplementary Reports on Spiritual
Manifestations.
Chin, late +4th or early +5th century.
Thao Chhien 陶潛.
- Ssu Khu Thi Yao Pien Chêng* 四庫提要辨證.
See Yü Chia-Hsi (1).
- Ssu Shêng Pên Tshao* 四聲本草.
Materia Medica Classified according to the
Four Tones (and the Standard Rhymes),
[the entries arranged in the order of the
pronunciation of the first character of
their names].
Thang, c. +775.
Hsiao Ping 蕭炳.
- Ssu Shih Thiao Shê Chien* 四時調攝箋.
Directions for Harmonising and Strengthen-
ing (the Vitalities) according to the Four
Seasons of the Year [the second part
(chs. 3-6) of *Tsun Shêng Pa Chien*, q.v.].
Ming, +1591.
Kao Lien 高謙.
Partial tr. of the gymnastic material,
Dudgeon (1).
- Ssu Shih Tsuan Yao* 四時纂要.
Important Rules for the Four Seasons
[agriculture and horticulture, family
hygiene and pharmacy, etc.].
Thang, c. +750.
Han O 韓鄂.
- Su Nü Ching* 素女經.
Canon of the Immaculate Girl.
Han.
Writer unknown.
Only as fragment in *Shuang Mei Ching An
Tshung Shu*, now containing the *Hsüan Nü
Ching* (q.v.).
Partial trs. van Gulik (3, 8).
Su Nü Miao Lun 素女妙論.
Mysterious Discourses of the Immaculate
Girl.
Ming, c. +1500.
Writer unknown.
Partial tr. van Gulik (3).
- Su Shen Liang Fang* 蘇沈良方.
Beneficial Prescriptions collected by Su
(Tung-Pho) and Shen (Kua).
Sung, c. +1120. Some of the data go back
as far as +1060. Preface by Lin Ling-Su
林靈素.
Shen Kua 沈括 and Su Tung-Pho
蘇東坡 (posthumous).
The collection was at first called *Shen
shih Liang Fang*, so that most of the
entries are Shen Kua's, but as some cer-
tainly stem from Su Tung-Pho, the latter
were probably added by editors at the
beginning of the new century.
Cf. ICK, pp. 737, 732.
- Su Wên Ling Shu Ching*.
See *Huang Ti Nei Ching*, *Su Wên* and
Huang Ti Nei Ching, *Ling Shu*.
- Su Wên Nei Ching*.
See *Huang Ti Nei Ching*, *Su Wên*.
- Sui Shu* 隋書.
History of the Sui Dynasty [+581 to
+617].
Thang, +636 (annals and biographies);
+656 (monographs and bibliography).
Wei Chêng 魏徵 *et al.*
Partial trs. Pfizmaier (61-65); Balazs (7, 8);
Ware (1).
For translations of passages see the index of
Frankel (1).
- Sun Kung Than Phu* 孫公談圃.
The Venerable Mr Sung's Conversation
Garden.
Sung, c. +1085.
Sun Shêng 孫升.
- Sung Chhao Shih Shih* 宋朝事實.
Records of Affairs of the Sung Dynasty.
Yuan, +13th.
Li Yu 李攸.
- Sung Shan Thai-Wu hsien-sêng Chhi Ching*
嵩山太无先生氣經.
Manual of the (Circulation of the) Chhi,
by Mr Grand-Nothingness of Sung
Mountain.
Thang, +766 to +779.
Prob. Li Fêng-Shih 李奉時 (Thai-Wu
hsien-sêng).
TT/817, and in *YCCC*, ch. 59 (partially),
pp. 7a ff.
Cf. Maspero (7), p. 199.

- Sung Shih* 宋史.
History of the Sung Dynasty [+960 to +1279].
Yuan, c. +1345.
Tho-Tho (Toktaga) 脫脫 & Ouyang Hsüan 歐陽玄.
Yin-Tê Index, no. 34.
- Szechuan Thung Chih* 四川通志.
General History and Topography of Szechuan Province.
Chhing, +18th century (pr. 1816).
Ed. Chhang Ming 常明, Yang Fang-Tshan 楊芳燦 *et al.*
- Ta Chao* 大招.
The Great Summons (of the Soul), [ode].
Chhu (between Chhin and Han), -206 or -205.
Writer unknown.
Tr. Hawkes (1), p. 109.
- Ta Chih Tu Lun* 大智度論.
Mahā-prajñāpāramitō-padeśa Śāstra (Commentary on the Great Sūtra of the Perfection of Wisdom).
India.
Attrib. Nāgārjuna, +2nd.
Mostly prob. of Central Asian origin.
Tr. Kumārajīva, +406.
N/1169; TW/1509.
- Ta Chün Ku Thung* 大鈞鼓銅.
(Illustrated Account of the Mining), Smelting and Refining of Copper [and other Non-Ferrous Metals], according to the Principles of Nature (lit. the Great Potter's Wheel).
See Masuda Tsuna (1).
- Ta Fang Kuang Fo Hua Yen Ching* 大方廣佛華嚴經.
Avatamsaka Sūtra.
India.
Tr. Śikshānanda, +699.
N/88; TW/279.
- Ta Huan Tan Chao Chien* 大還丹照鑑.
An Elucidation of the Great Cyclically Transformed Elixir [in verses].
Wu Tai (Shu), +962.
Writer unknown.
TT/919.
- Ta Huan Tan Chhi Pi Thu* 大還丹契祕圖.
Esoteric Illustrations of the Concordance of the Great Regenerative Enchymoma.
Thang or Sung.
Writer unknown.
In *YCCC*, ch. 72, pp. 1a ff.
Cf. *Hsiu Chen Li Yen Chhao Thu* and *Chin I Huan Tan Yin Chêng Thu*.
- Ta-Kuan Ching-Shih Chêng Lei Pei-Chi Pên Tshao* 大觀經史證類備急本草.
The Classified and Consolidated Armamentarium; Pharmacopoeia of the Ta-Kuan reign-period.
Sung, +1108; repr. +1211, +1214 (J/Chin), +1302 (Yuan).
Thang Shen-Wei 唐慎微.
Ed. Ai Shêng 艾晟.
- Ta Ming I Thung Chih* 大明一統志.
Comprehensive Geography of the (Chinese) Empire (under the Ming dynasty).
Ming, commissioned +1450, completed +1461.
Ed. Li Hsien 李賢.
- Ta Tai Li Chi* 大戴禮記.
Record of Rites [compiled by Tai the Elder] (cf. *Hsiao Tai Li Chi; Li Chi*).
Ascr. C/Han, c. -70 to -50, but really H/Han, between +80 and +105.
Attrib. ed. Tai Tê 戴德, in fact probably ed. Tshao Pao 曹褒.
See Legge (7).
Trs. Douglas (1); R. Wilhelm (6).
- Ta Tan Chhien Hung Lun* 大丹鉛汞論.
Discourse on the Great Elixir [or Enchymoma] of Lead and Mercury.
If Thang, +9th, more probably Sung.
Chin Chu-Pho 金竹坡.
TT/916.
Cf. Yoshida Mitsukuni (5), pp. 230-2.
- Ta Tan Chi* 大丹記.
Record of the Great Enchymoma.
Ascr. +2nd cent., but probably Sung, +13th.
Attrib. Wei Po-Yang 魏伯陽.
TT/892.
- Ta Tan Chih Chih* 大丹直指.
Direct Hints on the Great Elixir.
Sung, c. +1200.
Chhiu Chhu-Chi 邱處機.
TT/241.
- Ta Tan Wên Ta* 大丹問答.
Questions and Answers on the Great Elixir (or Enchymoma) [dialogues between Chêng Yin and Ko Hung].
Date unknown, prob. late Sung or Yuan.
Writer unknown.
TT/932.
- Ta Tan Yao Chüeh Pên Tshao* 大丹藥訣本草.
Pharmaceutical Natural History in the form of Instructions about Medicines of the Great Elixir (Type), [iatro-chemical].
Possible alternative title of *Wai Tan Pên Tshao* (q.v.).
- Ta-Tung Lien Chen Pao Ching, Chiu Huan Chin Tan Miao Chüeh* 大洞鍊真寶經九還金丹妙訣.
Mysterious Teachings on the Ninefold Cyclically Transformed Gold Elixir, supplementary to the Manual of the Making of the Perfected Treasure; a Ta-Tung Scripture.
Thang, +8th, perhaps c. +712.
Chhen Shao-Wei 陳少微.
TT/884. A sequel to TT/883, and in *YCCC*, ch. 68, pp. 8a ff.
Tr. Sivin (4).

- Ta-Tung Lien Chen Pao Ching, Hsiu Fu Ling Sha Miao Chieh* 大洞鍊真寶經修伏靈砂妙訣.
Mysterious Teachings on the Alchemical Preparation of Numinous Cinnabar, supplementary to the Manual of the Making of the Perfected Treasure; a Ta-Tung Scripture.
Thang, +8th, perhaps c. +712.
Chhen Shao-Wei 陳少微.
TT/883. Alt. title: *Chhi Fan Ling Sha Lun*, as in YCCC, ch. 69, pp. 1a ff.
Tr. Sivin (4).
- Ta Yu Miao Ching* 大有妙經.
[= *Tung-Chen Thai-Shang Su-Ling Tung-Yuan Ta Yu Miao Ching*.]
Book of the Great Mystery of Existence [Taoist anatomy and physiology; describes the *shang tan thien*, upper region of vital heat, in the brain].
Chin, +4th.
Writer unknown.
TT/1295.
Cf. Maspero (7), p. 192.
- Tai I Phien* 代疑篇.
On Replacing Doubts by Certainties.
Ming, +1621.
Yang Thing-Yün 楊廷筠.
Preface by Wang Chêng 王徵.
- Taketori Monogatari* 竹取物語.
The Tale of the Bamboo-Gatherer.
Japan (Heian), c. +865. Cannot be earlier than c. +810 or later than c. +955.
Writer unknown.
Cf. Matsubara Hisako (1, 2).
- Tan Ching Shih Tu* 丹經示讀.
A Guide to the Reading of the Enchymoma Manuals.
See Fu Chin-Chhuan (3).
- Tan Ching Yao Chieh*.
See *Thai-Chhing Tan Ching Yao Chieh*.
- Tan Fang Ao Lun* 丹房奧論.
Subtle Discourse on the (Alchemical) Laboratory (of the Human Body, for making the Enchymoma).
Sung, +1020.
Chheng Liao-I 程了一.
TT/913, and in TTCY (*chung mao chi*, 5).
- Tan Fang Chien Yuan* 丹方鏡源.
The Mirror of Alchemical Processes (and Reagents); a Source-book.
Wu Tai (H/Shu), c. +938 to +965.
Tuku Thao 獨孤酒.
Descr. Fêng Chia-Lo & Collier (1).
See Ho Ping-Yü & Su Ying-Hui (1).
TT/918.
- Tan Fang Ching Yuan* 丹房鏡源.
The Mirror of the Alchemical Laboratory; a Source-book.
Early Thang, not later than +800.
Writer unknown.
- Survives only incorporated in TT/912 and in CLPT.
See Ho Ping-Yü & Su Ying-Hui (1).
- Tan Fang Hsi Chih* 丹房須知.
Indispensable Knowledge for the Chymical Laboratory [with illustrations of apparatus].
Sung, +1163.
Wu Wu 吳悞.
TT/893.
- Tan Fang Pao Chien Chih Thu* 丹房寶鑑之圖.
[= *Tzu Yang Tan Fang Pao Chien Chih Thu*.]
Precious Mirror of the Elixir and Enchymoma Laboratory; Tables and Pictures (to illustrate the Principles).
Sung, c. +1075.
Chang Po-Tuan 張伯端 (Tzu Yang Tzu 紫陽子 or Tzu Yang Chen Jen).
Incorporated later in *Chin Tan Ta Yao Thu* (q.v.)
In *Chin Tan Ta Yao* (TTCY ed.), ch. 3, pp. 34a ff. Also in *Wu Chen Phien* (in *Hsiu Chen Shih Shu*, TT/260, ch. 26, pp. 5a ff.).
Cf. Ho Ping-Yü & Needham (2).
- Tan I San Chuan* 丹竅三卷.
See Pa Tzu-Yuan (1).
- Tan Lun Chieh Chih Hsin Ching* 丹論訣旨心鏡 (Chien or Chao 鑑, 照 occur as tabu forms in the titles of some versions.)
Mental Mirror Reflecting the Essentials of Oral Instruction about the Discourses on the Elixir and the Enchymoma.
Thang, probably +9th.
Chang Hsüan-Tê 張玄德, criticising the teachings of Ssuma Hsi-I 司馬希夷.
TT/928, and in YCCC, ch. 66, pp. 1a ff.
Tr. Sivin (5).
- Tan Thai Hsin Lu* 丹臺新錄.
New Discourse on the Alchemical Laboratory.
Early Sung or pre-Sung.
Attrib. Chhing Hsia Tzu 青霞子 or Hsia Yu-Chang 夏有章.
Extant only in quotations.
- Tan-Yang Chen Jen Yü Lu* 丹陽真人玉錄.
Precious Records of the Adept Tan-Yang.
Sung, mid +12th cent.
Ma Yü 馬鈺.
TT/1044.
- Tan-Yang Shen Kuang Tshan* 丹陽神光燦.
Tan Yang (Tzu's Book) on the Resplendent Glow of the Numinous Light.
Sung, mid +12th cent.
Ma Yü 馬鈺.
TT/1136.
- Tan Yao Pi Chieh* 丹藥祕訣.
Confidential Oral Instructions on Elixirs and Drugs.
Prob. Yuan or early Ming.
Hu Yen 胡演.
Now only extant as quotations in the pharmaceutical natural histories.

- Tao Fa Hsin Chhuan* 道法心傳.
Transmission of (a Lifetime of) Thought on Taoist Techniques [physiological alchemy with special reference to microcosm and macrocosm; many poems and a long exposition].
Yuan, +1294.
Wang Wei-I 王惟一.
TT/1235, and TTCY (*hsia mao chi*, 5).
- Tao Fa Hui Yuan* 道法會元.
Liturgical and Apotropaic Encyclopaedia of Taoism.
Thang and Sung.
Writers and compiler unknown.
TT/1203.
- Tao Hai Chin Liang* 道海津梁.
A Catena (of Words) to Bridge the Ocean of the Tao.
See Fu Chin-Chhuan (4).
- Tao Shu* 道樞.
Axial Principles of the Tao [doctrinal treatise, mainly on the techniques of physiological alchemy].
Sung, early +12th; finished by 1145.
Tsêng Tshao 曾慥.
TT/1005.
- Tao Su Fu* 壽素賦.
Ode on a Girl of Matchless Beauty [Chao nü, probably Chao Fei-Yen]; or, Of What does Spotless Beauty Consist?
C/Han, c. -20.
Pan chieh-yü 班婕妤.
In CSHK, Chhien Han Sect., ch. 11, p. 7a ff.
- Tao Tê Ching* 道德經.
Canon of the Tao and its Virtue.
Chou, before -300.
Attrib. Li Erh (Lao Tzu) 李耳(老子).
Tr. Waley (4); Chhu Ta-Kao (2); Lin Yü-Thang (1); Wieger (7); Duyvendak (18); and very many others.
- Tao Tsang* 道藏.
The Taoist Patrology [containing 1464 Taoist works].
All periods, but first collected in the Thang about +730, then again about +870 and definitively in +1019. First printed in the Sung (+1111 to +1117). Also printed in J/Chin (+1168 to +1191), Yuan (+1244), +1607), and Ming (+1445, +1598 and Writers numerous.
Indexes by Wieger (6), on which see Pelliot's review (58); and Ong Tu-Chien (Yin-Tê Index, no. 25).
- Tao Tsang Chi Yao* 道藏輯要.
Essentials of the Taoist Patrology [containing 287 books, 173 works from the Taoist Patrology and 114 Taoist works from other sources].
All periods, pr. 1906 at Erh-hsien-ssu 二仙寺, Chhêngtu.
Writers numerous.
- Ed. Ho Lung-Hsiang 賀龍驤 & Phêng Han-Jan 彭瀚然 (Chhing).
- Tao Tsang Hsü Phien Chhu Chi* 道藏續篇初集.
First Series of a Supplement to the Taoist Patrology.
Chhing, early 19th cent.
Edited by Min I-Tê 閔一得.
- Tao Yin Yang Shêng Ching* 導引養生經.
[= *Thai-Chhing Tao Yin Yang Shêng Ching*.]
Manual of Nourishing the Life-Force (or, Attaining Longevity and Immortality) by Gymnastics.
Late Thang, Wu Tai, or early Sung.
Writer unknown.
TT/811, and in YCCC, ch. 34.
Cf. Maspero (7), pp. 415 ff.
- Têng Chen Yin Chüeh* 登真隱訣.
Confidential Instructions for the Ascent to Perfected (Immortality).
Chin and S/Chhi. Original material from the neighbourhood of +365 to +366; commentary (the 'Confidential Instructions' of the title) by Thao Hung-Ching (+456 to +536) written between +493 and +498.
Original writer unknown.
Ed. Thao Hung-Ching 陶弘景.
TT/418, but conservation fragmentary.
Cf. Maspero (7), pp. 192, 374.
- Thai-Chhing Chen Jen Ta Tan* 太清真人太丹.
[Alternative later name of *Thai-Chhing Tan Ching Yao Chüeh*.]
The Great Elixirs of the Adepts; a Thai-Chhing Scripture.
Thang, mid +7th (c. +640).
Prob. Sun Ssu-Mo 孫思邈.
In YCCC, ch. 71.
Tr. Sivin (1), pp. 145 ff.
- Thai-Chhing Chin I Shen Chhi Ching* 太清金液神氣經.
Manual of the Numinous Chhi of Potable Gold; a Thai-Chhing Scripture.
Ch. 3 records visitations by the Lady Wei Hua-Tshun and her companion divinities mostly paralleling texts in the *Chen Kao*. They were taken down by Hsü Mi's great-grandson Hsü Jung-Ti (d. +435), c. +430. Chs 1 and 2 are Thang or Sung, before +1150. If pre-Thang, cannot be earlier than +6th.
Writers mainly unknown.
TT/875.
- Thai-Chhing Chin I Shen Tan Ching* 太清金液神丹經.
Manual of the Potable Gold (or Metallous Fluid), and the Magical Elixir (or Enchymoma); a Thai-Chhing Scripture.
Date unknown, but must be pre-Liang (Chhen Kuo-Fu (1), vol. 2, p. 419). Contains dates between +320 and +330, but most of the prose is more probably of the early +5th century.

- Thai-Chhing Chin I Shen Tan Ching (cont.)*
 Preface and main texts of *nei tan* character, all the rest *wai tan*, including laboratory instructions.
 Writer unknown; chs. variously attributed.
 The third chapter, devoted to descriptions of foreign countries which produced cinnabar and other chemical substances, may be of the second half of the +7th century (see Maspero (14), pp. 95 ff.). Most were based on Wan Chen's *Nan Chou I Wu Chih* (+3rd cent.), but not the one on the Roman Orient (Ta-Chhin) translated by Maspero. Stein (5) has pointed out however that the term *Fu-Lin* for Byzantium occurs as early as +500 to +520, so the third chapter may well be of the early +6th century.
 TT/873.
 Abridged in YCCC ch. 65, pp. 1 a ff.
 Cf. Ho Ping-Yü (10).
- Thai-Chhing Ching Thien-Shih Khou Chieh*
 太清經天師口訣.
 Oral Instructions from the Heavenly Masters [Taoist Patriarchs] on the Thai-Chhing Scriptures.
 Date unknown, but must be after the mid +5th cent. and before Yuan.
 Writer unknown.
 TT/876.
- Thai-Chhing Chung Huang Chen Ching* 太清中黃真經.
 See *Chung Huang Chen Ching*.
- Thai-Chhing Shih Pi Chi* 太清石壁記.
 The Records in the Rock Chamber (lit. Wall); a Thai-Chhing Scripture.
 Liang, early +6th, but includes earlier work of Chin time as old as the late +3rd, attributed to Su Yuan-Ming.
 Edited by Chhu Tsé hsien-sêng 楚潭先生.
 Original writer, Su Yuan-Ming 蘇元明 (Chhing Hsia Tzu 青霞子).
 TT/874.
 Tr. Ho Ping-Yü (8).
 Cf. *Lo-fou Shan Chih*, ch. 4, p. 13a.
- Thai-Chhing Tan Ching Yao Chieh* 太清丹經要訣.
 [= *Thai-Chhing Chen Jen Ta Tan*.]
 Essentials of the Elixir Manuals, for Oral Transmission; a Thai-Chhing Scripture.
 Thang, mid +7th (c. +640).
 Prob. Sun Ssu-Mo 孫思邈.
 In YCCC, ch. 71.
 Tr. Sivin (1), pp. 145 ff.
- Thai-Chhing Tao Yin Yang Shêng Ching* 太清導引養生經.
 See *Tao Yin Yang Shêng Ching*.
- Thai-Chhing Thiao Chhi Ching* 太清調氣經.
 Manual of the Harmonising of the Chhi; a Thai-Chhing Scripture [breathing exercises for longevity and immortality].
 Thang or Sung, +9th or +10th.
- Writer unknown.
 TT/813.
 Cf. Maspero (7), p. 202.
- Thai-Chhing (Wang Lao) (Fu Chhi) Khou Chieh* (or *Chhuan Fa*) 太清王老服氣口訣 (傳法).
 The Venerable Wang's Instructions for Absorbing the Chhi; a Thai-Chhing Scripture [Taoist breathing exercises].
 Thang or Wu Tai (the name of Wang added in the +11th).
 Writer unknown.
 Part due to a woman Taoist, Li I 李液.
 TT/815, and in YCCC, ch. 62, pp. 1 a ff. and ch. 59, pp. 10 a ff.
 Cf. Maspero (7), p. 209.
- Thai-Chhing Yü Pei Tzu* 太清玉碑子.
 The Jade Stele (Inscription); a Thai-Chhing Scripture [dialogues between Chêng Yin and Ko Hung].
 Date unknown, prob. late Sung or Yuan.
 Writer unknown.
 TT/920.
 Cf. *Ta Tan Wên Ta* and *Chin Mu Wan Ling Lun*, which incorporate parallel passages.
- Thai-Chi Chen-Yen Chiu Chuan Huan Tan Ching Yao Chieh* 太極真人九轉還丹經要訣.
 Essential Teachings of the Manual of the Supreme-Pole Adept on the Ninefold Cyclically Transformed Elixir.
 Date unknown, perhaps Sung on account of the pseudonym, but the Manual (*Ching*) itself may be pre-Sui because its title is in the *Sui Shu* bibliography. Mao Shan influence is revealed by an account of five kinds of magic plants or mushrooms that grow on Mt Mao, and instructions of Lord Mao for ingesting them.
 Writer unknown.
 TT/882.
 Partial tr. Ho Ping-Yü (9).
- Thai-Chi Chen-Yen Tsa Tan Yao Fang* 太極真人雜丹藥方.
 Tractate of the Supreme-Pole Adept on Miscellaneous Elixir Recipes [with illustrations of alchemical apparatus].
 Date unknown, but probably Sung on account of the philosophical significance of the pseudonym.
 Writer unknown.
 TT/939.
- Thai-Chi Ko Hsien-Ong Chuan* 太極葛仙翁傳.
 Biography of the Supreme-Pole Elder-Immortal Ko (Hsüan).
 Prob. Ming.
 Than Ssu-Hsien 譚嗣先.
 TT/447.
- Thai Hsi Ching* 胎息經.
 Manual of Embryonic Respiration.
 Thang, +8th, c. +755.

- Thai Hsi Ching (cont.)*
Huan Chen hsien-sêng 幻眞先生
(Mr Truth-and-Illusion).
TT/127, and YCCC, ch. 60, pp. 22b ff.
Tr. Balfour (1).
Cf. Maspero (7), p. 211.
- Thai Hsi Ching Wei Lun* 胎息精微論.
Discourse on Embryonic Respiration and
the Subtlety of the Seminal Essence.
Thang or Sung.
Writer unknown.
In YCCC, ch. 58, pp. 1a ff.
Cf. Maspero (7), p. 210.
- Thai Hsi Kên Chih Yao Chüeh* 胎息根旨要訣.
Instruction on the Essentials of (Under-
standing) Embryonic Respiration [Taoist
respiratory and sexual techniques].
Thang or Sung.
Writer unknown.
In YCCC, ch. 58, pp. 4b ff.
Cf. Maspero (7), p. 380.
- Thai Hsi Khou Chüeh* 胎息口訣.
Oral Explanation of Embryonic Respiration.
Thang or Sung.
Writer unknown.
In YCCC, ch. 58, pp. 12a ff.
Cf. Maspero (7), p. 198.
- Thai Hsi Shui Fa* 泰西水法.
Hydraulic Machinery of the West.
Ming, +1612.
Hsiung San-Pa (Sabatino de Ursis) 熊三拔
& Hsü Kuang-Chhi 徐光啓.
- Thai Hsüan Pao Tien* 太玄寶典.
Precious Records of the Great Mystery [of
attaining longevity and immortality by
physiological alchemy, *nei tan*].
Sung or Yuan, +13th or +14th.
Writer unknown.
TT/1022, and in TTCY (*shang mao chi*, 5).
- Thai-I Chin Hua Tsung Chih* 太一(或乙)金華
宗旨.
Principles of the (Inner) Radiance of the
Metallic (Enchymoma), (explained in
terms of the) Undifferentiated Universe.
See *Chin Hua Tsung Chih*.
- Thai-Ku Chi* 太古集.
Collected Works of (Ho) Thai-Ku [Ho Ta-
Thung].
Sung, c. +1200.
Ho Ta-Thung 郝大通.
TT/1147.
- Thai Ku Thu Tui Ching* 太古土兌經.
Most Ancient Canon of the Joy of the Earth;
or, of the Element Earth and the Kua
Tui [mainly on the alchemical sub-
duing of metals and minerals].
Date unknown, perhaps Thang or slightly
earlier.
Attrib. Chang hsien-sêng 張先生.
TT/942.
- Thai Pai Ching* 太白經.
The Venus Canon.
Thang, c. +800.
Shih Chien-Wu 施肩吾.
TT/927.
- Thai Phing Ching* 太平經.
[= *Thai Phing Chhing Ling Shu*.]
Canon of the Great Peace (and Equality).
Ascr. H/Han, c. +150 (first mentioned
+166) but with later additions and inter-
polations.
Part attrib. Yü Chi 于吉.
Perhaps based on the *Thien Kuan Li Pao*
Yuan Thai Phing Ching (c. -35) of Kan
Chung-Kho 甘忠可.
TT/1087. Reconstructed text, ed. Wang
Ming (2).
Cf. Yü Ying-Shih (2), p. 84.
According to Hsiung Tê-Chi (1) the parts
which consist of dialogue between a
Heavenly Teacher and a disciple corre-
spond with what the *Pao Phu Tzu*
bibliography lists as *Thai Phing Ching*
and were composed by Hsiang Khai
襄楷.
The other parts would be for the most part
fragments of the *Chia I Ching* 甲乙經,
also mentioned in *Pao Phu Tzu*, and due
to Yü Chi and his disciple Kung Chhung
宮崇 between +125 and +145.
- Thai Phing Chhing Ling Shu* 太平清領書.
Received Book of the Great Peace and
Purity.
See *Thai Phing Ching*.
- Thai-Phing Huan Yü Chi* 太平寰宇記.
Thai-Phing reign-period General Descrip-
tion of the World [geographical record].
Sung, +976 to +983.
Yüeh Shih 樂史.
- Thai-Phing Hui Min Ho Chi Chü Fang* 太平惠
民和劑局方.
Standard Formularies of the (Government)
Great Peace People's Welfare Pharmacies
[based on the *Ho Chi Chü Fang*, etc.].
Sung, +1151.
Ed. Chhen Shih-Wên 陳師文, Phei
Tsung-Yuan 裴完元, and Chhen
Chhêng 陳承.
Cf. Li Thao (1, 6); SIC, p. 973.
- Thai-Phing Kuang Chi* 太平廣記.
Copious Records collected in the Thai-
Phing reign-period [anecdotes, stories,
mirabilia and memorabilia].
Sung, +978.
Ed. Li Fang 李昉.
- Thai-Phing Shêng Hui Fang* 太平聖惠方.
Prescriptions Collected by Imperial
Benevolence during the Thai-Phing
reign-period.
Sung, commissioned +982; completed
+992.
Ed. Wang Huai-Yin 王懷隱, Chêng Yen
鄭彥 *et al.*
SIC, p. 921; *Yü Hai*, ch. 63.

- Thai-Phing Yü Lan* 太平御覽.
Thai-Phing reign-period Imperial Encyclopaedia (lit. the Emperor's Daily Readings).
Sung, +983.
Ed. Li Fang 李昉.
Some chs. tr. Pfizmaier (84-106).
Yin-Tê Index, no. 23.
- Thai-Shang Chu Kuo Chiu Min Tsung Chen Pi Yao* 太上助國救民總真秘要.
Arcane Essentials of the Mainstream of Taoism, for the Help of the Nation and the Saving of the People; a Thai-Shang Scripture [apotropaics and liturgy].
Sung +1116.
Yuan Miao-Tsung 元妙宗.
TT/1210.
- Thai-Shang Chuan Hsi Wang Mu Wo Ku Fa* 太上傳西王母握固法.
See *Chuan Hsi Wang Mu Wo Ku Fa*.
- Thai-Shang Huang Thing Nei* (or *Wai* or *Chung*) *Ching* (Yü) *Ching* 太上黃庭內(外,中)景(玉)經.
See *Huang Thing*, etc.
- Thai-Shang Lao Chün Yang Shêng Chüeh* 太上老君養生訣.
Oral Instructions of Lao Tzu on Nourishing the Life-Force; a Thai-Shang Scripture [Taoist respiratory and gymnastic exercises].
Thang.
Attrib. Hua Tho 華佗 and Wu Phu 吳普.
Actual writer unknown.
TT/814.
- Thai-Shang Ling-Pao Chih Tshao Thu* 太上靈寶芝草圖.
Illustrations of the Numinous Mushrooms; a Thai-Shang Ling-Pao Scripture.
Sui or pre-Sui.
Writer unknown.
TT/1387.
- Thai-Shang Ling-Pao Wu Fu* (Ching) 太上靈寶五符(經).
(Manual of) the Five Categories of Formulae (for achieving Material and Celestial Immortality); a Thai-Shang Ling-Pao Scripture [liturgical].
San Kuo, mid +3rd.
Writers unknown.
TT/385.
On the term Ling-Pao see Kaltenmark (4).
- Thai-Shang Pa-Ching Ssu-fui Tzu-Chiang* (Wu-Chu) *Chiang-Shêng Shen Tan Fang* 太上八景四靈紫漿(五珠)降生神丹方.
Method for making the Eight-Radiances Four-Stamens Purple-Fluid (Five-Pearl) Incarnate Numinous Elixir; a Thai-Shang Scripture.
Chin, probably late +4th.
Putatively dictated to Yang Hsi 楊羲.
In YCCC, ch. 68; another version in TT/1357.
- Thai-Shang Pa Ti Yuan* (Hsüan) *Pien Ching* 太上八帝元(玄)變經.
See *Tung-Shen Pa Ti Yuan* (Hsüan) *Pien Ching*.
- Thai Shang-San-shüh-liu pu Tsun Ching* 太上三十六部尊經.
The Venerable Scripture in 36 Sections.
TT/8.
See *Shang Chhing Ching*.
- Thai-Shang Tung Fang Nei Ching Chu* 太上洞房內經注.
Esoteric Manual of the Innermost Chamber, a Thai-Shang Scripture; with Commentary.
Ascr. — 1st cent.
Attrib. Chou Chi-Thung 周季通.
TT/130.
- Thai-Shang Tung-Hsüan Ling-Pao Mieh Tu* (or *San Yuan*) *Wu Lien Shêng Shih Miao Ching* 太上洞玄靈寶滅度(或三元)五鍊生尸妙經.
Marvellous Manual of the Resurrection (or Preservation) of the Body, giving Salvation from Dispersal, by means of (the Three Primary Vitalities and) the Five Transmutations; a Ling-Pao Thai-Shang Tung-Hsüan Scripture.
Date uncertain.
Writer unknown.
TT/366.
- Thai-Shang Tung-Hsüan Ling-Pao Shou Tu I* 太上洞玄靈寶授度儀.
Formulae for the Reception of Salvation; a Thai-Shang Tung-Hsüan Ling-Pao Scripture [liturgical].
L/Sung, c. +450.
Lu Hsiu-Ching 陸修靜.
TT/524.
- Thai-Shang Wei Ling Shen Hua Chiu Chuan Tan Sha Fa* 太上衛靈神化九轉丹砂法.
Methods of the Guardian of the Mysteries for the Marvellous Thaumaturgical Transmutation of Ninefold Cyclically Transformed Cinnabar; a Thai-Shang Scripture.
Sung, if not earlier.
Writer unknown.
TT/885.
Tr. Spooner & Wang (1); Sivin (3).
- Thai-Shang Yang Shêng Thai Hsi Chhi Ching* 太上養生胎息氣經.
See *Yang Shêng Thai Hsi Chhi Ching*.
- Thai Tsang Lun* 胎藏論.
Discourse on the Foetalisation of the Viscera (the Restoration of the Embryonic Condition of Youth and Health).
Alternative title of *Chung Huang Chen Ching* (q.v.).
- Thai-Wei Ling Shu Tzu-Wên Lang-Kan Hua Tan Shen Chen Shang Ching* 太微靈書繁女琅玕華丹神眞上經.

- Thai-Wei Ling Shu Tzu-Wên Lang-Kan Hua Tan Shon Chen Shang Ching* (cont.)
Divinely Written Exalted Spiritual Realisation Manual in Purple Script on the Lang-Kan (Gem) Radiant Elixir; a Thai-Wei Scripture.
Chin, late +4th century, possibly altered later.
Dictated to Yang Hsi 楊羲.
TT/252.
- Thai-Wu hsien-sêng Fu Chhi Fa* 太无先生服氣法.
See *Sung Shan Thai-Wu hsien-sêng Chhi Ching*.
- Than hsien-sêng Shui Yün Chi* 譚先生水雲集.
Mr Than's Records of Life among the Mountain Clouds and Waterfalls.
Sung, mid +12th cent.
Than Chhu-Tuan 譚處端.
TT/1146.
- Thang Hui Yao* 唐會要.
History of the Administrative Statutes of the Thang Dynasty.
Sung, +961.
Wang Phu 王溥.
Cf. des Rotours (2), p. 92.
- Thang Liu Tien* 唐六典.
Institutes of the Thang Dynasty (lit. Administrative Regulations of the Six Ministries of the Thang).
Thang, +738 or +739.
Ed. Li Lin-Fu 李林甫.
Cf. des Rotours (2), p. 99.
- Thang Pên Tshao* 唐本草.
Pharmacopoeia of the Thang Dynasty.
= *Hsin Hsiu Pên Tshao*, (q.v.).
- Thang Yü Lin* 唐語林.
Miscellanea of the Thang Dynasty.
Sung, collected c. +1107.
Wang Tang 王彙.
Cf. des Rotours (2), p. 109.
- Thao Chen Jen Nei Tan Fu* 陶真人內丹賦.
See *Nei Tan Fu*.
- Thi Kho Ko* 體殼歌.
Song of the Bodily Husk (and the Deliverance from its Ageing).
Wu Tai or Sung, in any case before +1040
Yen Lo Tzu (ps.) 煙蘿子.
In *Hsiu Chen Shih Shu* (TT/260), ch. 18.
- Thiao Chhi Ching* 調氣經.
See *Thai-Chhing Thiao Chhi Ching*.
- Thieh Wei Shan Tshung Than* 鐵圍山叢談.
Collected Conversations at Iron-Fence Mountain.
Sung, c. +1115.
Tshai Thao 蔡條.
- Thien-Hsia Chün Kuo Li Ping Shu* 天下郡國利病書.
Merits and Drawbacks of all the Countries in the World [geography].
Chhing, +1662.
Ku Yen-Wu 顧炎武.
- Thien Hsien Chêng Li Tu 'Fa Tien Ching'* 天仙正理讀法點睛.
The Right Pattern of the Celestial Immortals; Thoughts on Reading the *Consecration of the Law*.
See *Fu Chin-Chhüan* (2).
- Thien Hsien Chih Lun Chhang Shêng Tu Shih Nei Lien Chin Tan (Chüeh Hsin) Fa* 天仙直論長生度世內煉金丹(訣心)法.
(Confidential) Methods for Processing the Metallous Encyhmoma; a Plain Discourse on Longevity and Immortality (according to the Principles of the), Celestial Immortals for the Salvation of the World.
Alternative title for *Nei Chin Tan* (q.v.).
- Thien Kung Khai Wu* 天工開物.
The Exploitation of the Works of Nature.
Ming, +1637.
Sung Ying-Hsing 宋應星.
Tr. Sun Jen I-Tu & Sun Hsüeh-Chuan (1).
- Thien-thai Shan Fang Wai Chih* 天臺山方外志.
Supplementary Historical Topography of Thien-thai Shan.
Ming.
Chhuan-Têng (monk) 傳燈.
- Thien Ti Yin-Yang Ta Lo Fu* 天地陰陽大樂賦.
Poetical Essay on the Supreme Joy.
Thang, c. +800.
Pai Hsing-Chien 白行簡.
- Thien Yuan Yu Yao Ching* 天元入藥鏡.
Mirror of the All-Penetrating Medicine (the Enchymoma; restoring the Endowment) of the Primary Vitalities.
Wu Tai, +940.
Tshui Hsi-Fan 崔希範.
In *Hsiu Chen Shih Shu* (TT/260), ch. 21, pp. 6b to 9b; a prose text without commentary, not the same as the *Yu Yao Ching* (q.v.) and ending with a diagram absent from the latter.
Cf. van Gulik (8), pp. 224 ff.
- Tho Yo Tzu* 橐籥子.
Book of the Bellows-and-Tuyère Master [physiological alchemy in mutationist terms].
Sung or Yuan.
Writer unknown.
TT/1174, and *TTCY* (*hsin mao chi*, 5).
- Thou Huang Tsa Lu* 投荒雜錄.
Miscellaneous Jottings far from Home.
Thang, c. +835.
Fang Chhien-Li 房千里.
- Thu Ching (Pên Tshao)* 圖經(本草).
Illustrated Treatise (of Pharmaceutical Natural History). See *Pên Tshao Thu Ching*.
The term *Thu Ching* applied originally to one of the two illustrated parts (the other being a *Yao Thu*) of the *Hsin Hsiu Pên*

- Thu Ching (Pên Tshao) (cont.)*
Tshao of +659 (q.v.); cf. *Hsin Thang Shu*, ch. 59, p. 21 a or *TSCCIW*, p. 273. By the middle of the +11th century these had become lost, so Su Sung's *Pên Tshao Thu Ching* was prepared as a replacement. The name *Thu Ching Pên Tshao* was often afterwards applied to Su Sung's work, but (according to the evidence of the *Sung Shih* bibliographies, *SSIW*, pp. 179, 529) wrongly.
- Thu Ching Chi-Chu Yen I Pên Tshao* 圖經集注衍義本草.
 Illustrations and Collected Commentaries for the *Dilations upon Pharmaceutical Natural History*.
 TT/761 (Ong index, no. 767).
 See also *Thu Ching Yen I Pên Tshao*.
 The *Tao Tsang* contains two separately catalogued books, but the *Thu Ching Chi-Chu Yen I Pên Tshao* is in fact the introductory 5 chapters, and the *Thu Ching Yen I Pên Tshao* the remaining 42 chapters of a single work.
- Thu Ching Yen I Pên Tshao* 圖經衍義本草.
 Illustrations (and Commentary) for the *Dilations upon Pharmaceutical Natural History*. (An abridged conflation of the *Chêng-Ho... Chêng Lei... Pên Tshao* with the *Pên Tshao Yen I*).
 Sung, c. +1223.
 Thang Shen-Wei 唐慎微, Khou Tsung-Shih 寇宗奭, ed. Hsü Hung 許洪.
 TT/761 (Ong index, no. 768).
 See also *Thu Ching Chi-Chu Yen I Pên Tshao*.
 Cf. Chang Tsan-Chhen (2); Lung Po-Chien (1), nos. 38, 39.
- Thu Hsiu Chen Chün Tsao-Hua Chih Nan* 土宿眞君造化指南.
 Guide to the Creation, by the Earth's Mansions Immortal.
 See *Tsao-Hua Chih Nan*.
- Thu Hsiu Pên Tshao* 土宿本草.
 The Earth's Mansions Pharmacopoeia.
 See *Tsao-Hua Chih Nan*.
- Thung Hsüan Pi Shu* 通玄秘術.
 The Secret Art of Penetrating the Mystery [alchemy].
 Thang, soon after +864.
 Shen Chih-Yen 沈知言.
 TT/935.
- Thung Su Pien* 通俗編.
 Thesaurus of Popular Terms, Ideas and Customs.
 Chhing, +1751.
 Tsê Hao 翟灝.
- Thung Ya* 通雅.
 Helps to the Understanding of the *Literary Expositor* [general encyclopaedia with much of scientific and technological interest].
 Ming and Chhing, finished +1636, pr. +1666.
 Fang I-Chih 方以智.
- Thung Yu Chüeh* 通幽訣.
 Lectures on the Understanding of the Obscurity (of Nature) [alchemy, proto-chemical and physiological].
 Not earlier than Thang.
 Writer unknown.
 TT/906.
 Cf. Chhen Kuo-Fu (1), vol. 2, p. 390.
- Tien Hai Yü Hêng Chih* 滇海虞衡志.
 A Guide to the Region of the Kunming Lake (Yunnan).
 Chhing, c. +1770, pr. +1799.
 Than Tshui 檀萃.
- Tien Shu* 典術.
 Book of Arts.
 L./Sung.
 Wang Chien-Phing 王建平.
- Ting Chhi Ko* 鼎器歌.
 Song (or, Mnemonic Rhymes) on the (Alchemical) Reaction-Vessel.
 Han, if indeed originally, as it is now, a chapter of the *Chou I Tshan Thung Chhi* (q.v.).
 It has sometimes circulated separately.
 In *Chou I Tshan Thung Chhi Pên Chang Chu Chieh*, ch. 33 (ch. 3, pp. 7 a ff.).
 Cf. *Chou I Tshan Thung Chhi Ting Chhi Ko Ming Ching Thu* (TT/994).
- Ton Isho* 頓醫抄.
 Medical Excerpts Urgently Copied.
 Japan, +1304.
 Kajiwara Shozen 梶原性全.
- Tongüi Pogam* 東醫寶鑑.
 See *Tung I Pao Chien*.
- Tou hsien-sêng Hsiu Chen Chih Nan* 寶先生修真指南.
 See *Hsi Yo Tou hsien-sêng Hsiu Chen Chih Nan*.
- Tsao Hua Chih Chhui* 造化錯錯.
 The Hammer and Tongs of Creation (i.e. Nature).
 Ming, c. +1430.
 Chu Chhüan 朱權.
 (Ning Hsien Wang 寧獻王, prince of the Ming.)
- Tsao-Hua Chih Nan* 造化指南.
 [= *Thu Hsiu Pên Tshao*.]
 Guide to the Creation (i.e. Nature).
 Thang, Sung or possibly Ming. A date about +1040 may be the best guess, as there are similarities with the *Wai Tan Pên Tshao* (q.v.).
 Thu Hsiu Chen Chün 土宿眞君 (the Earth's Mansions Immortal).
 Preserved only in quotation, as in *PTKM*.
- Tsê Ko Lu* 則克錄.
 Methods of Victory.
 Title, in certain editions, of the *Huo Kung Chieh Yao* (q.v.).

- Tsêng Kuang Chih Nang Pu* 增廣智囊補.
Additions to the *Enlarged Bag of Wisdom*
Supplemented.
Ming, c. +1620.
Fêng Mêng-Lung 馮夢龍.
Tshai Chen Chi Yao 採真機要.
Important (Information on the) Means (by
which one can) Attain (the Regeneration
of the) Primary (Vitalities) [physiological
alchemy, poems and commentary].
Part of *San-Fêng Tan Chüeh* (q.v.).
Tshan Thung Chhi 參同契.
The Kinship of the Three; or, The Accord-
ance (of the *Book of Changes*) with the
Phenomena of Composite Things
[alchemy].
H/Han, +142.
Wei Po-Yang 魏伯陽.
Tshan Thung Chhi.
See also titles under *Chou I Tshan Thung*
Chhi.
Tshan Thung Chhi Chang Chü 參同契章句
The Kinship of the Three (arranged in)
Chapters and Sections.
Chhing, +1717.
Ed. Li Kuang-Ti 李光地.
Tshan Thung Chhi Khao I 參同契考異.
[= *Chou I Tshan Thung Chhi Chu*.]
A Study of the Kinship of the Three.
Sung, +1197.
Chu Hsi 朱熹 (originally using pseudonym
Tsou Hsin 鄒訥).
TT/992.
Tshan Thung Chhi Shan Yu 參同契闡幽.
Explanation of the Obscurities in the *Kin-
ship of the Three*.
Chhing, +1669, pref. +1729, pr. +1735.
Ed and comm. Chu Yuan-Yü 朱元育.
TCY.
Tshan Thung Chhi Wu Hsiang Lei Pi Yao 參同
契五相類祕要.
Arcane Essentials of the Similarities and
Categories of the Five (Substances) in the
Kinship of the Three (sulphur, realgar,
orpiment, mercury and lead).
Liu Chhao, possibly Thang; prob. between
+3rd and +7th cents., must be before
the beginning of the +9th cent., though
ascr. +2nd.
Writer unknown (attrib. Wei Po-Yang).
Comm. by Lu Thien-Chi 盧天驥, wr.
Sung, +1111 to +1117, probably +1114.
TT/898.
Tr. Ho Ping-Yü & Needham (2).
Tshao Mu Tzu 草木子.
The Book of the Fading-like-Grass Master.
Ming, +1378.
Yeh Tzu-Chhi 葉子奇.
Tshê Fu Yuan Kuei 册府元龜.
Collection of Material on the Lives of
Emperors and Ministers, (lit. (Lessons of)
the Archives, (the True) Scapulimancy);
[a governmental ethical and political
encyclopaedia.]
Sung, commissioned +1005, pr. +1013.
Ed. Wang Chhin-Jo 王欽若 & Yang I
楊億.
Cf. des Rotours (2), p. 91.
Tshui Hsi Phien 翠虛篇.
Book of the Emerald Heaven.
Sung, c. +1200.
Chhen Nan 陳楠.
TT/1076.
Tshui Kung Ju Yao Ching Chu (or *Ho*) *Chieh*
崔公入藥鏡註(合)解.
See *Ju Yao Ching* and *Thien Yuan Ju Yao*
Ching.
Tshun Chen Huan Chung Thu 存眞環中圖.
Illustrations of the True Form (of the Body)
and of the (Tracts of) Circulation (of the
Chhi).
Sung, +1113.
Yang Chieh 楊介.
Now partially preserved only in the *Ton-
Isho* and the *Man-Anpô* (q.v.). Some of
the drawings are in Chu Hung's *Nei*
Wai Erh Ching Thu, also in *Hua Tho*
Nei Chao Thu and *Kuang Wei Ta Fa*
(q.v.).
Tshun Fu Chai Wên Chi 存復齋文集.
Literary Collection of the Preservation-and-
Return Studio.
Yuan, +1349.
Chu Tê-Jun 朱德潤.
Tso Chuan 左傳.
Master Tso chhiu's Tradition (or Enlarge-
ment) of the *Chhun Chhiu* (*Spring and*
Autumn Annals), [dealing with the period
-722 to -453].
Late Chou, compiled from ancient written
and oral traditions of several States be-
tween -430 and -250, but with addi-
tions and changes by Confucian scholars
of the Chhin and Han, especially Liu
Hsin. Greatest of the three commen-
taries on the *Chhun Chhiu*, the others
being the *Kungyang Chuan* and the
Kuliang Chuan, but unlike them, prob-
ably originally itself an independent book
of history.
Attrib. Tsochhiu Ming 左邱明.
See Karlgren (8); Maspero (1); Chhi Ssu-
Ho (1); Wu Khang (1); Wu Shih-
Chhang (1); van der Loon (1), Eberhard,
Müller & Henseling (1).
Tr. Couvreur (1); Legge (11); Pfizmaier
(1-12).
Index by Fraser & Lockhart (1).
Tso Wang Lun 坐忘論.
Discourse on (Taoist) Meditation.
Thang, c. +715.
Ssuma Chhêng-Chên 司馬承貞.
TT/1024, and in *TCY* (*shang mao chi*,
5).

- Tsui Shang I Chheng Hui Ming Ching* 最上一乘慧命經.
Exalted Single-Vehicle Manual of the Sagacious (Lengthening of the) Life-Span.
See *Hui Ming Ching*.
- Tsun Shêng Pa Chien* 遵生八牋.
Eight Disquisitions on Putting Oneself in Accord with the Life-Force [a collection of works].
Ming, +1591.
Kao Lien 高謙.
For the separate parts see:
1. *Chhing Hsiu Miao Lun Chien* (chs. 1, 2).
2. *Ssu Shih Thiao Shê Chien* (chs. 3-6).
3. *Chhi Chü An Lo Chien* (chs. 7, 8).
4. *Yen Nien Chhio Ping Chien* (chs. 9, 10).
5. *Yin Chuan Fu Shih Chien* (chs. 11-13).
6. *Yen Hsien Chhing Shang Chien* (chs. 14, 15).
7. *Ling Pi Tan Yao Chien* (chs. 16-18).
8. *Lu Wai Hsia Chü Chien* (ch. 19).
- Tsurezuregusa* 徒然草.
Gleanings of Leisure Moments [miscellaneous], with much on Confucianism, Buddhism and Taoist philosophy.
Japan, c. +1330.
Kenkō hōshi 兼好法師 (Yoshida no Kaneyoshi 吉田兼好).
Cf. Anon. (103), pp. 197 ff.
- Tu Hsing Tsa Chih* 獨醒雜志.
Miscellaneous Records of the Lone Watcher.
Sung, +1176.
Tsêng Min-Hsing 曾敏行.
- Tu I Chih* 獨異志.
Things Uniquely Strange.
Thang.
Li Jung 李冗 (or 冗).
- Tu Jen Ching* 度人經.
See *Ling-Pao Wu Liang Tu Jen Shang Phin Miao Ching*.
- Tu Shih Fang Yü Chi Yao* 讀史方輿紀要.
Essentials of Historical Geography.
Chhing, first pr. +1667, greatly enlarged before the author's death in +1692, and pr. c. +1799.
Ku Tsu-Yü 顧祖禹.
- Tung-Chen Ling Shu Tzu-Wên Lang-Kan Hua Tan Shang Ching* 洞真靈書紫文琅玕華丹上經.
Divinely Written Exalted Manual in Purple Script on the Lang-Kan (Gem) Radiant Elixir; a Tung-Chen Scripture.
Alternative name of *Thai-Wei Ling Shu Tzu-Wên Lang-Kan Hua Tan Shen Chen Shang Ching* (q.v.).
- Tung-Chen Thai-Shang Su-Ling Tung-Yuan Ta Yu Miao Ching* 洞真太上素靈洞元大有妙經.
See *Ta Yu Miao Ching*.
- Tung-Chen Thai-Wei Ling Shu Tzu-Wên Shang Ching* 洞真太微靈書紫文上經.
Divinely Written Exalted Canon in Purple Script; a Tung-Chen Thai-Wei Scripture.
See *Thai-Wei Ling Shu Tzu-Wên Lang-Kan Hua Tan Shen Chen Shang Ching*, which it formerly contained.
- Tung Hsien Pi Lu* 東軒筆錄.
Jottings from the Eastern Side-Hall.
Sung, end +11th.
Wei Thai 魏泰.
- Tung-Hsüan Chin Yü Chi* 洞玄金玉集.
Collections of Gold and Jade; a Tung-Hsüan Scripture.
Sung, mid +12th cent.
Ma Yü 馬鈺.
TT/1135.
- Tung-Hsüan Ling-Pao Chen Ling Wei Yeh Thu* 洞玄靈寶真靈位業圖.
Charts of the Ranks, Positions and Attributes of the Perfected (Immortals); a Tung-Hsüan Ling-Pao Scripture.
Ascr. Liang, early +6th.
Attrib. Thao Hung-Ching 陶弘景.
TT/164.
- Tung Hsüan Tzu* 洞玄子.
Book of the Mystery-Penetrating Master.
Pre-Thang, perhaps +5th century.
Writer unknown.
In *Shuang Mei Ching An Tshung Shu*.
Tr van Gulik (3).
- Tung I Pao Chien* 東醫寶鑑.
Precious Mirror of Eastern Medicine [system of medicine].
Korea, commissioned in +1596, presented +1610, printed +1613.
Hō Chun 許浚.
- Tung-Pho Shih Chi Chu* 東坡詩集注.
[= *Mei-Chhi Shih Chu*.]
Collected Commentaries on the Poems of (Su) Tung-Pho.
Sung, c. +1140.
Wang Shih-Phêng 王十朋 (i.e. Wang Mei-Chhi 王梅溪).
- Tung Shen Ching* 洞神經.
See *Tung Shen Pa Ti Miao Ching Ching* and *Tung Shen Pa Ti Yuan Pien Ching*.
- Tung Shen Pa Ti Miao Ching Ching* 洞神入帝妙精經.
Mysterious Canon of Revelation of the Eight (Celestial) Emperors; a Tung-Shen Scripture.
Date uncertain, perhaps Thang but more probably earlier.
Writer unknown.
TT/635.
- Tung Shen Pa Ti Yuan (Hsüan) Pien Ching* 洞神入帝元(玄)變經.
Manual of the Mysterious Transformations of the Eight (Celestial) Emperors; a Tung-Shen Scripture [nomenclature of

- Tung Shen Pa Ti Yuan (Hsüan) Pien Ching*
(cont.)
spiritual beings, invocations, exorcisms,
techniques of rapport].
Date uncertain, perhaps Tang but more
probably earlier.
Writer unknown.
TT/1187.
- Tzu Chin Kuang Yao Ta Hsien Hsiu Chen Yen I*
紫金光耀大仙修真演義.
See *Hsiu Chen Yen I*.
- Tzu-Yan Chi* 自然集.
Collected (Poems) on the Spontaneity of
Nature.
Sung, mid + 12th cent.
Ma Yü 馬鈺.
TT/1130.
- Tzu-Yang Chen Jen Nei Chuan* 紫陽真人內傳.
Biography of the Adept of the Purple Yang.
H/Han, San Kuo or Chin, before +399.
Writer unknown.
This Tzu-Yang Chen Jen was Chou I-Shan
周義山 (not to be confused with Chang
Po-Tuan).
Cf. Maspero (7), p. 201; (13), pp. 78, 103.
TT/300.
- Tzu-Yang Chen Jen Wu Chen Phien* 紫陽真人
悟真篇.
See *Wu Chen Phien*.
- Tzu Yang Tan Fang Pao Chien Chih Thu* 紫陽
丹房寶鑑之圖.
See *Tan Fang Pao Chien Chih Thu*.
- Wai Chin Tan* 外金丹.
Disclosures (of the Nature of) the Metallous
Enchymoma [a collection of some thirty
tractates on *nei tan* physiological alchemy,
ranging in date from Sung to Chhing and
of varying authenticity].
Sung to Chhing.
Ed. Fu Chin-Chhüan 傅金銓, c. 1830.
In *CTPS*, *pên* 6-10 incl.
- Wai Kho Chêng Tsung* 外科正宗.
An Orthodox Manual of External Medicine.
Ming, +1617.
Chhen Shih-Kung 陳實功.
- Wai Kuo Chuan* 外國傳.
See *Wu Shih Wai Kuo Chuan*.
- Wai Tan Pên Tshao* 外丹本草.
Iatrochemical Natural History.
Early Sung, c. +1045.
Tshui Fang 崔昉.
Now extant only in quotations.
Cf. *Chin Tan Ta Yao Pao Chüeh* and *Ta
Tan Yao Chüeh Pên Tshao*.
- Wai Thai Pi Yao (Fang)* 外臺秘要(方).
Important (Medical) Formulae and Pre-
scriptions now revealed by the Governor
of a Distant Province.
Thang, +752.
Wang Thao 王燾.
On the title see des Rotours (1), pp. 294,
721. Wang Thao had had access to the
books in the Imperial Library as an
Academician before his posting as a high
official to the provinces.
- Wakan Sanzai Zue* 和漢三才圖會.
The Chinese and Japanese Universal
Encyclopaedia (based on the *San Tshai
Thu Hui*).
Japan, +1712.
Terashima Ryōan 寺島良安.
- Wamyō-Honzō*. See *Honzō-Wamyō*.
- Wamyō Ruijūshō* 和(或倭)名類聚抄.
General Encyclopaedic Dictionary.
Japan (Heian), +934.
Minamoto no Shitagau 源順.
- Wamyōshō* 和名抄.
See *Wamyō Ruijūshō*.
- Wan Hsing Thung Phu* 萬姓統譜.
General Dictionary of Biography.
Ming, +1579.
Ling Ti-Chih 凌迪知.
- Wan Ping Hui Chhun* 萬病回春.
The Restoration of Well-Being from a
Myriad Diseases.
Ming, +1587, pr. +1615.
Kung Thing-Hsien 龔廷賢.
- Wan Shou Hsien Shu* 萬壽仙書.
A Book on the Longevity of the Immortals
[longevity techniques, especially gym-
nastics and respiratory exercises].
Chhing, +18th.
Tshao Wu-Chi 曹無極.
Included in *Pa Tzu-Yuan* (1).
- Wang Hsien Fu* 望仙賦.
Contemplating the Immortals; a Hymn of
Praise [ode on Wangtzu Chhiao and
Chhieh Sung Tzu].
C/Han, -14 or -13.
Huan Than 桓譚.
In *CSHK* (Hou Han sect.), ch. 12, p. 7b;
and several encyclopaedias.
- Wang Lao Fu Chhi Khou Chüeh* 王老服氣口
訣.
See *Thai-Chhing Wang Lao Fu Chhi Khou
Chüeh*.
- Wang-Wu Chen-Yen Khou Shou Yin Tan Pi
Chüeh Ling Phien* 王屋真人口授陰丹
秘訣靈篇.
Numinous Record of the Confidential Oral
Instructions on the Yin Enchymoma
handed down by the Adept of Wang-Wu
(Shan).
Thang, perhaps c. +765; certainly between
+8th and late +10th.
Probably Liu Shou 劉守.
In *YCCC*, ch. 64, pp. 13a ff.
- Wang-Wu Chen-Yen Liu Shou I Chen-Yen Khou
Chüeh Chin Shang* 王屋真人劉守依真
人口訣進上.
Confidential Oral Instructions of the Adept
of Wang-Wu (Shan) presented to the
Court by Liu Shou.

- Wang-Wu Chen-jen Liu Shou I Chen-jen Khou Chüeh Chin Shang* (cont.)
Thang, c. +785 (after +780); certainly between +8th and late +10th.
Liu Shou 劉守.
In YCCC, ch. 64, pp. 14a ff.
- Wei Lüeh* 緯畧.
Compendium of Non-Classical Matters.
Sung, +12th century (end), c. +1190.
Kao Ssu-Sun 高似孫.
- Wei Po-Yang Chhi Fan Tan Sha Chüeh.*
See *Chhi Fan Tan Sha Chüeh.*
- Wei Shêng I Chin Ching* 衛生易筋經.
See *I Chin Ching.*
- Wei Shu* 魏書.
History of the (Northern) Wei Dynasty [+386 to +550, including the Eastern Wei successor State].
N/Chhi, +554, revised +572.
Wei Shou 魏收.
See Ware (3).
One ch. tr. Ware (1, 4).
For translations of passages, see the index of Frankel (1).
- Wên Shih Chen Ching* 文始真經.
True Classic of the Original Word (of Lao Chün, third person of the Taoist Trinity).
Alternative title of *Kuan Yin Tzu* (q.v.).
- Wên Yuan Ying Hua* 文苑英華.
The Brightest Flowers in the Garden of Literature [imperial commission collection, intended as a continuation of the *Wên Hsüan* (q.v.) and containing therefore compositions written between +500 and +960].
Sung, +987; first pr. +1567.
Ed. Li Fang 李昉, Sung Pai 宋白 et al.
Cf des Rotours (2), p. 93.
- Wu Chen Phien* 悟真篇.
[= *Tzu-Yang Chen Jen Wu Chen Phien.*]
Poetical Essay on Realising (the Necessity of Regenerating the) Primary (Vitalities) [Taoist physiological alchemy].
Sung, +1075.
Chang Po-Tuan 張伯端.
In, e.g., *Hsiu Chen Shih Shu* (TT/260), chs. 26-30 incl.
TT/138. Cf. TT/139-43.
Tr. Davis & Chao Yün-Tshung (7).
- Wu Chen Phien Chih Chih Hsiang Shuo San Chhêng Pi Yao* 悟真篇直指詳說三乘秘要.
Precise Explanation of the Difficult Essentials of the *Essay on Realising the Necessity of Regenerating the Primary Vitalities*, in accordance with the Three Classes of (Taoist) Scriptures.
Sung, c. +1170.
Ong Pao-Kuang 翁葆光.
TT/140.
- Wu Chen Phien San Chu* 悟真篇三註.
Three Commentaries on the *Essay on Realising the Necessity of Regenerating the Primary Vitalities* [Taoist physiological alchemy].
Sung and Yuan, completed c. +1331.
Hsüeh Tao-Kuang 薛道光 (or Ong Pao-Kuang 翁葆光), Lu Shu 陸壘 & Tai Chhi-Tsung 戴起宗 (or Chhen Chih-Hsü 陳致虛).
TT/139.
Cf. Davis & Chao Yün-Tshung (7).
- Wu Chhêng Tzu* 務成子.
See *Huang Thing Wai Ching Yü Ching Chu.*
- Wu Chhu Ching* 五廚經.
See *Lao Tzu Shuo Wu Chhu Ching.*
- Wu Hsiang Lei Pi Yao* 五相類秘要.
See *Tshan Thung Chhi Wu Hsiang Lei Pi Yao.*
- Wu Hsing Ta I* 五行大義.
Main Principles of the Five Elements.
Sui, c. +600.
Hsiao Chi 蕭吉.
- Wu Hsüan Phien* 悟玄篇.
Essay on Understanding the Mystery (of the Enchymoma), [Taoist physiological alchemy].
Sung, +1109 or +1169.
Yü Tung-Chen 余洞真.
TT/1034, and in *TTCY* (*shang mao chi*, 5).
- Wu I Chi* 武夷集.
The Wu-I Mountains Literary Collection [prose and poems on physiological alchemy].
Sung, c. +1220.
Ko Chhang-Kêng 葛長庚 (Pai Yü-Chhan 白玉蟾).
In *Hsiu Chen Shih Shu* (TT/260), chs. 45-52.
- Wu Kên Shu* 無根樹.
The Rootless Tree [poems on physiological alchemy].
Ming, c. +1410 (if genuine).
Attrib. Chang San-Fêng 張三峯.
In *San-Fêng Tan Chüeh* (q.v.).
- Wu Lei Hsiang Kan Chih* 物類相感志.
On the Mutual Responses of Things according to their Categories.
Sung, c. +980.
Attrib. wrongly to Su Tung-Pho 蘇東坡.
Actual writer (Lu) Tsan-Ning (monk) 錄贊寧.
See Su Ying-Hui (1, 2).
- Wu Li Hsiao Shih* 物理小識.
Small Encyclopaedia of the Principles of Things.
Ming and Chhing, finished by +1643, pr. +1664.
Fang I-Chih 方以智.
Cf. Hou Wai-Lu (3, 4).

- Wu Lu* 吳錄.
Record of the Kingdom of Wu.
San Kuo, +3rd century.
Chang Pho 張勃.
- Wu Shang Pi Yao* 無上秘要.
Essentials of the Matchless Books (of Taoism), [a florilegium].
N/Chou, between +561 and +578.
Compiler unknown.
TT/1124.
Cf. Maspero (13), p. 77; Schipper (1), p. 11.
- Wu shih Pên Tshao* 吳氏本草.
Mr Wu's Pharmaceutical Natural History.
San Kuo (Wei), c. +235.
Wu Phu 吳普.
Extant only in quotations in later literature.
- Wu Shih Wai Kuo Chuan* 吳時外國傳.
Records of the Foreign Countries in the Time of the State of Wu.
San Kuo, c. +260.
Khang Thai 康泰.
Only in fragments in TPYL and other sources.
- Wu Tai Shih Chi*.
See *Hsin Wu Tai Shih*.
- Wu Yuan* 物原.
The Origins of Things.
Ming, +15th.
Lo Chhi 羅頤.
- Yang Hsing Yen Ming Lu* 養性延命錄.
On Delaying Destiny by Nourishing the Natural Forces (or, Achieving Longevity and Immortality by Regaining the Vitality of Youth), [Taoist sexual and respiratory techniques].
Sung, betw. +1013 and +1161 (acc. to Maspero), but as it appears in YCCC it must be earlier than +1020, very probably pre-Sung.
Attrib. Thao Hung-Ching or Sun Ssu-Mo. Actual writer unknown.
TT/831, abridged version in YCCC, ch. 32, pp. 1 a ff.
Cf. Maspero (7), p. 232.
- Yang Hui Suan Fa* 楊輝算法.
Yang Hui's Methods of Computation.
Sung, +1275.
Yang Hui 楊輝.
- Yang Shêng Shih Chi* 養生食忌.
Nutritional Recommendations and Prohibitions for Health [appended to *Pao Shêng Hsin Chien*, q.v.].
Ming, c. +1506.
Thieh Fêng Chü-Shih 鐵峰居士.
(The Recluse of Iron Mountain, ps.).
Ed. Hu Wên-Huan (c. +1596) 胡文煥.
- Yang Shêng Tao Yin Fa* 養生導引法.
Methods of Nourishing the Vitality by Gymnastics (and Massage), [appended to *Pao Shêng Hsin Chien*, q.v.].
Ming, c. +1506.
- Thieh Fêng Chü-Shih 鐵峰居士.
(The Recluse of Iron Mountain, ps.).
Ed. Hu Wên-Huan (c. +1596) 胡文煥.
- Yang Shêng Thai Hsi Chhi Ching* 養生胎息氣經.
[= *Thai-Shang Yang Shêng Thai Hsi Chhi Ching*.]
Manual of Nourishing the Life-Force (or, Attaining Longevity and Immortality) by Embryonic Respiration.
Late Thang or Sung.
Writer unknown.
TT/812.
Cf. Maspero (7), pp. 358, 365.
- Yang Shêng Yen Ming Lu* 養生延命錄.
On Delaying Destiny by Nourishing the Natural Forces.
Alternative title for *Yang Hsing Yen Ming Lu* (q.v.).
- Yao Chung Chhao* 藥種抄.
Memoir on Several Varieties of Drug Plants.
Japan, c. +1163.
Kuan-Yu (Kanyu) 觀祐. MS. preserved at the 滋賀石山寺 Temple. Facsim. reprod. in Suppl. to the Japanese Tripitaka, vol. 11.
- Yao Hsing Lun* 藥性論.
Discourse on the Natures and Properties of Drugs.
Liang (or Thang, if identical with *Pên Tshao Yao Hsing*, q.v.).
Attrib. Thao Hung-Ching 陶弘景.
Only extant in quotations in books on pharmaceutical natural history.
ICK, p. 169.
- Yao Hsing Pên Tshao* 藥性本草.
See *Pên Tshao Yao Hsing*.
- Yao Ming Yin Chüeh* 藥名隱訣.
Secret Instructions on the Names of Drugs and Chemicals.
Perhaps an alternative title for the *Thai-Chhing Shih Pi Chi* (q.v.).
- Yeh Chung Chi* 鄴中記.
Record of Affairs at the Capital of the Later Chao Dynasty.
Chin.
Lu Hui 陸翹.
Cf. Hirth (17).
- Yen Fan Lu* 演繁露.
Extension of the *String of Pearls* (on the *Spring and Autumn Annals*), [on the meaning of many Thang and Sung expressions].
Sung, +1180.
Chhêng Ta-Chhang 程大昌.
See des Rotours (1), p. cix.
- Yen Hsien Chhing Shang Chien* 燕閒清賞賡.
The Use of Leisure and Innocent Enjoyments in a Retired Life [the sixth part (chs. 14, 15) of *Tsun Shêng Pa Chien*, q.v.].
Ming, +1591.
Kao Lien 高謙.

- Yen I I Mou Lu* 燕翼貽謀錄.
Handing Down Good Plans for Posterity
from the Wings of Yen.
Sung, +1227.
Wang Yung 王祐.
- Yen-Ling hsien-sêng Chi Hsin Chiu Fu Chhi*
Ching 延陵先生集新舊服氣經.
New and Old Manuals of Absorbing the Chhi,
Collected by the Teacher of Yen-Ling.
Thang, early +8th, c. +745.
Writer unidentified.
Comm. by Sang Yü Tzu (+9th or +10th)
桑榆子.
TT/818, and (partially) in YCCC, ch. 58,
p. 2a et passim, ch. 59, pp. 1a ff., 18b ff.,
ch. 61, pp. 19a ff.
Cf. Maspero (7), pp. 220, 222.
- Yen Mên Kung Miao Chieh Lu* 鴈門公妙解錄.
The Venerable Yen Mên's Record of Mar-
vellous Antidotes [alchemy and elixir
poisoning].
Thang, probably in the neighbourhood of
+847 since the text is substantially
identical with the *Hsüan Chieh Lu*
(q.v.) of this date.
Yen Mên 鴈門 (perhaps a ps. taken
from the pass and fortress on the
Great Wall, cf. Vol. 4, pt. 3, pp. 11,
48 and Fig. 711).
TT/937.
- Yen Nien Chüo Ping Chien* 延年却病錢.
How to Lengthen one's Years and Ward off
all Diseases [the fourth part (chs. 9, 10)
of *Tsun Shêng Pa Chien*, q.v.].
Ming, +1591.
Kao Lien 高謙.
Partial tr. of the gymnastic material,
Dudgeon (1).
- Yen Shou Chüh Shu* 延壽赤書.
Red Book on the Promotion of Longevity.
Thang, perhaps Sui.
Phei Yü (or Hsüan) 裴煜 (玄).
Extant only in excerpts preserved in the
I Hsin Fang (+982), SIC, p. 465.
- Yen Thieh Lun* 鹽鐵論.
Discourses on Salt and Iron [record of the
debate of -81 on State control of com-
merce and industry].
C/Han, c. -80 to -60.
Huan Kuan 桓寬.
Partial tr. Gale (1); Gale, Boodberg & Lin.
- Yin Chen Chün Chün Shih Wu Hsiang Lei* 陰眞
君金石五相類.
Alternative title of *Chün Shih Wu Hsiang
Lei* (q.v.).
- Yin Chen Jen Liao Yang Tien Wên Ta Pien*
尹真人寥陽殿問答編.
See *Liao Yang Tien Wên Ta Pien*.
- Yin Chen Jen Tung-Hua Chêng Mo Huang Chi*
Ho Pi Chêng Tao Hsien Ching 尹真人
東華正脈皇極闢關證道仙經.
See *Huang Chi Ho Pi Hsien Ching*.
- Yin Chuan Fu Shih Chien* 飲饋服食踐.
Explanations on Diet, Nutrition and
Clothing [the fifth part (chs. 11-13) of
Tsun Shêng Pa Chien, q.v.].
Ming, +1591.
Kao Lien 高謙.
- Yin Fu Ching* 陰符經.
The Harmony of the Seen and the Unseen.
Thang, c. +735 (unless in essence a pre-
served late Warring States document).
Li Chhüan 李筌.
TT/30.
Cf. TT/105-124. Also in *TTCY* (*tau chi*, 6).
Tr. Legge (5).
Cf. Maspero (7), p. 222.
- Yin Shan Chêng Yao* 飲膳正要.
Principles of Correct Diet [on deficiency
diseases, with the aphorism 'many
diseases can be cured by diet alone'].
Yuan, +1330, re-issued by imperial order
in +1456.
Hu Ssu-Hui 忽思慧.
See Lu & Needham (1).
- Yin Tan Nei Phien* 陰丹內篇.
Esoteric Essay on the Yin Enchymoma.
Appendix to the *Tho Yo Tzu* (q.v.).
- Yin-Yang Chiu Chuan Chhêng Tzu-Chin Tien-
Hua Huan Tan Chieh* 陰陽九轉成紫
金點化還丹訣.
Secret of the Cyclically Transformed Elixir,
Treated through Nine Yin-Yang Cycles
to Form Purple Gold and Projected to
Bring about Transformation.
Date unknown.
Writer unknown, but someone with Mao
Shan affiliations.
TT/888.
- Ying Chhan Tzu Yü Lu* 螢蟾子語錄.
Collected Discourses of the Luminous-
Toad Master.
Yuan, c. +1320.
Li Tao-Shun 李道純 (Ying Chhan Tzu
螢蟾子).
TT/1047.
- Ying Yai Shêng Lan* 瀛涯勝覽.
Triumphant Visions of the Ocean Shores
[relative to the voyages of Chêng Ho].
Ming, +1451. (Begun +1416 and com-
pleted about +1435.)
Ma Huan 馬歡.
Tr. Mills (11); Groeneveldt (1); Phillips (1);
Duyvendak (10).
- Ying Yai Shêng Lan Chi* 瀛涯勝覽集.
Abstract of the *Triumphant Visions of the
Ocean Shores* [a refacimento of Ma Huan's
book].
Ming, +1522.
Chang Shêng (b) 張昇.
Passages cit. in *TSCC*, *Pien i tien*, chs. 58,
73, 78, 85, 86, 96, 97, 98, 99, 101, 103,
106.
Tr. Rockhill (1).

- Yōjōkun* 養生訓.
Instructions on Hygiene and the Prolongation of Life.
Japan (Tokugawa), c. +1700.
Kaibara Ekiken 貝原益軒 (ed. Sugiyasu Saburō 杉端三郎).
- Yü-Chhing Chin-Ssu Chhing-Hua Pi-Wên Chin-Pao Nei-Lien Tan Chüeh* 玉清金簡青華祕文金寶內鍊丹訣.
The Green-and-Elegant Secret Papers in the Jade-Purity Golden Box on the Essentials of the Internal Refining of the Golden Treasure, the Enchymoma.
Sung, late +11th century.
Chang Po-Tuan 張伯端.
TT/237.
Cf. Davis & Chao Yün-Tshung (5).
- Yü-Chhing Nei Shu* 玉清內書.
Inner Writings of the Jade-Purity (Heaven).
Probably Sung, but present version incomplete, and some of the material may be, or may have been, older.
Compiler unknown.
TT/940.
- Yü Fang Chih Yao* 玉房指要.
Important Matters of the Jade Chamber.
Pre-Sui, perhaps +4th century.
Writer unknown.
In *I Hsin Fang (Ishinhō)* and *Shuang Mei Ching An Tshung Shu*.
Partial trs. van Gulik (3, 8).
- Yü Fang Pi Chüeh* 玉房祕訣.
Secret Instructions concerning the Jade Chamber.
Pre-Sui, perhaps +4th century.
Writer unknown.
Partial tr. van Gulik (3).
Only as fragment in *Shuang Mei Ching An Tshung Shu* (q.v.).
- Yu Huan Chi Wên* 游宦紀聞.
Things Seen and Heard on my official Travels.
Sung, +1233.
Chang Shih-Nan 張世南.
- Yü Phien* 玉篇.
Jade Page Dictionary.
Liang, +543.
Ku Yeh-Wang 顧野王.
Extended and edited in the Thang (+674) by Sun Chhiang 孫強.
- Yü Shih Ming Yen* 喻世明言.
Stories to Enlighten Men.
Ming, c. +1640.
Fêng Mêng-Lung 馮夢龍.
- Yü Tung Ta Shen Tan Sha Chen Yao Chüeh* 玉洞大神丹砂眞要訣.
True and Essential Teachings about the Great Magical Cinnabar of the Jade Heaven [paraphrase of +8th-century materials].
Thang, not before +8th.
Attrib. Chang Kuo 張果.
TT/889.
- Yu-Yang Tsa Tsu* 酉陽雜俎.
Miscellany of the Yu-yang Mountain (Cave) [in S.E. Szechuan].
Thang, +863.
Tuan Chhêng-Shih 段成式.
See des Rotours (1), p. civ.
- Yuan Chhi Lun* 元氣論.
Discourse on the Primary Vitality (and the Cosmogonic Chhi).
Thang, late +8th or perhaps +9th.
Writer unknown.
In *YCCC*, ch. 56.
Cf. Maspero (7), p. 207.
- Yuan-Shih Shang Chen Chung Hsien Chi* 元始上眞衆仙記.
Record of the Assemblies of the Perfected Immortals; a Yuan-Shih Scripture.
Ascr. Chin, c. +320, more probably +5th or +6th.
Attrib. Ko Hung 葛洪.
TT/163.
- Yuan Yang Ching* 元陽經.
Manual of the Primary Yang (Vitality).
Chin, L/Sung, Chhi or Liang, before +550.
Writer unknown.
Extant only in quotations, in *Yang Hsing Yen Ming Lu*, etc.
Cf. Maspero (7), p. 232.
- Yuan Yu* 遠遊.
Roaming the Universe; or, The Journey into Remoteness [ode].
C/Han, c. -110.
Writer's name unknown, but a Taoist.
Tr. Hawkes (1).
- Yüeh Wei Tshao Thang Pi Chi* 閩微草堂筆記.
Jottings from the Yüeh-wei Cottage.
Chhing, 1800.
Chi Yün 紀昀.
- Yün Chai Kuang Lu* 雲齋廣錄.
Extended Records of the Cloudy Studio.
Sung.
Li Hsien-Min 李獻民.
- Yün Chhi Yu I* 雲溪友談.
Discussions with Friends at Cloudy Pool
Thang, c. +870.
Fan Shu 范攄.
- Yün Chi Chhi Chhien* 雲笈七籤.
The Seven Bamboo Tablets of the Cloudy Satchel [an important collection of Taoist material made by the editor of the first definitive form of the *Tao Tsang* (+1019), and including much material which is not in the *Patrology* as we now have it].
Sung, c. +1022.
Chang Chün-Fang 張君房.
TT/1020.
- Yün Hsien Tsa Chi* 雲仙雜記.
Miscellaneous Records of the Cloudy Immortals.
Thang or Wu Tai, c. +904.
Fêng Chih 馮贇.

- Yün Hsien San Lu* 雲仙散錄.
Scattered Remains on the Cloudy Im-
mortals.
Ascr. Thang or Wu Tai, c. +904, actually
probably Sung.
Attrib. Fêng Chih 馮贇, but probably by
Wang Chih 王鉞.
- Yün Kuang Chi* 雲光集.
Collected (Poems) of Light (through the)
Clouds.
Sung, c. +1170.
Wang Chhu-I 王處一.
TT/1138.

ADDENDA TO BIBLIOGRAPHY A

- Chêng Mêng* 正蒙
Right Teaching for Youth
[or, Intellectual Discipline for Beginners].
Sung, c. +1060.
Chang Tsai 張載
- Chêng Mêng Chu* 正蒙注
Commentary on the *Chêng Mêng Right
Teaching for Youth* (of Chang Tsai).
Chhing, c. +1650.
Wang Chhuan-Shan 王船山
- Chih Yu Tzu* 至游子
Book of the Attainment-through-Wandering
Master.
Ming (preface of +1566 by Yao Ju-Hsün.
姚汝循
Probable writer, Chang Shang-Ying.
張商英 (+15th. cent.)
Cf. *SKCS/TMTY*, ch. 147, p. 9b
- Chin Ssu Lu* 近思錄
Modern Thought.
Sung, +1175.
Chu Hsi & Lü Tsu-Chhien 朱熹, 呂祖謙
Tr. Graf (2), Chhen Jung-Chieh (11).
- Chuang Tzu* 莊子
[= *Nan Hua Chen Ching*.]
The Book of Master Chuang.
Chou, c. -290.
Chuang Chou 莊周
Tr. Legge (5); Fêng Yu-Lan (5); Lin Yü-Thang
(1).
Yin-Tê Index no. (Suppl.) 20.
- Chhian Ching* 拳經
Manual of Boxing.
Chhing, +18th.
Chang Khung-Chao 張孔昭
- Chhuan Shan I Shu* 船山遺書
Collected Writings of Wang Fu-Chih
(Chhuan-Shan).
Chhing, 2nd half +17th century.
Wang Chhuan-Shan 王船山
[1st ed. +1840; ed. used +1933.]
- Hsing Chheng Chi* 行程記
Memoirs of my Official Journey
(to the Western Regions).
Sung, +984.
Chang Khuang-Yeh 張匡鄴
- Pai Wên Phien* 百問篇
The Hundred Questions [dialogue between
Chungli Chhüan and Lü Tung-Pin].
Ch. 5 of *Tao Shu*, q.v.
Cf. *Chung Lü Chuan Tao Chi*.
Tr. Homann (2).
- Tao Tsang Ching Hua* 道藏精華
Intrinsic Glories of the Taoist Patrology.
Repr. Taiwan, 1958.
Ed. anon.
- Thien Lao Shen Kuang Ching* 天老神光經
The Celestial Elder's Canon of
the Spirit Lights
Thang, +633; later enlarged.
Li Ching 李靖
TT/859.
Tr. Sivin (16).
- Yang-Chou Shao-Yao Phu* 揚州芍藥譜
A Treatise on the Herbaceous
Peonies of Yangchow.
Sung, +1075.
Wang Kuan 王觀

CONCORDANCE FOR
TAO TSANG BOOKS AND TRACTATES

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1	(<i>Ling-Pao Wu Liang</i>) <i>Tu Jen (Shang Phin Miao) Ching</i>	1	258 <i>Chin Tan Fu</i>
8	<i>Thai-Shang San-shih-liu Pu Tsun Ching</i> (contains <i>Shang Chhing Ching</i>)	8	260 <i>Hsiu-Chen Shih Shu</i>
30	(<i>Huang Ti</i>) <i>Yin Fu Ching</i>		261 <i>Chen Chhi Huan Yuan Ming</i>
119	<i>Huang Ti Yin Fu Ching Chu</i>	31	263 <i>Chin I Huan Tan Pai Wên Chüeh</i>
127	<i>Thai Hsi Ching Chu</i>	122	266 <i>Chih Chen Tzu Lung Hu Ta Tan Shih</i>
130	<i>Thai-Shang Tung Fang Nei Ching Chu</i>	130	275 <i>Chhing Wei Tan Chüeh (or Fa)</i>
132	(<i>Tshui Kung</i>) <i>Ju Yao Ching Chu Chieh</i>	133	289 <i>Han Wu (Ti) Nei Chuan</i>
133	<i>Lü Shun-Yang Chen Jen Chhin Yuan Chhun Tan Tzhu Chu Chieh</i>	135	290 <i>Han Wu (Ti) Wai Chuan</i>
134	(<i>Chhiu Chhang-Chhun</i>) <i>Chhing Thien Ko Chu Shih</i>	136	293 <i>Li-Shih Chen Hsien Thi Tao Thung Chien</i>
137	<i>Shang-Chhing Wo Chung Chüeh</i>	137	297 <i>Hua-Yang Thao Yin-Chü Chuan</i>
138	(<i>Tzu-Yang Chen Jen</i>) <i>Wu Chen Phien Chu Su</i>	140	300 <i>Tzu-Yang Chen Jen (Chou I-Shan) Nei Chuan</i>
139	<i>Wu Chen Phien San Chu</i>	141	301 (<i>San</i>) <i>Mao Shan Chih</i>
140	(<i>Tzu-Yang Chen Jen</i>) <i>Wu Chen Phien Chih Chih Hsiang Shuo San Chhêng Pi Yao</i>	142	304 <i>Hsi Yo Hua-Shan Chih</i>
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153	<i>Shang-Chhing Tung-Chen Chiu Kung Tzu Fang Thu</i>	152	398 <i>Huang Thing Nei Ching Yü Ching Chu</i> by Liu Chhang-Shêng
163	<i>Yuan-Shih Shang Chen Chung Hsien Chi</i>	156	399 <i>Huang Thing Nei Ching (Yü) Ching Chu</i> by Liang Chhiu Tzu
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243	<i>Hsi Shan Chhun Hsien Hui Chen Chi</i>	246	445 (<i>Hsi Shan</i>) <i>Hsü Chen-Chün (Hsü Hsün) Pa-shih-wu Hua Lu</i>
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256	(<i>Thao Chen Jen</i>) <i>Nei Tan Fu</i>	259	605 <i>Ling-Pao Chiu Yu Chhang Yeh Chhi Shih Tu Wang Hsüan Chang</i>
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634	<i>Huang-Thien Shang-Chhing Chin</i>	639	890 <i>Ling Sha Ta Tan Pi Chüeh</i>
	<i>Chhüeh Ti Chün Ling Shu Tzu-Wên</i>		891 <i>Pi Yü Chu Sha Han Lin Yü Shu</i>
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813	<i>Thai-Chhing Thiao Chhi Ching</i>	819	<i>Pi Yao</i>
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	<i>Ching</i>		902 <i>Lung Hu Huan Tan Chüeh</i>
818	<i>(Yen-Ling hsien-sêng Chi) Hsin Chiu</i>	824	903 <i>Chin Hua Yü I Ta Tan</i>
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821	<i>(Huan-Chen hsien-sêng) Fu Nei Yuan</i>	827	905 <i>Hsiu Lien Ta Tan Yao Chih (or</i>
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874	<i>Thai-Chhing Shih Pi Chi</i>	880	914 <i>Chih Kuei Chi</i>
875	<i>Thai-Chhing Chin I Shen Chhi Ching</i>	881	915 <i>Huan Chin Shu</i>
876	<i>(Thai-Chhing Ching) Thien-Shih</i>	882	916 <i>Ta Tan Chhien Hung Lun</i>
	<i>Khou Chüeh</i>		917 <i>Chen Yuan Miao Tao Yao Lüeh</i>
878	<i>(Huang Ti) Chiu Ting Shen Tan</i>	884	918 <i>Tan Fang Chien Yuan</i>
	<i>Ching Chüeh</i>		919 <i>Ta Huan Tan Chao Chien</i>
879	<i>Chiu Chuan Ling Sha Ta Tan Tzu</i>	885	920 <i>Thai-Chhing Yü Pei Tzu</i>
	<i>Shêng Hsüan Ching</i>		921 <i>Hsüan Chieh Lu</i>
880	<i>(Chang Chen Jen) Chin Shih Ling</i>	886	922 <i>(Hsien-Yuan Huang Ti) Shui Ching</i>
	<i>Sha Lun</i>		<i>Yao Fa</i>
881	<i>(Wei Po-Yang) Chhi Fan Tan Sha</i>	887	923 <i>San-shih-liu Shui Fa</i>
	<i>Chüeh</i>		927 <i>Thai Pai Ching</i>
882	<i>(Thai-Chi Chen Jen) Chiu Chuan</i>	888	928 <i>Tan Lun Chüeh Chih Hsin Chien</i>
	<i>Huan Tan Ching Yao Chüeh</i>		932 <i>Ta Tan Wên Ta</i>
883	<i>(Ta-Tung Lien Chen Pao Ching) Hsiu</i>	889	933 <i>Chin Mu Wan Ling Lun</i>
	<i>Fu Ling Sha Miao Chüeh</i>		934 <i>Hung Chhien Ju Hei Chhien Chüeh</i>
884	<i>(Ta-Tung Lien Chen Pao Ching) Chiu</i>	890	935 <i>Thung Hsüan Pi Shu</i>
	<i>Huan Chin Tan Miao Chüeh</i>		937 <i>Yen Mên Kung Miao Chieh Lu</i>
885	<i>(Thai-Shang Wei Ling Shen Hua)</i>	891	<i>(=921)</i>
	<i>Chiu Chuan Tan Sha Fa</i>		938 <i>Hsüan Shuang Chang Shang Lu</i>
886	<i>Chiu Chuan Ling Sha Ta Tan</i>	892	939 <i>Thai-Chi Chen Jen Tsa Tan Yao</i>
887	<i>Chiu Chuan Chhing Chin Ling Sha Tan</i>	893	<i>Fang</i>
888	<i>Yin-Yang Chiu Chuan Chhêng Tzu</i>	894	940 <i>Yü Chhing Nei Shu</i>
	<i>Chin Tien Hua Huan Tan Chüeh</i>		942 <i>Thai-Ku Thu Tui Ching</i>
889	<i>Yü-Tung Ta Shen Tan Sha Chen</i>	895	943 <i>Shang-Tung Hsin Tan Ching Chüeh</i>
	<i>Yao Chüeh</i>		944 <i>(Hsü Chen-Chün) Shih Han Chi</i>
			950

Wieger nos.		Ong nos.	Wieger nos.		Ong nos.	
945	<i>Chiu Chuan Liu (or Ling) Chu Shen</i>	951	1077	<i>Huan Yuan Phien</i>	1083	
	<i>Hsien Chiu Tan Ching</i>		1087	<i>Thai Phing Ching</i>	1093	
946	<i>Kêng Tao Chi</i>	952	1124	<i>Wu Shang Pi Yao</i>	1130	
988	(<i>Ku Wên</i>) <i>Lung Hu Ching Chu Su</i>	994	1125	<i>San Tung Chu Nang</i>	1131	
989	(<i>Ku Wên</i>) <i>Lung Hu Shang Ching</i>	995	1127	<i>Hsien Lo Chi</i>	1133	
	<i>Chu</i>		1128	<i>Chien Wu Chi</i>	1134	
990	<i>Chou I Tshan Thung Chhi (Chu)</i>	996	1130	<i>Tzu-Jan Chi</i>	1136	
	comm. by Yin Chhang-Shêng		1135	<i>Tung-Hsüan Chin Yü Chi</i>	1141	
991	<i>Chou I Tshan Thung Chhi Chu</i>	997	1136	<i>Tan-Yang Shen Kuang Tshan</i>	1142	
	comm. anon.		1138	<i>Yün Kuang Chi</i>	1144	
992	<i>Tshan Thung Chhi Khao I (or</i>	998	1139	(<i>Wang</i>) <i>Chhung-Yang Chhüan Chen</i>	1145	
	<i>Chou I Tshan Thung Chhi Chu</i>			<i>Chi</i>		
	comm. by Chu Hsi		1140	(<i>Wang</i>) <i>Chhung-Yang Chiao Hua</i>	1146	
993	<i>Chou I Tshan Thung Chhi Fên</i>	999		<i>Chi</i>		
	<i>Chang Thung Chen I</i> comm. by		1141	(<i>Wang</i>) <i>Chhung-Yang Fên-Li</i>	1147	
	Phêng Hsiao			<i>Shih-Hua Chi</i>		
994	<i>Chou I Tshan Thung Chhi Ting Chhi</i>	1000	1142	(<i>Wang</i>) <i>Chhung-Yang (Chen Jen)</i>	1148	
	<i>Ko Ming Ching Thu</i> comm. by			<i>Chin-Kuan (or Chhüeh) Yü-So</i>		
	Phêng Hsiao			<i>Chüeh</i>		
995	<i>Chou I Tshan Thung Chhi Chu</i>	1001	1145	<i>Chhang-Chhun Tzu Phan-Chhi Chi</i>	1151	
	comm. anon.		1146	<i>Than hsien-sêng Shui Yün Chi</i>	1152	
996	<i>Chou I Tshan Thung Chhi Fa Hui</i>	1002	1147	<i>Thai-Ku Chi</i>	1153	
	comm. by Yü Yen		1162	<i>Mo Tzu</i>	1168	
997	<i>Chou I Tshan Thung Chhi Shih I</i>	1003	1170	<i>Huai Nan (Tzu) Hung Lieh Chieh</i>	1176	
	comm. by Yü Yen		1171	<i>Pao Phu Tzu, Nei Phien</i>	1177	
998	<i>Chou I Tshan Thung Chhi Chieh</i>	1004	1172	<i>Pao Phu Tzu, Pieh Chih</i>	1178	
	comm. by Chhen Hsien-Wei		1173	<i>Pao Phu Tzu, Wai Phien</i>	1179	
999	<i>Chou I Tshan Thung Chhi Chu</i>	1005	1174	<i>Tho Yo Tzu</i>	1180	
	comm. by Chhu Hua-Ku		1187	<i>Tung Shen Pa Ti Yuan (Hsüan)</i>	1193	
1004	<i>Chen Kao</i>	1010		<i>Pien Ching</i>		
1005	<i>Tao Shu</i>	1011	1204			
1020	<i>Yün Chi Chhi Chhien</i>	1026	1205	} <i>Shang-Chhing Ling-Pao Ta Fa</i>	{ 1211	
1022	<i>Thai Hsüan Pao Tien</i>	1028	1206			1212
1024	<i>Tso Wang Lun</i>	1030	1212			<i>Chhüan-Chen Tso Po Chieh Fa</i>
1028	<i>Huang Chi Ching Shih (Shu)</i>	1034	1216	(<i>Wang</i>) <i>Chhung-Yang Li-Chiao</i>	1223	
1034	<i>Wu Hsüan Phien</i>	1040		<i>Shih-Wu Lun</i>		
1044	<i>Tan-Yang Chen Jen Yü Lu</i>	1050	1225	<i>Chêng I Fa Wên (Thai-Shang)</i>	1233	
1047	<i>Ying Chhan Tzu Yü Lu</i>	1053		<i>Wai Lu I</i>		
1053	(<i>Shang Yang Tzu</i>) <i>Chin Tan Ta</i>	1059	1235	<i>Tao Fa Hsin Chhuan</i>	1243	
	<i>Yao</i>		1273	<i>Shang-Chhing Ching Pi Chüeh</i>	1281	
1054	(<i>Shang Yang Tzu</i>) <i>Chin Tan Ta</i>	1060	1276	<i>Shang-Chhing Huang Shu Kuo Tu I</i>	1284	
	<i>Yao Thu</i>		1287	<i>Ko Hsien-Ong (Ko Hung) Chou</i>	1295	
1055	(<i>Shang Yang Tzu</i>) <i>Chin Tan Ta</i>	1061		<i>Hou Pei Chi Fang</i>		
	<i>Yao Lieh Hsien Chih</i>		1295	(<i>Tung-Chen Thai-Shang Su-Ling</i>	1303	
1056	(<i>Sheng Yang Tzu</i>) <i>Chin Tan Ta</i>	1062		<i>Tung-Yuan) Ta Yu Miao Ching</i>		
	<i>Yao Hsien Phai (Yuan Liu)</i>		1357	<i>Shang-Chhing Thai-Shang Ti Chün</i>	1365	
1058	<i>Chin Tan Chih Chih</i>	1064		<i>Chiu Chen Chung Ching</i>		
1067	<i>Chin Tan Ssu Pai Tzu (Chu)</i>	1073	1382	<i>Huang Thing Chung Ching Ching</i>	1390	
1068	<i>Lung Hu Huan Tan Chüeh Sung</i>	1074	1405	<i>Thai-Shang Lao Chün Thai Su Ching</i>	1413	
1074	<i>Huan Tan Fu Ming Phien</i>	1080		(see index s.v. <i>Thai Su Chuan</i>)		
1076	<i>Tshui Hsü Phien</i>	1082	1442	<i>Han Thien Shih Shih Chia</i>	1451	

B. CHINESE AND JAPANESE BOOKS AND JOURNAL
ARTICLES SINCE +1800

- Achiwa Gorō (1) 阿知波五郎.
Rangaku-ki no Shisen Ryū-nō-setsu Kenkyū
蘭學期の自然良能説研究.
A Study of the Theory of Nature-Healing
in the Period of Dutch Learning in Japan.
ID, 1965 No. 31, 2223.
- Akitsuki Kanei (1) 秋月観瑛.
Kōrō Kannen no Shiroku 黄老觀念の
系譜.
On the Genealogy of the Huang-Lao Con-
cept (in Taoism).
THG, 1955, 10, 69.
- Andō Kōsei (1) 安藤更生.
Kanshin 鑑眞.
Life of Chien-Chen (+688 to +763),
[outstanding Buddhist missionary to
Japan, skilled also in medicine and archi-
tecture].
Bijutsu Shuppansha, Tokyo 1958, repr.
1963.
Abstr. *RBS*, 1964, 4, no. 889.
- Andō Kōsei (2) 安藤更生.
Nihon no Miira 日本のミイラ.
Mummification in Japan.
Mainichi Shimbunsha, Tokyo, 1961.
Abstr. *RBS*, 1968, 7, no. 575.
- Anon. (10).
Tunhuang Pi Hua Chi 敦煌壁畫集.
Album of Coloured Reproductions of the
fresco-paintings at the Tunhuang cave-
temples.
Peking, 1957.
- Anon. (11).
Changsha Fa Chüeh Pao-Kao 長沙發掘
報告.
Report on the Excavations (of Tombs of
the Chhu State, of the Warring States
period, and of the Han Dynasties) at
Chhangsha.
Acad. Sinica Archaeol. Inst., Kho-Hstieh,
Peking, 1957.
- Anon. (17).
Shou-hsien Tshai Hou Mu Chhu Thu I Wu
壽縣蔡侯墓出土遺物.
Objects Excavated from the Tomb of the
Duke of Tshai at Shou-hsien.
Acad. Sinica. Archaeol. Inst., Peking, 1956.
- Anon. (27).
Shang-Tshun-Ling Kuo Kuo Mu Ti
上村嶺隗國墓地.
The Cemetery (and Princely Tombs) of the
State of (Northern) Kuo at Shang-
tshun-ling (near Shen-hsien in the San-
mên Gorge Dam Area of the Yellow
River).
Institute of Archaeology, Academia Sinica,
Peking, 1959 (Field Expedition Reports,
Ting Series, no. 10), (Yellow River
Excavations Report no. 3).
- Anon. (28).
Yünnan Chin-Ning Shih-Chai Shan Ku Mu
Chhün Fa-Chüeh Pao-Kao 雲南晉寧
石寨山古墓羣發掘報告.
Report on the Excavation of a Group of
Tombs (of the Tien Culture) at Shih-chai
Shan near Chin-ning in Yunnan.
2 vols.
Yunnan Provincial Museum.
Wên-Wu, Peking, 1959.
- Anon. (57).
Chung Yao Chih 中藥志.
Repertorium of Chinese Materia Medica
(Drug Plants and their Parts, Animals
and Minerals).
4 vols.
Jen-min Wei-shêng, Peking, 1961.
- Anon. (73) (Anhui Medical College Physio-
therapy Dept.).
Chung I An-Mo Hsüeh Chien Phien 中醫
按摩學簡編.
Introduction to the Massage Techniques in
Chinese Medicine.
Jen-min Wei-shêng, Peking, 1960, repr. 1963
- Anon. (74) (National Physical Education
Council).
Thai Chi Chhüan Yün Tung 太極拳運動.
The Chinese Boxing Movements [instruc-
tions for the exercises].
Jen-min Thi-yü, Peking, 1962.
- Anon. (77).
Chhi Kung Liao Fa Chiang I 氣功療法講義.
Lectures on Respiratory Physiotherapy.
Kho-hstieh Chi-shu, Shanghai, 1958.
- Anon. (78).
Chung-Kuo Chih Chhien chih Ting Liang
Fên-Hsi 中國制錢之定量分析.
Analyses of Chinese Coins (of different
Dynasties).
KHS, 1921, 6 (no. 11), 1173.
Table reprinted in Wang Chin (2), p. 88.
- Anon. (100).
Shao-Hsing Chiu Niang Tsao 紹興酒釀造.
Methods of Fermentation (and Distillation)
of Wine used at Shao-hsing (Chekiang).
Chhing Kung Yeh, Peking, 1958.
- Anon. (101).
Chung-Kuo Ming Tshai Phu 中國名菜譜.
Famous Dishes of Chinese Cookery.
12 vols.
Chhing Kung Yeh, Peking, 1965.

- Anon. (103).
Nihon Miira no Kenkyū 日本ミイラの研究.
Researches on Mummies (and Self-Mummification) in Japan.
Heibonsha, Tokyo, 1971.
- Anon. (104).
Chhangsha Ma Wang Tui i Hao Han Mu Fa-Chüeh Chien-Pao 長沙馬王堆一號漢墓發掘簡報.
Preliminary Report on the Excavation of Han Tomb No. 1 at Ma-wang-tui (Hayagriva Hill) near Chhangsha [the Lady of Tai, c. -180].
Wên Wu, Peking, 1972.
- Anon. (105).
Kōkogaku-shō no Shin-Hakken; Nisen-yonen mae no Kinue Orimono Sono-hoka 考古學上の新発見; 二千余年まえの緞織物その他.
A New Discovery in Archaeology; Painted Silks, Textiles and other Things more than Two Thousand Years old.
JC, 1972 (no. 9), 68, with colour-plates.
- Anon. (106).
Wên-Hua Ta Ko-Ming Chhi Chien Chhu Thu Wên Wu 文化大革命期間出土文物.
Cultural Relics Unearthed during the period of the Great Cultural Revolution (1965-71), vol. 1 [album].
Wên Wu, Peking, 1972.
- Anon. (109).
Chung-Kuo Kao Têng Chih-Wu Thu Chien 中國高等植物圖鑑.
Iconographia Cormophytorum Sinicorum (Flora of Chinese Higher Plants).
2 vols. Kho-Hsüeh, Peking, 1972 (for Nat. Inst. of Botany).
- Anon. (110).
Chhang Yung Chung Tshao Yao Thu Phu 常用中草藥圖譜.
Illustrated Flora of the Most Commonly Used Drug Plants in Chinese Medicine.
Jen-min Wei-shêng, Peking, 1970.
- Anon. (111).
Man-chhêng Han Mu Fa-Chüeh Chi Yao 滿城漢墓發掘紀要.
The Essential Findings of the Excavations of the (Two) Han Tombs at Man-chhêng (Hopei), [Liu Shêng, Prince Ching of Chung-shan, and his consort Tou Wan].
KKTH, 1972, (no. 1), 8.
- Anon. (112).
Man-chhêng Han Mu 'Chin Lou Yü-I' ti Chhüing-Li ho Fu-Yuan 滿城漢墓「金縷玉衣」的清理和復原.
On the Origin and Detailed Structure of the Jade Body-cases Sewn with Gold Thread found in the Han Tombs at Man-chhêng.
KKTH, 1972, (no. 2), 39.
- Anon. (113).
Shih Than Chi-nan Wu-ying Shan Chhu-Thu-ti Hsi Han, Lo Wu, Tsa Chi, Yen Huan Thao Yung 試談濟南无影山出土的西漢樂舞雜技宴歡陶俑.
A Discourse on the Early Han pottery models of musicians, dancers, acrobats and miscellaneous artists performing at a banquet, discovered in a Tomb at Wu-ying Shan (Shadowless Hill) near Chinan (in Shantung province).
WWTK, 1972, (no. 5), 19.
- Anon. (115).
Tzhu-Hang Ta Shih Chuan 慈航大師傳.
A Biography of the Great Buddhist Teacher, Tzhu-Hang (d., self-mummified, 1954).
Thaipei, 1959 (Kan Lu Tshung Shu ser. no. 11).
- Aoki Masaru (1) 青水正兒.
Chüka Meibutsu Kō 中華名物考.
Studies on Things of Renown in (Ancient and Medieval) China, [including aromatics, incense and spices].
Shunjūsha, Tokyo, 1959.
Abstr. RBS, 1965, 5, no. 836.
- Asahina Yasuhiko (1) (ed.) 朝比奈泰彦 with 16 collaborators.
Shōsōin Yakubutsu 正倉院藥物.
The Shōsōin Medicinals; a Report on Scientific Researches.
With an English abstract by Obata Shige-yoshi.
Shokubutsu Bunken Kankō-kai, Osaka, 1955.
- Chan Jan-Hui (1) 湛然慧.
Alternative orthography of Tan Jan-Hui (1).
- Chang Chhang-Shao (1) 張昌紹.
Hsien-tai-ti Chung Yao Yen-Chiu 現代的中藥研究.
Modern Researches on Chinese Drugs.
Kho-hsüeh Chi-shu, Shanghai, 1956.
- Chang Chhi-Yün (2) (ed.) 張其鈞.
Chung-Hua Min Kuo Yi-Thu Chi 中華民國地圖集.
Atlas of the Chinese Republic (5 vols.):
vol. 1 Taiwan, vol. 2, Central Asia,
vol. 3 North China, vol. 4 South China,
vol. 5 General maps.
National Defence College }
National Geographical Institute } Taipei, 1962-3.
- Chang Ching-Lu (1).
Chung-Kuo Chin-Tai Chhu-Pan Shih-Liao Chhu Phien 中國近代出版史料初編.
Materials for a History of Modern Book-Publishing in China, Pt. 1.
- Chang Hsin-Chhêng (1) 張心澂.
Wei Shu Thung Khao 僞書通考.
A Complete Investigation of the (Ancient and Medieval) Books of Doubtful Authenticity.
2 vols., Com. Press, 1939, repr. 1957.

- Chang Hsing-Yün (1) 章杏雲.
Yin Shih Pien 飲食辨.
A Discussion of Foods and Beverages.
1814, repr. 1824.
Cf. Dudgeon (2).
- Chang Hsüan (1) 張璠.
Chung Wên Chhang Yung San Chhien Tzu Hsing I Shih 中文常用三千字形義釋.
Etymologies of Three Thousand Chinese Characters in Common Use.
Hongkong Univ. Press, 1968.
- Chang Hung-Chao (1) 章鴻釗.
Shih Ya 石雅.
Lapidarium Sinicum; a Study of the Rocks, Fossils and Minerals as known in Chinese Literature.
Chinese Geol. Survey, Peiping: 1st ed. 1921, 2nd ed. 1927.
MGSC (ser. B), no. 2, 1-432 (with Engl. summary).
Crit. P. Demiéville, *BEFEO*, 1924, 24, 276.
- Chang Hung-Chao (3) 章鴻釗.
Chung-Kuo Yung Hsin ti Chhi-Yuan 中國用銜的起源.
Origins and Development of Zinc Technology in China.
KHS, 1923, 8 (no. 3), 233, repr. in Wang Chin (2), p. 21.
Cf. Chang Hung-Chao (2).
- Chang Hung-Chao (6) 章鴻釗.
Tsai Shu Chung-Kuo Yung Hsin ti Chhi-Yuan 再述中國用銜的起源.
Further Remarks on the Origins and Development of Zinc Technology in China.
KHS, 1925, 9 (no. 9), 1116, repr. in Wang Chin (2), p. 29.
Cf. Chang Hung-Chao (3).
- Chang Hung-Chao (8) 章鴻釗.
Lo shih 'Chung-Kuo I-Lan' Chüan Chin Shih I Chêng 洛氏「中國伊蘭」卷金石譯證.
Metals and Minerals as Treated in Laufer's 'Sino-Iranica', translated with Commentaries.
MGSC 1925 (Ser. B), no. 3, 1-119.
With English preface by Ong Wên-Hao.
- Chang Tzu-Kao (1) 張子高.
Kho-Hsüeh Fa Ta Lüh Shih 科學發達略史.
A Classified History of the Natural Sciences.
Com. Press, Shanghai, 1923, repr. 1936.
- Chang Tzu-Kao (2) 張子高.
Chung-Kuo Hua-Hsüeh Shih Kao (Ku-Tai chih Pu) 中國化學史稿(古代之部).
A Draft History of Chemistry in China (Section on Antiquity).
Kho-Hsüeh, Peking, 1964.
- Chang Tzu-Kao (3) 張子高.
Lien Tan Shu Fa-Shêng yü Fa-Chan 鍊丹術發生與發展.
On the Origin and Development of Chinese Alchemy.
CHJ, 1960, 7 (no. 2), 35.
- Chang Tzu-Kao (4) 張子高.
Tshung Tu Hsi Thung Chhi Than Tao 'Wu' Tzu Pên I 從鼓錫銅器談到「錫」字本義.
Tin-Plated Bronzes and the Possible Original Meaning of the Character *wu*.
AS/CJA, 1958 (no. 3), 73.
- Chang Tzu-Kao (5) 張子高.
Chao Hsüeh-Min 'Pên Tshao Kang Mu Shih I' Chu Shu Nien-Tai, Chien-Lun Wo-Kuo Shou-Tzhu Yung Chhiang-Shiu Kho Thung Pan Shih 趙學敏「本草綱目拾遺」著述年代兼論我國首次用強水刻銅版事.
On the Date of Publication of Chao Hsüeh-Min's *Supplement to the Great Pharmacopoeia*, and the Earliest Use of Acids for Etching Copper Plates in China.
KHSC, 1962, 1 (no. 4), 106.
- Chang Tzu-Kao (6) 張子高.
Lun Wo Kuo Niang Chiu Chhi-Yuan ti Shih-Tai Wên-Thi 論我國釀酒起源的時代問題.
On the Question of the Origin of Wine in China.
CHJ, 1960, 17 (7), no. 2, 31.
- Chang Tzu-Kung (1) 張資琮.
Lüeh Lun Chung-Kuo ti Nieh Chih Pai-Thung ho tha tsai Li-Shih shang yü Ou-Ya Ko Kuo ti Kuan-Hsi 略論中國的鍊質白銅和他在歷史上與歐亞各國的關係.
On Chinese Nickel and Paktong, and on their Role in the Historical Relations between Asia and Europe.
KHS, 1957, 33 (no. 2), 91.
- Chang Tzu-Kung (2) 張資琮.
Yuan Su Fa-Hsien Shih 元素發現史.
The Discovery of the Chemical Elements (a translation of Weeks (1), with some 40% of original material added).
Shanghai, 1941.
- Chang Wên-Yuan (1).
Thai Chi Chhüan Chhang Shih Wên Ta 太極拳常識問答.
Explanation of the Standard Principles of Chinese Boxing.
Jen-min Thi-yü, Peking, 1962.
- Chao Pi-Chhen (1) 趙蓬塵.
Hsing Ming Fa Chüeh Ming Chih 性命法訣明指.
A Clear Explanation of the Oral Instructions concerning the Techniques of the Nature and the Life-Span.
Chhi-shan-mei, Taipei, Taiwan, 1963.
Tr. Lu Khuan-Yü (4).
- Chi Yün (1).
Yüeh Wei Tshao Thang Pi Chi 關微草堂錄記.

- Chi Yün (1) (cont.)
Jottings from the Yüeh-wei Cottage.
1800.
- Chia Tsu-Chang & Chia Tsu-Shan (1) 賈祖璋
賈祖璋.
Chung-Kuo Chih-Wu Thu Chien 中國植物
圖鑑.
Illustrated Dictionary of Chinese Flora
[arranged on the Engler system; 2602
entries].
Chung-hua, Peking, 1936, repr. 1955, 1958.
- Chia Yo-Han (Kerr, J. G.) 嘉約翰 & Ho
Liao-Jan 何了然 (1).
Hua Hsüeh Chhu Chia 化學初階.
First Steps in Chemistry.
Canton, 1870.
- Chiang Thien-Shu (1) 蔣天樞.
'*Chhu Tzhu Hsin Chu*' *Tao Lun* 「楚辭新
注」導論.
A Critique of the *New Commentary on the
Odes of Chhu*.
CHWSLT, 1962, 1, 81.
Abstr. *RBS*, 1969, 8, no. 558.
- Chiang Wei-Chhiao (1) [Yin Shih Tzu] 蔣維喬.
Yin Shih Tzu Ching Tso Fa 因是子靜坐
法.
Yin Shih Tzu's Methods of Meditation
[Taoist].
Shih-yung, Hongkong, 1914, repr. 1960,
1969.
With Buddhist addendum, Hsü Phien
續編.
Cf. Lu Khuan-Yü (1), pp. 167, 193.
- Chiang Wei-Chhiao (2) [Yin Shih Tzu] 蔣維喬
Ching Tso Fa Chi Yao 靜坐法輯要.
The Important Essentials of Meditation
Practice.
Repr. Taiwan Yin Ching Chhu, Taipei,
1962.
- [Chiang Wei-Chhiao] (3) Yin Shih Tzu 蔣維喬.
Hu Hsi Hsi Ching Yang Shêng Fa 呼吸習
靜養生法.
Methods of Nourishing the Life-Force by
Respiratory Physiotherapy and Medita-
tion Technique.
Repr. Thai-Phing, Hongkong, 1963.
- [Chiang Wei-Chhiao] (4) Yin Shih Tzu 蔣維喬.
*Yin Shih Tzu Ching Tso Wei Shêng Shih
Yen Than* 因是子靜坐衛生實驗談.
Talks on the Preservation of Health by
Experiments in Meditation.
Printed together with the Hsü Phien of (1).
Tzu-Yu, Thaichung, (Taiwan) 1957.
Hongkong
- Cf. Lu Khuan-Yü, (1), pp. 157, 160, 193.
- Chiang Wei-Chhiao (5) 蔣維喬.
*Chung-Kuo-ti Hu Hsi Hsi Ching Yang
Shêng Fa (Chhi Kung Fang Chih Fa)*
中國的呼吸習靜養生法(氣功防
治法).
The Chinese Methods of Prolongevity by
Respiratory and Meditational Technique
(Hygiene and Health due to the Circula-
tion of the Chhi).
Wei-Shêng, Shanghai, 1956, repr. 1957.
- Chiang Wei-Chhiao 蔣維喬 & Liu Kuei-Chen
(1).
Chung I Than Chhi Kung Liao Fa 中醫談
氣功療法.
Respiratory Physiotherapy in Chinese
Medicine.
Thai-Phing, Hongkong, 1964.
- Chieh Hsi-Kung (1) 解希恭.
*Thai-yuan Tung-thai-pao Chhu Thu ti Han
Tai Thung Chhi* 太原東太堡出土的
漢代銅器.
Bronze Objects of Han Date Excavated at
Tung-thai-pao Village near Taiyuan
(Shansi), [including five unicorn-foot
horse-hoof gold pieces, about 140 gms. wt.,
with almost illegible inscriptions].
WWTk, 1962 (no. 4/5), no. 138-9, 66
(71), ill. p. 11.
Abstr. *RBS*, 1969, 8, no. 360 (p. 196).
- Chikashige Masumi (1) = (1) 近重眞澄.
*Tôyô Renkinjutsu; Kagakujô yori mitaru
Tôyôjôdai no Bunka*
東洋鍊金術; 化學上より見たる東
洋上代の文化.
East Asian Alchemy; the Culture of
East Asia in Early Times seen from the
Chemical Point of View.
Rokakuho Uchida, Tokyo, 1929, repr.
1936.
Based partly on (4) and on papers in
SN 1918, 3 (no. 2) and 1919, 4 (no. 2).
- Chikashige Masumi (2) 近重眞澄.
Tôyô Kodôki no Kagaku-teki Kenkyû
東洋古銅器の化學的研究.
A Chemical Investigation of Ancient
Chinese Bronze [and Brass] Vessels.
SN, 1918, 3 (no. 2), 177.
- Chikashige Masumi (3) 近重眞澄.
Kagaku yori mitaru Tôyôjôdai no Bunka
化學より見たる東洋上代の文化.
The Culture of Ancient East Asia seen
from the Viewpoint of Chemistry.
SN, 1919, 4 (no. 2), 169.
- Chikashige Masumi (4) 近重眞澄.
Tôyô Kodai Bunka no Kagakukan
東洋古代文化の化學觀.
A Chemical View of Ancient East Asian
Culture.
Pr. pr. Tokyo, 1920.
- Chojiya Heibei (1).
Shoseki Seirenho 硝石製煉法.
The Manufacture of Saltpetre.
Yedo, 1863.
- Chôn Sangun (2) 全相運.
Han'guk kwahak kisul sa
韓國科學技術史.
A Brief History of Science and Technology
in Korea.
World Science Co. Seoul, 1966.

- Chou Fêng-Wu 周鳳梧, Wang Wan-Chieh 王萬杰 & Hsü Kuo-Chhien 徐國仟 (1).
Huang Ti Nei Ching Su Wen, Pai Hua Chieh
黃帝內經素問白話解.
The Yellow Emperor's Manual of Corporeal
(Medicine); Questions (and Answers) about
Living Matter; done into Colloquial
Language.
Jen-min Wei-shêng, Peking, 1963.
- Chou Shao-Hsien (1) 周紹賢.
Tao Chia yü Shen Hsien 道家與神仙.
The Holy Immortals of Taoism; the
Development of a Religion.
Chung-Hua, Taipei (Taiwan), 1970.
- Chu Chi-Hai (1) 朱季滄.
'Chhu Tzhu' Chieh Ku Shih I 「楚辭」解故
識遺.
Commentary on Parts of the *Odes of Chhu*
(especially *Li Sao* and *Chiu Pien*), [with
special attention to botanical identifi-
cations].
CHWSLT, 1962, 2, 77.
Abstr. *RBS*, 1969, 8, no. 557.
- Chu Lien (1) 朱璉.
Hsin Chen Chiu Hsüeh 新針灸學.
New Treatise on Acupuncture and Moxi-
bustion.
Jen-min Wei-shêng, Peking, 1954.
- Chhang Pi-Tè (1) 昌彼得.
Shuo Fu Khao 說郭考.
A Study of the *Shuo Fu* Florilegium.
Chinese Planning Commission for East
Asian Studies, Taipei (Taiwan), 1962.
- Chhen Ching (1) 陳經.
Chhiu Ku Ching Shê Chin Shih Thu 求古
稽合金石圖.
Illustrations of Antiques in Bronze and
Stone from the Spirit-of-Searching-Out-
Antiquity Cottage.
- Chhen Kung-Jou (3) 陳公柔.
Pai-Sha Thang Mu Chien Pao 白沙唐墓
簡報.
Preliminary Report on (the Excavation of) a
Thang Tomb at the Pai-sha (Reservoir),
(in Yü-hsien, Honan).
KKTH, 1955 (no. 1), 22.
- Chhen Kuo-Fu (1) 陳國符.
'Tao Tsang' Yuan Liu Khao 「道藏」源流考.
A Study on the Evolution of the Taoist
Patrology.
1st ed. Chung-Hua, Shanghai, 1949.
2nd ed. in 2 vols., Chung-Hua, Peking, 1963.
- Chhen Méng-Chia (4) 陳夢家.
Yin Hsü Pu Tzhu Tsung Shu 殷虛卜辭綜
述.
A study of the Characters on the Shang
Oracle-Bones.
Kho-Hsüeh, Peking, 1956.
- Chhen Pang-Hsien (1) 陳邦賢.
Chung Kuo I-Hsüeh Shih 中國醫學史.
History of Chinese Medicine.
Com. Press, Shanghai, 1937, 1957.
- Chhen Phan (7) 陳燧.
Chan-Kuo Chhin Han Chien Fang-Shih
Khao Lun 戰國秦漢間方士考論.
Investigations on the Magicians of the
Warring States, Chhin and Han periods.
AS/BIHP, 1948, 17, 7.
- Chhen Pi-Liu 陳豐疏 & Chêng Cho-Jen (1)
鄭卓人.
Ling Shu Ching, Pai Hua Chieh 靈樞經
白話解.
The Yellow Emperor's Manual of Corporeal
(Medicine); the Vital Axis; done into
Colloquial Language.
Jen-min Wei-shêng, Peking, 1963.
- Chhen Thao (1).
Chhi Kung Kho-Hsüeh Chhang Shih 氣功
科學常識.
A General Introduction to the Science of
Respiratory Physiotherapy.
Kho-hsüeh Chi-shu, Shanghai, 1958.
- Chhen Wên-Hsi (1) 陳文熙.
Lu-kan-shih 'Tutty' Thou-shih Thang-Thi
爐甘石 Tutty 鎔石鑄錫.
A Study of the Designations of Zinc Ores,
lu-kan-shih, tutty and brass.
HITC 1933, 12, 839; 1934, 13, 401.
- Chhen Yin-Kho (3) 陳寅恪.
Thien Shih Tao yü Pin-Hai Tü-Yü chih
Kuan-Hsi 天師道與濱海地域之關係
On the Taoist Church and its Relation to
the Coastal Regions of China (c. +126 to
+536).
AS/BIHP, 1934 (no. 3/4), 439.
- Chhen Yuan (4) 陳垣.
Shih Hui Chü Li 史講舉例.
On the Tabu Changes of Personal Names in
History; Some Examples.
Chung-Hua, Peking, 1962, repr. 1963.
- Dohi Keizō (1) 土肥慶藏.
Shōsōin Yakushi no Shiteki Kōsatsu 正倉
院藥種の史的考察.
Historical Investigation of the Drugs pre-
served in the Imperial Treasury at
Nara.
In *Zoku Shōsōin Shiron* 續正倉院史論.
1932, No. 15, Neiyaku 寧樂.
1st pagination, p. 133.
- Dōno Tsurumatsu (1) 道野鶴松.
Kodai no Shina ni okeru Kagakushisō toku
ni Genzōshisō ni tsuite 古代の支那に
於ける化學思想特に元素思想に就
いて.
On Ancient Chemical Ideas in China, with
Special Reference to the Idea of Ele-
ments [comparison with the Four
Aristotelian Elements and the Spagyric
Tria Prima].
TG/T, 1931, 1, 159.
- Fan Hsing-Chun (6) 范行準.
Chung Hua I-Hsüeh Shih 中華醫學史.

- Fan Hsing-Chun (6) (*cont.*)
Chinese Medical History.
ISTC, 1947, 1 (no. 1), 37, (no. 2), 21;
1948, 1 (no. 3/4), 17.
- Fan Hsing-Chun (12) 范行準.
Liang Han San Kuo Nan Pei Chhao Sui
Thang I Fang Chien Lu 兩漢三國南北朝隋唐醫方簡錄.
A Brief Bibliography of (Lost) Books on
Medicine and Pharmacy written during
the Han, Three Kingdoms, Northern and
Southern Dynasties and Sui and Thang
Periods.
CHWSLT, 1965, 6, 295.
- Fêng Chhêng-Chün (1) 馮承鈞.
Chung-Kuo Nan-Yang Chiao-Thung Shih
中國南洋交通史.
History of the Contacts of China with the
South Sea Regions.
Com. Press, Shanghai, 1937, repr. Thai-
Phing, Hongkong, 1963.
- Fêng Chia-Shêng (1) 馮家昇.
Huo-Yao ti Fa-Hsien chi chhi Chhuan Pu
火藥的發現及其傳佈.
The Discovery of Gunpowder and its
Diffusion.
AP/HY, 1947, 5, 29.
- Fêng Chia-Shêng (2) 馮家昇.
Hui Chiao Kuo wei Huo-Yao yu Chung-Kuo
Chhuan Yu Ou-Chou ti Chhiao Liang 回
教國爲火藥由中國傳入歐州的橋梁.
The Muslims as the Transmitters of Gun-
powder from China to Europe.
AP/HY, 1949, 1.
- Fêng Chia-Shêng (3) 馮家昇.
Tu Hsi-Yang ti Chi Chung Huo-Chhi Shih
Hou 讀西洋的幾種火器史後.
Notes on reading some of the Western
Histories of Firearms.
AP/HY, 1947, 5, 279.
- Fêng Chia-Shêng (4) 馮家昇.
Huo-Yao ti Yu Lai chi chhi Chhuan Yu
Ou-chou ti Ching Kuo 火藥的由來及
其傳入歐洲的經過.
On the Origin of Gunpowder and its Trans-
mission to Europe.
Essay in Li Kuang-Pi & Chhien Chün-Yeh
(q.v.), p. 33.
Peking, 1955.
- Fêng Chia-Shêng (5) 馮家昇.
Lien Tan Shu ti Chhêng Chhang chi chhi
Hsi Chhuan 煉丹術的成長及其西傳.
Achievements of (ancient Chinese) Al-
chemy and its Transmission to the West.
Essay in Li Kuang-Pi & Chhien Chün-Yeh
(q.v.), p. 120.
Peking 1955.
- Fêng Chia-Shêng (6) 馮家昇.
Huo-Yao ti Fa-Ming ho Hsi Chhuan 火藥
的發明和西傳.
The Discovery of Gunpowder and its
Transmission to the West.
Hua-Tung, Shanghai, 1954.
Revised ed. Jen-Min, Shanghai, 1962.
- Fu Chhin-Chia (1) 傅勤家.
Chung-Kuo Tao Chiao Shih 中國道教史.
A History of Taoism in China.
Com. Press, Shanghai, 1937.
- Fu Chin-Chhüan (1) 傅金銓.
Chhieh Shui Yin 赤水吟.
Chants of the Red River [physiological
alchemy].
1823.
In *CTPS*, *pên* 4.
- Fu Chin-Chhüan (2) 傅金銓.
Thien Hsien Chêng Li Tu 'Fa Tien Ching'
天仙正理讀法點睛.
The Right Pattern of the Celestial Im-
mortals; Thoughts on Reading the
Consecration of the Law [physiological
alchemy. *Tien ching* refers to the cere-
mony of painting in the pupils of the eyes
in an image or other representation].
1820.
In *CTPS*, *pên* 5.
- Fu Chin-Chhüan (3) 傅金銓.
Tan Ching Shih Tu 丹經示讀.
A Guide to the Reading of the Enchymoma
Manuals [dialogue of pupil and teacher on
physiological alchemy]
c. 1825.
In *CTPS*, *pên* 11.
- Fu Chin-Chhüan (4) 傅金銓.
Tao Hai Chin Liang 道海津梁.
A Catena (of Words) to Bridge the Ocean
of the Tao [mutationism, Taoist-Buddh-
ist-Confucian syncretism, and physio-
logical alchemy].
1822.
In *CTPS*, *pên* 11.
- Fu Chin-Chhüan (5) 傅金銓.
Shih Chin Shih 試金石.
On the Testing of (what is meant by)
'Metal' and 'Mineral'.
c. 1820.
In *Wu Chen Phien Ssu Chu* ed.
- Fu Chin-Chhüan (6) (ed.) 傅金銓.
Chêng Tao Pi Shu Shih Chung 證道秘書十種
Ten Types of Secret Books on the Verifica-
tion of the Tao.
Early 19th.
- Fu Lan-Ya (Fryer, John) 傅蘭雅 & Hsü Shou
徐壽 (1) (tr.).
Hua-Hsüeh Chien Yuan 化學鑒原.
Authentic Mirror of Chemical Science
(translation of Wells, 1).
Chiangnan Arsenal Transl. Bureau, Shang-
hai, 1871.
- Fukui Kōjun (1) 福井康順.
Tōyō Shisō no Kenkyū 東洋思想の研究.
Studies in the History of East Asian
Philosophy.
Risōsha, Tokyo, 1956.
Abstr. *RBS*, 1959, 2, no. 564.

- Fukunaga Mitsuji (1) 福永光司.
Hōzensetsu no Keisei 封禪説の形成.
The Evolution of the Theory of the Fêng and
Shan Sacrifices (in Chhin and Han Times).
TS, 1954, 1 (no. 6), 28, (no. 7), 45.
- Harada Yoshito 原田淑人 & Tazawa Kingo (2)
田澤金吾.
Rakurō Gokan-en Ō Ku no Fumbo 樂浪五
官祿王野の墳墓.
Lo-Lang; a Report on the Excavation of
Wang Hsü's Tomb in the Lo-Lang Pro-
vince (an ancient Chinese Colony in Korea).
Tokyo Univ. Tokyo, 1930.
- Hasegawa Usaburo (1) 長谷川卯三郎.
Shin Igaku Zen 新醫學禪.
New Applications of Zen Buddhist Tech-
niques in Medicine.
So Gensha, Tokyo, 1970. (In the Hara-o-
tsukuruzen Series.)
- Hiraoka Teikichi (2) 平岡楢吉.
'Enanji' ni arawareta Ki no Kenkyū 「淮南
子」に現われた氣の研究.
Studies on the Meaning and the Conception
of 'chhi' in the *Huai Nan Tau* book.
Kan Gi Bunka Gakkai, Tokyo, 1961.
Abstr. *RBS*, 1968, 7, no. 620.
- Ho Han-Nan (1) 何漢南.
*Sian Shih Hsi-yao-shih Tshun Thang Mu
Chhing-Li Chi* 西安市西麓實村唐
墓清理記.
A Summary Account of the Thang Tomb at
Hsi-yao-shih Village near Sian [the tomb
which yielded early Arabic coins].
Cf. Hsia Nai (3).
KKTH, 1965, no. 8 (no. 108), pp. 383, 388.
- Ho Hsin (1) (Hobson, Benjamin) 合信.
Po Wu Hsin Phien 博物新編.
New Treatise on Natural Philosophy and
Natural History [the first book on modern
chemistry in Chinese].
Shanghai, 1855.
- Ho Ping-Yü 何丙郁 & Chhen Thieh-Fan (1)
陳鐵凡.
*Lun 'Shun Yang Lü Chen Jen Yao Shih
Chih' ti Chu Chhing Shih-Tai* 論「純陽
呂真人藥石製」的著成時代.
On the Dating of the 'Manipulations of
Drugs and Minerals, by the Adept Lü
Shun-Yang', a Taoist Pharmaceutical and
Alchemical Manual.
YOSHK, 1971, 9, 181-228.
- Ho-Ping-Yü 何丙郁 & Su Ying-Hui 蘇瑩輝
(1).
'Tan Fang Ching Yuan' Khao 「丹房鏡源」
考.
On the *Mirror of the Alchemical
Laboratory*, (a Thang Manual of
Practical Experimentation).
YOSHK, 1970, 8 (no. 1), 1, 23.
- Hori Ichirō (1) 堀一郎.
*Yudono-san Kei no Sokushimbutsu (Miira) to
sono Haikei* 湯殿山系の即身佛(ミイ
ラ)とその背景.
The Preserved Buddhas (Mummies) at the
Temples on Yudono Mountain.
TBKK, 1961, no. 35 (no. 3).
Repr. in Hori Ichirō (2), p. 191.
- Hori Ichirō (2) 堀一郎.
Shūkyō Shūzoku no Seikatsu Kisei 宗教習
俗の生活規制.
Life and Customs of the Religious Sects (in
Buddhism).
Miraisha, Tokyo, 1963.
- Hou Pao-Chang (1) 侯寶璋.
Chung-Kuo Chieh-Phou Shih 中國解剖史
A History of Anatomy in China.
ISTC, 1957, 8 (no. 1), 64.
- Hou Wai-Lu (3) 侯外廬.
*Fang I-Chih—Chung-Kuo ti Pai Kho
Chhian Shu Phai Ta Chê-Hsüeh Chia*
方以智—中國的百科全書派大哲
學家.
Fang I-Chih—China's Great Encyclopaedist
Philosopher.
LSYC, 1957 (no. 6), 1; 1957 (no. 7), 1.
- Hou Wai-Lu (4) 侯外廬.
*Shih-liu Shih-Chi Chung-Kuo ti Chin-Pu
ti Chê-Hsüeh Ssu-Chhao Kai-Shu* 十六
世紀中國的進步的哲學思潮概述.
Progressive Philosophical Thinking in
+16th-century China.
LSYC, 1959 (no. 10), 39.
- Hou Wai-Lu 侯外廬, Chao Chi-Pin 趙紀彬,
Tu Kuo-Hsiang 杜國庠 & Chhiu
Han-Shêng (1) 邱漢生.
Chung-Kuo Ssu-Hsiang Thung Shih 中國
思想通史.
General History of Chinese Thought.
5 vols.
Jen-Min, Peking, 1957.
- Hu Shih (7) 胡適.
Lun Hsüeh Chin Chu, ti-i Chi 論學近著
第一集.
Recent Studies on Literature (first series).
- Hu Yao-Chen (1).
Chhi Kung Chien Shen Fa 氣功健身法.
Respiratory Exercises and the Strengthen-
ing of the Body.
Thai-Phing, Hongkong, 1963.
- Huang Chu-Hsün (1) 黃著勳.
Chung-Kuo Khuang Chhan 中國鑛產.
The Mineral Wealth and Productivity of
China.
2nd ed., Com. Press, Shanghai, 1930.
- Hung Huan-Chhun (1) 洪煥椿.
*Shih chih Shih-san Shih-Chi Chung-Kuo
Kho-Hsüeh-ti Chu-Yao Chheng-Chiu.*
十至十三世紀中國科學的主要成就.
The Principal Scientific (and Techno-
logical) Achievements in China from the
+10th to the +13th centuries (inclusive),
[the Sung period].
LSYC, 1959, 5 (no. 3), 27.

- Hung Yeh (2) 洪業.
Tsai Shuo 'Hsi Ching Tsa Chi' 再說「西京雜記」.
 Further Notes on the *Miscellaneous Records of the Western Capital* [with a study of the dates of Ko Hung].
AS/BIHP, 1963, 34 (no. 2), 397.
- Hsia Nai (2) 夏鼐.
Khao-Ku-Hsüeh Lun Wên Chi 考古學論文集.
 Collected Papers on Archaeological Subjects. Academia Sinica, Peking, 1961.
- Hsia Nai (3) 夏鼐.
Sian Thang Mu Chhu Thu A-la-pa Chin Pi 西安唐墓出土阿拉伯金幣.
 Arab Gold Coins unearthed from a Thang Dynasty Tomb (at Hsi-yao-thou Village) near Sian, Shensi (gold dīnārs of the Umayyad Caliphs 'Abd al-Malik, +702, 'Umar ibn 'Abd al-'Azīz, +718, and Marwān II, +746).
 Cf. Ho Han-Nan (1).
KKTH, 1965, no. 8 (no. 108), 420, with figs 1-6 on pl. 1.
- Hsiang Ta (3) 向達.
Thang Tai Chhang-An yü Hsi Yü Wên Ming 唐代長安與西域文明.
 Western Cultures at the Chinese Capital (Chhang-an) during the Thang Dynasty. *YCHP* Monograph series, no. 2, Peiping, 1933.
- Hsieh Sung-Mu (1) 謝誦穆.
Chung-Kuo Li-Tai I-Hsüeh Wei Shu Khao 中國歷代醫學偽書考.
 A Study of the Authenticity of (Ancient and Medieval) Chinese Medical Books.
ISTC, 1947, 1 (no. 1), 53.
- Hsiung Tê-Chi (1) 熊德基.
'Thai Ping Ching' ti Tso-Chê ho Ssu-Hsiang chü chhi yü Huang Chin ho Thien Shih Tao ti Kuan-Hsi 「太平經」的作者和思想及其與黃巾和天師道的關係.
 The Authorship and Ideology of the *Canon of the Great Peace*; and its Relation with the Yellow 'Turbans (Rebellion) and the Taoist Church ('Tao of the Heavenly Teacher).
LSYC 1962 (no. 4), 8.
 Abstr. *RBS*, 1969, 8, no. 737.
- Hsü Chien-Yin (1) 徐建寅.
Ko Chih Tshung Shu 格致叢書.
 A General Treatise on the Natural Sciences. Shanghai, 1901.
- Hsü Chih-I (1) 徐致一.
Wu Chia Thai Chi Chhuan 吳家太極拳.
 Chinese Boxing Calisthenics according to the Wu Tradition.
 Hsin-Wên, Hongkong, 1969.
- Hsü Chung-Shu (7) 徐中舒.
Chin Wên Chia Tzhu Shih Li 金文韻辭釋例.
 Terms and Forms of the Prayers for Blessings in the Bronze Inscriptions.
AS/BIHP, 1936, (no. 4), 15.
- Hsü Chung-Shu (8) 徐中舒.
Chhen Hou Ssu Chhi Khao Shih 陳侯四器考釋.
 Researches on Four Bronze Vessels of the Marquis Chhen [i.e. Prince Wei of Chhi State, r. -378 to -342].
AS/BIHP, 1934, (no. 3/4), 499.
- Hsü Ti-Shan (1) 許地山.
Tao Chiao Shih 道教史.
 History of Taoism.
 Com. Press, Shanghai, 1934.
- Hsü Ti-Shan (2) 許地山.
Tao Chia Ssu-Hsiang yü Tao Chiao 道家思想與道教.
 Taoist Philosophy and Taoist Religion.
YCHP, 1927, 2, 249.
- Hsüeh Yü (1) 薛愚.
Tao-Chia Hsien Yao chih Hua-Hsüeh Kuan 道家仙藥之化學觀.
 A Look at the Chemical Reactions involved in the Elixir-making of the Taoists.
HSS, 1942, 1 (no. 5), 126.
- Huang Lan-Sun (1) (ed.) 黃蘭孫.
Chung-Kuo Yao-Wu-ti Kho-Hsüeh Yen-Chiu 中國藥物的科學研究.
 Scientific Researches on Chinese Materia Medica.
 Chhien-Chhing Thang, Shanghai, 1952.
- Imai Usaburō (1) 今井宇三郎.
 'Goshinpen' no Seisho to Shisō 悟真篇の成書と思想.
 The Poetical Essay on Realising the... Primary Vitalities [by Chang Po-Tuan, +1075]; its System of Thought and how it came to be written.
TS, 1962, 19, 1.
 Abstr. *RBS*, 1969, 8, no. 799.
- Ishihara Akira (1) 石原明.
Gozōnyūtai no Igi ni tsuite 五臟入胎の意義について.
 The Buddhist Meaning of the Visceral Models (in the Sakyamuni Statue at the Seiryōji Temple).
NIZ, 1956, 7 (nos. 1-3), 5.
- Ishihara Akira (2) 石原明.
Indo Kaibōgaku no Seiritsu to sono Ryūden 印度解剖學の成立とその流傳.
 On the Introduction of Indian Anatomical Knowledge (to China and Japan).
NIZ, 1956, 7 (nos. 1-3), 64.
- Ishii Masako (1) 石井昌子.
Kōhon 'Chen Kao' 稿本「真誥」.
 Draft of an Edition of the *Declarations of Perfected Immortals*, (with Notes on Variant Readings).
 In several volumes.
 Toyoshima Shobō, Tokyo, (for Dōkyō Kankōkai 道教刊行會), 1966-.

- Ishii Masako (2) 石井昌子.
 'Chen Kao' no Seiritsu o Meguru Shiryō-teki Kentō; 'Teng Chen Yin Chüeh', 'Chen Ling Wei Yeh Thu' oyobi 'Wu Shang Pi Yao' tōno Kankei wo Chūshin-ni 「眞誥」の成立をみぐる資料的検討; 「登眞隱訣」, 「眞靈位業圖」及び「無上秘要」との關係を中心に.
 Documents for the Study of the Formation of the Declarations of Perfected Immortals...
 DK, 1968, 3, 79-195 (with French summary on p. iv).
- Ishii Masako (3) 石井昌子.
 'Chen Kao' no Seiritsu ni Kansuru Kōsatsu 「眞誥」の成立に關する一考察.
 A Study of the Formation of the Declarations of Perfected Immortals.
 DK, 1965, 1, 215 (French summary, p. x).
- Ishii Masako (4) 石井昌子.
 Thao Hung-Ching Denkiō 陶弘景傳記考.
 A Biography of Thao Hung-Ching.
 DK, 1971, 4, 29-113 (with French summary, p. iv).
- Ishijima Yasutaka (1) 石島快隆.
 Hōbokushi Insho Kō 抱朴子引書考.
 A Study of the Books quoted in the Pao Phu Tzu and its Bibliography.
 BK, 1956, 20, 877.
 Abstr. RBS, 1959, 2, no. 565.
- Ito Kenkichi (1) 伊藤堅吉.
 Sei no Mihotoke 性のみほとけ.
 Sexual Buddhas (Japanese Tantric images etc.).
 Zufushinsha, Tokyo, 1965.
- Ito Mitsutōshi (1) 伊藤光遠.
 Yang Sheng Nei Kung Pi Chüeh 養生内功秘訣.
 Confidential Instructions on Nourishing the Life Force by Gymnastics (and other physiological techniques).
 Tr. from the Japanese by Tuan Chu-Chün 段竹君.
 Taipei (Taiwan), 1966. †
- Jen Ying-Chhiu (1) 任應秋.
 Tung Su Chung-Kuo I-Hsüeh Shih Hua 通俗中國醫學史話.
 Popular Talks on the History of Medicine.
 Chungking, 1957.
- Jung Kêng (3) 容庚.
 Chin Wên Pien 金文編.
 Bronze Forms of Characters.
 Peking, 1925, repr. 1959.
- Kao Chih-Hsi (1) 高至喜.
 Niu Têng 牛鐙.
 An 'Ox Lamp' (bronze vessel of Chhien Han date, probably for sublimation, with the boiler below formed in the shape of an ox, and the rising tubes a continuation of its horns).
 WWTK, 1959 (no. 7), 66.
- Kao Hsien (1) et al. 高銜.
 Hua-Hsüeh Yao Phin Tshu-Tien 化學藥品辭典.
 Dictionary of Chemistry and Pharmacy (based on T. C. Gregory (1), with the supplement by A. Rose & E. Rose).
 Shanghai Sei & Tech. Pub., Shanghai, 1960.
- Kawabata Otakeshi 川端男勇 & Yoneda Yūtarō 米田祐太郎 (1)
 Tōsei Biyaku-kō 東西婦藥考.
 Die Liebestränke in Europa und Orient.
 Bunkūsha, Tokyo.
- Kawakubo Teirō (1) 川久保悌郎.
 Shindai Manshū ni oheru Shōka no Zokusei ni tsuite 清代滿洲における燒鍋の燒生について.
 On the (Kao-liang) Spirits Distilleries in Manchuria in the Chhing Period and their Economic Role in Rural Colonisation.
 Art. in Wada Hakase Koki Kinen Tōyōshi Ronsō (Wada Festschrift) 和田博士古稀記念東洋史論叢, Kōdansha, Tokyo, 1961, p. 303.
 Abstr. RBS, 1968, 7, no. 758.
- Khung Chhing-Lai et al. (1) 孔慶萊 (13 collaborators).
 Chih-Wu-Hsüeh Ta Tshu Tien 植物學大辭典.
 General Dictionary of Chinese Flora.
 Com. Press, Shanghai and Hongkong, 1918, repr. 1933 and often subsequently.
- Kimiya Yasuhiko (1) 木宮泰彦.
 Nikka Bunka Kōryūshi 日華文化交流史.
 A History of Cultural Relations between Japan and China.
 Fuzambō, Tokyo, 1955.
 Abstr. RBS, 1959, 2, no. 37.
- Kobayashi Katsuhito (1) 小林勝人.
 Yō Shu Gakuha no hitobite 楊朱學派の人々.
 On the Disciples and Representatives of the (Hedonist) School of Yang Chu.
 TYGK, 1961, 5, 29.
 Abstr. RBS, 1968, 7, no. 606.
- Koyanagi Shikita (1) 小柳司氣太.
 Tao Chiao Kai Shuo 道教概説.
 A Brief Survey of Taoism.
 Tr. Chhen Pin-Ho 陳斌和.
 Com. Press, Shanghai, 1926.
 Repr. Com. Press, Taipei, 1966.
- Kuo Mo-Jo (8) 郭沫若.
 Chhu Thu Wên Wu Erh San Shih 出土文物二三事.
 One or two Points about Cultural Relics recently Excavated (including Japanese coin inscriptions).
 WWTK, 1972 (no. 3), 2.
- Kuo Pao-Chün (1) 郭寶鈞.
 Hsün-hsien Hsin-tshun Ku Tshan Mu chih Chhing Li 濬縣辛村古殘墓之清理.

- Kuo Pao-Chün (1) (cont.)
Preliminary Report on the Excavations at the Ancient Cemetery of Hsin-tshun village, Hsün-hsien (Honan).
TYKK, 1936, 1, 167.
- Kuo Pao-Chün (2) 郭寶鈞.
Hsün-hsien Hsin-tshun 濬縣辛村.
(Archaeological Discoveries at) Hsin-tshun Village in Hsün-hsien (Honan).
Inst. of Archaeology, Academia Sinica, Peking, 1964 (Field Expedition Reports, I series, no. 13).
- Kurihara Keisuke (1) 栗原圭介.
Gusai no Gireiteki Igi 虞祭の「儀禮」的意義.
The Meaning and Practice of the Yü Sacrifice, as seen in the *Personal Conduct Ritual*.
NCGH, 1961, 13, 19.
Abstr. *RBS*, 1968, 7, no. 615.
- Kuroda Genji (1) 黒田源次.
Ki 氣.
On the Concept of Chhi (*pneuma*; in ancient Chinese thought).
TS, 1954 (no. 4/5), 1; 1955 (no. 7), 16.
- Lai Chia-Tu (1) 賴家度.
'Thien Kung Khai Wu' chi chhi Chu ché; Sung Ying-Hsing 「天工開物」及其著者宋應星.
The *Exploitation of the Works of Nature* and its Author; Sung Ying-Hsing.
Essay in Li Kuang-Pi & Chhien Chün-Yeh (q.v.), p. 338.
Peking, 1955.
- Lai Tou-Yen (1) 賴斗岩.
I Shih Sui Chin 醫史碎錦.
Medico-historical Gleanings.
ISTC, 1948, 2 (nos 3/4), 41.
- Lao Kan (6) 勞翰.
Chung-Kuo Tan-Sha chih Ying-Yung chi chhi Thui-Yen 中國丹砂之應用及其推演.
The Utilisation of Cinnabar in China and its Historical Implications.
AS/BIHP, 1936, 7 (no. 4), 519.
- Li Chhiao-Phing (1) 李喬萃.
Chung-Kuo Hua-Hsüeh Shih 中國化學史.
History of Chemistry in China.
Com. Press, Chhangsha, 1940, 2nd (enlarged) ed. Taipei, 1955.
- Li Kuang-Pi 李光燾 & Chhien Chün-Yeh (1) 錢君擘.
Chung-Kuo Kho-Hsüeh Chi-Shu Fa-Ming ho Kho-Hsüeh Chi-Shu Yen Wu Lun Chi 中國科學技術發明和科學技術人物論集.
Essays on Chinese Discoveries and Inventions in Science and Technology, and on the Men who made them.
San-lien Shu-tien, Peking, 1955.
- Li Nien (4) 李儼.
Chung Suan Shih Lun Tshung 中算史論叢.
Gesammelte Abhandlungen ü. die Geschichte d. chinesischen Mathematik.
3 vols. 1933-5; 4th vol. (in 2 parts), 1947.
Com. Press, Shanghai.
- Li Nien (21) 李儼.
Chung Suan Shih Lun Tshung (second series) 中算史論叢.
Collected Essays on the History of Chinese Mathematics—vol. 1, 1954; vol. 2, 1954; vol. 3, 1955; vol. 4, 1955; vol. 5, 1955.
Kho-Hsüeh, Peking.
- Li Shu-Hua (3) 李書華.
Li Shu-Hua Yu Chi 李書華遊記.
Travel Diaries of Li Shu-Hua [recording visits to temples and other notable places around Huang Shan, Fang Shan, Thien-thai Shan, Yen-tang Shan etc. in 1935 and 1936].
Chhuan-chi Wên-hsüeh, Taipei, 1969.
- Li Shu-Huan (1) 李叔澧.
Tao Chiao Yao I Wen Ta Chi Chheng 道教要義問答集成.
A Catechism of the Most Important Ideas and Doctrines of the Taoist Religion.
Pr. Kao-hsiung and Taipei, Taiwan, 1970.
Distributed by the Chhing Sung Kuan (Caerulean Pine-tree Taoist Abbey), Chhing Shan (Castle Peak), N.T. Hongkong.
- Liang Chin (1) 梁津.
Chou Tai Ho Chin Chheng Fên Khao 周代合金成分考.
A Study of the Analysis of Alloys of the Chou period.
KHS, 1925, 9 (no. 3), 1261; repr. in Wang Chin (2), p. 52.
- Lin Thien-Wei (1) 林天爵.
Sung-Tai Hsiang-Yao Mou-I Shih Kao 宋代香藥貿易史稿.
A History of the Perfume and Drug Trade during the Sung Dynasty.
Chung-kuo Hsüeh-shé, Hongkong, 1960.
- Ling Shun-Shêng (6) 凌純聲.
Chung-Kuo Chiu chih Chhi Yuan 中國酒之起源.
On the Origin of Wine in China.
AS/BIHP, 1958, 29, 883 (Chao Yuan-Jen Presentation Volume).
- Liu Kuei-Chen (1).
Chhi Kung Liao Fa Shih Chien 氣功療法實踐.
The Practice of Respiratory Physiotherapy.
Hopei Jen-min, Paoting, 1957.
Also published as: *Shih Yen Chhi Kung Liao Fa* 試驗氣功療法.
Experimental Tests of Respiratory Physiotherapy.
Thai-Phing, Hongkong, 1965.

- Liu Po (1) 劉波.
Mo-Ku chi chhi Tsai-Phei 蘑菇及其栽培.
Mushrooms, Toadstools, and their Cultivation.
Kho-Hsüeh, Peking, 1959, repr, 1960, 2nd ed. enlarged, 1964.
- Liu Shih-Chi (1) 劉仕驥.
Chung-Kuo Tsang Su Sou Chhi 中國葬俗搜奇.
A Study of the Curiosities of Chinese Burial Customs.
Shanghai Shu-chü, Hongkong, 1957.
- Liu Shou-Shan et al. (1) 劉壽山.
Chung Yao Yen-Chiu Wên-Hsien Tsê-Yao 1820-1961 中藥研究文獻摘要.
A Selection of the Most Important Findings in the Literature on Chinese Drugs from 1820 to 1961.
Kho-Hsüeh, Peking, 1963.
- Liu Wên-Tien (2) 劉文典.
Huai Nan Hung Lieh Chi Chieh 淮南鴻烈集解.
Collected Commentaries on the *Huai Nan Tzu* Book.
Com. Press, Shanghai, 1923, 1926.
- Liu Yu-Liang (1) 劉友樞.
Khuang Wu Yao yü Tan Yao 礦物藥與丹藥.
The Compounding of Mineral and Inorganic Drugs in Chinese Medicine.
Sci. & Tech. Press, Shanghai, 1962.
- Lo Hsiang-Lin (3) 羅香林.
Thang Tai Kuang-chou Kuang-Hsiao Ssu yü Chung-Yin Chiao-Thung chih Kuan-Hsi 唐代廣州光孝寺與中印交通之關係.
The Kuang-Hsiao Temple at Canton during the Thang period, with reference to Sino-Indian Relations.
Chung-kuo Hsüeh-shê, Hongkong, 1960.
- Lo Tsung-Chen (1) 羅宗眞.
Chiangsu I-Hsing Chin Mu Fa-Chüeh Pao-Kao 江蘇宜興晉墓發掘報告 (with a postscript by Hsia Nai 夏鼐).
Report of an Excavation of a Chin Tomb at I-hsing in Chiangsu [that of Chou Chhu, d. +297, which yielded the belt-ornaments containing aluminium; see p. 192].
AS/CJA, 1957 (no. 4), no. 18, 83.
Cf. Shen Shih-Ying (1); Yang Kên (1).
- Lo Tsung-Chen (2) 羅宗眞.
Rejoinder to Shen Shih-Ying (1).
KKTH, 1963 (no. 3), 165.
- Lu Khuei-Shêng (1) (ed.) 陸奎生.
Chung Yao Kho-Hsüeh Ta Tzhu-Tien 中藥科學大辭典.
Dictionary of Scientific Studies of Chinese Drugs.
Shanghai Pub. Co., Hongkong, 1957.
- Lung Po-Chien (1) 龍伯堅.
Hsien Tshun Pên-Tshao Shu Lu 現存本草書錄.
Bibliographical Study of Extant Pharmacopoeias and Treatises on Natural History (from all periods).
Jên-min Wei-shêng, Peking, 1957.
- Ma Chi-Hsing (2) 馬繼興.
Sung-Tai-ti Jen Thi Chieh Phou Thu 宋代的人體解剖圖.
On the Anatomical Illustrations of the Sung Period.
ISTC, 1957, 8 (no. 2), 125.
- Maeno Naoaki (1) 前野直彬.
Meikai Yûko 冥界遊行.
On the Journey into Hell [critique of Duyvendak (20) continued; a study of the growth of Chinese conceptions of hell].
CBH, 1961, 14, 38; 15, 33.
Abstr. *RBS*, 1968, 7, no. 636.
- Mao Phan-Lin (1) 荊泮林.
Ed. & comm. *Huai Nan Wan Pi Shu* (q.v.).
In *Lung Chhi Ching Shih Tshung-Shu* 龍溪精舍叢書.
Collection from the Dragon Pool Studio.
Ed. Cheng Kuo-Hsün 鄭國勳 (1917).
c. 1821.
- Masuda Tsuna (1) 増田綱謹. Master-Craftsman to the Sumitomo Family.
Kodô Zurôku 鼓銅圖錄.
Illustrated Account of the (Mining,) Smelting and Refining of Copper (and other Non-Ferrous Metals).
Kyoto, 1801.
Tr. in *CRRR*, 1840, 9, 86.
- Masutomi Kazunosuke (1) 益富壽之助.
Shôsôin Yakubutsu o Chûshin to suru Kodai Sekiyaku no Kenkyû 正倉院藥物を中心とする古代石薬の研究.
A study of Ancient Mineral Drugs based on the chemicals preserved in the Shôsôin ('Treasury, at Nara).
Nihon Kobutsu shumi no Kai, Kyoto, 1957.
- Matsuda Hisao (1) 松田壽男.
Jûen to Ninjin to Chôbi 戎鹽と人參と貂皮.
On Turkestan salt, Ginseng and Sable Furs.
SGZ, 1957, 66, 49.
- Mei Jung-Chao (1) 梅榮照.
Wo Kuo ti-ti pên Wei-chi-fên Hsüeh ti i-pên; 'Tai Wei Chi Shih Chi' Chhu Pan I Pai Chou Nien 我國第一本微積分學的譯本;「代微積拾級」出版一百周年.
The Centenary of the First Translation into Chinese of a book on Analytical Geometry and Calculus; (Li Shan-Lan's translation of Elias Loomis).
KHSC, 1960, 3, 59.
Abstr. *RBS*, 1968, 7, no. 747.
- Mêng Nai-Chhang (1) 孟乃昌.
Kuan-yü Chung-Kuo Lien-Tan-Shu Chung Hsiao-Suan-ti Ying Yung 關於中國煉丹術中硝酸的應用.
On the (Possible) Applications of Nitric Acid in (Mediaeval) Chinese Alchemy.
KHSC, 1966, 9, 24.

- Michihata Ryōshū (1) 道端良秀.
Chūgoku Bukkyō no Kishin 中國佛教の鬼神.
 The 'Gods and Spirits' in Chinese Buddhism.
IBK, 1962, 10, 486.
 Abstr. *RBS*, 1969, 8, no. 700.
- Mikami, Yoshio (16) 三上義夫.
Shina no Muki Sanrui ni kansuru Chishiki no Hajime 支那の無機酸類に関する知識の始め.
 Le Premier Savoir des Acides Inorganiques en Chine.
Jl, 1931, 1 (no. 1), 95.
- Miki Sakae (1) 三木榮.
Chōsen Igakushi oyobi Shippeishi 朝鮮醫學史及疾病史.
 A History of Korean Medicine and of Diseases in Korea.
 Sakai, Osaka, 1962.
- Miki Sakae (2) 三木榮.
Taikei Sekai Igakushi; Shoshi Teki Kenkyū 體系世界醫學史; 書誌的研究.
 A Systematic History of World Medicine; Bibliographical Researches.
 Tokyo, 1972.
- Min I-Tê (1) 閔一得.
Kuan Khuei Pien 管窺編.
 An Optick Glass (for the Enchymoma).
 c. 1830.
 In *Tao Tsang Hsi Pien (Chhu chi)*, 7.
- Miyagawa Torao et al. (1) 宮川寅雄.
Changsha Kanbo no Kiseki; Yomigaeru Tai Hou Fu Jen no Sekai 長沙漢墓の奇跡; よみがえる駄侯夫人の世界
 Marvellous Relics from a Han Tomb; the World of the Resurrected Lady of Tai.
SHA 1972 (増刊) no. 9-10.
 Other important picture also in *AGR* 1972, 25 Aug.
- Miyashita Saburō (1) 宮下三郎.
Kanyaku, Shūseki no Yakushi-gaku teki Kenkyū 漢藥; 秋石の藥史學的研究.
 A Historical-Pharmaceutical Study of the Chinese Drug 'Autumn Mineral' (*chhiu shih*).
 Priv. pr. Osaka, 1969.
- Miyashita Saburō (2) 宮下三郎.
Senroku-jūichi-ren ni Chin Katsu ga Seizō shita Sei-horunonzai ni tsuite 一〇六一年に沈括が製造した性ホルモン劑について.
 On the Preparation of 'Autumn Mineral' [Steroid Sex Hormones from Urine] by Shen Kua in +1061.
NIZ, 1965, 11 (no. 2), 1.
- Mizuno Seiichi (3) 水野清一.
Indai Seidō Bunka no Kenkyū 殷代青銅文化の研究.
 Researches on the Bronze Culture of the Shang (Yin) Period.
 Kyoto, 1953.
- Morita Kōmon (1) 森田幸門.
Josetsu 序説.
 Introduction to the Special Number of *Nihon Ishigaku Zasshi (Journ. Jap. Soc. Hist. of Med.)* on the Model Human Viscera in the Cavity of the Statue of Sakyamuni (Buddha) at the Seiryōji Temple at Saga (near Kyoto).
NIZ, 1956, 7 (nos. 1-3), 1.
- Murakami Yoshimi (3) 村上嘉實.
Chūgoku no Sennin; Hōbokushi no Shisō 中國の仙人; 抱朴子の思想.
 On the Immortals of Chinese (Taoism); a Study of the Thought of Pao Phu Tzu (Ko Hung).
 Heirakuji Shoten, Tokyo, 1956; repr. Se-u Sōshō, Kyoto, 1957.
 Abstr. *RBS*, 1959, 2, nos. 566, 567.
- Nakajima Satoshi (1) 中島敏.
Shina ni okeru Shisshiki Shūdōhō no Kigen 支那に於ける濕式收銅法の起源.
 The Origins and Development of the Wet Method for Copper Production in China.
 In *Miscellany of Oriental Studies presented to Prof. Katō Gen'ichi*, Tokyo 1950.
 加藤博士還曆記念東洋史集説.
 Also *TYG*, 1945, 27 (no. 3).
- Nakao, Manzō (1) 中尾万三.
Shokuryō-honsō no Kōsatsu 「食療本草」の考察.
 A Study of the [Tunhuang MS. of the] *Shih Liao Pên Tshao* (Nutritional Therapy; a Pharmaceutical Natural History), [by Mêng Shen, c. +670].
SSIP, 1930, 1 (no. 3).
- Nakaseko Rokuro (1).
Sekai Kwagakushi 世界化學史.
 General History of Chemistry.
 Kaniya Shoten, Kyoto, 1927.
 Rev. M. Muccioli, *A*, 1928, 9, 379.
- Ōbuchi Ninji (1) 大淵忍爾.
Dōkyō-shi no Kenkyū 道教史の研究.
 Researches on the History of Taoism and the Taoist Church.
 Okayama, 1964.
- Ogata Kōan (1) 緒方洪庵.
Byōgaku Tsūron 病學通論.
 Survey of Pathology (after Christopher Hufeland's theories).
 Tokyo, 1849.
- Ogata Kōan (2) 緒方洪庵.
Hushi Keiken Ikun 扶氏經驗遺訓.
 Mr. Hu's (Christopher Hufeland's) Well-tested Advice to Posterity [medical macrobiotics].
 Tokyo, 1857.
- Ogata Tamotsu (1) 小片保.
Waga Kumi Sokushimutsu seiritsu ni Kansuru Shomondai 我國即身佛成立に關する諸問題.
 The Self-Mummified Buddhas of Japan, and Several (Anatomical) Questions concerning them.
NDI (Spec. N o.), 1962 (no. 15), 16, with 8 pls.

- Okanishi Tameto (2) 岡西爲人.
Sung I-chhien I Chi Khao 宋以前醫籍考.
Comprehensive Annotated Bibliography of
Chinese Medical Literature in and before
the Sung Period.
Jên-min Wei-shêng, Peking, 1958.
- Okanishi Tameto (4) 岡西爲人.
Tan Fang chih Yen-Chiu 丹方之研究.
Index to the 'Tan' Prescriptions in Chinese
Medical Works.
In *Huang Han I-Hsüeh Tshung-Shu*, 1936,
vol. 11.
- Okanishi Tameto (5) 岡西爲人.
Chhung Chi 'Hsin Hsiu Pên Tshao' 重輯
「新修本草」.
Newly Reconstituted Version of the *Neo
and Improved Pharmacopoeia* (of +659).
National Pharmaceutical Research Insti-
tute, Taipei, 1964.
- Ong Tu-Chien (1) 翁獨健.
'*Tao Tsang' Tzu Mu Yin Tê* 道藏子目
引得.
An Index to the Taoist Patrology.
Harvard-Yenching, Peiping, 1935.
- Ong Wên-Hao (1) 翁文灝.
Chung-Kuo Kung Chhan Chih Lüeh 中國
鑛產誌畧.
The Mineral Resources of China (Metals
and Non-Metals except Coal).
MGSC (Ser. B), 1919, no. 1, 1-270.
With English contents-table.
- Ôya Shin'ichi (1) 大矢眞一.
Nihon no Sangyô Gijutsu 日本の産業技
術.
Industrial Arts and Technology in (Old)
Japan.
Sanseido, Tokyo, 1970.
- Pa Tzu-Yuan (1) (ed.) 巴子園.
Tan I San Chüan 丹擬三卷.
Three Books of Draft Memoranda on
Elixirs and Enchymomas.
1801.
- Phan Wei (1) 潘霽.
Wei Shêng Yao Shu 衛生要術.
Essential Techniques for the Preservation
of Health [based on earlier material on
breathing exercises, physical culture and
massage etc. collected by Hsü Ming-
Fêng 徐鳴峰].
1848, repr. 1857.
- Pi Li-Kan (Billequin, M. A.) 畢利干,
Chhêng Lin 承霖 & Wang Chung-
Hsiang 王鍾祥 (2).
Hua-Hsüeh Shan Yuan 化學闡原.
Explanation of the Fundamental Principles
of Chemistry.
Thung Wên Kuan, Peking, 1882.
- Richie, Donald ドナルド・リチー & Itô
Kenkichi (1) = (1) 伊藤堅吉.
Danjôzô 男女儂.
Images of the Male and Female Sexes
[= The Erotic Gods].
Zufushinsha, Tokyo, 1967.
- Sanaka Sô (1) 佐中壯.
*Tô Inkyo Shôden; Sono Senjutsu o tsujite
mita Honzôgaku to Senyaku to no Kankei*
陶隱居小傳; その撰述を通じて見
た本草學と仙藥との關係.
A Biography of Thao Hung-Ching; his
Knowledge of Botany and Medicines of
Immortality.
Art. in *Wada Hakase Koki Kinen Tôyôshi
Ronsô* (Wada Festschrift) 和田博士古
稀記念東洋史論叢. Kôdansha, Tokyo,
1961, p. 447.
Abstr. *RBS*, 1968, 7, no. 756.
- Sawa Ryûken (1) 左和隆研.
Nihon Mikkyô, sono Tenkai to Bijutsu
日本密教その展開と美術.
Esoteric (Tantric) Buddhism in Japan; its
Development and (Influence on the) Arts.
NHK, Tokyo, 1966, repr. 1971.
- Shen Shih-Ying (1) 沈時英.
*Kuan-yü Chiangsu I-Hsing Hsi Chin Chou
Chhu Mu Chhu-Thu Tai-Shih Chhêng-
Fên Wên-Thi* 關於江蘇宜興西晉周處
墓出土帶飾成分問題.
Notes on the Chemical Composition of the
Belt Ornaments from the Western
Chin Period (+265 to +316) found in
the Tomb of Chou Chhu at I-hsing in
Chiangsu.
KKTH, 1962 (no. 9), 503.
Eng. tr. by N. Sivin (unpub.).
Cf. Lo Tsung-Chen (1); Yang Kên (1).
- Shih Shu-Chhing (2) 史樹菁.
Ku-Tai Kho-Chi Shih Wu Ssu Khao 古代
科技事物四考.
Four Notes on Ancient Scientific Tech-
nology; (a) Ceramic objects for medical
heat-treatment; (b) Mercury silvering of
bronze mirrors; (c) Cardan Suspension
perfume burners; (d) Dyeing stoves.
WWTk, 1962 (no. 3), 47.
- Shima Kunio (1) 島邦男.
Inkyo Bokuji Kenkyû 殷墟卜辭研究.
Researches on the Shang Oracle-Bones and
their Inscriptions.
Chûgokugaku Kenkyûkai, Hirosaki, 1958.
Abstr. in *RBS*, 1964, 4, no. 520.
- Shinoda Osamu (1) 篠田統.
Daki Hyô Shôkô 暖氣樽小考.
A Brief Study of the 'Daki' [*Nuan Chhi*]
Temperature Stabiliser (used in breweries
for the saccharification vats, cooling them
in summer and warming them in winter).
MOULA, ser. B, 1963 (no. 12), 217.
- Shinoda Osamu (2) 篠田統.
Chûsei no Sake 中世の酒.
Wine-Making in Medieval (China and
Japan).

- Shinoda Osamu (2) (cont.)
 Art. in Yabuuchi Kiyoshi (25), p. 321.
- Su Fên 蘇芬, Chu Chia-Hsüan 朱稼軒 et al. (1).
Tzhu-Hang Fa Shih Phu-Sa Ssu Pu Hsiu
 航慈法師菩薩四不朽.
 The Self-Mummification of the Abbot and Bodhisattva, Tzhu-Hang (d. 1954).
CYFC, 1959 (no. 27), pp. 15, 21, etc.
- Su Ying-Hui (1) 蘇瑩輝.
Lun 'Wu Lei Hsiang Kan Chih' chih Tso-Chheng Shih-Tai 論「物類相感志」之作成時代.
 On the Time of Completion of the Mutual Responses of Things according to their Categories.
TLTC 1970, 40 (no. 10).
- Su Ying-Hui (2) 蘇瑩輝.
'Wu Lei Hsiang Kan Chih' Fên Chüan Yen-Ko Khao-Lüeh 「物類相感志」分卷沿革考略.
 A Study of the Transmission of the Mutual Responses of Things according to their Categories and the Vicissitudes in the Numbering of its Chapters.
KKTS, 1970, 1 (no. 2), 23.
- Sun Fêng-I (1) 孫馮翼.
 Ed. & comm. *Huai Nan Wan Pi Shu* (q.v.).
 In *Wên Ching Thang Tshung-Shu* 問經堂叢書.
 Collection from the Hall of Questioning the Classics.
 +1797 to 1802.
- Sun Tso-Yün (1) 孫作雲.
Shuo Yü Jen 說羽人.
 On the Feathered and Winged Immortals (of early Taoism).
LSYKK, 1948.
- Takeuchi Yoshio (1) 武内義雄.
Shinsen Setsu 神僊說.
 The Holy Immortals (a study of ancient Taoism).
 Tokyo, 1935.
- Taki Mototane (1) 多紀元胤.
I Chi Khao (Iseki-kō) 醫籍考.
 Comprehensive Annotated Bibliography of Chinese Medical Literature (Lost or Still Existing).
 c. +1825, pr. 1831.
 Repr. Tokyo, 1933, and Chinese-Western Medical Research Society, Shanghai, 1936, with introd. by Wang Chi-Min.
- Takizawa Bakin (1) 瀧澤馬琴.
Kinsei-setsu Bishōnen-roku 近世說美少年錄.
 Modern Stories of Youth and Beauty.
 Japan (Yedo), c. 1820.
- Tan Jan-Hui (1) (ed.) 澹然慧.
'Chhang Shêng Shu', 'Hsü Ming Fang' Ho Khan 「長生術」「續命方」合刊.
 A Joint Edition of the *Art and Mystery of Longevity and Immortality* and the *Precepts for Lengthening the Life-Span*. [The former work is that previously entitled *Thai-I Chin Hua Tsung Chih* (q.v.) and the latter is that previously entitled *Tsui-Shang I Chheng Hui Ming Ching* (q.v.).]
 Peiping, 1921 (the edition used by Wilhelm & Jung, 1).
- Thang Yung-Thung 湯用彤 & Thang I-Chieh (1) 湯一介.
Khou Chhien-Chih ti Chu-Tso yü Ssu-Hsiang 寇謙之的著作與思想.
 On the Doctrines and Writings of (the Taoist reformer) Khou Chhien-Chih (in the Northern Wei period).
LSYC, 1961, 8 (no. 5), 64.
 Abstr. *RBS*, 1968, 7, no. 659.
- Ting Hsü-Hsien (1) 丁緒賢.
Hua Hsüeh Shih Thung Khao 化學史通考.
 A General Account of the History of Chemistry.
 2 vols., Com. Press, Shanghai, 1936, repr. 1951.
- Ting Wei-Liang (Martin, W. A. P.) (1) 丁麗良.
Ko Wu Yu Men 格物入門.
 An Introduction to Natural Philosophy.
 Thung Wên Kuan, Peking, 1868.
- Ting Wên-Chiang (1) 丁文江.
 Biography of Sung Ying-Hsing 宋應星 (author of the *Exploitation of the Works of Nature*).
 In the *Hsi Yung Hsüan Tshung-Shu* 喜詠軒叢書, ed. Thao Hsiang 陶湘.
 Peiping, 1929.
- Tōdō Kyōshun (1) 藤堂恭俊.
Shina Jōdokyō ni okeru Zuichiku Yōgo
Setsu no seiritsu Katei ni tsuite シナ淨土教における階逐擁護説の成立過程について.
 On the Origin of the Invocation to the 25 Bodhisattvas for Protection against severe Judgments; a Practice of the Chinese Pure Land (Amidist) School.
 Art. in *Tsukamoto Hakase Shōju Kinen Bukkyōshigaku Ronshū* (Tsukamoto Festschrift) 塚本博士頌壽記念佛教史學論集, Kyoto, 1961, p. 502.
 Abstr. *RBS*, 1968, 7, no. 664.
- Tokiwa, Daijō (1) 常盤大定.
Dōkyō Gaisetsu 道教概説.
 Outline of Taoism.
TYG, 1920, 10 (no. 3), 305.
- Tokiwa, Daijō (2) 常盤大定.
Dōkyō Hattatsu-shi Gaisetsu 道教發達史概説.
 General Sketch of the Development of Taoism.
TYG, 1921, 11 (no. 2), 243.

- Tsêng Chao-Lun (1) 曾昭掄
The Translations of the Chiangnan Arsenal Bureau.
TFTC, 1951, 38 (no. 1), 56.
- Tsêng Chao-Lun (2) 曾昭掄.
Chung Wai Hua-Hsiéh Fa-Chan Kai Shu
中外化學發展概述.
Chinese and Western Chemical Discoveries; an Outline.
TFTC, 1953, 40 (no. 18), 33.
- Tsêng Chao-Lun (3) 曾昭掄.
Erh-shih Nien Lai Chung-Kuo Hua-Hsiéh chih Chin-Chan 二十年來中國化學之進展
Advances in Chemistry in China during the past Twenty Years.
KHS, 1936, 19 (no. 10), 1514.
- Tsêng Hsi-Shu (1) 曾熙畧.
Ssu Thi Ta Tzu Tien 四體大字典.
Dictionary of the Four Scripts.
Shanghai, 1929.
- Tsêng Yuan-Jung (1) 曾遠榮.
Chung-Kuo Yung Hsin chih Chhi-Yuan
中國用銻之起源.
Origins and Development of Zinc Technology in China [with a dating of the *Pao Tsang Lun*].
Letter of Oct. 1925 to Wang Chin.
Pr. in Wang Chin (2), p. 92.
- Tshai Lung-Yün (1) 蔡龍雲.
Ssu Lu Hua Chhuan 四路華拳.
Chinese Boxing Calisthenics on the Four Directions System.
Jen-min Thi-yu, Peking, 1959, repr. 1964.
- Tshao Yuan-Yü (1) 曹元宇.
Chung-Kuo Ku-Tai Chin-Tan-Chia ti Shê-Pei ho Fang-Fa 中國古代金丹家的設備和方法.
Apparatus and Methods of the Ancient Chinese Alchemists.
KHS, 1933, 17 (no. 1), 31.
Reprinted in Wang Chin (2), p. 67.
Engl. précis by Barnes (1).
Engl. abstr. by H. D. C[ollier], *ISIS*, 1935, 23, 570.
- Tshao Yuan-Yü (2) 曹元宇.
Chung-Kuo Tso Chiu Hua-Hsiéh Shih-Liao
中國作酒化學史料.
Materials for the History of Fermentation (Wine-making) Chemistry in China.
HITC, 1922, 6 (no. 6), 1.
- Tshao Yuan-Yü (3) 曹元宇.
Kuan-yü Thang-Tai mei-yu Chêng-Liu Chiu ti Wên-thi 關於唐代沒有蒸餾酒的問題.
On the Question of whether Distilled Alcoholic Liquors were known in the Thang Period.
KHSC, 1963, no. 6, 24.
- Tsuda Sōkichi (2) 津田左右吉.
Shinsen Shisō ni kansuru ni-san no Kōsatsu
神仙思想に關する二三の考察.
Some Considerations and Researches on the Holy Immortals (and the Immortality Cult in Ancient Taoism).
In *Man-Sen Chiri Rekishi Kenkyū Hōkoku*
滿鮮地理歷史研究報告 (Research Reports on the Historical Geography of Manchuria and Korea), 1924, no. 10, 235.
- Tsumaki, Naoyoshi (1) 妻木直良.
Dōkyō no Kenkyū 道教の研究.
Studies in Taoism.
TYG, 1911, 1 (no. 1), 1; (no. 2), 20; 1912, 2 (no. 1), 58.
- Tuan Wên-Chieh (1) (ed.) 段文杰.
Yü Lin Khu 榆林窟.
The Frescoes of Yü-lin-khu [i.e. Wan-fohsia, a series of cave-temples in Kansu].
Tunhuang Research Institute, Chung-kuo Ku-tien I-shu, Peking, 1957.
- Tzu Chhi (1) 梓溪.
Chhing Thung Chhi Ming Tzhu Chieh-Shuo
青銅器名詞解說.
An Explanation of the Terminology of (Ancient) Bronze Vessels.
WWTG, 1958 (no. 1), 1; (no. 2), 55; (no. 3), 1; (no. 4), 1; (no. 5), 1; (no. 6), 1; (no. 7), 68.
- Udagawa Yōan (1) 宇田川裕庵.
Seimi Kaisō 舍密開宗.
Treatise on Chemistry [largely a translation of W. Henry (1), but with added material from other books, and some experiments of his own].
Tokyo, 1837-46.
Cf. Tanaka Minoru (3).
- Umehara Sueji (3) 梅原末治.
Senoku Seishō Shinshūhen 泉屋清賞; 新收編.
New Acquisitions of the Sumitomo Collection of Ancient Bronzes (Kyoto); a Catalogue.
Kyoto, 1961.
With English contents-table.
- Wada Hisanori (1) 和田久徳.
'Namban Kōroku' to 'Shohanshi' to no Kankei 「南蕃香錄」と「諸蕃志」の關係.
On the Records of Perfumes and Incense of the Southern Barbarians [by Yeh Thing-kuei, c. +1150] and the Records of Foreign Peoples [by Chao Ju-Kua, c. +1250, for whom it was an important source].
OUSS, 1962, 15, 133.
Abstr. *RBS*, 1969, 8, no. 183.
- Wang Chi-Liang 王季梁 & Chi Jen-Jung (1) 紀經容.
Chung-Kuo Hua-Hsiéh Chieh chih Kuo-Chhü yü Wei-Lai 中國化學界之過去與未來.
The Past and Future of Chemistry [and Chemical Industry] in China.
HHSTH, 1942, 3.

- Wang Chi-Wu (1) 王輯五.
Chung-Kuo Yih-Pên Chiao Tung Shih
中國日本交通史.
A History of the Relations and Connections
between China and Japan.
Com. Pr., Taiwan, 1965 (*Chung-Kuo*
Wên-Hua Shih Tshung-Shu ser.).
- Wang Chin (1) 王繼.
Chung-Kuo chih Kho-Hsüeh Ssu-Hsiang
中國之科學思想.
On (the History of) Scientific Thought in
China.
Art. in *Kho-Hsüeh Thung Lun* (科學通
論).
Sci. Soc. of China, Shanghai, 1934.
Orig. pub. *KHS*, 1922, 7 (no. 10), 1022.
- Wang Chin (2) (ed.) 王繼.
Chung-Kuo Ku-Tai Chin-Shu Hua-Hsüeh chi
Chin Tan Shu 中國古代金屬化學及
金丹術.
Alchemy and the Development of Metal-
lurgical Chemistry in Ancient and Medi-
eval China [collective work].
Chung-kuo Kho-hsüeh Thu-shu I-chhi
Kung-ssu, Shanghai, 1955.
- Wang Chin (3) 王繼.
Chung-Kuo Ku-Tai Chin Shu Yuan Chih
chih Hua-Hsüeh 中國古代金屬原質
之化學.
The Chemistry of Metallurgical Operations
in Ancient and Medieval China [smelt-
ing and alloying].
KHS, 1919, 5 (no. 6), 555; repr. in Wang
Chin (2), p. 1.
- Wang Chin (4) 王繼.
Chung-Kuo Ku-Tai Chin Shu Hua Ho Wu
chih Hua Hsüeh 中國古代金屬化合物
之化學.
The Chemistry of Compounds containing
Metal Elements in Ancient and Medieval
China.
KHS, 1920, 5 (no. 7), 672; repr. in Wang
Chin (2), p. 10.
- Wang Chin (5) 王繼.
Wu Shu Chhien Hua-Hsüeh Chhêng-Fên chi
Ku-Tai Ying-Yung Chhien Hsi Hsin La
Khao 五銖錢化學成分及古代應用
鉛錫鋅鐵考.
An Investigation of the Ancient Tech-
nology of Lead, Tin, Zinc and Iron, together
with Chemical Analyses of the Five-Shu
Coins [of the Han and subsequent
periods].
KHS, 1923, 8 (no. 9), 839; repr. in Wang
Chin (2), p. 39.
- Wang Chin (6) 王繼.
Chung-Kuo Thung Ho Chin nei chih Nieh
中國銅合金內之鎳.
On the Chinese Copper Alloys containing
Nickel [paktong] etc.
KHS, 1929, 13, 1418; abstr. in Wang Chin
(2), p. 91.
- Wang Chin (7) 王繼.
Chung-Kuo Ku-Tai Chiu-Ching Fa-Chiao
Yeh chih i pan 中國古代酒精發醱藥
之一斑.
A Brief Study of the Alcoholic Fermentation
Industry in Ancient (and Medieval)
China.
KHS, 1921, 6 (no. 3), 270.
- Wang Chin (8) 王繼.
Chung-Kuo Ku-Tai Thao Yeh chih Kho-
Hsüeh Kuan 中國古代陶業之科學
觀.
Scientific Aspects of the Ceramics Industry
in Ancient China.
KHS, 1921, 6 (no. 9), 869.
- Wang Chin (9) 王繼.
Chung-Kuo Huang Thung Yeh chih Chhüan
Shêng Shih-Chhi 中國黃銅業之全盛
時期.
On the Date of Full Development of the
Chinese Brass Industry.
KHS, 1925, 10, 495.
- Wang Chin (10) 王繼.
I-Hsing Thao Yeh Yuan Liao chih Kho-
Hsüeh Kuan 宜興陶業原料之科學觀
Scientific Aspects of the Raw Materials of
the I-hsing Ceramics Industry.
KHS, 1932, 16 (no. 2), 163.
- Wang Chin (11) 王繼.
Chung-Kuo Ku-Tai Hua-Hsüeh ti Chhêng-
Chiu 中國古代化學的成就.
Achievements of Chemical Science in
Ancient and Medieval China.
KHTP, 1951, 2 (no. 11), 1142.
- Wang Chin (12) 王繼.
Ko Hung i-chhien chih Chin Tan Shih Lüeh
葛洪以前之金丹史略.
A Historical Survey of Alchemy before Ko
Hung (c. +300).
HITC, 1935, 14, 145, 283.
- Wang Hsien-Chhien (3) 王先謙.
Shih Ming Su Chêng Pu 釋名疏證補.
Revised and Annotated Edition of the
[Han] *Explanation of Names* [dictionary].
Peking, 1895.
- Wang Khuei-Kho (1) (tr.) 王奎克.
San-shih-liu Shui-Fa—Chung-Kuo Ku Tai
Kuan-yü Shui Jung I ti I Chung Tsao
Chhi Lien Tan Wên Hsien 三十六水
法—中國古代關於水溶液的一種早期
煉丹文獻.
The Thirty-six Methods of Bringing Solids
into Aqueous Solution—an Early Chinese
Alchemical Contribution to the Problem
of Dissolving (Mineral Substances), [a
partial translation of Tshao Thien-Chhin,
Ho Ping-Yü & Needham, J. (1).]
KHSC, 1963, 5, 67.
- Wang Khuei-Kho (2) 王奎克.
Chung-Kuo Lien-Tan-Shu Chung ti Chin-I
ho Hua-Chhieh 中國煉丹術中的金液
和華池.

- Wang Khuei-Kho (2) (cont.)
 'Potable Gold' and Solvents (for Mineral Substances) in (Medieval) Chinese Alchemy.
KHSC, 1964, 7, 53.
- Wang Ming (2) 王明.
 'Thai Phing Ching' Ho Chiao 「太平經」合校.
 A Reconstructed Edition of the *Canon of the Great Peace (and Equality)*.
 Chung-Hua, Peking and Shanghai, 1960.
- Wang Ming (3) 王明.
 'Chou I Tshan Thung Chhi' Khao Chêng 「周易參同契」考證.
 A Critical Study of the *Kinship of the Three*.
AS/BIHP, 1948, 19, 325.
- Wang Ming (4) 王明.
 'Huang Thing Ching' Khao 「黃庭經」考.
 A Study on the *Manuals of the Yellow Courts*.
AS/BIHP, 1948, 20A.
- Wang Ming (5) 王明.
 'Thai Phing Ching' Mu Lu Khao 「太平經」目錄考.
 A Study of the Contents Tables of the *Canon of the Great Peace (and Equality)*.
WS, 1965, no. 4, 19.
- Wang Tsu-Yuan (1) 王祖源.
 Nei Kung Thu Shuo 內功圖說.
 Illustrations and Explanations of Gymnastic Exercises [based on an earlier presentation by Phan Wei (q.v.) using still older material from Hsü Ming-Fêng].
 1881.
 Modern reprs. Jen-min Wei-shêng, Peking, 1956; Thai-Phing, Hongkong, 1962.
- Wang Yeh-Chhiu, 王治秋 Wang Chung-Shu 王仲殊 & Hsia Nai (1) 夏鼐.
 Bunka Dai-Kakumei-Kikan Shutsudo Bum-butsu Tenran 文化大革命期間出土文物展覽.
 Articles to accompany the Exhibition of Cultural Relics Excavated (in Ten Provinces of China) during the Period of the Great Cultural Revolution.
YC, 1971 (no. 10), 31, with colour-plates.
- Watanabe Kōzō (1) 渡邊幸三.
 Genzai suru Chūgoku Kinsei made no Gozō Rokufu Zu no Gaisetsu 現存する中國近世までの五藏六府圖の概説
 General Remarks on (the History of) Dissection and Anatomical Illustration in China.
NIZ, 1956, 7 (nos. 1-3), 88.
- Watanabe Kōzō (2) 渡邊幸三.
 Seiryōji Shaka Tainai Gozō no Kaibō-gakuteki Kenkyū 清涼寺釋迦胎內五藏の解剖學的研究.
 An Anatomical Study (of Traditional Chinese Medicine) in relation to the Visceral Models in the Sakyamuni Statue at the Seiryōji Temple (at Saga, near Kyoto).
NIZ, 1956, 7 (nos. 1-3), 30.
- Wei Yuan (1) 魏源.
 Shêng Wu Chi 聖武記.
 Records of the Warrior Sages [a history of the military operations of the Chhing emperors].
 1842.
- Wên I-To (3) 聞一多.
 Shen Hua yü Shih 神話與詩.
 Religion and Poetry (in Ancient Times), [contains a study of the Taoist immortality cult and a theory of its origins].
 Peking, 1956 (posthumous).
- Wu Chhêng-Lo (2) 吳承洛.
 Chung-Kuo Tu Liang Hêng Shih 中國度量衡史.
 History of Chinese Metrology [weights and measures].
 Com. Press, Shanghai, 1937; 2nd ed. Shanghai, 1957.
- Wu Shih-Chhang (1) 吳世昌.
 Mi Tsung Su Hsiang Shuo Lüeh 密宗觀像說略.
 A Brief Discussion of Tantric (Buddhist) Images.
AP/HJ, 1935, 1.
- Wu Tê-To (1) 吳德鐸.
 Thang Sung Wên-Hsien chung Kuan-yü Chêng-Liu Chiu yü Chêng-Liu Chhi Wên-thi 唐宋文獻中關於蒸餾酒與蒸餾器問題.
 On the Question of Liquor Distillation and Stills in the Literature of the Thang and Sung Periods.
KHSC, 1966, no. 9, 53.
- Yabuuchi Kiyoshi (11) (ed.) 藪内清.
 'Tenkō Kaibutsu' no Kenkyū 「天工開物」の研究.
 A Study of the *Thien Kung Khai Wu* (Exploitation of the Works of Nature, +1637).
 Japanese translation of the text, with annotative essays by several hands.
 Kōseisha, Tokyo, 1953.
 Rev. Yang Lien-Shêng, *HJAS*, 1954, 17, 307.
 English translation of the text (sparingly annotated). See Sun & Sun (1).
 Chinese translations of the eleven essays:
 (a) 'Thien Kung Khai Wu' chih Yen-Chiu by Su Hsiang-Yü 蘇翹雨 et al. Tshung-Shu Wei Yuan Hui, Taiwan, and Chi-Shêng, Hongkong, 1956
 (b) 'Thien Kung Khai Wu' Yen-Chiu Wên Chi by Chang Hsiung 章熊 & Wu Chieh 吳傑.
 Com. Press, Peking, 1961.

- Yabuuchi Kiyoshi (25) (ed.) 藪内清.
Chūgoku Chūsei Kagaku Gijutsushi no Kenkyū 中國中世科學技術史の研究.
 Studies in the History of Science and Technology in Medieval China [a collective work].
 Kadokawa Shoten (for the Jimbun Kagaku Kenkyusō), Tokyo, 1963.
- Yamada Keiji (1) 山田慶兒.
 'Butsurui sōkan shi' no seiritsu 「物類相感志」の成立.
 The Organisation of the Book *Wu Lei Hsiang Kan Chih* (Mutual Responses of Things according to their Categories).
SBK, 1965, 13, 305.
- Yamada Keiji (2) 山田慶兒.
Chūsei no Shizen-kan 中世の自然觀.
 The Naturalism of the (Chinese) Middle Ages [with special reference to Taoism, alchemy, magic and apotropiaics].
 Art. in Yabuuchi (25), pp. 55-110.
- Yamada Kentarō (1) 山田憲太郎.
Tōzai Kōyakuishi 東西香藥史.
 A History of Perfumes, Incense, Aromatics and Spices in East and West.
 Tokyo, 1958.
- Yamada Kentarō (2) 山田憲太郎.
Kōryō no Rekishi 香料の歴史.
 History of Perfumes, Incense and Aromatics.
 Tokyo, 1964 (Kiino Kuniya Shinshō, ser. B, 14).
- Yamada Kentarō (3) 山田憲太郎.
Ogawa Kō-ryō Jihō 小川香料時報.
 News from the Ogawa Company; A History of the Incense, Spice and Perfume Industry (in Japan).
 Ogawa & Co. (pr. pr.), Osaka, 1948.
- Yamada Kentarō (4) 山田憲太郎.
Tōa Kō-ryōshi 東亞香料史.
 A History of Incense, Aromatics and Perfumes in East Asia.
 Toyōten, Tokyo, 1942.
- Yamada Kentarō (5) 山田憲太郎.
Chūgoku no Ansoku-kō to Seiyō no Benzoin to no Genryū. 中國の安息香と西洋のベンゾインとの源.
 A Study of the Introduction of *an-hsi hsiang* (gum guggul, bdellium) into China, and that of gum benzoin into Europe.
SB, 1951 (no. 2), 1-36.
- Yamada Kentarō (6) 山田憲太郎.
Chūsei no Chūgokujin to Arabiajin ga Shitte ita Ryūnō no Sanshutsuchi toku ni Baritsu (no) Kuni ni tsuite 中世の中國人とアラビア人が知っていた龍腦の産出地とくに婆律國について
 On the knowledge which the Medieval Chinese and Arabs possessed of Baros camphor (from *Dryobalanops aromatica*) and its Place of Production, Borneo.
NYGDR, 1966 (no. 5), 1.
- Yamada Kentarō (7) 山田憲太郎.
Ryūnō-kō (Sono Shōhinshi-teki Kōsatsu)
 龍腦考(その商品史的考察)
 A Study of Borneo or Baros camphor (from *Dryobalanops aromatica*), and the History of the Trade in it.
NYGDR, 1967 (no. 10), 19.
- Yamada Kentarō (8) 山田憲太郎.
Chin sunawachi Kō 沈すなわ香.
 On the 'Sinking Aromatic' (garroo wood, *Aquilaria agallocha*).
NYGDR, 1970, 7 (no. 1), 1.
- Yang Chhêng-Hsi (1) et al. 楊承禧.
Hu-Pei Thung Chih 湖北通志.
 Historical Geography of Hupei Province. 1921.
- Yang Kên (1) 楊根.
Chin Tai Lü Thung ho-chin-ti Chien-Ting chi chhi Yeh-Lien Chi-Shu-ti Chhu-Pu Than-Thao 晉代鉛銅合金の鑑定及其冶煉技術の初步探討.
 An Aluminium-Copper Alloy of the Chin Dynasty (+265 to +420); its Determination and a Preliminary Study of the Metallurgical Technology (which it Implies).
AS/CJA, 1959 (no. 4), no. 26, 91.
 Eng. tr. by D. Bryan (unpub.) for the Aluminium Development Association, 1962.
 Cf. Lo Tsung-Chen (1); Shen Shih-Ying (1).
- Yang Lieh-Yü (1) 楊烈宇.
Chung-Kuo Ku-Tai Lao-Tung Yen-Min tsai Chin-Shu chi Ho-Chin Ying-Yung-shang-ti Chhêng-Chiu 中國古代勞動人民在金屬及合金應用上的成就.
 Ancient Chinese Achievements in Practical Metal and Alloy Technology.
KHTP, 1955, 5 (no. 10), 77.
- Yang Lien-Shêng (2) 楊聯陞.
Tao Chiao chih Tzu-Po yü Fo Chiao chih Tzu-Phu 道教之自縛與佛教之自撲
 Penitential Self-Flagellation, Violent Prostration and similar practices in Taoist and Buddhist Religion.
 Art. in *Tsukamoto Hakase Shōju Kinen Bukkyōshigaku Ronshū* (Tsukamoto Festschrift), 塚本博士頌壽記念佛教史學論集. Kyoto, 1961, p. 962.
 Abstr. *RBS*, 1968, 7, no. 642.
 Also *AS/BIHP*, 1962, 34, 275; abstr. in *RBS*, 1969, 8, no. 740.
- Yang Ming-Chao (1) 楊明照.
 Critical Notes on the *Pao Phu Tzu* book.
BCS, 1944, 4.
- Yang Po-Chün (1) 楊伯峻.
Lüeh Than Wo-Kuo Shih-Chi shang kuan-yü Shih Thi Fang-Fu-ti Chi-Tsai ho Ma-wang-tui I-hao Han-Mu Mu-Chu Wên-Thi 略談我國史籍上關於尸體

- Yang Po-Chun (1) (cont.)
防腐的記載和馬王堆一號漢墓墓主問題。
A Brief Discussion of Some Historical Texts concerning the Preservation of Human Bodies in an Incorrupt State, especially in connection with the Han Burial in Tomb no. 1 at Ma-wang-tui.
WWTK, 1972 (no. 9), 36.
- Yang Shih-Thai (1) 楊時泰。
Pên Tshao Shu Kou Yuan 本草述鉤元。
Essentials Extracted from the *Explanations of Materia Medica*.
Pref. 1833, first pr. 1842.
LPC, no. 108.
- Yeh Tê-Hui (1) (ed.) 葉德輝。
Shuang Mei Ching An Tshung Shu 雙梅景閣叢書。
Double Plum-Tree Collection [of ancient and medieval books and fragments on Taoist sexual techniques].
Contains *Su Nü Ching* (incl. *Hsüan Nü Ching*), *Tung Hsüan Tzu*, *Yü Fang Chih Yao*, *Yü Fang Pi Chüeh*, *Thien Ti Yin Yang Ta Lo Fu*, etc. (qq.v.).
Chhangsha, 1903 and 1914.
- Yeh Tê-Hui (2) 葉德輝。
Ed. & comm. *Huai Nan Wan Pi Shu* (q.v.).
In *Kuan Ku Thang So Chu Shu* 觀古堂所著書。
Writings from the Hall of Pondering Antiquity.
Chhangsha, 1919.
- Yen Tun-Chieh (20) 嚴敦傑。
Chung-Kuo Ku-Tai Tzu-Jan Kho-Hsüeh ti Fa-Chan chi chhi Chhêng-Chiu 中國古代自然科學的發展及其成就。
The Development and Achievements of the Chinese Natural Sciences (down to 1840).
KHSC, 1969, 1 (no. 3), 6.
- Yen Tun-Chieh (21) 嚴敦傑。
Hsü Kuang-Chhi 徐光啓。
A Biography of Hsü Kuang-Chhi.
Art. in *Chung-Kuo Ku-Tai Kho-Hsüeh Chia*, ed. Li Nien (27), 2nd ed. p. 181.
- Yin Shih Tzu 因是子。
See Chiang Wei-Chhiaó.
- Yoshida Mitsukuni (2) 吉田光邦。
'*Tenkô Kaibutsu*' no *Seiren Shuzô Gijutsu* 「天工開物」の製鍊鑄造技術。
Metallurgy in the *Thien Kung Khai Wu* (Exploitation of the Works of Nature, +1637).
Art. in Yabuuchi Kiyoshi (11), p. 137.
- Yoshida Mitsukuni (5) 吉田光邦。
Chüsei no Kagaku (Rentan-jitsu) to Senjitsu 中世の化學(煉丹術)と仙術。
Chemistry and Alchemy in Medieval China.
Art. in Yabuuchi (25), p. 200.
- Yoshida Mitsukuni (6) 吉田光邦。
Renkinjutsu 鍊金術。
(An Introduction to the History of) Alchemy (and Early Chemistry in China and Japan).
Chûô Kôronsha, Tokyo, 1963.
- Yoshida Mitsukuni (7) 吉田光邦。
Chûgoku Kagaku-gijutsu-shi Ronshû 中國科學技術史論集。
Collected Essays on the History of Science and Technology in China.
Tokyo, 1972.
- Yoshioka Yoshitoyo (1) 吉岡義豊。
Dôkyô Keiten Shiron 道教經典史論。
Studies on the History of the Canonical Taoist Literature.
Dôkyô Kankôkai, Tokyo, 1955, repr. 1966.
Abstr. *RBS*, 1957, 1, no. 415.
- Yoshioka Yoshitoyo (2) 吉岡義豊。
Sho Tô ni okeru Butsu-Dô Ronsô no ichi Shiryô, 'Dôkyô Gisu' no seiritsu ni tsuite 初唐における佛道論争の一資料「道教義樞」の成立について。
The *Tao Chiao I Shu* (Basic Principles of Taoism, by Meng An-Phai 孟安排, c. +660) and its Background; a Contribution to the Study of the Polemics between Buddhism and Taoism at the Beginning of the Tang Period.
IBK, 1956, 4, 58.
Cf. *RBS*, 1959, 2, no. 590.
- Yoshioka Yoshitoyo (3) 吉岡義豊。
Eisei e no Nagai Dôkyô 永生への願い道教。
Taoism; the Quest for Material Immortality and its Origins.
Tankôsha, Tokyo, 1972 (Sekai no Shûkyô, no. 9).
- Yü Chia-Hsi (1) 余嘉錫。
Ssu Khu Thi Yao Pien Chêng 四庫提要辨證。
A Critical Study of the Annotations in the 'Analytical Catalogue of the Complete Library of the Four Categories (of Literature)'.
1937.
- Yü Fei-An (1) 于非闇。
Chung-Kuo Hua Yen-Sê-ti Yen-Chiu 中國畫顏色的研究。
A Study of the Pigments Used by Chinese Painters.
Chao-hua Mei-shu, Peking, 1955, 1957.
- Yü Yün-Hsiu (1) 余雲帥。
Ku-tai Chi-Ping Ming Hou Su I 古代疾病名候疏義。
Explanations of the Nomenclature of Diseases in Ancient Times.
Jen-min Wei-shêng, Shanghai, 1953.
Rev. Nguyen Tran-Huan, *RHS*, 1956, 9, 275.
- Yuan Han-Chhing (1) 袁翰青。
Chung-Kuo Hua-Hsüeh Shih Lun Wên Chi 中國化學史論文集。
Collected Papers in the History of Chemistry in China.
San-Lien, Peking, 1956.

ADDENDA TO BIBLIOGRAPHY B

- Anon. (196).
Ma-wang-tui Po shu Ssu Chung Ku I-Hsteh I Shu Chien Chieh 馬王堆帛書四種古醫學佚書簡介
 A Brief study of Four Lost Ancient Medical Texts contained in the Silk Manuscripts recovered from Tomb (no. 3) at Ma-wang-tui (by the History of Medicine Research Group of the Academy of Traditional-Chinese Medicine).
 Date of Burial, -168.
WWTk, 1975 (no. 6), no. 229, 16.
- Anon. (197)
Ma-wang-tui Han Mu Chhu Thu I Shu Shih Wên (pt. 1) 馬王堆漢墓出土醫書釋文
 A Transcription of Some of the Medical Texts (contained in the Silk Manuscripts) unearthed at the Han Tomb (no. 3), at Ma-wang-tui (-168).
WWTk, 1975 (no. 6), no. 229, 1.
- Anon. (198)
Ma-wang-tui San Hao Mu Po Hua Tao-Yun Thu ti Chhu Pu Yen-Chiu 馬王堆三號墓帛書導引圖的初步研究
 Preliminary Investigations of the Text and Paintings of (Medical) Gymnastics, etc. contained in the Silk Manuscripts recovered from Tomb No. 3 at Ma-wang-tui (-168)—with drawings.
WWTk, 1975, (no. 6), no. 229, 6.
- Anon. (199)
Ma-wang-tui Han Mu Chhu Thu I Shu Shih Wên (pt. 2) 馬王堆漢墓出土醫書釋文
 A Transcription of a Medical Text (the 'Book of Fifty-two Diseases') unearthed (as a Silk Manuscript) at the Han Tomb (no. 3) at Ma-wang-tui (-168).
WWTk, 1975 (no. 9), no. 232, 35.
- Anon. (204)
Chhangsha Ma-wang-tui Erh. San, hao Han Mu Fa Chüeh Chien Pao 長沙馬王堆二三號漢墓發掘簡報
 Brief Preliminary Report on the Excavation of Han Tombs nos. 2 and 3 at Ma-wang-tui near Chhangsha.
WWTk, 1974, no. 7 (no. 218), 39.
- Anon. (205), (ed.)
Ma-wang-tui Han Mu Po Shu Ku Ti-thu Lun Wên Chi 馬王堆漢墓帛書古地圖論文集
 Discussion (with Facsimile Reproductions) of the Ancient Maps discovered in the Han Tomb (no. 3) at Ma-wang-tui (-168).
Wên Wu and Hsin-Hua, Peking, 1977 (in envelope).
- Anon. (206)
Thiai Chhi Wai Tan Thu 調氣外丹圖
 Illustrations of the Harmonising of the Chhi and the Outer Enchymoma.
 Chin-Hua, Hongkong, n.d. (1978).
- Anon. (207)
Pao Chien An-Mo 保健按摩
 Hygienic and Therapeutic (Self-)Massage.
Jen-min Thi-yü, Peking, 1964, repr. 1973.
- Chou Chhien-Chhuan (1) 周潛川
Chhi Kung Yao Erh Liao Fa Chhüan Shu 氣功藥餌療法全書
 Systematic Treatise on Respiratory Physiotherapy and Therapeutic Pharmacy.
Thai-phing, Hongkong, 1962.
- Chung I-Yen & Ling Hsiang (1) 鍾依研凌襄
Wo Kuo Hsien I Fa-Hsien-ti Tsui Ku I Fang—Po Shu 'Wu-shih-erh Ping Fang' 我國現已發現的最古醫方：帛書「五十二方」
 The Oldest Chinese Work on Therapeutics, the 'Book of Fifty-two Diseases' now discovered as a Silk Manuscript (in Tomb No. 3 at Ma-wang-tui, dating from -168).
WWTk, 1975 (no. 9), no. 232, 49.
- Fujiyoshi Jikai (1) 藤吉慈海
Zazen to Zabō ni tsuite 坐禪と坐忘について
 On 'Dhyāna sitting' and 'Sitting in forgetfulness' (Buddhist and Taoist Meditation).
TG/K 1964, 36, 305.
 Abstr. *RBS* 1973, 10, no. 685.
- Jao Tsung-I (3) 饒宗頤
Huang-erh Chiu Chieh yü San Ho I 想爾九戒與三合義
 The Ideas of the 'Nine Precepts of the Hsiang Erh Book' and the 'Triple Harmony.'
CHJ/T 1964, 4 (no. 2), 76.
 Abstr. *RBS* 1973, 10, no. 764.
- Ku Chêng-Hua (1) 谷正華
Pa Tuan Chin yü Liu Tuan Kung 八段錦與六段功
 The Eight Elegant Physical Exercises [of Chungli Chhüan] and the Six Meritorious Movements.
I-Mei, Hongkong, 1974.
- Li Hsin-Hua (1) 李新華
Wo Kuo Ku-Tai-ti Yüi Fang I Hsteh 我國古代的預防醫學
 On Ancient Chinese Preventive Medicine.
SHIY, 1958 (no. 1), 6.
- Mêng Nai-Chhang (2) 孟乃昌
 Chhui Shih Shih I; Kuan-yü Chung-Kuo Ku-Tai Sui Tsai-Thi Chi-Su Chih-Chi-ti Chih Lüeh 秋石試識：
 關於中國古代尿體性激素制的制略

- A Critical Study of 'Autumn Mineral'; on Urinary Steroid Hormones in Ancient and Medieval China.
TJKHSYC 1982, 1 (no. 4), 289.
- Ni Chhing-Ho (1) 倪清和
Hsien Chia Chhang Shêng Shu; fu, Chen-I Tao Jen Ta Wên 仙家長生術：附真一道人答問
The Prolongevity Arts of the Schools of the Immortals; with an Appendix, the Questions and Answers of the Taoist Chen-I.
Chan-shan-mei, Hongkong, 1968, repr. 1975.
- Sung Ta-Jen (6) 宋大仁
Chung-Kuo I Yao Pa Chieh Thu 中國醫藥八傑圖
Paintings of Eight Heroes of Chinese Medicine and Pharmacy.
Shanghai Gastro-Intestinal Hospital, Shanghai, 1937.
- Thang Lan (3) 唐蘭
Mu-wang-tui Po Shu 'Chhio ku shih chhi'
Phien Khao 馬王堆帛書「却谷食氣」篇考
- A Study of the Tractate on 'Abstaining from Cereals and Imbibing the Chhi' in the Silk Manuscripts recovered from Tomb (no. 3) at Ma-wang-tui (-168).
WWTK, 1975, (no. 6), no. 229, 14.
- Umezu Jirō (1) 梅津次郎
Emakimono Sōshi 繪卷物叢誌
A Study of Several (Medieval) Scroll-Paintings.
Hōzōkan, Kyoto, 1972.
- Wang Chia-Fu (1) 王嘉美
Tshung Ma-wang-tui san hao Han Mu Po-Hua Tao-Yin Thu Khan Wo-Kuo Ku-Tai-ti I-Liao Pao-Chien Thi Tshao 從馬王堆三號漢墓帛書導引圖看我國古代的醫療保健體操
The Medical and Hygienic Physical Exercises of Chinese Antiquity demonstrated by the (recently discovered) silk scroll paintings (and text) in the Han Tomb no. 3 at Ma-wang-tui (-168).
HTYTC, 1976, no. 1 (no. 317), 34.

C. BOOKS AND JOURNAL ARTICLES IN WESTERN LANGUAGES

- ABBOTT, B. C. & BALLENTINE, D. (1). 'The "Red Tide" Alga, a toxin from *Gymnodinium veneficum*. *JMBA*, 1957, **36**, 169.
- ABEGG, E., JENNY, J. J. & BING, M. (1). 'Yoga'. *CIBA/M*, 1949, **7** (no. 74), 2578. *CIBA/MZ*, 1948, **10**, (no. 121), 4122.
Includes: 'Die Anfänge des Yoga' and 'Der klassische Yoga' by E. Abegg; 'Der Kundalini-Yoga' by J. J. Jenny; and 'Über medizinisches und psychologisches in Yoga' by M. Bing & J. J. Jenny.
- ABICHI, M. (1). 'Note sur la Formation de l'Hydrochlorate d'Ammoniaque à la Suite des Éruptions Volcaniques et surtout de celles du Vésuve.' *BSGF*, 1836, **7**, 98.
- ABRAHAM, H. J. (1). Introduction to the Facsimile Reprint of the 1530 Edition of the English Translation of H. Brunschwyk's *Vertuose Boke of Distillacyon*. Johnson, New York and London, 1971 (Sources of Science Ser., no. 79).
- ABRAHAMSOHN, J. A. G. (1). 'Berättelse om Kien [chien], elt Nativt Alkali Minerale från China...' *KSVA/H*, 1772, **33**, 170. Cf. von Engeström (2).
- ABRAMI, M., WALLICH, R. & BERNAL, P. (1). 'Hypertension Artérielle Volontaire.' *PM*, 1936, **44** (no. 17), 1 (26 Feb.).
- ACHELIS, J. D. (1). 'Über den Begriff Alchemie in der Paracelsischen Philosophie.' *BDP*, 1929-30, **3**, 99.
- ADAMS, F. D. (1). *The Birth and Development of the Geological Sciences*. Baillière, Tindall & Cox, London, 1938; repr. Dover, New York, 1954.
- ADNAN ADIVAR (1). 'On the *Tankusuq-nāmah-i Ilkhān dar Funūn-i 'Ulūm-i Khīṭāi*.' *ISIS*, 1940 (appeared 1947), **32**, 44.
- ADOLPH, W. H. (1). 'The Beginnings of Chemical Research in China.' *PNHB*, 1950, **18** (no. 3), 145.
- ADOLPH, W. H. (2). 'Observations on the Early Development of Chemical Education in China.' *YCE*, 1927, **4**, 1233, 1488.
- ADOLPH, W. H. (3). 'The Beginnings of Chemistry in China.' *SM*, 1922, **14**, 441. Abstr. *MCE*, 1922, **26**, 914.
- AGASSI, J. (1). 'Towards an Historiography of Science.' Mouton, 's-Gravenhage, 1963. (History and Theory; Studies in the Philosophy of History, Beiheft no. 2.)
- AHMAD, M. & DATTA, B. B. (1). 'A Persian Translation of the +11th-Century Arabic Alchemical Treatise 'Ain al-Šan'ah wa 'Aun al-Šana'ah (Essence of the Art and Aid to the Workers) [by 'Abd al-Malik al-Šāliḥī al-Khwārizmī al-Kathī +1034].' *MAS/B*, 1927, **8**, 417. Cf. Stapleton & Azo (1).
- AIGREMONT, Dr [ps. S. Schultze] (1). *Volkserotik und Pflanzenwelt; eine Darstellung alter wie moderner erotischer und sexuelle Gebräuche, Vergleiche, Benennungen, Sprichwörter, Redewendungen, Rätsel, Volkslieder, erotischer Zaubers und Aberglaubens, sexuelle Heilkunde die sich auf Pflanzen beziehen*. 2 vols. Trensinger, Halle, 1908. Re-issued as 2 vols. bound in one, Bläschke, Darmstadt, n.d. (1972).
- AIKIN, A. & AIKIN, C. R. (1). *A Dictionary of Chemistry and Mineralogy*. 2 vols. Phillips, London, 1807.
- AINSLIE, W. (1). *Materia Indica; or, some Account of those Articles which are employed by the Hindoos and other Eastern Nations in their Medicine, Arts and Agriculture; comprising also Formulae, with Practical Observations, Names of Diseases in various Eastern Languages, and a copious List of Oriental Books immediately connected with General Science, etc. etc.* 2 vols. Longman, Rees, Orme, Brown & Green, London, 1826.
- ATCHISON, L. (1). *A History of Metals*. 2 vols. McDonald & Evans, London, 1960.
- ALEXANDER, GUSTAV (1). *Herrengrunder Kupfergefäße*. Vienna, 1927.
- ALEXANDER, W. & STREET, A. (1). *Metals in the Service of Man*. Pelican Books, London, 1956 (revised edition).
- ALI, M. T., STAPLETON, H. E. & HUSAIN, M. H. (1). 'Three Arabic Treatises on Alchemy by Muḥammad ibn Umail [al-Šādiq al-Tamīnī] (d. c. +960); the *Kitāb al-Mā' al-Waraqī wa'l Arḍ al-Najmiyah* (Book of the Silvery Water and the Starry Earth), the *Risālat al-Shams Ilā'l Hilālī* (Epistle of the Sun to the Crescent Moon), and the *al-Qaṣīdat al-Nūnīyah* (Poem rhyming in Nūn) —edition of the texts by M.T.A.; with an Excursus (with relevant Appendices) on the Date, Writings and Place in Alchemical History of Ibn Umail, an Edition (with glossary) of an early mediaeval Latin rendering of the first half of the *Mā' al-Waraqī*, and a Descriptive Index, chiefly of the alchemical authorities quoted by Ibn Umail [Senior Zadith Filius Hamuel], by H.E.S. & M.H.H.' *MAS/B*, 1933, **12** (no. 1), 1-213.
- ALLEN, E. (ed.) (1). *Sex and Internal Secretions; a Survey of Recent Research*. Williams & Wilkins, Baltimore, 1932.

- ALLEN, H. WARNER (1). *A History of Wine; Great Vintage Wines from the Homeric Age to the Present Day*. Faber & Faber, London, 1961.
- ALLETON, V. & ALLETON, J. C. (1). *Terminologie de la Chimie en Chinois Moderne*. Mouton, Paris and The Hague, 1966. (Centre de Documentation Chinois de la Maison des Sciences de l'Homme, and VLE Section de l'École Pratique des Hautes Études, etc.; Matériaux pour l'Étude de l'Extrême-Orient Moderne et Contemporain; Études Linguistiques, no. 1.)
- AMIOT, J. J. M. (7). 'Extrait d'une Lettre...' *MCHSAMUC*, 1791, 15, v.
- AMIOT, J. J. M. (9). 'Extrait d'une Lettre sur la Secte des Tao-sée [Tao shih].' *MCHSAMUC*, 1791, 15, 208-59.
- ANAND, B. K. & CHHINA, G. S. (1). 'Investigations of Yogis claiming to stop their Heart Beats.' *IJMR*, 1961, 49, 90.
- ANAND, B. K., CHHINA, G. S. & BALDEV SINGH (1). 'Studies on Shri Ramanand Yogi during his Stay in an Air-tight Box.' *IJMR*, 1961, 49, 82.
- ANAND, MULK RAJ (1). *Kama-Kala; Some Notes on the Philosophical Basis of Hindu Erotic Sculpture*. Nagel; Geneva, Paris, New York and Karlsruhe, 1958.
- ANAND, MULK RAJ & KRAMRISCH, S. (1). *Homage to Khajuraho*. With a brief historical note by A. Cunningham. Marg, Bombay, n.d. (c. 1960).
- ANDERSON, J. G. (8). 'The Goldsmith in Ancient China.' *BMFEA*, 1935, 7, 1.
- ANDŌ KŌSEI (1). 'Des Momies au Japon et de leur Culte.' *LH*, 1968, 8 (no. 2), 5.
- ANIANE, M. (1). 'Notes sur l'Alchimie, "Yoga" Cosmologique de la Chrétienté Médiévale'; art. in *Yoga, Science de l'Homme Intégrale*. Cahiers du Sud, Loga, Paris, 1953.
- ANON. (83). 'Préparation de l'Albumine d'Oeuf en Chine.' *TP*, 1897 (1e sér.), 8, 452.
- ANON. (84). *Beitrag zur Geschichte der höhern Chemie*. 1785. Cf. Ferguson (1), vol. 1, p. 111.
- ANON. (85). *Aurora Consurgens* (first half of the + 14th cent.). In ANON. (86). *Artis Auriferae*. Germ. tr. 'Aufsteigung der Morgenröthe' in *Morgenstern* (1).
- ANON. (86). *Artis Auriferae, quam Chemicam vocant, Volumina Duo, quae continent 'Turbam Philosophorum', aliosq̄ antiquiss. auctores, quae versa pagina indicat; Accessit noviter Volumen Tertium...* Waldkirch, Basel, 1610. One of the chief collections of standard alchemical authors' (Ferguson (1), vol. 1, p. 51).
- ANON. (87). *Musaeum Hermeticum Reformatum et Amplificatum* (twenty-two chemical tracts). à Sande, Frankfurt, 1678 (the original edition, much smaller, containing only ten tracts, had appeared at Frankfurt, in 1625; see Ferguson (1), vol. 2, p. 119). Tr. Waite (8).
- ANON. (88). *Probierrüchlein, auff Golt, Silber, Kupffer und Bley, Auch allerley Metall, wie man die Zunutz arbeyten und Probieren Soll.* c. 1515 or some years earlier; first extant pr. ed., Knappe, Magdeburg, 1524. Cf. Partington (7), vol. 2, p. 66. Tr. Sisco & Smith (2).
- ANON. (89). (in Swedish) *METL*, 1960 (no. 3), 95.
- ANON. (90). 'Les Chinois de la Dynastie Tsin [Chin] Connaissaient-ils déjà l'Alliage Aluminium-Cuivre?' *RALUM*, 1961, 108. Eng. tr. 'Did the Ancient Chinese discover the First Aluminium-Copper Alloy?' *GBT*, 1961, 41.
- ANON. [initialled Y.M.] (91). 'Surprenante Découverte; un Alliage Aluminium-Cuivre réalisé en Chine à l'Époque Tsin [Chin].' *LN*, 1961 (no. 3316), 333.
- ANON. (92). *British Encyclopaedia of Medical Practice; Pharmacopoeia Supplement* [proprietary medicines]. 2nd ed. Butterworth, London, 1967.
- ANON. (93). *Gehes Codex d. pharmakologische und organotherapeutische Spezial-präparate...* [proprietary medicines]. 7th ed. Schwarzeck, Dresden, 1937.
- ANON. (94). *Loan Exhibition of the Arts of the Sung Dynasty* (Catalogue). Arts Council of Great Britain and Oriental Ceramic Society, London, 1960.
- ANON. (95). Annual Reports, Messrs Schimmel & Co., Distillers, Miltitz, near Leipzig, 1893 to 1896.
- ANON. (96). Annual Report, Messrs Schimmel & Co., Distillers, Miltitz, near Leipzig, 1911.
- ANON. (97). *Decennial Reports on Trade etc. in China and Korea* (Statistical Series, no. 6), 1882-1891. Inspectorate-General of Customs, Shanghai, 1893.
- ANON. (98). 'Saltpetre Production in China.' *CEM*, 1925, 2 (no. 8), 8.
- ANON. (99). 'Alkali Lands in North China [and the sodium carbonate (*chien*) produced there].' *JSCI*, 1894, 13, 910.
- ANON. (100). *A Guide to Peiping [Peking] and its Environs*. Catholic University (Fu-Jen) Press, for Peking Bookshop (Vetch), Peking, 1946.
- ANON. (101) (ed.). *De Alchemia: In hoc Volumine de Alchemia continentur haec: Geber Arabis, philosophi solertissimi rerumque naturalium, praecipue metallicarum peritissimi...* (4 books); *Speculum Alchemiae* (Roger Bacon); *Correctorium Alchemiae* (Richard Anglici); *Rosarius Minor*; *Liber Secretorum Alchemicae* (Calid = Khalid); *Tabula Smaragdina* (with commentary of Hortulanus)...etc. Petreius, Nuremberg, 1541. Cf. Ferguson (1), vol. 1, p. 18.

- ANON. (103). *Introduction to Classical Japanese Literature*. Kokusai Bunka Shinkokai (Soc. for Internat. Cultural Relations), Tokyo, 1948.
- ANON. (104). *Of a Degradation of Gold made by an Anti-Elixir; a Strange Chymical Narrative*. Herringman, London, 1678. 2nd ed. *An Historical Account of a Degradation of Gold made by an Anti-Elixir; a Strange Chymical Narrative*. By the Hon. Robert Boyle, Esq. Montagu, London, 1739.
- ANON. (105). 'Some Observations concerning Japan, made by an Ingenious Person that hath many years resided in that Country. . . ' *PTRS*, 1669, 4 (no. 49), 983.
- ANON. (113). 'A 2100-year-old Tomb Excavated; the Contents Well Preserved,' *PKR*, 1972, no. 32 (11 Aug.), 10. *EHOR*, 1972, 11 (no. 4), 16 (with colour-plates). [The Lady of Tai (d. c. -186), incorrupted body, with rich tomb furnishings.] The article also distributed as an offprint at showings of the relevant colour film, e.g. in Hongkong, Sept. 1972.
- ANON. (114). 'A 2100-year-old Tomb Excavated.' *CREC*, 1972, 21 (no. 9), 20 (with colour-plates). [The Lady of Tai, see previous entry.]
- ANON. (115). *Antiquities Unearthed during the Great Proletarian Cultural Revolution*. n.d. [Foreign Languages Press, Peking, 1972]. With colour-plates. Arranged according to provinces of origin.
- ANON. (116). *Historical Relics Unearthed in New China* (album). Foreign Languages Press, Peking, 1972.
- ANTENORID, J. (1). 'Die Kenntnisse der Chinesen in der Chemie.' *CHZ*, 1902, 26 (no. 55), 627.
- ANTZE, G. (1). 'Metallarbeiten aus Peru.' *MMVKH*, 1930, 15, 1.
- APOLLONIUS OF TYANA. See Conybeare (1); Jones (1).
- ARDAILLON, E. (1). *Les Mines de Laurion dans l'Antiquité*. Inaug. Diss. Paris. Fontemoing, Paris, 1897.
- ARLINGTON, L. C. & LEWISOHN, W. (1). *In Search of Old Peking*. Vetch, Peiping, 1935.
- ARMSTRONG, E. F. (1). 'Alcohol through the Ages.' *CHIND*, 1933, 52 (no. 12), 251, (no. 13), 279. (Jubilee Memorial Lecture of the Society of Chemical Industry.)
- ARNOLD, P. (1). *Histoire des Rose-Croix et les Origines de la Franc-Maçonnerie*. Paris, 1955.
- AROUX, E. (1). *Dante, Hérétique, Révolutionnaire et Socialiste; Révélations d'un Catholique sur le Moyen Age*. 1854.
- AROUX, E. (2). *Les Mystères de la Chevalerie et de l'Amour Platonique au Moyen Age*. 1858.
- ARSENDAUX, H. & RIVET, P. (1). 'L'Orfèvrerie du Chiriqui et de Colombie'. *JSA*, 1923, 15, 1.
- ASCHHEIM, S. (1). 'Weitere Untersuchungen über Hormone und Schwangerschaft; das Vorkommen der Hormone im Harn der Schwangeren.' *AFG*, 1927, 132, 179.
- ASCHHEIM, S. & ZONDEK, B. (1). 'Hypophysenvorderlappen Hormon und Ovarialhormon im Harn von Schwangeren.' *KW*, 1927, 6, 1322.
- ASHBEE, C. R. (1). *The Treatises of Benvenuto Cellini on Goldsmithing and Sculpture; made into English from the Italian of the Marcian Codex. . .* Essex House Press, London, 1898.
- ASHMOLE, ELIAS (1). *Theatrum Chemicum Britannicum; Containing Severall Poeticall Pieces of our Famous English Philosophers, who have written the Hermetique Mysteries in their owne Ancient Language, Faithfully Collected into one Volume, with Annotations thereon by E. A. Esq.* London, 1652. Facsim. repr. ed. A. G. Debus, Johnson, New York and London, 1967 (Sources of Science ser. no. 39).
- ASTON, W. G. (tr.) (1). 'Nihongi', *Chronicles of Japan from the Earliest Times to +697*. Kegan Paul, London, 1896; repr. Allen & Unwin, London, 1956.
- ATKINSON, R. W. (2). '[The Chemical Industries of Japan; I,] Notes on the Manufacture of oshiroi (White Lead).' *TAS/J*, 1878, 6, 277.
- ATKINSON, R. W. (3). '[The Chemical Industries of Japan; II, Ame [dextrin and maltose].]' *TAS/J*, 1879, 7, 313.
- [ATWOOD, MARY ANNE] (1) (Mary Anne South, Mrs Atwood). *A Suggestive Enquiry into the Hermetic Mystery; with a Dissertation on the more Celebrated of the Alchemical Philosophers, being an Attempt towards the Recovery of the Ancient Experiment of Nature*. Trelawney Saunders, London, 1850. Repr. with introduction by W. L. Wilmhurst, Tait, Belfast, 1918, repr. 1920. *Hermetic Philosophy and Alchemy; a Suggestive Enquiry*. Repr. New York, 1960.
- AVALON, A. (ps.). See Woodroffe, Sir J.
- AYRES, LEW (1). *Altars of the East*. New York, 1956.
- BACON, J. R. (1). *The Voyage of the Argonauts*. London, 1925.
- BACON, ROGER
Compendium Studii Philosophiae, +1271. See Brewer (1).
De Mirabili Potestatis Artis et Naturae et de Nullitate Magiae, bef. +1250. See de Tournus (1); T. M [oufet]? (1); Tenney Davis (16).
De Retardatione Accidentium Senectutis etc., +1236 to +1245. See R. Browne (1); Little & Withington (1).
De Secretis operibus Artis et Naturae et de Nullitate Magiae, bef. +1250. See Brewer (1).
Opus Majus, +1266. See Bridges (1); Burke (1); Jebb (1).
Opus Minus, +1266 or +1267. See Brewer (1).

- Opus Tertium*, +1267. See Little (1); Brewer (1).
Sanioris Medicinae etc., pr. +1603. See Bacon (1).
Secretum Secretorum (ed.), c. +1255, introd. c. +1275. See Steele (1).
- BACON, ROGER (1). *Sanioris Medicinae Magistri D. Rogeri Baconis Angli De Arte Chymiae Scripta*. Schönvetter, Frankfurt, 1603. Cf. Ferguson (1), vol. 1, p. 63.
- BAGCHI, B. K. & WENGER, M. A. (1). 'Electrophysiological Correlates of some Yogi Exercises.' *EECN*, 1957, 7 (suppl.), 132.
- BAIKIE, J. (1). 'The Creed [of Ancient Egypt].' *ERE*, vol. iv, p. 243.
- BAILEY, CYRIL (1). *Epicurus; the Extant Remains*. Oxford, 1926.
- BAILEY, SIR HAROLD (1). 'A Half-Century of Irano-Indian Studies.' *JRAS*, 1972 (no. 2), 99.
- BAILEY, K. C. (1). *The Elder Pliny's Chapters on Chemical Subjects*. 2 vols. Arnold, London, 1929 and 1932.
- BAIN, H. FOSTER (1). *Ores and Industry in the Far East; the Influence of Key Mineral Resources on the Development of Oriental Civilisation*. With a chapter on Petroleum by W. B. Heroy. Council on Foreign Relations, New York, 1933.
- BAIRD, M. M., DOUGLAS, C. G., HALDANE, J. B. S. & PRIESTLEY, J. G. (1). 'Ammonium Chloride Acidosis.' *JOP*, 1923, 57, xli.
- BALAZS, E. (= S.) (1). 'La Crise Sociale et la Philosophie Politique à la Fin des Han.' *TP*, 1949, 39, 83.
- BANKS, M. S. & MERRICK, J. M. (1). 'Further Analyses of Chinese Blue-and-White [Porcelain and Pottery].' *AMY*, 1967, 10, 101.
- BARNES, W. H. (1). 'The Apparatus, Preparations and Methods of the Ancient Chinese Alchemists.' *JCE*, 1934, 12, 655. 'Diagrams of Chinese Alchemical Apparatus' (an abridged translation of Tshao Yuan-Yü, 1). *JCE*, 1936, 13, 453.
- BARNES, W. H. (2). 'Possible References to Chinese Alchemy in the -4th or -3rd Century.' *CY*, 1935, 23, 75.
- BARNES, W. H. (3). 'Chinese Influence on Western Alchemy.' *N*, 1935, 135, 824.
- BARNES, W. H. & YUAN, H. B. (1). 'Thao the Recluse (+452 to +536); Chinese Alchemist.' *AX*, 1946, 2, 138. Mainly a translation of a short biographical paper by Tshao Yuan-Yü.
- LA BARRE, W. (1). 'Twenty Years of Peyote Studies.' *CURRA*, 1960, 1, 45.
- LA BARRE, W. (2). *The Peyote Cult*. Yale Univ. Press, New Haven, Conn., repr. Shoestring Press, Hamden, Conn. 1960. (Yale Univ. Publications in Anthropology, no. 19.)
- BARTHOLD, W. (2). *Turkestan down to the Mongol Invasions*. 2nd ed. London, 1958.
- BARTHOLINUS, THOMAS (1). *De Nivis Usu Medico Observationes Variæ*. Copenhagen, 1661.
- BARTON, G. A. (1). '[The "Abode of the Blest" in] Semitic [including Babylonian, Jewish and ancient Egyptian, Belief].' *ERE*, ii, 706.
- DE BARY, W. T. (3) (ed.). *Self and Society in Ming Thought*. Columbia Univ. Press, New York and London, 1970.
- BASU, B. N. (1) (tr.). *The 'Kāmasūtra' of Vātsyāyana* [prob. +4th century]. Rev. by S. L. Ghosh. Pref. by P. C. Bagchi. Med. Book Co., Calcutta, 1951 (10th ed.).
- BAUDIN, L. (1). 'L'Empire Socialiste des Inka [Incas].' *TMIE*, 1928, no. 5.
- BAUER, W. (3). 'The Encyclopaedia in China.' *JWH*, 1966, 9, 665.
- BAUER, W. (4). *China und die Hoffnung auf Glück; Paradiese, Utopien, Idealvorstellungen*. Hanser, München, 1971.
- BAUMÉ, A. (1). *Éléments de Pharmacie*. 1777.
- BAWDEN, F. C. & PIRIE, N. W. (1). 'The Isolation and Some Properties of Liquid Crystalline Substances from Solanaceous Plants infected with Three Strains of Tobacco Mosaic Virus.' *PRSB*, 1937, 123, 274.
- BAWDEN, F. C. & PIRIE, N. W. (2). 'Some Factors affecting the Activation of Virus Preparations made from Tobacco Leaves infected with a Tobacco Necrosis Virus.' *JGMB*, 1950, 4, 464.
- BAYES, W. (1). *The Triple Aspect of Chronic Disease, having especial reference to the Treatment of Intractable Disorders affecting the Nervous and Muscular System*. Churchill, London, 1854.
- BAYLISS, W. M. (1). *Principles of General Physiology*. 4th ed. Longmans Green, London, 1924.
- BEAL, S. (2) (tr.). *Sī Yu Kī [Hsi Yü Chi], Buddhist Records of the Western World, transl. from the Chinese of Hiuen Tsiang [Hsüan-Chuang]*. 2 vols. Trübner, London, 1881, 1884, 2nd ed. 1906. Repr. in 4 vols. with new title; *Chinese Accounts of India, translated from the Chinese of Hiuen Tsiang*. Susil Gupta, Calcutta, 1957.
- BEAUVOIS, E. (1). 'La Fontaine de Jouvence et le Jourdain dans les Traditions des Antilles et de la Floride.' *MUSEON*, 1884, 3, 404.
- BEBEY, F. (1). 'The Vibrant Intensity of Traditional African Music.' *UNESC*, 1972, 25 (no. 10), 15. (On p. 19, a photograph of a relief of Ouroboros in Dahomey.)
- BEDINI, S. A. (5). 'The Scent of Time; a Study of the Use of Fire and Incense for Time Measurement in Oriental Countries.' *TAPS*, 1963 (N.S.), 53, pt. 5, 1-51. Rev. G. J. Whitrow, *A/AIHS*, 1964, 17, 184.

- BEDINI, S. A. (6). 'Holy Smoke; Oriental Fire Clocks.' *NS*, 1964, 21 (no. 380), 537.
- VAN BEEK, G. W. (1). 'The Rise and Fall of Arabia Felix.' *SAM*, 1969, 221 (no. 6), 36.
- BEER, G. (1) (ed. & tr.). 'Das Buch Henoch [Enoch]' in *Die Apokryphen und Pseudepigraphien des alten Testaments*, ed. E. Kautzsch, 2 vols. Mohr (Siebeck), Tübingen, Leipzig and Freiburg i/B, 1900, vol. 2 (Pseudepigraphien), pp. 217 ff.
- LE BEGUE, JEAN (1). *Tabula de Vocabulis Synonymis et Equivocis Colorum and Experimenta de Coloribus* (MS. BM. 6741 of +1431). Eng. tr. Merrifield (1), vol. 1, pp. 1-321.
- BEH, Y. T. See Kung, S. C., Chao, S. W., Bei, Y. T. & Chang, C. (1).
- BEHANAN, KOVOOR T. (1). *Yoga; a Scientific Evaluation*. Secker & Warburg, London, 1937. Paperback repr. Dover, New York and Constable, London. n.d. (c. 1960).
- BEHMEN, JACOB. See Boehme, Jacob.
- BELL, SAM HANNA (1). *Erin's Orange Lily*. Dobson, London, 1956.
- BELPAIRE, B. (3). 'Note sur un Traité Taoïste.' *MUSEON*, 1946, 59, 655.
- BENDALL, C. (1) (ed.). *Subhāṣita-saṃgraha*. Istaś, Louvain, 1905. (Muséon Ser. nos. 4 and 5.)
- BENEDETTI-PICHLER, A. A. (1). 'Micro-chemical Analysis of Pigments used in the Fossae of the Incisions of Chinese Oracle-Bones.' *IEC/AE*, 1937, 9, 149. Abstr. *CA*, 1938, 31, 3350.
- BENFEY, O. T. (1). 'Dimensional Analysis of Chemical Laws and Theories.' *JCE*, 1957, 34, 286.
- BENFEY, O. T. (2) (ed.). *Classics in the Theory of Chemical Combination*. Dover, New York, 1963. (Classics of Science, no. 1.)
- BENFEY, O. T. & FIKES, L. (1). 'The Chemical Prehistory of the Tetrahedron, Octahedron, Icosahedron and Hexagon.' *ADVC*, 1966, 61, 111. (Kekulé Centennial Volume.)
- BENNETT, A. A. (1). *John Fryer; the Introduction of Western Science and Technology into Nineteenth-Century China*. Harvard Univ. Press, Cambridge, Mass. 1967. (Harvard East Asian Monographs, no. 24.)
- BENSON, H., WALLACE, R. K., DAHL, E. C. & COOKE, D. F. (1). 'Decreased Drug Abuse with Transcendental Meditation; a Study of 1862 Subjects.' In 'Hearings before the Select Committee on Crime of the House of Representatives (92nd Congress)', U.S. Govt. Washington, D.C. 1971, p. 681 (Serial no. 92-1).
- BENTHAM, G. & HOOKER, J. D. (1). *Handbook of the British Flora; a Description of the Flowering Plants and Ferns indigenous to, or naturalised in, the British Isles*. 6th ed. 2 vols. (1 vol. text, 1 vol. drawings). Reeve, London, 1892. repr. 1920.
- BENVENISTE, E. (1). 'Le Terme obryza et la Métallurgie de l'Or.' *RPLHA*, 1953, 27, 122.
- BENVENISTE, E. (2). *Textes Sogdiens* (facsimile reproduction, transliteration, and translation with glossary). Paris, 1940. Rev. W. B. Hemming, *BLSOAS*, 11.
- BERENDES, J. (1). *Die Pharmacie bei den alten Culturvölkern; historisch-kritische Studien*. 2 vols. Tausch & Grosse, Halle, 1891.
- BERGMAN, FOLKE (1). *Archaeological Researches in Sinkiang*. Reports of the Sino-Swedish [scientific] Expedition [to Northwest China]. 1939, vol. 7 (pt. 1).
- BERGMAN, TORBERN (1). *Opuscula Physica et Chemica, pleraque antea seorsim edita, jam ab Auctore collecta, revisa et aucta*. 3 vols. Edman, Upsala, 1779-83. Eng. tr. by E. Cullen, *Physical and Chemical Essays*, 2 vols. London, 1784, 1788; the 3rd vol. Edinburgh, 1791.
- BERGSØE, P. (1). 'The Metallurgy and Technology of Gold and Platinum among the Pre-Columbian Indians.' *IVS*, 1937, no. A44, 1-45. Prelim. pub. *N*, 1936, 137, 29.
- BERGSØE, P. (2). 'The Gilding Process and the Metallurgy of Copper and Lead among the Pre-Columbian Indians.' *IVS*, 1938, no. A46. Prelim. pub. 'Gilding of Copper among the Pre-Columbian Indians.' *N*, 1938, 141, 829.
- BERKELEY, GEORGE, BP. (1). *Siris; Philosophical Reflections and Enquiries concerning the Virtues of Tar-Water*. London, 1744.
- BERNAL, J. D. (1). *Science in History*. Watts, London, 1954. (Beard Lectures at Ruskin College, Oxford.) Repr. 4 vols. Penguin, London, 1969.
- BERNAL, J. D. (2). *The Extension of Man; a History of Physics before 1900*. Weidenfeld & Nicolson, London, 1972. (Lectures at Birkbeck College, London, posthumously published.)
- BERNARD, THEOS (1). *Hathayoga; the Report of a Personal Experience*. Columbia Univ. Press, New York, 1944; Rider, London, 1950. Repr. 1968.
- BERNARD-MAÎTRE, H. (3). 'Un Correspondant de Bernard de Jussieu en China; le Père le Chéron d'Incarville, missionnaire français de Pékin, d'après de nombreux documents inédits.' *AIHS*, 1949, 28, 333, 692.
- BERNARD-MAÎTRE, H. (4). 'Notes on the Introduction of the Natural Sciences into the Chinese Empire.' *YJSS*, 1941, 3, 220.
- BERNARD-MAÎTRE, H. (9). 'Deux Chinois du 18^e siècle à l'École des Physiocrates Français.' *BUA*, 1949 (3^e sér.), 10, 151.
- BERNARD-MAÎTRE, H. (17). 'La Première Académie des Lincei et la Chine.' *MP*, 1941, 65.

- BERNARD-MAÎTRE, H. (18). 'Les Adaptations Chinoises d'Ouvrages Européens; Bibliographie chronologique depuis la venue des Portugais à Canton jusqu'à la Mission française de Pékin (+1514 à +1688).' *MS*, 1945, **10**, 1-57, 309-88.
- BERNAREGGI, E. (1). 'Nummi Pelliculati' (silver-clad copper coins of the Roman Republic). *RIN*, 1965, **67** (5th. ser., **13**), 5.
- BERNOULLI, R. (1). 'Seelische Entwicklung im Spiegel der Alchemie u. verwandte Disciplinen.' *ERYB*, 1935, **3**, 231-87. Eng. tr. 'Spiritual Development as reflected in Alchemy and related Disciplines.' *ERYB*, 1960, **4**, 305. Repr. 1970.
- BERNTHSEN, A. See Sudborough, J. J. (1).
- BERRIMAN, A. E. (2). 'A Sumerian Weight-Standard in Chinese Metrology during the Former Han Dynasty (-206 to -23).' *RAAO*, 1958, **52**, 203.
- BERRIMAN, A. E. (3). 'A New Approach to the Study of Ancient Metrology.' *RAAO*, 1955, **49**, 193.
- BERTHELOT, M. (1). *Les Origines de l'Alchimie*. Steinheil, Paris, 1885. Repr. Libr. Sci. et Arts, Paris, 1938.
- BERTHELOT, M. (2). *Introduction à l'Étude de la Chimie des Anciens et du Moyen-Age*. First published at the beginning of vol. 1 of the *Collection des Anciens Alchimistes Grecs* (see Berthelot & Ruelle), 1888. Repr. sep. Libr. Sci. et Arts, Paris, 1938. The 'Avant-propos' is contained only in Berthelot & Ruelle; there being a special Preface in Berthelot (2).
- BERTHELOT, M. (3). Review of de Mély (1), *Lapidaires Chinois*. *JS*, 1896, 573.
- BERTHELOT, M. (9). Les Compositons Incendiaires dans l'Antiquité et Moyen Ages.' *RDM*, 1891, **106**, 786.
- BERTHELOT, M. (10). *La Chimie au Moyen Age*; vol. 1, *Essai sur la Transmission de la Science Antiquie au Moyen Age* (Latin texts). Impr. Nat. Paris, 1893. Photo. repr. Zeller, Osnabrück; Philo, Amsterdam, 1967. Rev. W. P[agel], *AX*, 1967, **14**, 203.
- BERTHELOT, M. (12). 'Archéologie et Histoire des Sciences; avec Publication nouvelle du Papyrus Grec chimique de Leyde, et Impression originale du *Liber de Septuaginta* de Geber.' *MRASP*, 1906, **49**, 1-377. Sep. pub. Philo, Amsterdam, 1968.
- BERTHELOT, M. [P. E. M.]. See Tenney L. Davis' biography (obituary), with portrait. *JCE*, 1934, **11** (585) and Boutaric (1).
- BERTHELOT, M. & DUVAL, R. (1). *La Chimie au Moyen Age*; vol. 2, *l'Alchimie Syriaque*. Impr. Nat. Paris, 1893. Photo. repr. Zeller, Osnabrück; Philo, Amsterdam, 1967. Rev. W. P[agel], *AX*, 1967, **14**, 203.
- BERTHELOT, M. & HOUDAS, M. O. (1). *La Chimie au Moyen Age*; vol. 3, *l'Alchimie Arabe*. Impr. Nat. Paris, 1893. Photo repr. Zeller, Osnabrück; Philo, Amsterdam, 1967. Rev. W. P[agel], *AX*, 1967, **14**, 203.
- BERTHELOT, M. & RUELLE, C. E. (1). *Collection des Anciens Alchimistes Grecs*. 3 vols. Steinheil, Paris, 1888. Photo. repr. Zeller, Osnabrück, 1967.
- BERTHOLD, A. A. (1). 'Transplantation der Hoden.' *AAPWM*, 1849, **16**, 42. Engl. tr. by D. P. Quiring. *BIHM*, 1944, **16**, 399.
- BERTRAND, G. (1). Papers on laccase. *CRAS*, 1894, **118**, 1215; 1896, **122**, 1215; *BSCF*, 1894, **11**, 717; 1896, **15**, 793.
- BERTUCCIOLI, G. (2). 'A Note on Two Ming Manuscripts of the *Pên Tshao Phîn Hui Ching Yao*.' *JOSHK*, 1956, **2**, 63. Abstr. *RBS*, 1959, **2**, 228.
- BETTENDORF, G. & INSLER, V. (1) (ed.). *The Clinical Application of Human Gonadotrophins*. Thieme, Stuttgart, 1970.
- BEURDELEY, M. (1) (ed.). *The Clouds and the Rain; the Art of Love in China*. With contributions by K. Schipper on Taoism and sexuality, Chang Fu-Jui on literature and poetry, and J. Pimpaneau on perversions. Office du Livre, Fribourg and Hammond & Hammond, London, 1969.
- BEVAN, E. R. (1). 'India in Early Greek and Latin Literature.' *CHI*, Cambridge, 1935, vol. 1, ch. 16, p. 391.
- BEVAN, E. R. (2). *Stoics and Sceptics*. Oxford, 1913.
- BEVAN, E. R. (3). *Later Greek Religion*. Oxford, 1927.
- BEZOLD, C. (3). *Die 'Schatzhöhle'*; aus dem Syrische Texte dreier unedirten Handschriften in's Deutsche übersetzt und mit Anmerkungen versehen. . . . nebst einer Arabischen Version nach den Handschriften zu Rom, Paris und Oxford. 2 vols. Hinrichs, Leipzig, 1883, 1888.
- BHAGVAT, K. & RICHTER, D. (1). 'Animal Phenolases and Adrenaline.' *BJ*, 1938, **32**, 1397.
- BHAGVAT SINGHI, H. H. (Maharajah of Gondal) (1). *A Short History of Aryan Medical Science*. Gondal, Kathiawar, 1927.
- BHATTACHARYA, B. (1) (ed.). *Guhya-samāja Tantra, or Tathāgata-guhyaka*. Orient. Instit., Baroda, 1931. (Gaekwad Orient. Ser. no. 53.)
- BHATTACHARYA, B. (2). *Introduction to Buddhist Esoterism*. Oxford, 1932.

- BHISHAGRATNA, (KAVIRAJ) KUNJA LAL SHARMA (1) (tr.). *An English Translation of the 'Sushruta Samhita', based on the original Sanskrit Text*. 3 vols. with an index volume, pr. pr. Calcutta, 1907-18. Re-issued, Chowkhamba Sanskrit Series Office, Varanasi, 1963. Rev. M. D. Grmek, *A/AlHS*, 1965, 18, 130.
- BIDEZ, J. (1). 'L'Épître sur la Chrysope' de Michel Psellus [with Italian translation]; [also] *Opuscles et Extraits sur l'Alchimie, la Météorologie et la Démonologie...* (Pt. VI of *Catalogue des Manuscrits Alchimiques Grecques*). Lamertin, for Union Académique Internationale, Brussels, 1928.
- BIDEZ, J. (2). *Vie de Porphyre le Philosophe Neo-Platonicien avec les Fragments des Traités περί ἀγαλμάτων et 'De Regressu Animae'*. 2 pts. Univ. Gand, Leipzig, 1913. (Recueil des Trav. pub. Fac. Philos. Lettres, Univ. Gand.)
- BIDEZ, J. & CUMONT, F. (1). *Les Mages Hellenisés; Zoroastre, Ostanès et Hytaspe d'après la Tradition Grecque*. 2 vols. Belles Lettres, Paris, 1938.
- BIDEZ, J., CUMONT, F., DELATTE, A., HEIBERG, J. L., LAGERCRANTZ, O., KENYON, F., RUSKA, J. & DE FALCO, V. (1) (ed.). *Catalogue des Manuscrits Alchimiques Grecs*. 8 vols. Lamertin, Brussels, 1924-32 (for the Union Académique Internationale).
- BIDEZ, J., CUMONT, F., DELATTE, A., SARTON, G., KENYON, F. & DE FALCO, V. (1) (ed.). *Catalogue des Manuscrits Alchimiques Latins*. 2 vols. Union Acad. Int., Brussels, 1939-51.
- BIOT, E. (1) (tr.). *Le Tcheou-Li ou Rites des Tcheou [Chou]*. 3 vols. Imp. Nat., Paris, 1851. (Photographically reproduced, Wëntienko, Peiping, 1930.)
- BIOT, E. (17). 'Notice sur Quelques Procédés Industriels connus en Chine au XVIe siècle.' *JA*, 1835 (2^e sér.), 16, 130.
- BIOT, E. (22). 'Mémoires sur Divers Minéraux Chinois appartenant à la Collection du Jardin du Roi.' *JA*, 1839 (3^e sér.), 8, 206.
- BIRKENMAIER, A. (1). 'Simeon von Köln oder Roger Bacon?' *FRS*, 1924, 2, 307.
- AL-BIRŪNĪ, ABŪ AL-RAIḤĀN MUHAMMAD IBN-AḤMAD. *Ta'riḥh al-Hind* (History of India). See Sachau (1).
- BISCHOP, K. G. (1). *Elements of Chemical and Physical Geology*, tr. B. H. Paul & J. Drummond from the 1st German edn. (3 vols., Marcus, Bonn, 1847-54), Harrison, London, 1854 (for the Cavendish Society). 2nd German ed. 3 vols. Marcus, Bonn, 1863, with supplementary volume, 1871.
- BLACK, J. DAVIDSON (1). 'The Prehistoric Kansu Race.' *MGSC* (Ser. A.), 1925, no. 5.
- BLAKNEY, R. B. (1). *The Way of Life; Lao Tzu—a new Translation of the 'Tao Tê Ching'*. Mentor, New York, 1955.
- BLANCO-FREIJEIRO, A. & LUZÓN, J. M. (1). 'Pre-Roman Silver Miners at Rio Tinto.' *AQ*, 1969, 43, 124.
- DE BLANCOURT, HAUDICQUER (1). *L'Art de la Verrerie...* Paris, 1697. Eng. tr. *The Art of Glass... with an Appendix containing Exact Instructions for making Glass Eyes of all Colours*. London, 1699.
- BLAU, J. L. (1). *The Christian Interpretation of the Cabala in the Renaissance*. Columbia Univ. Press, New York, 1944. (Inaug. Diss. Columbia, 1944.)
- BLOCHMANN, H. F. (1) (tr.). *The 'Āṭn-i Akbari' (Administration of the Mogul Emperor Akbar) of Abū'l Faẓl 'Allāmī*. Rouse, Calcutta, 1873. (Bibliotheca Indica, n.s., nos. 149, 158, 163, 194, 227, 247 and 287.)
- BLOFELD, J. (3). *The Wheel of Life; the Autobiography of a Western Buddhist*. Rider, London, 1959.
- BLOOM, ANDRÉ [METROPOLITAN ANTHONY] (1). 'Contemplation et Ascèse; Contribution Orthodoxe', art. in *Technique et Contemplation*. Études Carmelitaines, Paris, 1948, p. 49.
- BLOOM, ANDRÉ [METROPOLITAN ANTHONY] (2). 'l'Hésychasme, Yoga Chrétien?', art. in *Yoga*, ed. J. Masui, Paris, 1953.
- BLOOMFIELD, M. (1) (tr.). *Hymns of the Atharva-veda, together with Extracts from the Ritual Books and the Commentaries*. Oxford, 1897 (*SBE*, no. 42). Repr. Motilal Banarsidass, Delhi, 1964.
- BLUNDELL, J. W. F. (2). *Medicina Mechanica*. London.
- BOAS, G. (1). *Essays on Primitivism and Related Ideas in the Middle Ages*. Johns Hopkins Univ. Press, Baltimore, 1948.
- BOAS, MARIE (2). *Robert Boyle and Seventeenth-Century Chemistry*. Cambridge, 1958.
- BOAS, MARIE & HALL, A. R. (2). 'Newton's Chemical Experiments.' *A/AlHS*, 1958, 37, 113.
- BOCHARTUS, S. (1). *Opera Omnia, hoc est Phaleg, Canaan, et Hierozoicon*. Boutesteyn & Luchtmans, Leiden and van de Water, Utrecht, 1692. [The first two books are on the geography of the Bible and the third on the animals mentioned in it.]
- BOETHOR, E. (1). *Dictionnaire Français-Arabe*, enl. and ed. A. Caussin de Perceval. Didot, Paris, 1828-9. 3rd ed. Didot, Paris, 1864.
- BODDE, D. (5). 'Types of Chinese Categorical Thinking.' *JAOS*, 1939, 59, 200.
- BODDE, D. (9). 'Some Chinese Tales of the Supernatural; Kan Pao and his *Sou Shen Chi*.' *HJAS*, 1942, 6, 338.
- BODDE, D. (10). 'Again Some Chinese Tales of the Supernatural; Further Remarks on Kan Pao and his *Sou Shen Chi*.' *JAOS*, 1942, 62, 305.
- BOECKH, A. (1) (ed.). *Corpus Inscriptionum Graecorum*. 4 vols. Berlin, 1828-77.

- BOEHME, JACOB (1). *The Works of Jacob Behmen, the Teutonic Theosopher. . . To which is prefixed, the Life of the Author, with Figures illustrating his Principles, left by the Rev. W. Law. Richardson*, 4 vols. London, 1764-81. See Ferguson (1), vol. 1, p. 111. Based partly upon: *Idea Chemiae Böhmiæ Adeptæ; das ist, ein Kurtzer Abriss der Bereitung deß Steins der Weisen, nach Anleitung deß Jacobi Böhm. . .* Amsterdam, 1680, 1690; and: *Jacob Böhm's kurtze und deutliche Beschreibung des Steins der Weisen, nach seiner Materia, aus welcher er gemacht, nach seiner Zeichen und Farbe, welche im Werck erscheinen, nach seiner Kraft und Würckung, und wie lange Zeit darzu erfordert wird, und was insgemein bey dem Werck in acht zu nehmen. . .* Amsterdam, 1747.
- BOEHME, JACOB (2). *The Epistles of Jacob Behmen, aliter Teutonicus Philosophus, translated out of the German Language*. London, 1649.
- BOERHAAVE, H. (1). *Elementa Chemiæ, quæ anniversario labore docuit, in publicis, privatisque, Scholis*. 2 vols. Severinus and Imhoff, Leiden, 1732. Eng. tr. by P. Shaw: *A New Method of Chemistry, including the History, Theory and Practice of the Art*. 2 vols. Longman, London, 1741, 1753.
- BOERHAAVE, HERMANN. See Lindeboom (1).
- BOERSCHMANN, E. (11). 'Peking, eine Weltstadt der Baukunst.' *AT*, 1931 (no. 2), 74.
- BOLL, F. (6). 'Studien zu Claudius Ptolemæus.' *JCP*, 1894, 21 (Suppl.), 155.
- BOLLE, K. W. (1). *The Persistence of Religion; an Essay on Tantrism and Sri Aurobindo's Philosophy*. Brill, Leiden, 1965. (Supplements to *Numen*, no. 8.)
- BONI, B. (3). 'Oro e Formiche Erodotee.' *CHIM*, 1950 (no. 3).
- BONMARCHAND, G. (1) (tr.). 'Les Notes de Li Yi-Chan [Li I-shan], (Yi-Chan Tsa Tsouan [I-Shan Tsa Tsuan]), traduit du Chinois; Étude de Littérature Comparée.' *BMFJ*, 1955 (N.S.) 4 (no. 3), 1-84.
- BONNER, C. (1). 'Studies in Magical Amulets, chiefly Græco-Egyptian.' Ann Arbor, Michigan, 1950. (Univ. Michigan Studies in Humanities Ser., no. 49.)
- BONNIN, A. (1). *Tutenag and Paktong; with Notes on other Alloys in Domestic Use during the Eighteenth Century*. Oxford, 1924.
- BONUS, PETRUS, of Ferrara (1). *M. Petri Boni Lombardi Ferrariensis Physici et Chemici Excellentiss. Introductio in Artem Chemiæ Integra, ab ipso authore inscripta Margarita Preciosa Novella; composita ante annos plus minus ducentos septuaginta, Nune multis mendis sublatis, comodiore, quam antehâc, forma edita, et indice rerum ad calcem adornata*. Foillet, Montbeliard, 1602. 1st ed. Lacinius ed. Aldus, Venice, 1546. Tr. Waite (7). See Leicester (1), p. 86. Cf. Ferguson (1), vol. 1, p. 115.
- BORNET, P. (2). 'Au Service de la Chine; Schall et Verbiest, maîtres-fondeurs, I. les Canons.' *BCP*, 1946 (no. 389), 160.
- BORNET, P. (3) (tr.). 'Relation Historique' [de Johann Adam Schall von Bell, S.J.]; Texte Latin avec Traduction française.' *Hautes Études, Tientsin*, 1942 (part of *Lettres et Mémoires d'Adam Schall S.J.* ed H. Bernard[-Maître]).
- BORRICHUS, O. (1). *De Ortu et Progressu Chemiæ*. Copenhagen, 1668.
- BOSE, D. M., SEN, S.-N., SUBBARAYAPPA, B. V. et al. (1). *A Concise History of Science in India*. Baptist Mission Press, Calcutta, for the Indian National Science Academy, New Delhi, 1971.
- BOSON, G. (1). 'Alcuni Nomi di Pietri nelle Inscrizioni Assiro-Babilonesi.' *RSO*, 1914, 6, 969.
- BOSON, G. (2). 'I Metalli e le Pietri nelle Inscrizioni Assiro-Babilonesi.' *RSO*, 1917, 7, 379.
- BOSON, G. (3). *Les Métaux et les Pierres dans les Inscrizions Assyro-Babyloniennes*. Munich, 1914.
- BOSTOCKE, R. (1). *The Difference between the Ancient Physicke, first taught by the godly Forefathers, insisting in unity, peace and concord, and the Latter Physicke. . .* London, 1585. Cf. Debus (12).
- BOUCHÉ-LECLERCQ, A. (1). *L'Astrologie Grecque*. Leroux, Paris, 1899.
- BOURKE, J. G. (1). 'Primitive Distillation among the Tarascoes.' *AAN*, 1893, 6, 65.
- BOURKE, J. G. (2). 'Distillation by Early American Indians.' *AAN*, 1894, 7, 297.
- BOURNE, F. S. A. (2). *The Lo-fou Mountains; an Excursion*. Kelly & Walsh, Shanghai, 1895.
- BOUTARIC, A. (1). *Marcellin Berthelot (1827 à 1907)*. Payot, Paris, 1927.
- BOVILL, E. W. (1). 'Musk and Amber[gris].' *NQ*, 1954.
- BOWERS, J. Z. & CARUBBA, R. W. (1). 'The Doctoral Thesis of Engelbert Kaempfer: "On Tropical Diseases, Oriental Medicine and Exotic Natural Phenomena".' *JHMAS*, 1970, 25, 270.
- BOYLE, ROBERT (1). *The Sceptical Chymist; or, Chymico-Physical Doubts and Paradoxes, touching the Experiments whereby Vulgar Spagyristes are wont to endeavour to evince their Salt, Sulphur and Mercury to be the True Principles of Things*. Crooke, London, 1661.
- BOYLE, ROBERT (4). 'A New Frigoric Experiment.' *PTRS*, 1666, 1, 255.
- BOYLE, ROBERT (5). *New Experiments and Observations touching Cold*. London, 1665. Repr. 1772.
- BOYLE, ROBERT. See Anon. (104).
- BRADLEY, J. E. S. & BARNES, A. C. (1). *Chinese-English Glossary of Mineral Names*. Consultants' Bureau, New York, 1963.
- BRASAVOLA, A. (1). *Examen Omnium Simplicium Medicamentorum*. Rome, 1536.
- BRELICH, H. (1). 'Chinese Methods of Mining Quicksilver.' *TIMM*, 1905, 14, 483.
- BRELICH, H. (2). 'Chinese Methods of Mining Quicksilver.' *MJ*, 1905 (27 May), 578, 595.

- BRETSCHNEIDER, E. (1). *Botanicon Sinicum; Notes on Chinese Botany from Native and Western Sources*, 3 vols. Vol. 1 (Pt. 1, no special sub-title) contains
 ch. 1. Contribution towards a History of the Development of Botanical Knowledge among Eastern Asiatic Nations.
 ch. 2. On the Scientific Determination of the Plants Mentioned in Chinese Books.
 ch. 3. Alphabetical List of Chinese Works, with Index of Chinese Authors.
 app. Celebrated Mountains of China (list)
 Trübner, London, 1882 (printed in Japan); also pub. *JRAS/NCB*, 1881 (n.s.), 16, 18-230 (in smaller format).
- Vol. 2, Pt. II, *The Botany of the Chinese Classics*, with Annotations, Appendixes and Indexes by E. Faber, contains
 Corrigenda and Addenda to Pt. I
 ch. 1. Plants mentioned in the *Erh Ya*.
 ch. 2. Plants mentioned in the *Shih Ching*, the *Shu Ching*, the *Li Chi*, the *Chou Li* and other Chinese classical works.
 Kelly & Walsh, Shanghai etc. 1892; also pub. *JRAS/NCB*, 1893 (n.s.), 25, 1-468.
- Vol. 3, Pt. III, *Botanical Investigations into the Materia Medica of the Ancient Chinese*, contains
 ch. 1. Medicinal Plants of the *Shen Nung Pên Tshao Ching* and the [Ming I] *Pieh Lu* with indexes of geographical names, Chinese plant names and Latin generic names.
 Kelly & Walsh, Shanghai etc., 1895; also pub. *JRAS/NCB*, 1895 (n.s.), 29, 1-623.
- BRETSCHNEIDER, E. (2). *Mediaeval Researches from Eastern Asiatic Sources; Fragments towards the Knowledge of the Geography and History of Central and Western Asia from the +13th to the +17th century*. 2 vols. Trübner, London, 1888. New ed. Routledge & Kegan Paul, 1937. Photo-reprint, 1967.
- BREUER, H. & KASSAU, E. (1). *Eine einfache Methode zur Isolierung von Steroiden aus biologischen Medien durch Mikrosublimation*. Proc. 1st International Congress of Endocrinology, Copenhagen, 1960, Session XI (d), no. 561.
- BREUER, H. & NOCKE, L. (1). 'Stoffwechsel der Oestrogene in der menschlichen Leber'; art. in VIter Symposium d. Deutschen Gesellschaft f. Endokrinologie, *Moderne Entwicklungen auf dem Gestagengebiet Hormone in der Veterinärmedizin*. Kiel, 1959, p. 410.
- BREWER, J. S. (1) (ed.). *Fr. Rogeri Bacon Opera quaedam hactenus inedita*. Longman, Green, Longman & Roberts, London, 1859 (Rolls Series, no. 15). Contains *Opus Tertium* (c. +1268), part of *Opus Minus* (c. +1267), part of *Compendium Studii Philosophiae* (+1272), and the *Epistola de Secretis Operibus Artis et Naturae et de Nullitate Magiae* (c. +1270).
- BRIDGES, J. H. (1) (ed.). *The 'Opus Maius' [c. +1266] of Roger Bacon*. 3 vols. Oxford, 1897-1900.
- BRIDGMAN, E. C. (1). *A Chinese Chrestomathy, in the Canton Dialect*. S. Wells Williams, Macao, 1841.
- BRIDGMAN, E. C. & WILLIAMS, S. WELLS (1). 'Mineralogy, Botany, Zoology and Medicine' [sections of a Chinese Chrestomathy], in Bridgman (1), pp. 429, 436, 460 and 497.
- BRIGHTMAN, F. E. (1). *Liturgies, Eastern and Western*. Oxford, 1896.
- BROMEHEAD, C. E. N. (2). 'Aetites, or the Eagle-Stone.' *AQ*, 1947, 21, 16.
- BROOKS, CHANDLER McC., GILBERT, J. L., LEVEY, H. A. & CURTIS, D. R. (1). *Humors, Hormones and Neurosecretions; the Origins and Development of Man's present Knowledge of the Humoral Control of Body Function*. New York State Univ. N.Y. 1962.
- BROOKS, E. W. (1). 'A Syriac Fragment [a chronicle extending from +754 to +813].' *ZDMG*, 1900, 54, 195.
- BROOKS, G. (1). *Recherches sur le Latex de l'Arbre à Laque d'Indochine; le Laccol et ses Dérivés*. Jouve, Paris, 1932.
- BROOKS, G. (2). 'La Laque Végétale d'Indochine.' *LN*, 1937 (no. 3011), 359.
- BROOMHALL, M. (1). *Islam in China*. Morgan & Scott, London, 1910.
- BROSSE, T. (1). *Études instrumentales des Techniques du Yoga; Expérimentation psychosomatique...* with an Introduction 'La Nature du Yoga dans sa Tradition' by J. Filliozat, École Française d'Extrême-Orient, Paris, 1963 (Monograph series, no. 52).
- BROUGH, J. (1). 'Soma and *Amanita muscaria*.' *BLSOAS*, 1971, 34, 331.
- BROWN-SÉQUARD, C. E. (1). 'Du Rôle physiologique d'un thérapeutique d'un Suc extrait de Testicules d'Animaux, d'après nombre de faits observés chez l'Homme.' *APNP*, 1889, 21, 651.
- BROWNE, C. A. (1). 'Rhetorical and Religious Aspects of Greek Alchemy; including a Commentary and Translation of the Poem of the Philosopher Archelaos upon the Sacred Art.' *AX*, 1938, 2, 129; 1948, 3, 15.
- BROWNE, E. G. (1). *Arabian Medicine*. Cambridge, 1921. Repr. 1962. (French tr. H. J. P. Renaud; Larose, Paris, 1933.)
- BROWNE, RICHARD (1) (tr.). *The Cure of Old Age and the Preservation of Youth* (tr. of Roger Bacon's *De Retardatione Accidentium Senectutis...*). London, 1683.
- BROWNE, SIR THOMAS (1). *Religio Medici*. 1642.

- BRUCK, R. (1) (tr.). 'Der Traktat des Meisters Antonio von Pisa.' *RKW*, 1902, 25, 240. A + 14th-century treatise on glass-making.
- BRUNET, P. & MIELI, A. (1). *L'Histoire des Sciences (Antiquité)*. Payot, Paris, 1935. Rev. G. Sarton, *ISIS*, 1935, 24, 444.
- BRUNSCHWYK, H. (1). 'Liber de arte Distillandi de Compositis': *Das Buch der wahren Kunst zu distillieren die Composita und Simplicia; und das Buch 'Thesaurus Pauperum', Ein schatz der armen genant Micarium die brösamlin gefallen von den büchern d'Artzny und durch Experiment von mir Jheronimo Brunschwick uff geclubt und geoffenbart zu trost denen die es begehren*. Grüninger, Strassburg, 1512. (This is the so-called 'Large Book of Distillation'.) Eng. tr. *The Vertuose Boke of the Distillacyon*. . . , Andrewe, or Treveris, London, 1527, 1528 and 1530. The last reproduced in facsimile, with an introduction by H. J. Abrahams, Johnson, New York and London, 1971 (Sources of Science Ser., no. 79).
- BRUNSCHWYK, H. (2). 'Liber de arte distillandi de simplicibus' oder *Buch der rechten Kunst zu distillieren die einzigen Dinge*. Grüninger, Strassburg, 1500. (The so-called 'Small Book of Distillation'.)
- BRUNTON, T. LAUDER (1). *A Textbook of Pharmacology, Therapeutics and Materia Medica*. Adapted to the United States Pharmacopoeia by F. H. Williams. Macmillan, London, 1888.
- BRYANT, P. L. (1). 'Chinese Camphor and Camphor Oil.' *CJ*, 1925, 3, 228.
- BUCH, M. (1). 'Die Wotjaken, eine ethnologische Studie.' *ASSF*, 1883, 12, 465.
- BUCK, J. LOSSING (1). *Land Utilisation in China; a Study of 16,786 Farms in 168 Localities, and 38,256 Farm Families in Twenty-two Provinces in China, 1929 to 1933*. Univ. of Nanking, Nanking and Commercial Press, Shanghai, 1937. (Report in the International Research Series of the Institute of Pacific Relations.)
- BUCKLAND, A. W. (1). 'Ethnological Hints afforded by the Stimulants in Use among Savages and among the Ancients.' *JRAI*, 1879, 8, 239.
- BUDGE, E. A. WALLIS (4) (tr.). *The Book of the Dead; the Papyrus of Ani in the British Museum*. Brit. Mus., London, 1895.
- BUDGE, E. A. WALLIS (5). *First Steps in [the Ancient] Egyptian [Language and Literature]; a Book for Beginners*. Kegan Paul, Trench & Trübner, London, 1923.
- BUDGE, E. A. WALLIS (6) (tr.). *Syrian Anatomy, Pathology and Therapeutics; or, 'The Book of Medicines'—the Syriac Text, edited from a Rare Manuscript, with an English Translation*. . . 2 vols. Oxford, 1913.
- BUDGE, E. A. WALLIS (7) (tr.). *The 'Book of the Cave of Treasures'; a History of the Patriarchs and the Kings and their Successors from the Creation to the Crucifixion of Christ, translated from the Syriac text of BM Add. MS. 25875*. Religious Tract Soc. London, 1927.
- BUHOT, J. (1). *Arts de la Chine*. Editions du Chêne, Paris, 1951.
- BÜLFINGER, G. B. (1). *Specimen Doctrinae Veterum Sinarum Moralis et Politicæ; tanquam Exemplum Philosophiæ Gentium ad Rem Publicam applicatæ; Excerptum Libellis Sinicæ Genti Classicis, Confucii sive Dicta sive Facta Complexis*. Frankfurt a/M, 1724.
- BULLING, A. (14). 'Archæological Excavations in China, 1949 to 1971.' *EXPED*, 1972, 14 (no. 4), 2; 15 (no. 1), 22.
- BURCKHARDT, T. (1). *Alchemie*. Walter, Freiburg i/B, 1960. Eng. tr. by W. Stoddart: *Alchemy; Science of the Cosmos, Science of the Soul*. Stuart & Watkins, London, 1967.
- BURKE, R. B. (1) (tr.). *The 'Opus Majus' of Roger Bacon*. 2 vols. Philadelphia and London, 1928.
- BURKILL, I. H. (1). *A Dictionary of the Economic Products of the Malay Peninsula* (with contributions by W. Birtwhistle, F. W. Foxworthy, J. B. Scrivener & J. G. Watson). 2 vols. Crown Agents for the Colonies, London, 1935.
- BURKITT, F. C. (1). *The Religion of the Manichees*. Cambridge, 1925.
- BURKITT, F. C. (2). *Church and Gnosis*. Cambridge, 1932.
- BURNAM, J. M. (1). *A Classical Technology edited from Codex Lucensis 490*. Boston, 1920.
- BURNES, A. (1). *Travels into Bokhara*. . . 3 vols. Murray, London, 1834.
- BURTON, A. (1). *Rush-bearing; an Account of the Old Customs of Strewing Rushes, Carrying Rushes to Church, the Rush-cart; Garlands in Churches, Morris-Dancers, the Wakes, and the Rush*. Brook & Chrystal, Manchester, 1891.
- BUSHELL, S. W. (2). *Chinese Art*. 2 vols. For Victoria and Albert Museum, HMSO, London, 1909; 2nd ed. 1914.
- CABANÈS, A. (1). *Remèdes d'Autrefois*. 2nd ed. Maloine, Paris, 1910.
- CALEY, E. R. (1). 'The Leyden Papyrus X; an English Translation with Brief Notes.' *JCE*, 1926, 3, 1149.
- CALEY, E. R. (2). 'The Stockholm Papyrus; an English Translation with Brief Notes.' *JCE*, 1927, 4, 979.
- CALEY, E. R. (3). 'On the Prehistoric Use of Arsenical Copper in the Aegean Region.' *HE*, 1949, 8 (Suppl.), 60 (Commemorative Studies in Honour of Theodore Leslie Shear).
- CALEY, E. R. (4). 'The Earliest Use of Nickel Alloys in Coinage.' *NR*, 1943, 1, 17.

- CALEY, E. R. (5). 'Ancient Greek Pigments.' *JCE*, 1946, **23**, 314.
- CALEY, E. R. (6). 'Investigations on the Origin and Manufacture of Orichalcum', art. in *Archaeological Chemistry*, ed. M. Levey. Pennsylvania University Press, Philadelphia, Pennsylvania, 1967, p. 59.
- CALEY, E. R. & RICHARDS, J. C. (1). *Theophrastus on the Stones*. Columbus, Ohio, 1956.
- CALLOWAY, D. H. (1). 'Gas in the Alimentary Canal.' Ch. 137 in *Handbook of Physiology*, sect. 6, 'Alimentary Canal', vol. 5, 'Bile; Digestion; Ruminal Physiology'. Ed. C. F. Code & W. Heidel. Williams & Wilkins, for the American Physiological Society, Washington, D.C. 1968.
- CALMET, AUGUSTIN (1). *Dissertations upon the Appearances of Angels, Daemons and Ghosts, and concerning the Vampires of Hungary, Bohemia, Moravia and Silesia*. Cooper, London, 1759, tr. from the French ed. of 1745. Repr. with little change, under the title: *The Phantom World, or the Philosophy of Spirits, Apparitions, etc.* . . ., ed. H. Christmas, 2 vols. London, 1850.
- CAMMANN, S. VAN R. (4). 'Archaeological Evidence for Chinese Contacts with India during the Han Dynasty.' *S*, 1956, **5**, 1; abstr. *RBS*, 1959, **2**, no. 320.
- CAMMANN, S. VAN R. (5). 'The "Bactrian Nickel Theory".' *AJA*, 1958, **62**, 409. (Commentary on Chêng & Schwitter, 1.)
- CAMMANN, S. VAN R. (7). 'The Evolution of Magic Squares in China.' *JAOS*, 1960, **80**, 116.
- CAMMANN, S. VAN R. (8). 'Old Chinese Magic Squares.' *S*, 1962, **7**, 14. Abstr. L. Lanciotti, *RBS*, 1969, **8**, no. 837.
- CAMMANN, S. VAN R. (9). 'The Magic Square of Three in Old Chinese Philosophy and Religion.' *HOR*, 1961, **1** (no. 1), 37. Crit. J. Needham, *RBS*, 1968, **7**, no. 581.
- CAMMANN, S. VAN R. (10). 'A Suggested Origin of the Tibetan Maṇḍala Paintings.' *ARQ*, 1950, **13**, 107.
- CAMMANN, S. VAN R. (11). 'On the Renewed Attempt to Revive the "Bactrian Nickel Theory".' *AJA*, 1962, **66**, 92 (rejoinder to Chêng & Schwitter, 2).
- CAMMANN, S. VAN R. (12). 'Islamic and Indian Magic Squares.' *HOR*, 1968, **8**, 181, 271.
- CAMMANN, S. VAN R. (13). Art. 'Magic Squares' in *EB* 1957 ed., vol. xiv, p. 573.
- CAMPBELL, D. (1). *Arabian Medicine and its Influence on the Middle Ages*. 2 vols. (the second a bibliography of Latin MSS translations from Arabic). Kegan Paul, London, 1926.
- CARATINI, R. (1). 'Quadrature du Cercle et Quadrature des Lunules en Mésopotamie.' *RAAO*, 1957, **51**, 11.
- CARBONELLI, G. (1). *Sulle Fonti Storiche della Chimica e dell'Alchimia in Italia*. Rome, 1925.
- CARDEW, S. (1). 'Mining in China in 1952.' *MJ*, 1953, **240**, 390.
- CARLID, G. & NORDSTRÖM, J. (1). *Torbern Bergman's Foreign Correspondence* (with brief biography by H. Olsson). Almqvist & Wiksell, Stockholm, 1965.
- CARLSON, C. S. (1). 'Extractive and Azeotropic Distillation.' Art. in *Distillation*, ed. A. Weissberger (*Technique of Organic Chemistry*, vol. 4), p. 317. Interscience, New York, 1951.
- CARR, A. (1). *The Reptiles*. Time-Life International, Holland, 1963.
- CARTER, G. F. (1). 'The Preparation of Ancient Coins for Accurate X-Ray Fluorescence Analysis.' *AMY*, 1964, **7**, 106.
- CARTER, T. F. (1). *The Invention of Printing in China and its Spread Westward*. Columbia Univ. Press, New York, 1925, revised ed. 1931. 2nd ed. revised by L. Carrington Goodrich. Ronald, New York, 1955.
- CARY, G. (1). *The Medieval Alexander*. Ed. D. J. A. Ross. Cambridge, 1956. (A study of the origins and versions of the Alexander-Romance; important for medieval ideas on flying-machine and diving-bell or bathyscaphe.)
- CASAL, U. A. (1). 'The Yamabushi.' *MDGNVO*, 1965, **46**, 1.
- CASAL, U. A. (2). 'Incense.' *TASJ*, 1954 (3rd ser.), **3**, 46.
- CASARTELLI, L. C. (1). '[The State of the Dead in] Iranian [and Persian Belief].' *ERE*, vol. xi, p. 847.
- CASE, R. E. (1). 'Nickel-containing Coins of Bactria, -235 to -170.' *COCJ*, 1934, **102**, 117.
- CASSIANUS, JOHANNES. *Conlationes*, ed. Petschenig. Cf. E. C. S. Gibson tr. (1).
- CASSIUS, ANDREAS (the younger) (1). *De Extremo illo et Perfectissimo Naturae Opificio ac Principe Terræ-norum Sidere Auro de admiranda ejus Natura... Cogitata Nobilioribus Experimentis Illustrata*. Hamburg, 1685. Cf. Partington (7), vol. 2, p. 371; Ferguson (1), vol. 1, p. 148.
- CEDRENIUS, GEORGIUS (1). *Historiōn Archomenē* (c. + 1059), ed. Bekker (in *Corp. Script. Hist. Byz.* series).
- CENNINO, CENNINO (1). *Il Libro dell'Arte*. MS on dyeing and painting, 1437. Eng. trs. C. J. Herringham, Allen & Unwin, London, 1897; D. V. Thompson, Yale Univ. Press. New Haven, Conn. 1933.
- CERNY, J. (1). *Egyptian Religion*.
- CHADWICK, H. (1) (tr.). *Origen 'Contra Celsum'*; *Translated with an Introduction and Notes*. Cambridge, 1953.
- CHAMBERLAIN, B. H. (1). *Things Japanese*. Murray, London, 2nd ed. 1891; 3rd ed. 1898.
- CHAMPOLLION, J. F. (1). 'L'Égypte sous les Pharaons; ou Recherches sur la Géographie, la Religion, la Langue, les Écritures, et l'Histoire de l'Égypte avant l'invasion de Cambyse. De Bure, Paris, 1814.
- CHAMPOLLION, J. F. (2). *Grammaire Égyptienne en Écriture Hieroglyphique*. Didot, Paris, 1841.

- CHAMPOLLION, J. F. (3). *Dictionnaire Égyptien en Écriture Hieroglyphique*. Didot, Paris, 1841.
- CHANG, C. See Kung, S. C., Chao, S. W., Pei, Y. T. & Chang, C. (1).
- CHANG CHUNG-YUAN (1). 'An Introduction to Taoist Yoga.' *RR*, 1956, 20, 131.
- CHANG HUNG-CHAO (1). *Lapidarium Sinicum; a Study of the Rocks, Fossils and Minerals as known in Chinese Literature* (in Chinese with English summary). Chinese Geological Survey, Peiping, 1927. *MGSC* (ser. B), no. 2.
- CHANG HUNG-CHAO (2). 'The Beginning of the Use of Zinc in China.' *BCGS*, 1922, 2 (no. 1/2), 17. Cf. Chang Hung-Chao (3).
- CHANG HUNG-CHAO (3). 'New Researches on the Beginning of the Use of Zinc in China.' *BCGS*, 1925, 4 (no. 1), 125. Cf. Chang Hung-Chao (6).
- CHANG HUNG-CHAO (4). 'The Origins of the Western Lake at Hangchow.' *BCGS*, 1924, 3 (no. 1), 26. Cf. Chang Hung-Chao (5).
- CHANG HSIEN-FENG (1). 'A Communist Grows in Struggle.' *CREC*, 1969, 18 (no. 4), 17.
- CHANG KUANG-YU & CHANG CHENG-YU (1). *Peking Opera Make-up; an Album of Cut-outs*. Foreign Languages Press, Peking, 1959.
- CHANG TZU-KUNG (1). 'Taoist Thought and the Development of Science; a Missing Chapter in the History of Science and Culture-Relations.' Unpub. MS., 1945. Now in *MBPB*, 1972, 21 (no. 1), 7 (no. 2), 20.
- CHARLES, J. A. (1). 'Early Arsenical Bronzes—a Metallurgical View.' *AJA*, 1967, 71, 21. A discussion arising from the data in Renfrew (1).
- CHARLES, J. A. (2). 'The First Sheffield Plate.' *AQ*, 1968, 42, 278. With an appendix on the dating of the Minoan bronze dagger with silver-capped copper rivet-heads, by F. H. Stubbings.
- CHARLES, J. A. (3). 'Heterogeneity in Metals.' *AMY*, 1973, 15, 105.
- CHARLES, R. H. (1) (tr.). *The 'Book of Enoch', or 'I Enoch', translated from the Editor's Ethiopic Text, and edited with the Introduction, Notes and Indexes of the First Edition, wholly recast, enlarged and rewritten, together with a Reprint from the Editor's Text of the Greek Fragments*. Oxford, 1912 (first ed., Oxford, 1893).
- CHARLES, R. H. (2) (ed.). *The Ethiopic Version of the 'Book of Enoch', edited from 23 MSS, together with the Fragmentary Greek and Latin Versions*. Oxford, 1906.
- CHARLES, R. H. (3). *A Critical History of the Doctrine of a Future Life in Israel, in Judaism, and in Christianity; or, Hebrew, Jewish and Christian Eschatology from pre-Prophetic Times till the Close of the New Testament Canon*. Black, London, 1899. Repr. 1913 (Jowett Lectures, 1898-9).
- CHARLES, R. H. (4) 'Gehenna', art. in Hastings, *Dictionary of the Bible*, Clark, Edinburgh, 1899, vol. 2, p. 119.
- CHARLES, R. H. (5) (ed.). *The Apocrypha and Pseudepigrapha of the Old Testament in English; with Introductions, and Critical and Explanatory Notes, to the Several Books... 2 vols*. Oxford, 1913 (1 Enoch is in vol. 2).
- CHATLEY, H. (1). MS. translation of the astronomical chapter (ch. 3, Thien Wên) of *Huai Nan Tzu*. Unpublished. (Cf. note in *O*, 1952, 72, 84.)
- CHATLEY, H. (37). 'Alchemy in China.' *JALCHS*, 1913, 2, 33.
- CHATTERJI, S. K. (1). 'India and China; Ancient Contacts—What India received from China.' *JRAS/B*, 1959 (n.s.), 1, 89.
- CHATTOPADHYAYA, D. (1). 'Needham on Tantrism and Taoism.' *NAGE*, 1957, 6 (no. 12), 43; 1958, 7 (no. 1), 32.
- CHATTOPADHYAYA, D. (2). 'The Material Basis of Idealism.' *NAGE*, 1958, 7 (no. 8), 30.
- CHATTOPADHYAYA, D. (3) 'Brahman and Maya.' *ENQ*, 1959, 1 (no. 1), 25.
- CHATTOPADHYAYA, D. (4). *Lokāyata, a Study in Ancient Indian Materialism*. People's Publishing House, New Delhi, 1959.
- CHAVANNES, E. (14). *Documents sur les Tou-Kiue [Thu-Chüeh] (Turcs) Occidentaux, recueillis et commentés par E. C...* Imp. Acad. Sci., St Petersburg, 1903. Repr. Paris, with the inclusion of the 'Notes Additionnelles', n. d.
- CHAVANNES, E. (17). 'Notes Additionnelles sur les Tou-Kiue [Thu-Chüeh] (Turcs) Occidentaux.' *TP*, 1904, 5, 1-110, with index and errata for Chavannes (14).
- CHAVANNES, E. (19). 'Inscriptions et Pièces de Chancellerie Chinoises de l'Époque Mongole.' *TP*, 1904, 5, 357-447; 1905, 6, 1-42; 1908, 9, 297-428.
- CHAVANNES, E. & PELLIOU, P. (1). 'Un Traité Manichéen retrouvé en Chine, traduit et annoté.' *JA*, 1911 (10^e sér), 18, 499; 1913 (11^e sér), 1, 99, 261.
- CH'ËN, JEROME. See Chhen Chih-Jang.
- CHENG, C. F. & SCHWITTER, C. M. (1). 'Nickel in Ancient Bronzes.' *AJA*, 1957, 61, 351. With an appendix on chemical analysis by X-ray fluorescence by K. G. Carroll.
- CHENG, C. F. & SCHWITTER, C. M. (2). 'Bactrian Nickel and [the] Chinese [Square] Bamboos.' *AJA*, 1962, 66, 87 (reply to Cammann, 5).

- CHÈNG MAN-CHING & SMITH, R. W. (1). *Thai-Chi; the 'Supreme Ultimate' Exercise for Health, Sport and Self-Defence*. Weatherhill, Tokyo, 1966.
- CHÈNG TÈ-KHUN (2) (tr.). 'Travels of the Emperor Mu.' *JRAS/NCB*, 1933, 64, 142; 1934, 65, 128.
- CHÈNG TÈ-KHUN (7). 'Yin Yang, Wu Hsing and Han Art.' *HJAS*, 1957, 20, 162.
- CHÈNG TÈ-KHUN (9). *Archaeology in China*.
 Vol. 1, *Prehistoric China*. Heffer, Cambridge, 1959.
 Vol. 2, *Shang China*. Heffer, Cambridge, 1960.
 Vol. 3, *Chou China*, Heffer, Cambridge, and Univ. Press, Toronto, 1963.
 Vol. 4, *Han China* (in the press).
- CHENG WOU-CHAN. See Shêng Wu-Shan.
- CHEO, S. W. See Kung, S. C., Chao, S. W., Pei, Y. T. & Chang, C. (1).
- CHEYNE, T. K. (1). *The Origin and Religious Content of the Psalter*. Kegan Paul, London, 1891. (Bampton Lectures.)
- CHHEN CHIH-JANG (1). *Mao and the Chinese Revolution*. Oxford, 1965. With 37 Poems by Mao Tsé-Tung, translated by Michael Bullock & Chhen Chih-Jang.
- CHHEN SHOU-YI (3). *Chinese Literature; a Historical Introduction*. Ronald, New York, 1961.
- CHHU TA-KAO (2) (tr.). *Tao Tê Ching, a new translation*. Buddhist Lodge, London, 1937.
- CHIKASHIGE, MASUMI (1). *Alchemy and other Chemical Achievements of the Ancient Orient; the Civilisation of Japan and China in Early Times as seen from the Chemical (and Metallurgical) Point of View*. Rokakuho Uchida, Tokyo, 1936. Rev. Tenney L. Davis, *JACS*, 1937, 59, 952. Cf. Chinese résumé of Chakashige's lectures by Chhen Mêng-Yen, *KHS*, 1920, 5 (no. 3), 262.
- CHIU YAN Tsz. See Yang Tzu-Chiu (1).
- CHOISY, M. (1). *La Métaphysique des Yogas*. Ed. Mont. Blanc, Geneva, 1948. With an introduction by P. Masson-Oursel.
- CHÓN SANGÚN (1). *Science and Technology in Korea; Traditional Instruments and Techniques*. M.I.T. Press, Cambridge, Mass. 1972.
- CHOU I-LIANG (1). 'Tantrism in China.' *HJAS*, 1945, 8, 241.
- CHOULANT, L. (1). *History and Bibliography of Anatomic Illustration*. Schuman, New York, 1945, tr. from the German (Weigel, Leipzig, 1852) by M. Frank, with essays by F. H. Garrison, M. Frank, E. C. Streeter & Charles Singer, and a Bibliography of M. Frank by J. C. Bay.
- CHOU YI-LIANG. See Chou I-Liang.
- CHU HSI-THAO (1). 'The Use of Amalgam as Filling Material in Dentistry in Ancient China.' *CMJ*, 1958, 76, 553.
- CHWOLSON, D. (1). *Die Ssabier und der Ssabismus*. 2 vols. Imp. Acad. Sci., St Petersburg, 1856. (On the culture and religion of the Sabians, Šābi, of Harrān, 'pagans' till the +10th century, a people important for the transmission of the Hermetica, and for the history of alchemy, Harrān being a cross-roads of influences from the East and West of the Old World.)
- [CIBOT, P. M.] (3). 'Notice du Cong-Fou [*Kung fu*], des Bonzes Tao-sée [*Tao Shih*].' *MCHSAMUC*, 1779, 4, 441. Often ascribed, as by Dudgeon (1) and others, to J. J. M. Amiot, but considered Cibot's by Pfister (1), p. 896.
- [CIBOT, P. M.] (5). 'Notices sur différens Objets; (1) Vin, Eau-de-Vie et Vinaigre de Chine, (2) Raisins secs de Hami, (3) Notices du Royaume de Hami, (4) Rémèdes [*pao-hsing shih, khu chiu*], (5) Teinture chinoise, (6) Abricotier [selection, care of seedlings, and grafting], (7) Armoise.' *MCHSAMUC*, 1780, 5, 467-518.
- CIBOT, P. M. (11). (posthumous). 'Notice sur le Cinabre, le Vif-Argent et le *Ling sha*.' *MCHSAMUC*, 1786, 11, 304.
- CIBOT, P. M. (12) (posthumous). 'Notice sur le Borax.' *MCHSAMUC*, 1786, 11, 343.
- CIBOT, P. M. (13) (posthumous). 'Diverses Remarques sur les Arts-Pratiques en Chine; Ouvrages de Fer, Art de peindre sur les Glaces et sur les Pierres.' *MCHSAMUC*, 1786, 11, 361.
- CIBOT, P. M. (14). 'Notice sur le Lieou-li [*Liu-li*], ou Tuiles Vernissées.' *MCHSAMUC*, 1787, 13, 396.
- [CIBOT, P. M.] (16). 'Notice du Ché-hiang [*Shé hsiang*, musk and the musk deer].' *MCHSAMUC*, 1779, 4, 493.
- [CIBOT, P. M.] (17). 'Quelques Compositions et Recettes pratiquées chez les Chinois ou consignées dans leurs Livres, et que l'Auteur a crues utiles ou inconnues en Europe [on felt, wax, conservation of oranges, bronzing of copper, etc. etc.].' *MCHSAMUC*, 1779, 4, 484.
- CLAPHAM, A. R., TUTIN, T. G. & WARBURG, E. F. (1). *Flora of the British Isles*. 2nd ed. Cambridge, 1962.
- CLARK, A. J. (1). *Applied Pharmacology*. 7th ed. Churchill, London, 1942.
- CLARK, E. (1). 'Notes on the Progress of Mining in China.' *TAIMÉ*, 1891, 19, 571. (Contains an account (pp. 587 ff.) of the recovery of silver from argentiferous lead ore, and cupellation by traditional methods, at the mines of Yen-tang Shan.)
- CLARK, R. T. RUNDLE (1). *Myth and Symbol in Ancient Egypt*. Thames & Hudson, London, 1959.

- CLARK, W. G. & DEL GIUDICE, J. (1) (ed.). *Principles of Psychopharmacology*. Academic Press, New York and London, 1971.
- CLARKE, J. & GEIKIE, A. (1). *Physical Science in the Time of Nero, being a Translation of the 'Quaestiones Naturales' of Seneca, with notes by Sir Archibald Geikie*. Macmillan, London, 1910.
- CLAUDER, GABRIEL (1). *Inventum Cinnabarinum, hoc est Dissertatio Cinnabari Nativa Hungarica, longa circulatione in majorem efficaciam fixata et exalta*. Jena, 1684.
- CLEAVES, F. W. (1). 'The Sino-Mongolian Inscription of +1240 [edict of the empress Töregene, wife of Ogatai Khan (+1186 to +1241) on the cutting of the blocks for the Yuan edition of the *Tao Tsang*].' *HJAS*, 1960, 23, 62.
- CLINE, W. (1). *Mining and Metallurgy in Negro Africa*. Banta, Menasha, Wisconsin, 1937 (mimeographed). (General Studies in Anthropology, no. 5, Iron.)
- CLOW, A. & CLOW, NAN L. (1). *The Chemical Revolution; a Contribution to Social Technology*. Batchworth, London, 1952.
- CLOW, A. & CLOW, NAN L. (2). 'Vitriol in the Industrial Revolution.' *EHR*, 1945, 15, 44.
- CLULEE, N. H. (1). 'John Dee's Mathematics and the Grading of Compound Qualities.' *AX*, 1971, 18, 178.
- CLYMER, R. SWINBURNE (1). *Alchemy and the Alchemists; giving the Secret of the Philosopher's Stone, the Elixir of Youth, and the Universal Solvent; Also showing that the True Alchemists did not seek to transmute base metals into Gold, but sought the Highest Initiation or the Development of the Spiritual Nature in Man*. . . 4 vols. Philosophical Publishing Co. Allentown, Pennsylvania, 1907. The first two contain the text of Hitchcock (1), but 'considerably re-written and with much additional information, mis-information and miscellaneous nonsense interpolated' (Cohen, 1).
- COGHLAN, H. H. (1). 'Metal Implements and Weapons [in Early Times before the Fall of the Ancient Empires].' Art. in *History of Technology*, ed. C. Singer, E. J. Holmyard & A. R. Hall. Oxford, 1954, vol. 1, p. 600.
- COGHLAN, H. H. (3). 'Etruscan and Spanish Swords of Iron.' *SIB*, 1957, 3, 167.
- COGHLAN, H. H. (4). 'A Note upon Iron as a Material for the Celtic Sword.' *SIB*, 1957, 3, 129.
- COGHLAN, H. H. (5). *Notes on Prehistoric and Early Iron in the Old World; including a Metallographic and Metallurgical Examination of specimens selected by the Pitt Rivers Museum, and contributions by I. M. Allen*. Oxford, 1956. (Pitt Rivers Museum Occasional Papers on Technology, no. 8.)
- COGHLAN, H. H. (6). 'The Prehistorical Working of Bronze and Arsenical Copper.' *SIB*, 1960, 5, 145.
- COHAUSEN, J. H. (1). *Lebensverlängerung bis auf 115 Jahre durch den Hauch junger Mädchen*. Orig. title: *Der wieder lebende Hermippus, oder curieuse physikalisch-medizinische Abhandlung von der seltener Art, sein Leben durch das Anhauchen junger-Mädchlein bis auf 115 Jahr zu verlängern, aus einem römischen Denkmal genommen, nun aber mit medicinischen Gründen befestiget, und durch Beweise und Exempel, wie auch mit einer wunderbaren Erfindung aus der philosophischen Scheidekunst erläutert und bestätigt von J. H. C. . . . Alten Knaben*, (Stuttgart?), 1753. Latin ed. Andreae, Frankfurt, 1742. Reprinted in *Der Schatzgräber in den literarischen und bildlichen Seltenheiten, Sonderbarkeiten, etc., hauptsächlich des deutschen Mittelalters*, ed. J. Scheible, vol. 2. Scheible, Stuttgart and Leipzig, 1847. Eng. tr. by J. Campbell, *Hermippus Redivivus; or, the Sage's Triumph over Old Age and the Grave, wherein a Method is laid down for prolonging the Life and Vigour of Man*. London, 1748, repr. 1749, 3rd ed. London, 1771. Cf. Ferguson (1), vol. 1, pp. 168 ff.; Paal (1).
- COHEN, I. BERNARD (1). 'Ethan Allen Hitchcock; Soldier-Humanitarian-Scholar; Discoverer of the "True Subject" of the Hermetic Art.' *PAAQS*, 1952, 29.
- COLEBY, L. J. M. (1). *The Chemical Studies of P. J. Macquer*. Allen & Unwin, London, 1938.
- COLLAS, J. P. L. (3) (posthumous). 'Sur un Sel appellé par les Chinois *Kien*.' *MCHSAMUC*, 1786, 11, 315.
- COLLAS, J. P. L. (4) (posthumous). 'Extrait d'une Lettre de Feu M. Collas, Missionnaire à Péking, 1^e Sur la Chaux Noire de Chine, 2^e Sur une Matière appellée Lieou-li [*Liu-li*], qui approche du Verre, 3^e Sur une Espèce de Mottes à Brûler.' *MCHSAMUC*, 1786, 11, 321.
- COLLAS, J. P. L. (5) (posthumous). 'Sur le Hoang-fan [*Huang fan*] ou vitriol, le Nao-cha [*Nao sha*] ou Sel ammoniac, et le Hoang-pé-mou [*Huang po mu*].' *MCHSAMUC*, 1786, 11, 329.
- COLLAS, J. P. L. (6) (posthumous). 'Notice sur le Charbon de Terre.' *MCHSAMUC*, 1786, 11, 334.
- COLLAS, J. P. L. (7) (posthumous). 'Notice sur le Cuivre blanc de Chine, sur le Minium et l'Amadou.' *MCHSAMUC*, 1786, 11, 347.
- COLLAS, J. P. L. (8) (posthumous). 'Notice sur un Papier doré sans Or.' *MCHSAMUC*, 1786, 11, 351.
- COLLAS, J. P. L. (9) (posthumous). 'Sur la Quintessence Minérale de M. le Comte de la Garaye.' *MCHSAMUC*, 1786, 11, 298.
- COLLIER, H. B. (1). 'Alchemy in Ancient China.' *CHEMC*, 1952, 41 (101).
- COLLINS, W. F. (1). *Mineral Enterprise in China*. Revised edition, Tientsin Press, Tientsin, 1922. With an appendix chapter on 'Mining Legislation and Development' by Ting Wên-Chiang (V. K. Ting), and a memorandum on 'Mining Taxation' by G. G. S. Lindsey.

- CONDAMIN, J. & PICON, M. (1). 'The Influence of Corrosion and Diffusion on the Percentage of Silver in Roman Denarii.' *AMY*, 1964, 7, 98.
- DE CONDORCET, A. N. (1). *Esquisse d'un Tableau Historique des Progrès de l'Esprit Humain*. Paris, 1795. Eng. tr. by J. Barraclough, *Sketch for a Historical Picture of the Human Mind*. London, 1955.
- CONNELL, K. H. (1). *Irish Peasant Society; Four Historical Essays*. Oxford, 1968. ('Illicit Distillation', pp. 1-50.)
- CONRADY, A. (1). 'Indischer Einfluss in China in 4-jahrh. v. Chr.' *ZDMG*, 1906, 60, 335.
- CONRADY, A. (3). 'Zu Lao-Tze, cap. 6' (The valley spirit). *AM*, 1932, 7, 150.
- CONRING, H. (1). *De Hermetica Aegyptiorum Vetere et Paracelsicorum Nova Medicina*. Muller & Richter, Helmstadt, 1648.
- CONYBEARE, F. C. (1) (tr.). *Philostratus [of Lemnos]; the 'Life of Apollonius of Tyana'*. 2 vols. Heinemann, London, 1912, repr. 1948. (Loeb Classics series.)
- CONZE, E. (8). 'Buddhism and Gnosis.' *NUM/SHR*, 1967, 12, 651 (in *Le Origini dello Gnosticismo*).
- COOPER, W. C. & SIVIN, N. (1). 'Man as a Medicine; Pharmacological and Ritual Aspects of Traditional Therapy using Drugs derived from the Human Body.' Art. in Nakayama & Sivin (1), p. 203.
- CORBIN, H. (1). 'De la Gnose antique à la Gnose Ismaélienne.' Art. in *Atti dello Convegno di Scienze Morali, Storiche e Filologiche—Oriente ed Occidente nel Medio Evo*, Acc. Naz. dei Lincei, Rome, 1956 (Atti dei Convegni Alessandro Volta, no. 12), p. 105.
- CORDIER, H. (1). *Histoire Générale de la Chine*. 4 vols. Geuthner, Paris, 1920.
- CORDIER, H. (13). 'La Suppression de la Compagnie de Jésus et de la Mission de Péking' (1774). *TP* 1916, 17, 271, 561.
- CORDIER, L. (1). 'Observations sur la Lettre de Mons. Abel Rémusat... sur l'Existence de deux Volcans brûlans dans la Tartarie Centrale.' *JA*, 1824, 5, 47.
- CORDIER, V. (1). *Die chemischen Zeichensprache Einst und Jetzt*. Leykam, Graz, 1928.
- CORNARO, LUIGI (1). *Discorsi della Vita Sobria*. 1558. Milan, 1627. Eng. tr. by J. Burdell, *The Discourses and Letters of Luigi Cornaro on a Sober and Temperate Life*. New York, 1842. Also nine English translations before 1825, incl. Dublin, 1740.
- CORNER, G. W. (1). *The Hormones in Human Reproduction*. Univ. Press, Princeton, N.J. 1946.
- CORNFORD, F. M. (2). *The Laws of Motion in Ancient Thought*. Inaug. Lect. Cambridge, 1931.
- CORNFORD, F. M. (7). *Plato's Cosmology; the 'Timaeus' translated, with a running commentary*. Routledge & Kegan Paul, London, 1937, repr. 1956.
- COVARRUBIAS, M. (2). *The Eagle, the Jaguar, and the Serpent; Indian Art of the Americas—North America (Alaska, Canada, the United States)*. Knopf, New York, 1954.
- COWDRY, E. V. (1). 'Taoist Ideas of Human Anatomy.' *AMH*, 1925, 3, 301.
- COWIE, A. T. & FOLLEY, S. J. (1). 'Physiology of the Gonadotrophins and the Lactogenic Hormone.' Art. in *The Hormones...*, ed. G. Pincus, K. V. Thimann & E. B. Astwood. Acad. Press, New York, 1948-64, vol. 3, p. 309.
- COYAJI, J. C. (2). 'Some Shahnamah Legends and their Chinese Parallels.' *JRAS/B*, 1928 (n.s.), 24, 177.
- COYAJI, J. C. (3). 'Bahram Yasht; Analogues and Origins.' *JRAS/B*, 1928 (n.s.), 24, 203.
- COYAJI, J. C. (4). 'Astronomy and Astrology in the Bahram Yasht.' *JRAS/B*, 1928 (n.s.), 24, 223.
- COYAJI, J. C. (5). 'The Shahnamah and the Feng Shen Yen I.' *JRAS/B*, 1930 (n.s.), 26, 491.
- COYAJI, J. C. (6). 'The Sraosha Yasht and its Place in the History of Mysticism.' *JRAS/B*, 1932 (n.s.), 28, 225.
- CRAIG, SIR JOHN (1). 'Isaac Newton and the Counterfeiters.' *NRRS*, 1963, 18, 136.
- CRAIG, SIR JOHN (2). 'The Royal Society and the Mint.' *NRRS*, 1964, 19, 156.
- CRAIGIE, W. A. (1). '[The State of the Dead in] Teutonic [Scandinavian, Belief].' *ERE*, vol. xi, p. 851.
- CRAVEN, J. B. (1). *Count Michael Maier, Doctor of Philosophy and of Medicine, Alchemist, Rosicrucian, Mystic (+1568 to +1622); his Life and Writings*. Peace, Kirkwall, 1910.
- CRAWLEY, A. E. (1). *Dress, Drinks and Drums; Further Studies of Savages and Sex*, ed. T. Besterman. Methuen, London, 1931.
- CREEL, H. G. (7). 'What is Taoism?' *JAOS*, 1956, 76, 139.
- CREEL, H. G. (11). *What is Taoism?, and other Studies in Chinese Cultural History*. Univ. Chicago Press, Chicago, 1970.
- CRESSEY, G. B. (1). *China's Geographic Foundations; a Survey of the Land and its People*. McGraw-Hill, New York, 1934.
- CROCKET, R., SANDISON, R. A. & WALK, A. (1) (ed.). *Hallucinogenic Drugs and their Psychotherapeutic Use*. Lewis, London, 1961. (Proceedings of a Quarterly Meeting of the Royal Medico-Psychological Association.) Contributions by A. Cerletti and others.
- CROFFUT, W. A. (1). *Fifty Years in Camp and Field; the Diary of Major-General Ethan Allen Hitchcock, U.S. Army*. Putnam, New York and London, 1909. 'A biography including copious extracts from the diaries but relatively little from the correspondence' (Cohen, 1).

- CROLL, OSWALD (1). *Basilica Chymica*. Frankfurt, 1609.
- CRONSTEDT, A. F. (1). *An Essay towards a System of Mineralogy*. London, 1770, 2nd ed. 1788 (greatly enlarged and improved by J. H. de Magellan). Tr. by G. von Engeström from the Swedish *Försök till Mineralogie eller Mineral-Rikets Upställning*. Stockholm, 1758.
- CROSLAND, M. P. (1). *Historical Studies in the Language of Chemistry*. Heinemann, London, 1962.
- CUMONT, F. (4). *L'Égypte des Astrologues*. Fondation Égyptologique de la Reine Elisabeth, Brussels, 1937.
- CUMONT, F. (5) (ed.). *Catalogus Codic. Astrolog. Graecorum*. 12 vols. Lamertin, Brussels, 1929-.
- CUMONT, F. (6) (ed.). *Textes et Monuments Figurés relatifs aux Mystères de Mithra*. 2 vols. Lamertin, Brussels, 1899.
- CUMONT, F. (7). 'Masque de Jupiter sur un Aigle Éployé [et perché sur le Corps d'un Ouroboros]; Bronze du Musée de Bruxelles.' Art. in *Festschrift f. Otto Benndorf*. Hölder, Vienna, 1898, p. 291.
- CUMONT, F. (8). 'La Cosmogonie Manichéenne d'après Théodore bar Khôni [Bp. of Khalkar in Mesopotamia, c. +600]. Lamertin, Brussels, 1908 (Recherches sur le Manichéisme, no. 1). Cf. Kugener & Cumont, (1, 2).
- CUMONT, F. (9). 'La Roue à Puiser les Âmes du Manichéisme.' *RHR/AMG*, 1915, 72, 384.
- CUNNINGHAM, A. (1). 'Coins of Alexander's Successors in the East.' *NC*, 1873 (n.s.), 13, 186.
- CURWEN, M. D. (1) (ed.). *Chemistry and Commerce*. 4 vols. Newnes, London, 1935.
- CURZON, G. N. (1). *Persia and the Persian Question*. London, 1892.
- CYRIAX, E. F. (1). 'Concerning the Early Literature on Ling's Medical Gymnastics.' *JAN*, 1926, 30, 225.
- DALLY, N. (1). *Cinésiologie, ou Science du Mouvement dans ses Rapports avec l'Éducation, l'Hygiène et la Thérapie; Études Historiques, Théoriques et Pratiques*. Librairie Centrale des Sciences, Paris, 1857.
- DALMAN, G. (1). *Arbeit und Sitte in Palästina*.
 Vol. 1 *Jahreslauf und Tageslauf* (in two parts).
 Vol. 2 *Der Ackerbau*.
 Vol. 3 *Von der Ernte zum Mehl (Ernten, Dreschen, Worfeln, Sieben, Verwahren, Mahlen)*.
 Vol. 4 *Brot, Öl und Wein*.
 Vol. 5 *Webstoff, Spinnen, Weben, Kleidung*.
 Bertelsmann, Gütersloh, 1928- . (Schriften d. deutschen Palästina-Institut, nos. 3, 5, 6, 7, 8; Beiträge z. Forderung christlicher Theologie, ser. 2, Sammlung Wissenschaftlichen Monographien, nos. 14, 17, 27, 29, 33, 36.)
 Vol. 6 *Zeltleben, Vieh- und Milch-wirtschaft, Jagd, Fischfang*.
 Vol. 7. *Das Haus, Hühnerzucht, Taubenzucht, Bienenzucht*.
 Olms, Hildesheim, 1964. (Schriften d. deutschen Palästina-Institut, nos. 9, 10; Beiträge z. Forderung Christlicher Theologie, ser. 2, Sammlung Wissenschaftlichen Monographien, nos. 41, 48.)
- DANA, E. S. (1). *A Textbook of Mineralogy, with an Extended Treatise on Crystallography and Physical Mineralogy*. 4th ed. rev. & enlarged by W. E. Ford. Wiley, New York, 1949.
- DARMSTÄDTER, E. (1) (tr.). *Die Alchemie des Geber* [containing *Summa Perfectionis, Liber de Investigatione Perfectionis, Liber de Inventione Veritatis, Liber Fornacum, and Testamentum Geberis*, in German translation]. Springer, Berlin, 1922. Rev. J. Ruska, *ISIS*, 1923, 5, 451.
- DAS, M. N. & GASTAUT, H. (1). 'Variations de l'Activité électrique du Cerveau, du Coeur et des Muscles Squelettiques au cours de la Méditation et de l'Extase Yogique. Art. in *Conditionnement et Reactivité en Electro-encéphalographie*, ed. Fischgold & Gastaut (1). Masson, Paris, 1957, pp. 211 ff.
- DASGUPTA, S. N. (3). *A Study of Patañjali*. University Press, Calcutta, 1920.
- DASGUPTA, S. N. (4). *Yoga as Philosophy and Religion*. London, 1924.
- DAUBRÉE, A. (1). 'La Génération des Minéraux dans la Pratique des Mineurs du Moyen Age d'après le "Bergbüchlein".' *JS*, 1890, 379, 441.
- DAUMAS, M. (5). 'La Naissance et le Développement de la Chimie en Chine.' *SET*, 1949, 6, 11.
- DAVENPORT, JOHN (1), ed. A. H. Walton. *Aphrodisiacs and Love Stimulants, with other chapters on the Secrets of Venus; being the two books by John Davenport entitled 'Aphrodisiacs and Anti-Aphrodisiacs' [London, pr. pr. 1869, but not issued till 1873] and 'Curiositates Eroticae Physiologiae; or, Tabooed Subjects Freely Treated' [London, pr. pr. 1875]; now for the first time edited, with Introduction and Notes [and the omission of the essays 'On Generation' and 'On Death' from the second work] by A.H.W. . . . Lyle Stuart, New York, 1966.*
- DAVID, SIR PERCIVAL (3). *Chinese Connoisseurship; the 'Ko Ku Yao Lum' [+1388], (Essential Criteria of Antiquities)—a Translation made and edited by Sir P. D. . . . with a Facsimile of the Chinese Text*. Faber & Faber, London, 1971.
- DAVIDSON, J. W. (1). *The Island of Formosa, past and present*. Macmillan, London, 1903.
- DAVIES, D. (1). 'A Shangri-La in Ecuador.' *NS*, 1973, 57, 236. On super-centenarians, especially in the Vilcabamba Valley in the Andes.

- DAVIES, H. W., HALDANE, J. B. S. & KENNAWAY, E. L. (1). 'Experiments on the Regulation of the Blood's Alkalinity.' *JOP*, 1920, 54, 32.
- DAVIS, TENNEY L. (1). 'Count Michael Maier's Use of the Symbolism of Alchemy.' *JCE*, 1938, 15, 403.
- DAVIS, TENNEY L. (2). 'The Dualistic Cosmogony of Huai Nan Tzu and its Relations to the Background of Chinese and of European Alchemy.' *ISIS*, 1936, 25, 327.
- DAVIS, TENNEY L. (3). 'The Problem of the Origins of Alchemy.' *SM*, 1936, 43, 551.
- DAVIS, TENNEY L. (4). 'The Chinese Beginnings of Alchemy.' *END*, 1943, 2, 154.
- DAVIS, TENNEY L. (5). 'Pictorial Representations of Alchemical Theory.' *ISIS*, 1938, 28, 73.
- DAVIS, TENNEY L. (6). 'The Identity of Chinese and European Alchemical Theory.' *JUS*, 1929, 9, 7.
This paper has not been traceable by us. The reference is given in precise form by Davis & Chhen Kuo-Fu (2), but the journal in question seems to have ceased publication after the end of vol. 8.
- DAVIS, TENNEY L. (7). 'Ko Hung (Pao Phu Tzu), Chinese Alchemist of the +4th Century.' *JCE*, 1934, 11, 517.
- DAVIS, TENNEY L. (8). 'The "Mirror of Alchemy" [*Speculum Alchemiae*] of Roger Bacon, translated into English.' *JCE*, 1931, 8, 1945.
- DAVIS, TENNEY L. (9). 'The Emerald Table of Hermes Trismegistus; Three Latin Versions Current among Later Alchemists.' *JCE*, 1926, 3, 863.
- DAVIS, TENNEY L. (10). 'Early Chinese Rockets.' *TR*, 1948, 51, 101, 120, 122.
- DAVIS, TENNEY L. (11). 'Early Pyrotechnics; I, Fire for the Wars of China, II, Evolution of the Gun, III, Early Warfare in Ancient China.' *ORD*, 1948, 33, 52, 180, 396.
- DAVIS, TENNEY L. (12). 'Huang Ti, Legendary Founder of Alchemy.' *JCE*, 1934, 11, (635).
- DAVIS, TENNEY L. (13). 'Liu An, Prince of Huai-Nan.' *JCE*, 1935, 12, (1).
- DAVIS, TENNEY L. (14). 'Wei Po-Yang, Father of Alchemy.' *JCE*, 1935, 12, (51).
- DAVIS, TENNEY L. (15). 'The Cultural Relationships of Explosives.' *NFR*, 1944, 1, 11.
- DAVIS, TENNEY L. (16) (tr.). *Roger Bacon's Letter concerning the Marvellous Power of Art and Nature, and concerning the Nullity of Magic. . . with Notes and an Account of Bacon's Life and Work*. Chem. Pub. Co., Easton, Pa. 1923. Cf. T. M[oufett] (1659).
- DAVIS, TENNEY L. See Wu Lu-Chhiang & Davis.
- DAVIS, TENNEY L. & CHAO YÜN-TSHUNG (1). 'An Alchemical Poem by Kao Hsiang-Hsien [+ 14th cent.]'. *ISIS*, 1939, 30, 236.
- DAVIS, TENNEY L. & CHAO YÜN-TSHUNG (2). 'The Four-hundred Word *Chin Tan* of Chang Po-Tuan [+ 11th cent.]'. *PAAAS*, 1940, 73, 371.
- DAVIS, TENNEY L. & CHAO YÜN-TSHUNG (3). 'Three Alchemical Poems by Chang Po-Tuan.' *PAAAS*, 1940, 73, 377.
- DAVIS, TENNEY L. & CHAO YÜN-TSHUNG (4). 'Shih Hsing-Lin, disciple of Chang Po-Tuan [+ 11th cent.] and Hsieh Tao-Kuang, disciple of Shih Hsing-Lin.' *PAAAS*, 1940, 73, 381.
- DAVIS, TENNEY L. & CHAO YÜN-TSHUNG (5). 'The Secret Papers in the Jade Box of Chhing-Hua.' *PAAAS*, 1940, 73, 385.
- DAVIS, TENNEY L. & CHAO YÜN-TSHUNG (6). 'A Fifteenth-century Chinese Encyclopaedia of Alchemy.' *PAAAS*, 1940, 73, 391.
- DAVIS, TENNEY L. & CHAO YÜN-TSHUNG (7). 'Chang Po-Tuan of Thien-Thai; his *Wu Chen Phien* (Essay on the Understanding of the Truth); a Contribution to the Study of Chinese Alchemy.' *PAAAS*, 1939, 73, 97.
- DAVIS, TENNEY L. & CHAO YÜN-TSHUNG (8). 'Chang Po-Tuan, Chinese Alchemist of the + 11th Century.' *JCE*, 1939, 16, 53.
- DAVIS, TENNEY L. & CHAO YÜN-TSHUNG (9). 'Chao Hsüeh-Min's Outline of Pyrotechnics [*Huo Hsi Lüeh*]; a Contribution to the History of Fireworks.' *PAAAS*, 1943, 75, 95.
- DAVIS, TENNEY L. & CHHEN KUO-FU (1) (tr.). 'The Inner Chapters of *Pao Phu Tzu*.' *PAAAS*, 1941, 74, 297. [Transl. of chs. 8 and 11; précis of the remainder.]
- DAVIS, TENNEY L. & CHHEN KUO-FU (2). 'Shang Yang Tzu, Taoist writer and commentator on Alchemy.' *HYAS*, 1942, 7, 126.
- DAVIS, TENNEY L. & NAKASEKO ROKURO (1). 'The Tomb of Jofuku [Hsü Fu] or Joshi [Hsü Shih]; the Earliest Alchemist of Historical Record.' *AX*, 1937, 1, 109, ill. *JCE*, 1947, 24, (415).
- DAVIS, TENNEY L. & NAKASEKO ROKURO (2). 'The Jofuku [Hsü Fu] Shrine at Shingu; a Monument of Earliest Alchemy.' *NU*, 1937, 15 (no. 3), 60, 67.
- DAVIS, TENNEY L. & WARE, J. R. (1). 'Early Chinese Military Pyrotechnics.' *JCE*, 1947, 24, 522.
- DAVIS, TENNEY L. & WU LU-CHHIANG (1). 'Ko Hung on the Yellow and the White.' *JCE*, 1936, 13, 215.
- DAVIS, TENNEY L. & WU LU-CHHIANG (2). 'Ko Hung on the Gold Medicine.' *JCE*, 1936, 13, 103.
- DAVIS, TENNEY L. & WU LU-CHHIANG (3). 'Thao Hung-Chhing.' *JCE*, 1932, 9, 859.
- DAVIS, TENNEY L. & WU LU-CHHIANG (4). 'Chinese Alchemy.' *SM*, 1930, 31, 225. Chinese tr. by Chhen Kuo-Fu in *HHS*, 1936, 3, 771.

- DAVIS, TENNEY L. & WU LU-CHHIANG (5). 'The Advice of Wei Po-Yang to the Worker in Alchemy.' *NU*, 1931, **8**, 115, 117. Repr. *DB*, 1935, **8**, 13.
- DAVIS, TENNEY L. & WU LU-CHHIANG (6). 'The Pill of Immortality.' *TR*, 1931, **33**, 383.
- DAWKINS, J. M. (1). *Zinc and Spelter; Notes on the Early History of Zinc from Babylon to the +18th Century, compiled for the Curious*. Zinc Development Association, London, 1950. Repr. 1956.
- DEANE, D. V. (1). 'The Selection of Metals for Modern Coinages.' *CUNOB*, 1969, no. 15, 29.
- DEBUS, A. G. (1). *The Chemical Dream of the Renaissance*. Heffer, Cambridge, 1968. (Churchill College Overseas Fellowship Lectures, no. 3.)
- DEBUS, A. G. (2). Introduction to the facsimile edition of Elias Ashmole's *Theatrum Chemicum Britannicum* (1652). Johnson, New York and London, 1967. (Sources of Science ser., no. 39.)
- DEBUS, A. G. (3). 'Alchemy and the Historian of Science.' (An essay-review of C. H. Josten's *Elias Ashmole*.) *HOSC*, 1967, **6**, 128.
- DEBUS, A. G. (4). 'The Significance of the History of Early Chemistry.' *JWH*, 1965, **9**, 39.
- DEBUS, A. G. (5). 'Robert Fludd and the Circulation of the Blood.' *JHMAS*, 1961, **16**, 374.
- DEBUS, A. G. (6). 'Robert Fludd and the Use of Gilbert's *De Magnete* in the Weapon-Salve Controversy.' *JHMAS*, 1964, **19**, 389.
- DEBUS, A. G. (7). 'Renaissance Chemistry and the Work of Robert Fludd.' *AX*, 1967, **14**, 42.
- DEBUS, A. G. (8). 'The Sun in the Universe of Robert Fludd.' Art. in *Le Soleil à la Renaissance; Sciences et Mythes*, Colloque International, April 1963, Brussels, 1965, p. 261.
- DEBUS, A. G. (9). 'The Aerial Nitre in the +16th and early +17th Centuries.' Communication to the Xth International Congress of the History of Science, Ithaca, N.Y. 1962. In *Communications*, p. 835.
- DEBUS, A. G. (10). 'The Paracelsian Aerial Nitre.' *ISIS*, 1964, **55**, 43.
- DEBUS, A. G. (11). 'Mathematics and Nature in the Chemical Texts of the Renaissance.' *AX*, 1968, **15**, 1.
- DEBUS, A. G. (12). 'An Elizabethan History of Medical Chemistry' [R. Bostocke's *Difference between the Ancient Physicke . . . and the Latter Physicke*, +1585]. *ANS*, 1962, **18**, 1.
- DEBUS, A. G. (13). 'Solution Analyses Prior to Robert Boyle.' *CHYM*, 1962, **8**, 41.
- DEBUS, A. G. (14). 'Fire Analysis and the Elements in the Sixteenth and Seventeenth Centuries.' *ANS*, 1967, **23**, 127.
- DEBUS, A. G. (15). 'Sir Thomas Browne and the Study of Colour Indicators.' *AX*, 1962, **10**, 29.
- DEBUS, A. G. (16). 'Palissy, Plat, and English Agricultural Chemistry in the Sixteenth and Seventeenth Centuries.' *A/IIHS*, 1968, **21** (nos. 82-3), 67.
- DEBUS, A. G. (17). 'Gabriel Plattes and his Chemical Theory of the Formation of the Earth's Crust.' *AX*, 1961, **9**, 162.
- DEBUS, A. G. (18). *The English Paracelsians*. Oldbourne, London, 1965; Watts, New York, 1966. Rev. W. Pagel, *HOSC*, 1966, **5**, 100.
- DEBUS, A. G. (19). 'The Paracelsian Compromise in Elizabethan England.' *AX*, 1960, **8**, 71.
- DEBUS, A. G. (20) (ed.). *Science, Medicine and Society in the Renaissance; Essays to honour Walter Pagel*. 2 vols. Science History Pubs (Neale Watson), New York, 1972.
- DEBUS, A. G. (21). 'The Medico-Chemical World of the Paracelsians.' Art. in *Changing Perspectives in the History of Science*, ed. M. Teich & R. Young (1), p. 85.
- DEDEKIND, A. (1). *Ein Beitrag zur Purpurkunde*. 1898.
- DEGERING, H. (1). 'Ein Alkoholrezept aus dem 8. Jahrhundert.' [The earliest version of the *Mappae Clavicula*, now considered c. +820.] *SPAW/PH*, 1917, **36**, 503.
- DELZA, S. (1). *Body and Mind in Harmony; Thai Chi Chhüan (Wu Style), an Ancient Chinese Way of Exercise*. McKay, New York, 1961.
- DEMIÉVILLE, P. (2). Review of Chang Hung-Chao (1), *Lapidarium Sincicum*. *BEFEO*, 1924, **24**, 276.
- DEMIÉVILLE, P. (8). 'Momies d'Extrême-Orient.' *JIS*, 1965, **144**.
- DENIEL, P. L. (1). *Les Boissons Alcooliques Sino-Vietnamiennes*. Inaug. Diss. Bordeaux, 1954. (Printed Dong-nam-a, Saigon).
- DENNELL, R. (1). 'The Hardening of Insect Cuticles.' *BR*, 1958, **33**, 178.
- DEONNA, W. (2). 'Le Trésor des Fins d'Annecy.' *RA*, 1920 (5^e sér), **11**, 112.
- DEONNA, W. (3). 'Ouroboros.' *AA*, 1952, **15**, 163.
- DEVASTHALI, G. V. (1). *The Religion and Mythology of the Brāhmanas with particular reference to the 'Satapatha-brāhmaṇa'*. Univ. of Poona, Poona, 1965. (Bhau Vishnu Ashtekar Vedic Research series, no. 1.)
- DEVÉRIA, G. (1). 'Origine de l'Islamisme en Chine; deux Légendes Mussulmanes Chinoises; Pelérinages de Ma Fou-Tch'ou.' In *Volume Centenaire de l'Ecole des Langues Orientales Vivantes, 1795-1895*. Leroux, Paris, 1895, p. 305.
- DEY, K. L. (1). *Indigenous Drugs of India*. 2nd ed. Thacker & Spink, Calcutta, 1896.
- DEYSSON, G. (1). 'Hallucinogenic Mushrooms and Psilocybine.' *PRPH*, 1960, **15**, 27.

- DIELS, H. (1). *Antike Technik*. Teubner, Leipzig and Berlin, 1914; enlarged 2nd ed. 1920 (rev. B. Laufer, *AAN*, 1917, 19, 71). Photolitho reproduction, Zeller, Osnabrück, 1965.
- DIELS, H. (3). 'Die Entdeckung des Alkohols.' *APAW/PH*, 1913, no. 3, 1-35.
- DIELS, H. (4). 'Etymologica' (incl. 2. *χημεία*). *ZVSF*, 1916 (NF), 47, 193.
- DIELS, H. (5). *Fragmente der Vorsokratiker*. 7th ed., ed. W. Kranz. 3 vols.
- DIERGART, P. (1) (ed.). *Beiträge aus der Geschichte der Chemie dem Gedächtnis v. Georg W. A. Kahlbaum*. . . Deuticke, Leipzig and Vienna, 1909.
- DIHLE, A. (2). 'Neues zur Thomas-Tradition.' *JAC*, 1963, 6, 54.
- DILLENBERGER, J. (1). *Protestant Thought and Natural Science; a Historical Interpretation*. Collins, London, 1961.
- DIMIER, L. (1). *L'Art d'Enduminure*. Paris, 1927.
- DINDORF, W. See John Malala and Syncellos, Georgius.
- DIVERS, E. (1). 'The Manufacture of Calomel in Japan.' *JSCI*, 1894, 13, 108. Errata, p. 473.
- DIXON, H. B. F. (1). 'The Chemistry of the Pituitary Hormones.' Art. in *The Hormones*. . . ed. G. Pincus, K. V. Thimann & E. B. Astwood. Academic Press, New York, 1948-64, vol. 5, p. 1.
- DOBBS, B. J. (1). 'Studies in the Natural Philosophy of Sir Kenelm Digby.' *AX*, 1971, 18, 1.
- DODWELL, C. R. (1) (ed. & tr.). *Theophilus [Presbyter]; De Diversis Artibus (The Various Arts)* [probably by Roger of Helmarshausen, c. + 1130]. Nelson, London, 1961.
- DOHI KEIZO (1). 'Medicine in Ancient Japan; A Study of Some Drugs preserved in the Imperial Treasure House at Nara.' In *Zoku Shōshōin Shiron*, 1932, no. 15, Neiyaku. 1st pagination, p. 113.
- DONDAINE, A. (1). 'La Hierarchie Cathare en Italie.' *AFP*, 1950, 20, 234.
- DOOLITTLE, J. (1). *A Vocabulary and Handbook of the Chinese Language*. 2 vols. Rozario & Marcal, Fuchow, 1872.
- DORESSE, J. (1). *Les Livres Secrets des Gnostiques d'Égypte*. Plon, Paris, 1958-.
- Vol. 1. *Introduction aux Écrits Gnostiques Coptes découverts à Khénoboskion*.
- Vol. 2. 'L'Évangile selon Thomas', ou 'Les Paroles Secrètes de Jésus'.
- Vol. 3. 'Le Livre Secret de Jean'; 'l'Hypostase des Archontes' ou 'Livre de Nôrea'.
- Vol. 4. 'Le Livre Sacré du Grand Esprit Invisible' ou 'Évangile des Égyptiens'; 'l'Épître d'Eugnoste le Bienheureux'; 'La Sagesse de Jésus'.
- Vol. 5 'L'Évangile selon Philippe.'
- DORFMAN, R. I. & SHIPLEY, R. A. (1). *Androgens; their Biochemistry, Physiology and Clinical Significance*. Wiley, New York and Chapman & Hall, London, 1956.
- DOUGLAS, R. K. (2). *Chinese Stories*. Blackwood, Edinburgh and London, 1883. (Collection of translations previously published in *Blackwood's Magazine*.)
- DOUTHWAITE, A. W. (1). 'Analyses of Chinese Inorganic Drugs.' *CMJ*, 1890, 3, 53.
- DOZY, R. P. A. & ENGELMANN, W. H. (1). *Glossaire des Mots Espagnols et Portugais dérivés de l'Arabe*. 2nd ed. Brill, Leiden, 1869.
- DOZY, R. P. A. & DE GOEJE, M. J. (2). *Nouveaux Documents pour l'Étude de la Religion des Harrâniens*. Actes du 6e Congr. Internat. des Orientalistes, Leiden, 1883, 1885, vol. 2, pp. 281 ff., 341 ff.
- DRAKE, N. F. (1). 'The Coal Fields of North-East China.' *TAIME*, 1901, 31, 492, 1008.
- DRAKE, N. F. (2). 'The Coal Fields around Tsé-Chou, Shansi.' *TAIME*, 1900, 30, 261.
- DRONKE, P. (1). 'L'Amor che Move il Sole e l'Altre Stelle.' *STM*, 1965 (3th ser.), 6, 389.
- DRONKE, P. (2). 'New Approaches to the School of Chartres.' *AEM*, 1969, 6, 117.
- DRUCE, G. C. (1). 'The Ant-Lion.' *ANTY*, 1923, 3, 347.
- DU, Y., JIANG, R. & TSOU, C. (1). See Tu Yü-Tshang, Chiang Jung-Chhing & Tsou Chhêng-Lu (1).
- DUBLER, C. E. (1). *La 'Materia Medica' de Dioscorides; Transmission Medieval y Renacentista*. 5 vols. Barcelona, 1955.
- DUBS, H. H. (4). 'An Ancient Chinese Stock of Gold [Wang Mang's Treasury].' *JEH*, 1942, 2, 36.
- DUBS, H. H. (5). 'The Beginnings of Alchemy.' *ISIS*, 1947, 38, 62.
- DUBS, H. H. (34). 'The Origin of Alchemy.' *AX*, 1961, 9, 23. Crit. abstr. J. Needham, *RBS*, 1968, 7, no. 755.
- DUCKWORTH, C. W. (1). 'The Discovery of Oxygen.' *CN*, 1886, 53, 250.
- DUDGEON, J. (1). 'Kung-Fu, or Medical Gymnastics.' *JPOS*, 1895, 3 (no. 4), 341-565.
- DUDGEON, J. (2). 'The Beverages of the Chinese' (on tea and wine). *JPOS*, 1895, 3, 275.
- DUDGEON, J. (4). '[Glossary of Chinese] Photographic Terms', in Doolittle (1), vol. 2, p. 518.
- DUHR, J. (1). *Un Jésuite en Chine, Adam Schall*. Desclée de Brouwer, Paris, 1936. Engl. adaptation by R. Attwater, *Adam Schall, a Jesuit at the Court of China, 1592 to 1666*. Geoffrey Chapman, London, 1963. Not very reliable sinologically.
- DUNCAN, A. M. (1). 'The Functions of Affinity Tables and Lavoisier's List of Elements.' *AX*, 1970, 17, 28.
- DUNCAN, A. M. (2). 'Some Theoretical Aspects of Eighteenth-Century Tables of Affinity.' *ANS*, 1962, 18, 177, 217.

- DUNCAN, E. H. (1). 'Jonson's "Alchemist" and the Literature of Alchemy.' *PMLA*, 1946, **61**, 699.
- DUNLOP, D. M. (5). 'Sources of Silver and Gold in Islam according to al-Hamdānī (+10th century).' *SI*, 1957, **8**, 29.
- DUNLOP, D. M. (6). *Arab Civilisation to A.D. 1500*. Longman, London and Librairie du Liban, Beirut, 1971.
- DUNLOP, D. M. (7). *Arabic Science in the West*. Pakistan Historical Soc., Karachi, 1966. (Pakistan Historical Society Pubs. no. 35.)
- DUNLOP, D. M. (8). 'Theodoretus-Adhrifūs.' Communication to the 26th International Congress of Orientalists, New Delhi, 1964. Summaries of papers, p. 328.
- DÜNTZER, H. (1). *Life of Goethe*. 2 vols. Macmillan, London, 1883.
- DÜRING, H. I. (1). 'Aristotle's Chemical Treatise, *Meteorologica* Bk. IV, with Introduction and Commentary.' *GHA*, 1944 (no. 2), 1-112. Sep. pub., Elander, Göteborg, 1944.
- DURRANT, P. J. (1). *General and Inorganic Chemistry*. 2nd ed. repr. Longmans Green, London, 1956.
- DUVEEN, D. I. & WILLEMART, A. (1). 'Some +17th-Century Chemists and Alchemists of Lorraine.' *CHYM*, 1949, **2**, 111.
- DUYVENDAK, J. J. L. (18) (tr.). '*Tao Tê Ching*', the *Book of the Way and its Virtue*. Murray, London, 1954 (Wisdom of the East Series). Crit. revs. P. Demiéville, *TP*, 1954, **43**, 95; D. Bodde, *JAOS*, 1954, **74**, 211.
- DUYVENDAK, J. J. L. (20). 'A Chinese *Divina Commedia*.' *TP*, 1952, **41**, 255. (Also sep. pub. Brill, Leiden, 1952.)
- DYSON, G. M. (1). 'Antimony in Pharmacy and Chemistry; I, History and Occurrence of the Element; II, The Metal and its Inorganic Compounds; III, The Organic Antimony Compounds in Therapy.' *PJ*, 1928, **121** (4th ser. 67), 397, 520.
- EBELING, E. (1). 'Mittelassyrische Rezepte zur Bereitung (Herstellung) von wohlriechenden Salben.' *ORR*, 1948 (n.s.) **17**, 129, 299; 1949, **18**, 404; 1950, **19**, 265.
- ECKERMANN, J. P. (1). *Gespräche mit Goethe*. 3 vols. Vols. 1 and 2, Leipzig, 1836. Vol. 3, Magdeburg, 1848. Eng. tr. 2 vols. by J. Oxenford, London, 1850. Abridged ed. *Conversations of Goethe with Eckermann*, Dent, London, 1930. Ed. J. K. Moorhead, with introduction by Havelock Ellis.
- EDKINS, J. (17). 'Phases in the Development of Taoism.' *JRAS/NCB*, 1855 (1st ser.), **5**, 83.
- EDKINS, J. (18). 'Distillation in China.' *CR*, 1877, **6**, 211.
- EFRON, D. H., HOLMSTEDT, BO & KLINE, N. S. (1) (ed.). *The Ethno-pharmacological Search for Psychoactive Drugs*. Washington, D.C. 1967. (Public Health Service Pub. no. 1645.) Proceedings of a Symposium, San Francisco, 1967.
- EGERTON, F. N. (1). 'The Longevity of the Patriarchs; a Topic in the History of Demography.' *JHI*, 1966, **27**, 575.
- EGGELING, J. (1) (tr.). *The 'Satapatha-brāhmaṇa' according to the Text of the Mādhyandina School*. 5 vols. Oxford, 1882-1900 (*SBE*, nos. 12, 26, 41, 43, 44). Vol. 1 repr. Motilal Banarsidass, Delhi, 1963.
- EGLOFF, G. & LOWRY, C. D. (1). 'Distillation as an Alchemical Art.' *JCE*, 1930, **7**, 2063.
- EICHHOLZ, D. E. (1). 'Aristotle's Theory of the Formation of Metals and Minerals.' *CQ*, 1949, **43**, 141.
- EICHHOLZ, D. E. (2). *Theophrastus 'De Lapidibus'*. Oxford, 1964.
- EICHHORN, W. (6). 'Bemerkung z. Einführung des Zölibats für Taoisten.' *RSO*, 1955, **30**, 297.
- EICHHORN, W. (11) (tr.). *The Fei-Yen Wai Chuan*, with some notes on the *Fei-Yen Pieh Chuan*. Art. in *Eduard Erkes in Memoriam 1891-1958*, ed. J. Schubert. Leipzig, 1962. Abstr. *TP*, 1963, **50**, 285.
- EISLER, R. (4). 'l'Origine Babylonienne de l'Alchimie; à propos de la Découverte Récente de Récettes Chimiques sur Tablettes Cunéiformes.' *RSH*, 1926, **41**, 5. Also *CHZ*, 1926 (nos. 83 and 86); *ZASS*, 1926, 1.
- ELIADE, MIRCEA (1). *Le Mythe de l'Éternel Retour; Archétypes et Répétition*. Gallimard, Paris, 1949. Eng. tr. by W. R. Trask, *The Myth of the Eternal Return*. Routledge & Kegan Paul, London, 1955.
- ELIADE, MIRCEA (4). 'Metallurgy, Magic and Alchemy.' *Z*, 1938, **1**, 85.
- ELIADE, MIRCEA (5). *Forgerons et Alchimistes*. Flammarion, Paris, 1956. Eng. tr. S. Corrin, *The Forge and the Crucible*. Harper, New York, 1962. Rev. G. H[eym], *AX*, 1957, **6**, 109.
- ELIADE, MIRCEA (6). *Le Yoga, Immortalité et Liberté*. Payot, Paris, 1954. Eng. tr. by W. R. Trask. Pantheon, New York, 1958.
- ELIADE, MIRCEA (7). *Images and Symbols; Studies in Religious Symbolism*. Tr. from the French (Gallimard, Paris, 1952) by P. Mairet. Harvill, London, 1961.
- ELIADE, M. (8). 'The Forge and the Crucible: a Postscript.' *HOR*, 1968, **8**, 74-88.
- ELLINGER, T. U. H. (1). *Hippocrates on Intercourse and Pregnancy; an English Translation of 'On Semen' and 'On the Development of the Child'*. With introd. and notes by A. F. Guttmacher. Schuman, New York, 1952.
- ELLIS, G. W. (1). 'A Vacuum Distillation Apparatus.' *CHIND*, 1934, **12**, 77 (*JSCI*, **53**).

- ELLIS, W. (1). *History of Madagascar*. 2 vols. Fisher, London and Paris, 1838.
- VON ENGSTRÖM, G. (1). 'Pak-fong, a White Chinese Metal' (in Swedish). *KSVA/H*, 1776, 37, 35.
- VON ENGSTRÖM, G. (2). 'Försök på Förnt omtalle Salt eller Kien [chien]'. *KSVA/H*, 1772, 33, 172. Cf. Abrahamssohn (1).
- D'ENTRECOLLES, F. X. (1). *Lettre au Père Duhalde* (on alchemy and various Chinese discoveries in the arts and sciences, porcelain, artificial pearls and magnetic phenomena) dated 4 Nov. 1734. *LEC*, 1781, vol. 22, pp. 91 ff.
- D'ENTRECOLLES, F. X. (2). *Lettre au Père Duhalde* (on botanical subjects, fruits and trees, including the persimmon and the lichi; on medicinal preparations isolated from human urine; on the use of the magnet in medicine; on the feathery substance of willow seeds; on camphor and its sublimation; and on remedies for night-blindness) dated 8 Oct. 1736. *LEC*, 1781, vol. 22, pp. 193 ff.
- ST EPHRAIM OF SYRIA [d. +373]. *Discourses to Hypatius* [against the Theology of Mani, Marcion and Bardaisan]. See Mitchell, C. W. (1).
- EPHRAIM, F. (1). *A Textbook of Inorganic Chemistry*. Eng. tr. P. C. L. Thorne. Gurney & Jackson, London, 1926.
- ERCKER, L. (1). *Beschreibung Allefürnemsten Mineralischem Ertzt und Berckwercks Arten...* Prague, 1574. 2nd ed. Frankfurt, 1580. Eng. tr. by Sir John Pettus, as *Fleta Minor, or, the Laws of Art and Nature, in Knowing, Judging, Assaying, Fining, Refining and Inlarging the Bodies of confin'd Metals...* Dawks, London, 1683. See Sisco & Smith (1); Partington (7), vol. 2, pp. 104 ff.
- ERKES, E. (1) (tr.). 'Das Weltbild d. Huai Nan Tzu.' (Transl. of ch. 4.) *OAZ*, 1918, 5, 27.
- ERMAN, A. & GRAPOW, H. (1). *Wörterbuch d. Aegyptische Sprache*. 7 vols. (With *Belegstellen*, 5 vols. as supplement.) Hinrichs, Leipzig, 1926-.
- ERMAN, A. & GRAPOW, H. (2). *Aegyptisches Handwörterbuch*. Reuther & Reichard, Berlin, 1921.
- ERMAN, A. & RANKE, H. (1). *Aegypten und aegyptisches Leben in Altertum*. Tübingen, 1923.
- ESSIG, E. O. (1). *A College Entomology*. Macmillan, New York, 1942.
- ESTIENNE, H. (1) (Henricus Stephanus). *Thesaurus Graecae Linguae*. Geneva, 1572; re-ed. Hase, de Sinner & Fix, 8 vols. Didot, Paris, 1831-65.
- ETHÉ, H. (1) (tr.). *Zakariya ibn Muḥ. ibn Maḥmūd al-Qazwīnī's Kosmographie; Die Wunder der Schöpfung* [c. +1275]. Fues (Reisland), Leipzig, 1868. With notes by H. L. Fleischer. Part I only; no more published.
- EUGSTER, C. H. (1). 'Brève Revue d'Ensemble sur la Chimie de la Muscarine.' *RMY*, 1959, 24, 1.
- EUONYMUS PHILIATER. See Gesner, Conrad.
- EVOLA, J. (G. C. E.) (1). *La Tradizione Ermetica*. Bari, 1931. 2nd ed. 1948.
- EVOLA, J. (G. C. E.) (2). *Lo Yoga della Potenza, saggio sui Tantra*. Bocca, Milan, 1949. Orig. pub. as *L'Uomo come Potenza*.
- EVOLA, J. (G. C. E.) (3). *Metafisica del Sesso*. Atanòr, Rome, 1958.
- EWING, A. H. (1). *The Hindu Conception of the Functions of Breath; a Study in early Indian Psychophysics*. Inaug. Diss. Johns Hopkins University, Baltimore, 1901; and in *JAOs*, 1901, 22 (no. 2).
- FABRE, M. (1). *Pékin, ses Palais, ses Temples, et ses Environs*. Librairie Française, Tientsin, 1937.
- FABRICIUS, J. A. (1). *Bibliotheca Graeca...* Edition of G. C. Harles, 12 vols. Bohn, Hamburg, 1808.
- FABRICIUS, J. A. (2). *Codex Pseudepigraphicus Veteris Testamenti, Collectus, Castigatus, Testimoniisque Censuris et Animadversionibus Illustratus*. 3 vols. Felginer & Bohn, Hamburg, 1722-41.
- FABRICIUS, J. A. (3). *Codex Apocryphus Novi Testamenti, Collectus, Castigatus, Testimoniisque Censuris et Animadversionibus Illustratus*. 3 vols. in 4. Schiller & Kisner, Hamburg, 1703-19.
- FARABEE, W. C. (1). 'A Golden Hoard from Ecuador.' *MUJ*, 1912.
- FARABEE, W. C. (2). 'The Use of Metals in Prehistoric America.' *MUJ*, 1921.
- FARNWORTH, M., SMITH, C. S. & RODDA, J. L. (1). 'Metallographic Examination of a Sample of Metallic Zinc from Ancient Athens.' *HE*, 1949, 8 (Suppl.) 126. (Commemorative Studies in Honour of Theodore Leslie Shear.)
- FEDCHINA, V. N. (1). 'The + 13th-century Chinese Traveller, [Chhiu] Chhang-Chhun' (in Russian), in *Iz Istorii Nauki i Tekhniki Kitaya* (Essays in the History of Science and Technology in China), p. 172. Acad. Sci. Moscow, 1955.
- FEHL, N. E. (1). 'Notes on the Lü Hsing [chapter of the *Shu Ching*]; proposing a Documentary Theory.' *CCJ*, 1969, 9 (no. 1), 10.
- FEIFEL, E. (1) (tr.). 'Pao Phu Tzu (Nei Phien), chs. 1-3.' *MS*, 1941, 6, 113.
- FEIFEL, E. (2) (tr.). 'Pao Phu Tzu (Nei Phien), ch. 4.' *MS*, 1944, 9, 1.
- FEIFEL, E. (3) (tr.). 'Pao Phu Tzu (Nei Phien), ch. 11, Translated and Annotated.' *MS*, 1946, 11 (no. 1), 1.
- FEISENBERGER, H. A. (1). 'The [Personal] Libraries of Newton, Hooke and Boyle.' *NRRS*, 1966, 21, 42.
- FÈNG CHIA-LO & COLLIER, H. B. (1). 'A Sung-Dynasty Alchemical Treatise; the "Outline of Alchemical Preparations" [*Tan Fang Chien Yuan*], by Tuku Thao [+10th cent.]' *JWCBS*, 1937, 9, 199.

- FÈNG HAN-CHI (H. Y. Fèng) & SHRYOCK, J. K. (2). 'The Black Magic in China known as Ku.' *J.AOS*, 1935, **65**, 1. Sep. pub. Amer. Oriental Soc. Offprint Ser. no. 5.
- FERCHL, F. & SÜSSENGUTH, A. (1). *A Pictorial History of Chemistry*. Heinemann, London, 1939.
- FERDY, H. (1). *Zur Verhütung der Conception*. 1900.
- FERGUSON, JOHN (1). *Bibliotheca Chemica; a Catalogue of the Alchemical, Chemical and Pharmaceutical Books in the Collection of the late James Young of Kelly and Durriss*. . . 2 vols. Maclellan, Glasgow, 1906.
- FERGUSON, JOHN (2). *Bibliographical Notes on Histories of Inventions and Books of Secrets*. 2 vols. Glasgow, 1898; repr. Holland Press, London, 1959. (Papers collected from *T.G.A.S.*)
- FERGUSON, JOHN (3). 'The "Marrow of Alchemy" [1654-5].' *JALCHS*, 1915, **3**, 106.
- FERRAND, G. (1). *Relations de Voyages et Textes Géographiques Arabes, Persans et Turcs relatifs à l'Extrême Orient, du 8^e au 18^e siècles, traduits, revus et annotés etc.* 2 vols. Leroux, Paris, 1913.
- FERRAND, G. (2) (tr.). *Voyage du marchand Sulaymân en Inde et en Chine rédigé en +851; suivi de remarques par Abû Zayd Hasan (vers +916)*. Bossard, Paris, 1922.
- FESTER, G. (1). *Die Entwicklung der chemischen Technik, bis zu den Anfängen der Grossindustrie*. Berlin, 1923. Repr. Sändig, Wiesbaden, 1969.
- FESTUGIÈRE, A. J. (1). *La Révélation d'Hermès Trismégiste, I. L'Astrologie et les Sciences Occultes*. Gabalda, Paris, 1944. Rev. J. Filliozat, *J.A.*, 1944, **234**, 349.
- FESTUGIÈRE, A. J. (2). 'L'Hermétisme.' *KHVL*, 1948, no. 1, 1-58.
- FIERZ-DAVID, H. E. (1). *Die Entwicklungsgeschichte der Chemie*. Birkhauser, Basel, 1945. (Wissenschaft und Kultur ser., no. 2.) Crit. E. J. Holmyard, *N*, 1946, **158**, 643.
- FIESER, L. F. & FIESER, M. (1). *Organic Chemistry*. Reinhold, New York; Chapman & Hall, London, 1956.
- FIGUIER, L. (1). *L'Alchimie et les Alchimistes; ou, Essai Historique et Critique sur la Philosophie Hermétique*. Lecou, Paris, 1854. 2nd ed. Hachette, Paris, 1856. 3rd ed. 1860.
- FIGUROVSKY, N. A. (1). 'Chemistry in Ancient China, and its Influence on the Progress of Chemical Knowledge in other Countries' (in Russian). Art. in *Iz Istorii Nauki i Tehniki Kitaya*. Moscow, 1955, p. 110.
- FILLIOZAT, J. (1). *La Doctrine Classique de la Médecine Indienne*. Imp. Nat., CNRS and Geuthner, Paris, 1949.
- FILLIOZAT, J. (2). 'Les Origines d'une Technique Mystique Indienne.' *RP*, 1946, **136**, 208.
- FILLIOZAT, J. (3). 'Taoïsme et Yoga.' *DVN*, 1949, **3**, 1.
- FILLIOZAT, J. (5). Review of Festugière (1). *J.A.*, 1944, **234**, 349.
- FILLIOZAT, J. (6). 'La Doctrine des Brahmanes d'après St Hippolyte.' *J.A.*, 1945, **234**, 451; *RHR/AMG*, 1945, **128**, 59.
- FILLIOZAT, J. (7). 'L'Inde et les Échanges Scientifiques dans l'Antiquité.' *JWH*, 1953, **1**, 353.
- FILLIOZAT, J. (10). 'Al-Birûni et l'Alchimie Indienne.' Art. in *Al-Birûni Commemoration Volume*. Iran Society, Calcutta, 1958, p. 101.
- FILLIOZAT, J. (11). Review of P. C. Ray (1) revised edition. *ISIS*, 1958, **49**, 362.
- FILLIOZAT, J. (13). 'Les Limites des Pouvoirs Humains dans l'Inde.' Art. in *Les Limites de l'Humain*. Études Carmelitaines, Paris, 1953, p. 23.
- FISCHER, OTTO (1). *Die Kunst Indiens, Chinas und Japans*. Propylaea, Berlin, 1928.
- FISCHGOLD, H. & GASTAUT, H. (1) (ed.). *Conditionnement et Réactivité en Électro-encéphalographie*. Masson, Paris, 1957. For the Fédération Internationale d'Électro-encéphalographie et de Neurophysiologie Clinique, Report of 5th Colloquium, Marseilles, 1955 (*Electro-encephalography and Clinical Neurophysiology*, Supplement no. 6).
- FLIGHT, W. (1). 'On the Chemical Composition of a Bactrian Coin.' *NC*, 1868 (n.s.), **8**, 305.
- FLIGHT, W. (2). 'Contributions to our Knowledge of the Composition of Alloys and Metal-Work, for the most part Ancient.' *JCS*, 1882, **41**, 134.
- FLORKIN, M. (1). *A History of Biochemistry. Pt. I, Proto-Biochemistry; Pt. II, From Proto-Biochemistry to Biochemistry*. Vol. 30 of *Comprehensive Biochemistry*, ed. M. Florkin & E. H. Stotz. Elsevier, Amsterdam, London and New York, 1972.
- FLUDD, ROBERT (3). *Tractatus Theologo-Philosophicus, in Libros Tres distributus; quorum I, De Vita, II, De Morte, III, De Resurrectione; Cui inseruntur nonnulla Sapientiae Veteris . . . Fragmenta; . . . collecta Fratribusq a Cruce Rosea dictis dedicata à Rudolfo Otreb Britanno*. Oppenheim, 1617.
- FLÜGEL, G. (1) (ed. & tr.). *The 'Fihrist al-'Ulûm' (Index of the Sciences)* [by Abû'l-Faraj ibn abû-Ya'qûb al-Nadîm]. 2 vols. Leipzig, 1871-2.
- FLÜGEL, G. (2) (tr.). *Lexicon Bibliographicum et Encyclopaedicum, a Mustafa ben Abdallah Katib Jelebi dicto et nomine Haji Khalifa celebrato compositum . . . (the Kashf al-Zunûn (Discovery of the Thoughts of Muştafa ibn 'Abdallah Haji Khalifa, or Hajji Khalifa, +17th-century Turkish bibliographer)*. 7 vols. Bentley (for the Or. Tr. Fund Gt. Br. & Ireland), London and Leipzig, 1835-58.
- FOBNAHN, A. (1). 'Chats on Medicine, Myths and Magic from Chinese Classics and Historical Texts.' *JAN*, 1927, **31**, 395.

- FOLEY, M. G. (1) (tr.). *Luigi Galvani: 'Commentary on the Effects of Electricity on Muscular Motion', translated into English...* [from *De Viribus Electricitatis in Motu Musculari Commentarius*, Bologna, +1791]; with *Notes and a Critical Introduction* by I. B. Cohen, together with a *Facsimile...* and a *Bibliography of the Editions and Translations of Galvani's Book prepared by J. F. Fulton & M. E. Stanton*. Burndy Library, Norwalk, Conn. U.S.A. 1954. (Burndy Library Publications, no.10.)
- FORBES, R. J. (3). *Metallurgy in Antiquity; a Notebook for Archaeologists and Technologists*. Brill, Leiden, 1950 (in press since 1942). Rev. V. G. Childe, *A/AlHS*, 1951, 4, 829.
- [FORBES, R. J.] (4a). *Histoire des Bitumes, des Époques les plus Reculées jusqu'à l'an 1800*. Shell, Leiden, n.d.
- FORBES, R. J. (4b). *Bitumen and Petroleum in Antiquity*. Brill, Leiden, 1936.
- FORBES, R. J. (7). 'Extracting, Smelting and Alloying [in Early Times before the Fall of the Ancient Empires].' Art. in *A History of Technology*, ed. C. Singer, E. J. Holmyard & A. R. Hall. vol. 1, p.572. Oxford, 1954.
- FORBES, R. J. (8). 'Metallurgy [in the Mediterranean Civilisations and the Middle Ages].' In *A History of Technology*, ed. C. Singer et al. vol. 2, p. 41. Oxford, 1956.
- FORBES, R. J. (9). *A Short History of the Art of Distillation*. Brill, Leiden, 1948.
- FORBES, R. J. (10). *Studies in Ancient Technology*. Vol. 1, *Bitumen and Petroleum in Antiquity; The Origin of Alchemy; Water Supply*. Brill, Leiden, 1955. (Crit. Lynn White, *ISIS*, 1957, 48, 77.)
- FORBES, R. J. (16). 'Chemical, Culinary and Cosmetic Arts' [in early times to the Fall of the Ancient Empires]. Art. in *A History of Technology*, ed. C. Singer et al. Vol. 1, p. 238. Oxford, 1954.
- FORBES, R. J. (20). *Studies in Early Petroleum History*. Brill, Leiden, 1958.
- FORBES, R. J. (21). *More Studies in Early Petroleum History*, Brill, Leiden, 1959.
- FORBES, R. J. (26). 'Was Newton an Alchemist?' *CHYM*, 1949, 2, 27.
- FORBES, R. J. (27). *Studies in Ancient Technology*. Vol. 7, *Ancient Geology; Ancient Mining and Quarrying; Ancient Mining Techniques*. Brill, Leiden, 1963.
- FORBES, R. J. (28). *Studies in Ancient Technology*. Vol. 8, *Synopsis of Early Metallurgy; Physico-Chemical Archaeological Techniques; Tools and Methods; Evolution of the Smith (Social and Sacred Status); Gold; Silver and Lead; Zinc and Brass*. Brill, Leiden, 1964. A revised version of Forbes (3).
- FORBES, R. J. (29). *Studies in Ancient Technology*. Vol. 9, *Copper; Tin; Bronze; Antimony; Arsenic; Early Story of Iron*. Brill, Leiden, 1964. A revised version of Forbes (3).
- FORBES, R. J. (30). *La Destillation à travers les Ages*. Soc. Belge pour l'Étude du Pétrole, Brussels, 1947.
- FORBES, R. J. (31). 'On the Origin of Alchemy.' *CHYM*, 1953, 4, 1.
- FORBES, R. J. (32). Art. 'Chemic' in *Real-Lexikon f. Antike und Christentum*, ed. T. Klauser, 1950-3, vol. 2, p. 1061.
- FORBES, T. R. (1). 'A[rnold] A[dolf] Berthold [1803-61] and the First Endocrine Experiment; some Speculations as to its Origin.' *BIHM*, 1949, 23, 263.
- FORKE, A. (3) (tr.). *Me Ti [Mo Ti] des Sozialethikers und seiner Schüler philosophische Werke*. Berlin, 1922. (*MSOS*, Beibände, 23-25).
- FORKE, A. (4) (tr.). 'Lun-Hêng', *Philosophical Essays of Wang Chhung*. Vol. 1, 1907. Kelly & Walsh, Shanghai; Luzac, London; Harrassowitz, Leipzig. Vol. 2, 1911 (with the addition of Reimer, Berlin). (*MSOS*, Beibände, 10 and 14.) Photolitho Re-issue, Paragon, New York, 1962. Crit. P. Pelliot, *JJA*, 1912 (10^e sér.), 20, 156.
- FORKE, A. (9). *Geschichte d. neueren chinesischen Philosophie* (i.e. from the beginning of the Sung to modern times). De Gruyter, Hamburg, 1938. (Hansische Univ. Abhdl. a. d. Geb. d. Auslandskunde, no. 46 (ser. B, no. 25).)
- FORKE, A. (12). *Geschichte d. mittelalterlichen chinesischen Philosophie* (i.e. from the beginning of the Former Han to the end of the Wu Tai). De Gruyter, Hamburg, 1934. (Hamburg. Univ. Abhdl. a. d. Geb. d. Auslandskunde, no. 41 (ser. B, no. 21).)
- FORKE, A. (13). *Geschichte d. alten chinesischen Philosophie* (i.e. from antiquity to the beginning of the Former Han). De Gruyter, Hamburg, 1927. (Hamburg. Univ. Abhdl. a. d. Geb. d. Auslandskunde, no. 25 (ser. B, no. 14).)
- FORKE, A. (15). 'On Some Implements mentioned by Wang Chhung' (1. Fans, 2. Chopsticks, 3. Burning Glasses and Moon Mirrors). Appendix III to Forke (4).
- FORKE, A. (20). 'Ko Hung der Philosoph und Alchymist.' *AGP*, 1932, 41, 115. Largely incorporated in (12), pp. 204 ff.
- FÖRSTER, E. (1). *Roger Bacon's 'De Retardandis Senectutis Accidentibus et de Sensibus Conservandis' und Arnald von Villanova's 'De Conservanda Juventutis et Retardanda Senectute'*. Inaug. Diss. Leipzig, 1924.
- FOWLER, A. M. (1). 'A Note on ἀμβροτος.' *CP*, 1942, 37, 77.
- FRÄNGER, W. (1). *The Millennium of Hieronymus Bosch*. Faber, London, 1952.
- FRANCKE, A. H. (1). 'Two Ant Stories from the Territory of the Ancient Kingdom of Western Tibet; a Contribution to the Question of Gold-Digging Ants.' *AM*, 1924, 1, 67.

- FRANK, B. (1). 'Kata-imi et Kata-tagae; Étude sur les Interdits de Direction à l'Époque Heian.' *BMFY*, 1958 (n.s.), 5 (no. 2-4), 1-246.
- FRANKE, H. (17). 'Das chinesische Wort für "Mumie" [mummy].' *OR*, 1957, 10, 253.
- FRANKE, H. (18). 'Some Sinological Remarks on Rashīd al-Dīn's "History of China".' *OR*, 1951, 4, 21.
- FRANKE, W. (4). *An Introduction to the Sources of Ming History*. Univ. Malaya Press, Kuala Lumpur and Singapore, 1968.
- FRANKFORT, H. (4). *Ancient Egyptian Religion; an Interpretation*. Harper & Row, New York, 1948. Paperback ed. 1961.
- FRANTZ, A. (1). 'Zink und Messing im Alterthum.' *BHMZ*, 1881, 40, 231, 251, 337, 377, 387.
- FRASER, SIR J. G. (1). *The Golden Bough*. 3-vol. ed. Macmillan, London, 1900; superseded by 12-vol. ed. (here used), Macmillan, London, 1913-20. Abridged 1-vol. ed. Macmillan, London, 1923.
- FRENCH, J. (1). *Art of Distillation*. 4th ed. London, 1667.
- FRENCH, P. J. (1). *John Dee; the World of an Elizabethan Magus*. Routledge & Kegan Paul, London, 1971.
- FREUDENBERG, K., FRIEDRICH, K. & BUMANN, I. (1). 'Über Cellulose und Stärke [incl. description of a molecular still].' *LA*, 1932, 494, 41 (57).
- FREUND, IDA (1). *The Study of Chemical Composition; an Account of its Method and Historical Development, with illustrative quotations*. Cambridge, 1904. Repr. Dover, New York, 1968, with a foreword by L. E. Strong and a brief biography by O. T. Benfey.
- FRIEDRICHSEN, M. (1). 'Morphologie des Tien-schan [Thien Shan].' *ZGEB*, 1899, 34, 1-62, 193-271. Sep. pub. Pormetter, Berlin, 1900.
- FRIEDLÄNDER, P. (1). 'Über den Farbstoff des antiken Purpurs aus *Murex brandaris*.' *BDCG*, 1909, 42, pt. 1, 765.
- FRIEND, J. NEWTON (1). *Iron in Antiquity*. Griffin, London, 1926.
- FRIEND, J. NEWTON (2). *Man and the Chemical Elements*. London, 1927.
- FRIEND, J. NEWTON & THORNEYCROFT, W. E. (1). 'The Silver Content of Specimens of Ancient and Mediaeval Lead.' *JIM*, 1929, 41, 105.
- FRITZE, M. (1) (tr.). *Pancatantra*. Leipzig, 1884.
- FRODSHAM, J. D. (1) (tr.). *The Poems of Li Ho (+791 to +817)*. Oxford, 1970.
- FROST, D. V. (1). 'Arsenicals in Biology; Retrospect and Prospect.' *FP*, 1967, 26 (no. 1), 194.
- FRYER, J. (1). *An Account of the Department for the Translation of Foreign Books of the Kiangnan Arsenal*. *NCH*, 28 Jan. 1880, and offprinted.
- FRYER, J. (2). 'Scientific Terminology; Present Discrepancies and Means of Securing Uniformity.' *CRR*, 1872, 4, 26, and sep. pub.
- FRYER, J. (3). *The Translator's Vade-Mecum*. Shanghai, 1888.
- FRYER, J. (4). 'Western Knowledge and the Chinese.' *JRAS/NCB*, 1886, 21, 9.
- FRYER, J. (5). 'Our Relations with the Reform Movement.' Unpublished essay, 1909. See Bennett (1), p. 151.
- FUCHS, K. W. C. (1). *Die vulkanische Erscheinungen der Erde*. Winter, Leipzig and Heidelberg, 1865.
- FUCHS, W. (7). 'Ein Gesandtschaftsbericht ü. Fu-Lin in chinesischer Wiedergabe aus den Jahren +1314 bis +1320.' *OE*, 1959, 6, 123.
- FÜCK, J. W. (1). 'The Arabic Literature on Alchemy according to al-Nadīm (+987); a Translation of the Tenth Discourse of the Book of the Catalogue (*al-Fihrist*), with Introduction and Commentary.' *AX*, 1951, 4, 81.
- DE LA FUENTE, J. (1). *Yalalag; una Villa Zapoteca Serrana*. Museo Nac. de Antropol. Mexico City, 1949. (Ser. Científica, no. 1.)
- FYFE, A. (1). 'An Analysis of Tutenag or the White Copper of China.' *EPY*, 1822, 7, 69.
- GADD, C. J. (1). 'The Harrān Inscriptions of Nabonidus [of Babylon, -555 to -539].' *ANATS*, 1958, 8, 35.
- GADOLIN, J. (1). *Observationes de Cupro Albo Chinensium Pe-Tong vel Pack-Tong*. *NARSU*, 1827, 9, 137.
- GALLAGHER, L. J. (1) (tr.). *China in the 16th Century; the Journals of Matthew Ricci, 1583-1610*. Random House, New York, 1953. (A complete translation, preceded by inadequate bibliographical details, of Nicholas Trigault's *De Christiana Expeditione apud Sinas* (1615). Based on an earlier publication: *The China that Was; China as discovered by the Jesuits at the close of the 16th Century; from the Latin of Nicholas Trigault*. Milwaukee, 1942.) Identifications of Chinese names in Yang Lien-Shêng (4). Crit. J. R. Ware, *ISIS*, 1954, 45, 395.
- GANZENMÜLLER, W. (1). *Beiträge zur Geschichte der Technologie und der Alchemie*. Verlag Chemie, Weinheim, 1956. Rev. W. Pagel, *ISIS*, 1958, 49, 84.
- GANZENMÜLLER, W. (2). *Die Alchemie im Mittelalter*. Bonifacius, Paderborn, 1938. Repr. Olms, Hildesheim, 1967. French, tr. by Petit-Dutailles, Paris, n.d. (c. 1940).
- GANZENMÜLLER, W. (3). 'Liber Florum Geberti; alchemistischen Öfen und Geräte in einer Handschrift des 15. Jahrhunderts.' *QSGNM*, 1942, 8, 273. Repr. in (1), p. 272.

- GANZENMÜLLER, W. (4). 'Zukunftsaufgaben der Geschichte der Alchemie.' *CHYM*, 1953, 4, 31.
- GANZENMÜLLER, W. (5). 'Paracelsus und die Alchemie des Mittelalters.' *ZAC/AC*, 1941, 54, 427.
- VON GARBE, R. K. (3) (tr.). *Die Indischen Mineralien, ihre Namen und die ihnen zugeschriebenen Kräfte; Narahari's 'Rāja-nighaṇṭu' [King of Dictionaries], varga XIII, Sanskrit und Deutsch, mit kritischen und erläuternden Anmerkungen herausgegeben...* Hirzel, Leipzig, 1882.
- GARBERS, K. (1) (tr.). 'Kitāb Kimiya al-Itr wa'l-Tas'idat'; *Buch über die Chemie des Parfüms und die Destillationen von Ya'qub ibn Ishaq al-Kindī; ein Beitrag zur Geschichte der arabischen Parfümchemie und Drogenkunde aus dem 9tr Jahrh. A.D., übersetzt...* Brockhaus, Leipzig, 1948. (Abhdl. f.d. Kunde des Morgenlandes, no. 30.) Rev. A. Mazaheri, *A/AlHS*, 1951, 4 (no. 15), 521.
- GARNER, SIR HARRY (1). 'The Composition of Chinese Bronzes.' *ORA*, 1960, 6 (no. 4), 3.
- GARNER, SIR HARRY (2). *Chinese and Japanese Cloisonné Enamels*. Faber & Faber, London, 1962.
- GARNER, SIR HARRY (3). 'The Origins of "Famille Rose" [polychrome decoration of Chinese Porcelain].' *TOCS*, 1969.
- GEBER (ps. of a Latin alchemist c. +1290). *The Works of Geber, the most famous Arabian Prince and Philosopher, faithfully Englished by R. R., a Lover of Chymistry [Richard Russell]*. James, London, 1678. Repr. and ed. E. J. Holmyard, Dent, London, 1928.
- GEERTS, A. J. C. (1). *Les Produits de la Nature Japonaise et Chinoise, Comprenant la Dénomination, l'Histoire et les Applications aux Arts, à l'Industrie, à l'Economie, à la Médecine, etc. des Substances qui dérivent des Trois Régnes de la Nature et qui sont employées par les Japonais et les Chinois: Partie Inorganique et Minéralogique...* [only part published]. 2 vols. Levy, Yokohama; Nijhoff, 's Gravenhage, 1878, 1883. (A paraphrase and commentary on the mineralogical chapters of the *Pên Tshao Kang Mu*, based on Ono Ranzan's commentary in Japanese.)
- GEERTS, A. J. C. (2). 'Useful Minerals and Metallurgy of the Japanese; [Introduction and] A, Iron.' *TAS/J*, 1875, 3, 1, 6.
- GEERTS, A. J. C. (3). 'Useful Minerals and Metallurgy of the Japanese; [B], Copper.' *TAS/J*, 1875, 3, 26.
- GEERTS, A. J. C. (4). 'Useful Minerals and Metallurgy of the Japanese; C, Lead and Silver.' *TAS/J*, 1875, 3, 85.
- GEERTS, A. J. C. (5). 'Useful Minerals and Metallurgy of the Japanese; D, Quicksilver.' *TAS/J*, 1876, 4, 34.
- GEERTS, A. J. C. (6). 'Useful Minerals and Metallurgy of the Japanese; E, Gold' (with twelve excellent pictures on thin paper of gold mining, smelting and cupellation from a traditional Japanese mining book). *TAS/J*, 1876, 4, 89.
- GEERTS, A. J. C. (7). 'Useful Minerals and Metallurgy of the Japanese; F, Arsenic' (reproducing the picture from *Thien Kung Khai Wu*). *TAS/J*, 1877, 5, 25.
- GEHES CODEX. See Anon. (93).
- GEISLER, K. W. (1). 'Zur Geschichte d. Spirituserzeugung.' *BGTI*, 1926, 16, 94.
- GELBART, N. R. (1). 'The Intellectual Development of Walter Charleton.' *AX*, 1971, 18, 149.
- GELLHORN, E. & KIELY, W. F. (1). 'Mystical States of Consciousness; Neurophysiological and Clinical Aspects.' *JNMD*, 1972, 154, 399.
- GENZMER, F. (1). 'Ein germanisches Gedicht aus der Hallstattzeit.' *GRM*, 1936, 24, 14.
- GEORGHEGAN, D. (1). 'Some Indications of Newton's Attitude towards Alchemy.' *AX*, 1957, 6, 102.
- GEORGI, A. (1). *Kinésithérapie, ou Traitement des Maladies par le Mouvement selon la Méthode de Ling...* suivi d'un Abrégé des Applications de Ling à l'Éducation Physique. Baillière, Paris, 1847.
- GERNET, J. (3). *Le Monde Chinois*. Colin, Paris, 1972. (Coll. Destins du Monde.)
- GESNER, CONRAD (1). *De Remediis secretis, Liber Physicus, Medicus et partiam Chymicus et Oeconomicus in vinorum diversis apparatus, Medicis & Pharmacopois omnibus praecipit necessarius nunc primum in lucem editus*. Zürich, 1552, 1557; second book edited by C. Wolff, Zürich, 1569; Frankfurt, 1578.
- GESNER, CONRAD (2). *Thesaurus Euonymus Philiatrī, Ein köstlicher Schatz...* Zürich, 1555. Eng. tr. Daye, London, 1559, 1565. French tr. Lyon, 1557.
- GESSMANN, G. W. (1). *Die Geheimsymbole der Chemie und Medizin des Mittelalters; eine Zusammenstellung der von den Mystikern und Alchymisten gebrauchten geheimen Zeichenschrift, nebst einen Kurzgefassten geheimwissenschaftlichen Lexikon*. Pr. pr. Graz, 1899, then Mickl, München, 1900.
- GETTENS, R. J., FITZHUGH, E. W., BENE, I. V. & CHASE, W. T. (1). *The Freer Chinese Bronzes. Vol. 2. Technical Studies*. Smithsonian Institution, Washington, D.C. 1969 (Freer Gallery of Art Oriental Studies, no. 7). See also Pope, Gettens, Cahill & Barnard (1).
- GHOSH, HARINATH (1). 'Observations on the Solubility *in vitro* and *in vivo* of Sulphide of Mercury, and also on its Assimilation, probable Pharmacological Action and Therapeutic Utility.' *IMW*, 1 Apr. 1931.
- GIBB, H. A. R. (1). 'The Embassy of Hārūn al-Rashīd to Chhang-An.' *BLSOAS*, 1922, 2, 619.
- GIBB, H. A. R. (4). *The Arab Conquests in Central Asia*. Roy. Asiatic Soc., London, 1923. (Royal Asiatic Society, James G. Forlong Fund Pubs. no. 2.)

- GIBB, H. A. R. (5). 'Chinese Records of the Arabs in Central Asia.' *BLSOAS*, 1922, 2, 613.
- GIBBS, F. W. (1). 'Invention in Chemical Industries [+1500 to +1700].' Art. in *A History of Technology*, ed. C. Singer *et al.* Vol. 3, p. 676. Oxford, 1957.
- GIBSON, E. C. S. (1) (tr.). *Johannes Cassianus' 'Conlationes'* in 'Select Library of Nicene and Post-Nicene Fathers of the Christian Church'. Parker, Oxford, 1894, vol. 11, pp. 382 ff.
- GICHNER, L. E. (1). *Erotic Aspects of Hindu Sculpture*. Pr. pr., U.S.A. (no place of publication stated), 1949.
- GICHNER, L. E. (2). *Erotic Aspects of Chinese Culture*. Pr. pr., U.S.A. (no place of publication stated), c. 1957.
- GIDE, C. (1). *Les Colonies Communistes et Coopératives*. Paris, 1928. Eng. tr. by E. F. Row. *Communist and Cooperative Colonies*. Harrap, London, 1930.
- GILDEMEISTER, E. & HOFFMANN, F. (1). *The Volatile Oils*. Tr. E. Kremers. 2nd ed., 3 vols. Longmans Green, London, 1916. (Written under the auspices of Schimmel & Co., Distillers, Miltitz near Leipzig.)
- GILDEMEISTER, J. (1). 'Alchymie.' *ZDMG*, 1876, 30, 534.
- GILES, H. A. (2). *Chinese-English Dictionary*. Quaritch, London, 1892, 2nd ed. 1912.
- GILES, H. A. (7) (tr.). 'The *Hsi Yüan Lu* or "Instructions to Coroners"; (Translated from the Chinese).' *PRSM*, 1924, 17, 59.
- GILES, H. A. (14). *A Glossary of Reference on Subjects connected with the Far East*. 3rd ed. Kelly & Walsh, Shanghai, 1900.
- GILES, L. (6). *A Gallery of Chinese Immortals ('hsien'), selected biographies translated from Chinese sources (Lieh Hsien Chuan, Shen Hsien Chuan, etc.)*. Murray, London, 1948.
- GILES, L. (7). 'Wizardry in Ancient China.' *AP*, 1942, 13, 484.
- GILES, L. (14). 'A Thang Manuscript of the *Sou Shen Chi*.' *NCR*, 1921, 3, 378, 460.
- GILLAN, H. (1). *Observations on the State of Medicine, Surgery and Chemistry in China (+1794)*, ed. J. L. Cranmer-Byng (2). Longmans, London, 1962.
- GLAISTER, JOHN (1). *A Textbook of Medical Jurisprudence, Toxicology and Public Health*. Livingstone, Edinburgh, 1902. 5th ed. by J. Glaister the elder and J. Glaister the younger, Edinburgh, 1931. 6th ed. title changed to *Medical Jurisprudence and Toxicology*, J. Glaister the younger, Edinburgh, 1938. 7th ed. Edinburgh, 1942, 9th ed. Edinburgh, 1950. 10th to 12th eds. (same title), Edinburgh, 1957 to 1966 by J. Glaister the younger & E. Rentoul.
- GLISSON, FRANCIS (1). *Tractatus de Natura Substantiae Energetica, seu de Vita Naturae ejusque Tribus Primis Facultatibus; I, Perceptiva; II, Appetitiva; III, Motiva, Naturalibus*. Fleisher, Bromer & Hooke, London, 1672. Cf. Pagel (16, 17); Temkin (4).
- GLOB, P. V. (1). *Iron-Age Man Preserved*. Faber & Faber, London; Cornell Univ. Press, Ithaca, N.Y. 1969. Tr. R. Bruce-Mitford from the Danish *Mosefolket; Jernalderens Mennesker bevaret i 2000 År*.
- GLOVER, A. S. B. (1) (tr.). 'The Visions of Zosimus', in Jung (3).
- GMELIN, J. G. (1). *Reise durch Russland*. 3 vols. Berlin, 1830.
- GOAR, P. J. See Syncellos, Georgius.
- GODWIN, WM. (1). *An Enquiry concerning Political Justice, and its Influence on General Virtue and Happiness*. London, 1793.
- GOH THEAN-CHYE. See Ho Ping-Yü, Ko Thien-Chi *et al.*
- GOLDBRUNNER, J. (1). *Individuation; a study of the Depth Psychology of Carl Gustav Jung*. Tr. from Germ. by S. Godman. Hollis & Carter, London, 1955.
- GOLTZ, D. (1). *Studien zur Geschichte der Mineralnamen in Pharmazie, Chemie und Medizin von den Anfängen bis Paracelsus*. Steiner, Wiesbaden, 1972. (Sudhoffs Archiv. Beiheft, no. 14.)
- GONDAL, MAHARAJAH OF. See Bhagvat Singhji.
- GOODFIELD, J. & TOULMIN, S. (1). 'The Qatfāra; a Primitive Distillation and Extraction Apparatus still in Use.' *ISIS*, 1964, 55, 339.
- GOODMAN, L. S. & GILMAN, A. (ed.) (1). *The Pharmacological Basis of Therapeutics*. Macmillan, New York, 1965.
- GOODRICH, L. CARRINGTON (1). *Short History of the Chinese People*. Harper, New York, 1943.
- GOODWIN, B. (1). 'Science and Alchemy', art. in *The Rules of the Game...* ed. T. Shanin (1), p. 360.
- GOSENS, R. (1). 'Un Texte Grec relatif à Paśvamedha' [in the Life of Apollonius of Tyana by Philostratos]. *J.A.*, 1930, 217, 280.
- GÖTZE, A. (1). 'Die "Schatzhöhle"; Überlieferung und Quelle.' *SHAW/PH*, 1922, no. 4.
- GOULD, S. J. (1). 'History versus Prophecy; Discussion with J. W. Harrington.' *AJSC*, 1970, 268, 187. With reply by J. W. Harrington, p. 189.
- GOWLAND, W. (1). 'Copper and its Alloys in Prehistoric Times.' *JRAI*, 1906, 36, 11.
- GOWLAND, W. (2). 'The Metals in Antiquity.' *JRAI*, 1912, 42, 235. (Huxley Memorial Lecture 1912.)
- GOWLAND, W. (3). 'The Early Metallurgy of Silver and Lead.' Pt. 1, 'Lead' (no more published). *AAA* 1901, 57, 359.

- GOWLAND, W. (4). 'The Art of Casting Bronze in Japan.' *JRSA*, 1895, 43. Repr. *ARSI*, 1895, 609.
- GOWLAND, W. (5). 'The Early Metallurgy of Copper, Tin and Iron in Europe as illustrated by ancient Remains, and primitive Processes surviving in Japan.' *AAA*, 1899, 56, 267.
- GOWLAND, W. (6). 'Metals and Metal-Working in Old Japan.' *TJSL*, 1915, 13, 20.
- GOWLAND, W. (7). 'Silver in Roman and earlier Times.' Pt. I, 'Prehistoric and Protohistoric Times' (no more published). *AAA*, 1920, 69, 121.
- GOWLAND, W. (8). 'Remains of a Roman Silver Refinery at Silchester' (comparisons with Japanese technique). *AAA*, 1903, 57, 113.
- GOWLAND, W. (9). *The Metallurgy of the Non-Ferrous Metals*. Griffin, London, 1914. (Copper, Lead, Gold, Silver, Platinum, Mercury, Zinc, Cadmium, Tin, Nickel, Cobalt, Antimony, Arsenic, Bismuth, Aluminium.)
- GOWLAND, W. (10). 'Copper and its Alloys in Early Times.' *JIM*, 1912, 7, 42.
- GOWLAND, W. (11). 'A Japanese Pseudo-Speiss (*Shirome*), and its Relation to the Purity of Japanese Copper and the Presence of Arsenic in Japanese Bronze.' *JSCI*, 1894, 13, 463.
- GOWLAND, W. (12). 'Japanese Metallurgy; I, Gold and Silver and their Alloys.' *JCSI*, 1896, 15, 404. No more published.
- GRACE, V. R. (1). *Amphoras and the Ancient Wine Trade*. Amer. School of Classical Studies, Athens and Princeton, N.J., 1961.
- GRADY, M. C. (1). 'Préparation Electrolytique du Rouge au Japon.' *TP*, 1897 (1^e sér.), 8, 456.
- GRAHAM, A. C. (5). "'Being" in Western Philosophy compared with *shih/fei* and *yu/tau* in Chinese Philosophy.' With an appendix on 'The Supposed Vagueness of Chinese'. *AM*, 1959, 7, 79.
- GRAHAM, A. C. (6) (tr.). *The Book of Lieh Tzu*. Murray, London, 1960.
- GRAHAM, A. C. (7). 'Chuang Tzu's "Essay on Making Things Equal".' Communication to the First International Conference of Taoist Studies, Villa Serbelloni, Bellagio, 1968.
- GRAHAM, D. C. (4). 'Notes on the Han Dynasty Grave Collection in the West China Union University Museum of Archaeology [at Chhêngtu].' *JWCBRS*, 1937, 9, 213.
- GRANET, M. (5). *La Pensée Chinoise*. Albin Michel, Paris, 1934. (Evol. de l'Hum. series, no. 25 bis.)
- GRANT, R. MCQ. (1). *Gnosticism; an Anthology*. Collins, London, 1961.
- GRASSMANN, H. (1). 'Der Campherbaum.' *MDGNVO*, 1895, 6, 277.
- GRAY, B. (1). 'Arts of the Sung Dynasty.' *TOCS*, 1960, 13.
- GRAY, J. H. (1). '[The "Abode of the Blest" in] Persian [Iranian, Thought]'. *ERE*, vol. ii, p. 702.
- GRAY, J. H. (1). *China: a History of the Laws, Manners and Customs of the People*. Ed. W. G. Gregor. 2 vols. Macmillan, London, 1878.
- GRAY, W. D. (1). *The Relation of Fungi to Human Affairs*. Holt, New York, 1959.
- GREEN, F. H. K. (1). 'The Clinical Evaluation of Remedies.' *LT*, 1954, 1085.
- GREEN, R. M. (1) (tr.). *Galen's Hygiene; 'De Sanitate Tuenda'*. Springfield, Ill, 1951.
- GREENAWAY, F. (1). 'Studies in the Early History of Analytical Chemistry.' Inaug. Diss. London, 1957.
- GREENAWAY, F. (2). *The Historical Continuity of the Tradition of Assaying*. Proc. Xth Int. Congr. Hist. of Sci., Ithaca, N.Y., 1962, vol. 2, p. 819.
- GREENAWAY, F. (3). 'The Early Development of Analytical Chemistry.' *END*, 1962, 21, 91.
- GREENAWAY, F. (4). *John Dalton and the Atom*. Heinemann, London, 1966.
- GREENAWAY, F. (5). 'Johann Rudolph Glauber and the Beginnings of Industrial Chemistry.' *END*, 1970, 29, 67.
- GREGORY, E. (1). *Metallurgy*. Blackie, London and Glasgow, 1943.
- GREGORY, J. C. (1). *A Short History of Atomism*. Black, London, 1931.
- GREGORY, J. C. (2). 'The Animate and Mechanical Models of Reality.' *JPHST*, 1927, 2, 301. Abridged in 'The Animate Model of Physical Process'. *SPR*, 1925.
- GREGORY, J. C. (3). 'Chemistry and Alchemy in the Natural Philosophy of Sir Francis Bacon (+1561 to +1626).' *AX*, 1938, 2, 93.
- GREGORY, J. C. (4). 'An Aspect of the History of Atomism.' *SPR*, 1927, 22, 293.
- GREGORY, T. C. (1). *Condensed Chemical Dictionary*. 1950. Continuation by A. Rose & E. Rose. Chinese tr. by Kao Hsien (1).
- GRIERSON, SIR G. A. (1). *Bihar Peasant Life*. Patna, 1888; reprinted Bihar Govt., Patna, 1926.
- GRIERSON, P. (2). 'The Roman Law of Counterfeiting.' Art. in *Essays in Roman Coinage*, Mattingley Presentation Volume, Oxford, 1965, p. 240.
- GRIFFITH, E. F. (1). *Modern Marriage*. Methuen, London, 1946.
- GRIFFITH, F. LL. & THOMPSON, H. (1). 'The Demotic Magical Papyrus of London and Leiden [+3rd Cent.]. 3 vols. Gravel, London, 1904-9.
- GRIFFITH, R. T. H. (1) (tr.). *The Hymns of the 'Atharva-veda'*. 2 vols. Lazarus, Benares, 1896. Repr. Chowkhamba Sanskrit Series Office, Varanasi, 1968.
- GRIFFITHS, J. GWYN (1) (tr.). *Plutarch's 'De Iside et Osiride'*. University of Wales Press, Cardiff, 1970.

- GRINSPOON, L. (1). 'Marihuana.' *SAM*, 1969, 221 (no. 6), 17.
- GRMEK, M. D. (2). 'On Ageing and Old Age; Basic Problems and Historical Aspects of Gerontology and Geriatrics.' *MB*, 1958, 5 (no. 2).
- DE GROOT, J. J. M. (2). *The Religious System of China*. Brill, Leiden, 1892.
 Vol. 1, Funeral rites and ideas of resurrection.
 2 and 3, Graves, tombs, and *fêng-shui*.
 4, The soul, and nature-spirits.
 5, Demonology and sorcery.
 6, The animistic priesthood (*wu*).
- GRÖSCHEL-STEWART, U. (1). 'Plazentahormone.' *MMN*, 1970, 22, 469.
- GROSIER, J. B. G. A. (1). *De la Chine; ou, Description Générale de cet Empire*, etc. 7 vols. Pillet & Bertrand, Paris, 1818-20.
- GRUMAN, G. J. (1). 'A History of Ideas about the Prolongation of Life; the Evolution of Prolongevity Hypotheses to 1800.' Inaug. Diss., Harvard University, 1965. *TAPS*, 1966 (n.s.), 56 (no. 9), 1-102.
- GRUMAN, G. J. (2). 'An Introduction to the Literature on the History of Gerontology.' *BIHM*, 1957, 31, 78.
- GUARESCHI, S. (1). Tr. of Klaproth (5). *SAEC*, 1904, 20, 449.
- GUERLAC, H. (1). 'The Poets' Nitre.' *ISIS*, 1954, 45, 243.
- GUICHARD, F. (1). 'Properties of saponins of *Gleditschia*.' *BSPB*, 1936, 74, 168.
- VAN GULIK, R. H. (3). '*Pi Hsi Thu Khao*'; *Erotic Colour-Prints of the Ming Period, with an Essay on Chinese Sex Life from the Han to the Chhing Dynasty (-206 to +1644)*. 3 vols. in case. Privately printed. Tokyo, 1951 (50 copies only, distributed to the most important Libraries of the world). Crit. W. L. Hsü, *MN*, 1952, 8, 455; H. Franke, *ZDMG*, 1955 (NF) 30, 380.
- VAN GULIK, R. H. (4). 'The Mango "Trick" in China; an essay on Taoist Magic.' *TAS/J*, 1952 (3rd ser.), 3, 1.
- VAN GULIK, R. H. (8). *Sexual Life in Ancient China; a Preliminary Survey of Chinese Sex and Society from c. -1500 to +1644*. Brill, Leiden, 1961. Rev. R. A. Stein, *JA*, 1962, 250, 640.
- GUNAWARDANA, R. A. LESLIE H. (1). 'Ceylon and Malaysia; a Study of Professor S. Paranavitana's Research on the Relations between the Two Regions.' *UCR*, 1967, 25, 1-64.
- GUNDEL, W. (4). Art. 'Alchemie' in *Real-Lexikon f. Antike und Christentum*, ed. T. Klauser, 1950-3, vol. 1, p. 239.
- GUNDEL, W. & GUNDEL, H. G. (1). *Astrologumena; das astrologische Literatur in der Antike und ihre Geschichte*. Steiner, Wiesbaden, 1966. (*AGMW* Beiheft, no. 6, pp. 1-382.)
- GUNTHER, R. T. (3) (ed.). *The Greek Herbal of Dioscorides, illustrated by a Byzantine in +512, englished by John Goodyer in +1655, edited and first printed, 1933*. Pr. pr. Oxford, 1934, photolitho repr. Hafner, New York, 1959.
- GUNTHER, R. T. (4). *Early Science in Cambridge*. Pr. pr. Oxford, 1937.
- GUPPY, H. B. (1). 'Samshu-brewing in North China.' *JRAS/NCB*, 1884, 18, 63.
- GURE, D. (1). 'Jades of the Sung Group.' *TOCS*, 1960, 39.
- GUTZLAFF, C. (1). 'On the Mines of the Chinese Empire.' *JRAS/NCB*, 1847, 43.
- GYLLENSVÄRD, Bo (1). *Chinese Gold and Silver [-Work] in the Carl Kempe Collection*. Stockholm, 1953; Smithsonian Institution, Washington, D.C., 1954.
- GYLLENSVÄRD, Bo (2). 'Thang Gold and Silver.' *BMFEA*, 1957, 29, 1-230.
- HACKIN, J. & HACKIN, J. R. (1). *Recherches archéologiques à Begram, 1937*. Mémoires de la Délégation Archéologique Française en Afghanistan, vol. 9. Paris, 1939.
- HACKIN, J., HACKIN, J. R., CARL, J. & HAMELIN, P. (with the collaboration of J. Auboyer, V. Elisséeff, O. Kufz & P. Stern) (1). *Nouvelles Recherches archéologiques à Begram (ancienne Kāpisi), 1939-1940*. Mémoires de la Délégation Archéologique Française en Afghanistan, vol. 11. Paris, 1954. (Rev. P. S. Rawson, *JRAS*, 1957, 139.)
- HADD, H. E. & BLICKENSTAFF, R. T. (1). *Conjugates of Steroid Hormones*. Academic Press, New York and London, 1969.
- HADI HASAN (1). *A History of Persian Navigation*. Methuen, London, 1928.
- HAJI KHALFA (or Hajji Khalifa). See Flügel (2).
- HALBAN, J. (1). 'Über den Einfluss der Ovarien auf die Entwicklung der Genitales.' *MGG*, 1900, 12, 496.
- HALDANE, J. B. S. (2). 'Experiments on the Regulation of the Blood's Alkalinity.' *JOP*, 1921, 55, 265.
- HALDANE, J. B. S. (3). 'Über Halluzinationen infolge von Änderungen des Kohlensäuredrucks.' *PF*, 1924, 5, 356.
- HALDANE, J. B. S. See also Baird, Douglas, Haldane & Priestley (1); Davies, Haldane & Kennaway (1).
- HALDANE, J. B. S., LINDER, G. C., HILTON, R. & FRASER, F. R. (1). 'The Arterial Blood in Ammonium Chloride Acidosis.' *JOP*, 1928, 65, 412.

- HALDANE, J. B. S., WIGGLESWORTH, V. B. & WOODROW, C. E. (1). 'Effect of Reaction Changes on Human Inorganic Metabolism.' *PRSB*, 1924, 96, 1.
- HALDANE, J. B. S., WIGGLESWORTH, V. B. & WOODROW, C. E. (2). 'Effect of Reaction Changes on Human Carbohydrate and Oxygen Metabolism.' *PRSB*, 1924, 96, 15.
- HALEN, G. E. (1). *De Chemo Scientiarum Auctore*. Upsala, 1694.
- HALES, STEPHEN (2). *Philosophical Experiments; containing Useful and Necessary Instructions for such as undertake Long Voyages at Sea, shewing how Sea Water may be made Fresh and Wholsome*. London, 1739.
- HALL, E. T. (1). 'Surface Enrichment of Buried [Noble] Metal [Alloys].' *AMY*, 1961, 4, 62.
- HALL, E. T. & ROBERTS, G. (1). 'Analysis of the Moultsford Torc.' *AMY*, 1962, 5, 28.
- HALL, F. W. (1). '[The "Abode of the Blest" in] Greek and Roman [Culture].' *ERE*, vol. ii, p. 696.
- HALL, H. R. (1). 'Death and the Disposal of the Dead [in Ancient Egypt].' *Art. in ERE*, vol. iv, p. 458.
- HALL, MANLY P. (1). *The Secret Teachings of All Ages*. San Francisco, 1928.
- HALLEUX, R. (1). 'Fécondité des Mines et Sexualité des Pierres dans l'Antiquité Gréco-Romaine.' *RBPB*, 1970, 48, 16.
- HALOUN, G. (2). Translations of *Kuan Tzu* and other ancient texts made with the present writer, unpub. MSS.
- HAMARNEH, SAMI, K. & SONNEDECKER, G. (1). *A Pharmaceutical View of Albucasis (al-Zahrāwī) in Moorish Spain*. Brill, Leiden, 1963.
- HAMMER-JENSEN, I. (1). 'Deux Papyrus à Contenu d'Ordre Chimique.' *ODVS*, 1916 (no. 4), 279.
- HAMMER-JENSEN, I. (2). 'Die ältesten Alchemie.' *MKDVS/HF*, 1921, 4 (no. 2), 1-159.
- HANBURY, DANIEL (1). *Science Papers, chiefly Pharmacological and Botanical*. Macmillan, London, 1876.
- HANBURY, DANIEL (2). 'Notes on Chinese Materia Medica.' *Pf*, 1861, 2, 15, 109, 553; 1862, 3, 6, 204, 260, 315, 420. German tr. by W. C. Martius (without Chinese characters), *Beiträge z. Materia Medica Chinas*. Kranzbühler, Speyer, 1863. Revised version, with additional notes, references and map, in Hanbury (1), pp. 211 ff.
- HANBURY, DANIEL (6). 'Note on Chinese Sal Ammoniac.' *Pf*, 1865, 6, 514. Repr. in Hanbury (1), p. 276.
- HANBURY, DANIEL (7). 'A Peculiar Camphor from China [Ngai Camphor from *Blumea balsamifera*].' *Pf*, 1874, 4, 709. Repr. in Hanbury (1), pp. 393 ff.
- HANBURY, DANIEL (8). 'Some Notes on the Manufactures of Grasse and Cannes [and Enfleurance].' *Pf*, 1857, 17, 161. Repr. in Hanbury (1), pp. 150 ff.
- HANBURY, DANIEL (9). 'On Otto of Rose.' *Pf*, 1859, 18, 504. Repr. in Hanbury (1), pp. 164 ff.
- HANSFORD, S. H. (1). *Chinese Jade Carving*. Lund Humphries, London, 1950.
- HANSFORD, S. H. (2) (ed.). *The Seligman Collection of Oriental Art; Vol. 1, Chinese, Central Asian and Luristan Bronzes and Chinese Jades and Sculptures*. Arts Council G. B., London, 1955.
- HANSON, D. (1). *The Constitution of Binary Alloys*. McGraw-Hill, New York, 1958.
- HARADA, YOSHITO & TAZAWA, KINGO (1). *Lo-Lang; a Report on the Excavation of Wang Hsü's Tomb in the Lo-Lang Province, an ancient Chinese Colony in Korea*. Tokyo University, Tokyo, 1930.
- HARBORD, F. W. & HALL, J. W. (1). *The Metallurgy of Steel*. 2 vols. 7th ed. Griffin, London, 1923.
- HARDING, M. ESTHER (1). *Psychic Energy; its Source and Goal*. With a foreword by C. G. Jung. Pantheon, New York, 1947. (Bollingen series, no. 10.)
- VON HARLESS, G. C. A. (1). *Jakob Böhme und die Alchymisten; ein Beitrag zum Verständnis J. B.'s...* Berlin, 1870. 2nd ed. Hinrichs, Leipzig, 1882.
- HARRINGTON, J. W. (1). 'The First "First Principles of Geology".' *AJSC*, 1967, 265, 449.
- HARRINGTON, J. W. (2). 'The Prenatal Roots of Geology; a Study in the History of Ideas.' *AJSC*, 1969, 267, 592.
- HARRINGTON, J. W. (3). 'The Ontology of Geological Reasoning; with a Rationale for evaluating Historical Contributions.' *AJSC*, 1970, 269, 295.
- HARRIS, C. (1). '[The State of the Dead in] Christian [Thought].' *ERE*, vol. xi, p. 833.
- HARRISON, F. C. (1). 'The Miraculous Micro-Organism' (*B. prodigiosus* as the causative agent of 'bleeding hosts'). *TRSC*, 1924, 18, 1.
- HARRISON, T. (8). 'The palang; its History and Proto-history in West Borneo and the Philippines.' *JRAS/M*, 1964, 37, 162.
- HARTLEY, SIR HAROLD (1). 'John Dalton, F.R.S. (1766 to 1844) and the Atomic Theory; a Lecture to commemorate his Bicentenary.' *PRSA*, 1967, 300, 291.
- HARTNER, W. (12). *Oriens-Occidens; ausgewählte Schriften zur Wissenschafts- und Kultur-geschichte (Festschrift zum 60. Geburtstag)*. Olms, Hildesheim, 1968. (Collectanea, no. 3.)
- HARTNER, W. (13). 'Notes on Picatrix.' *ISIS*, 1965, 56, 438. Repr. in (12), p. 415.
- HASCHMI, M. Y. (1). 'The Beginnings of Arab Alchemy.' *AX*, 1961, 9, 155.
- HASCHMI, M. Y. (2). 'The Propagation of Rays'; the Oldest Arabic Manuscript about Optics (the Burning-Mirror), [a text written by] Ya'kub ibn Ishaq al-Kindi, Arab Philosopher and Scholar of the 9th Century. Photocopy, Arabic text and Commentary. Aleppo, 1967.

- HASCHMI, M. Y. (3). 'Sur l'Histoire de l'Alcool.' Résumés des Communications, XIIth International Congress of the History of Science, Paris, 1968, p. 91.
- HASCHMI, M. Y. (4). 'Die Anfänge der arabischen Alchemie.' Actes du XIe Congrès International d'Histoire des Sciences, Warsaw, 1965, p. 290.
- HASCHMI, M. Y. (5). 'Ion Exchange in Arabic Alchemy.' Proc. Xth Internat. Congr. Hist. of Sci., Ithaca, N.Y. 1962, p. 541. Summaries of Communications, p. 56.
- HASCHMI, M. Y. (6). 'Die Geschichte der arabischen Alchemie.' *DMAB*, 1967, **35**, 60.
- HATCHETT, C. (1). 'Experiments and Observations on the Various Alloys, on the Specific Gravity, and on the Comparative Wear of Gold...' *PTRS*, 1803, **93**, 43.
- HAUSHERR, I. (1). 'La Méthode d'Oraison Hésychaste.' *ORCH*, 1927, **9**, (no. 2), 102.
- HÄUSSLER, E. P. (1). 'Über das Vorkommen von a-Follikelhormon (3-oxy-17 Keto-1, 3, 5-oestratriën) im Hengsturin.' *HCA*, 1934, **17**, 531.
- HAWKES, D. (1) (tr.). 'Chhu Tshu'; *the Songs of the South—an Ancient Chinese Anthology*. Oxford, 1959. Rev. J. Needham, *NSN* (18 Jul. 1959).
- HAWKES, D. (2). 'The Quest of the Goddess.' *AM*, 1967, **13**, 71.
- HAWTHORNE, J. G. & SMITH, C. S. (1) (tr.). 'On Divers Arts'; *the Treatise of Theophilus [Presbyter], translated from the Mediaeval Latin with Introduction and Notes...* [probably by Roger of Helmarshausen, c. +1130]. Univ. of Chicago Press, Chicago, 1963.
- HAY, M. (1). *Failure in the Far East; Why and How the Breach between the Western World and China First Began* (on the dismantling of the Jesuit Mission in China in the late +18th century). Spearman, London; Scaldis, Wetteren (Belgium), 1956.
- HAYS, E. E. & STEELMAN, S. L. (1). 'The Chemistry of the Anterior Pituitary Hormones.' Art. in *The Hormones...*, ed. G. Pincus, K. V. Thimann & E. B. Astwood. Academic Press, New York, 1948-64. vol. 3, p. 201.
- HEDBLUM, C. A. (1). 'Disease Incidence in China [16,000 cases].' *CMJ*, 1917, **31**, 271.
- HEDFORS, H. (1) (ed. & tr.). *The 'Compositiones ad Tingenda Musiva'...* Uppsala, 1932.
- HEDIN, SVEN A., BERGMAN, F. et al. (1). *History of the Expedition in Asia, 1927/1935*. 4 vols. Reports of the Sino-Swedish [Scientific] Expedition [to NW China]. 1936. Nos. 23, 24, 25, 26.
- HEIM, R. (1). 'Old and New Investigations on Hallucinogenic Mushrooms from Mexico.' *APH*, 1959, **12**, 171.
- HEIM, R. (2). *Champignons Toxiques et Hallucinogènes*. Boubée, Paris, 1963.
- HEIM, R. & HOFMANN, A. (1). 'Psilocybine.' *CRAS*, 1958, **247**, 557.
- HEIM, R., WASSON, R. G. et al. (1). *Les Champignons Hallucinogènes du Mexique; Études Ethnologiques, Taxonomiques, Biologiques, Physiologiques et Chiniques*. Mus. Nat. d'Hist. Nat. Paris, 1958.
- VON HEINE-GELDERN, R. (4). 'Die asiatische Herkunft d. südamerikanische Metalltechnik.' *PAI*, 1954, **5**, 347.
- HEMNETER, E. (1). 'The Influence of the Caste-System on Indian Trades and Crafts.' *CIBA/T*, 1937, **1** (no. 2), 46.
- H[EMSLEY], W. B. (1). 'Camphor.' *N*, 1896, **54**, 116.
- HENDERSON, G. & HURVITZ, L. (1). 'The Buddha of Seiryō-ji [Temple at Saga, Kyoto]; New Finds and New Theory.' *AA*, 1956, **19**, 5.
- HENDY, M. F. & CHARLES, J. A. (1). 'The Production Techniques, Silver Content and Circulation History of the +12th-Century Byzantine Trachy.' *AMY*, 1970, **12**, 13.
- HENROTTE, J. G. (1). 'Yoga et Biologie.' *ATOM*, 1969, **24** (no. 265), 283.
- HENRY, W. (1). *Elements of Experimental Chemistry*. London, 1810. German. tr. by F. Wolff, Berlin, 1812. Another by J. B. Trommsdorf.
- HERMANN, A. (1). 'Das Buch *Kmj.t* und die Chemie.' *ZAES*, 1954, **79**, 99.
- HERMANN, P. (1). *Een consteljik Distilleerboec inhoudende de rechte ende waerachtige conste der distiliën om alderhande wateren der cruyden, bloemen ende wortelen ende voorts alle andere dinge te leeren distileren opt alder constelijcste, alsoo dat dies gelyke noyt en is gheprint geveest in geen derley sprake...* Antwerp, 1552.
- HERMANN, M. (1). *Die Nomaden von Tibet*. Vienna, 1949. Rev. W. Eberhard, *AN*, 1950, **45**, 942.
- HERRINGHAM, C. J. (1). *The 'Libro dell'Arte' of Cennino Cennini [+1437]*. Allen & Unwin, London, 1897.
- HERRMANN, A. (2). *Die Alten Seidenstrassen zw. China u. Syrien; Beitr. z. alten Geographie Asiens, I* (with excellent maps). Berlin, 1910. (Quellen u. Forschungen z. alten Gesch. u. Geographie, no. 21; photographically reproduced, Tientsin, 1941).
- HERRMANN, A. (3). 'Die Alten Verkehrswege zw. Indien u. Süd-China nach Ptolemäus.' *ZGEB*, 1913, **771**.
- HERRMANN, A. (5). 'Die Seidenstrassen vom alten China nach dem Römischen Reich.' *MGGW*, 1915, **58**, 472.

- HERRMANN, A. (6). *Die Verkehrswege zw. China, Indien und Rom um etwa 100 nach Chr.* Leipzig, 1922 (Veröffentlichungen d. Forschungs-instituts f. vergleich. Religionsgeschichte a.d. Univ. Leipzig, no. 7.)
- HERTZ, W. (1). 'Die Sage vom Giftmädchen.' *ABAW/PH*, 1893, 20, no. 1. Repr. in *Gesammelte Abhandlungen*, ed. v. F. von der Leyen, 1905, pp. 156-277.
- D'HERVEY ST DENYS, M. J. L. (3). *Trois Nouvelles Chinoises, traduites pour la première fois.* Leroux, Paris, 1885. 2nd ed. Dentu, Paris, 1889.
- HEYM, G. (1). 'The *Aurea Catena Homeri* [by Anton Joseph Kirchweger, +1723].' *AX*, 1937, 1, 78. Cf. Ferguson (1), vol. 1, p. 470.
- HEYM, G. (2). 'Al-Rāzī and Alchemy.' *AX*, 1938, 1, 184.
- HICKMAN, K. C. D. (1). 'A Vacuum Technique for the Chemist' (molecular distillation). *JFI*, 1932, 213, 119.
- HICKMAN, K. C. D. (2). 'Apparatus and Methods [for Molecular Distillation].' *IEC/I*, 1937, 29, 968.
- HICKMAN, K. C. D. (3). 'Surface Behaviour in the Pot Still.' *IEC/I*, 1952, 44, 1892.
- HICKMAN, K. C. D. & SANFORD, C. R. (1). 'The Purification, Properties and Uses of Certain High-Boiling Organic Liquids.' *JPCB*, 1930, 34, 637.
- HICKMAN, K. C. D. & SANFORD, C. R. (2). 'Molecular stills.' *RSI*, 1930, 1, 140.
- HICKMAN, K. C. D. & TREVOY, D. J. (1). 'A Comparison of High Vacuum Stills and Tensimeters.' *IEC/I*, 1952, 44, 1903.
- HICKMAN, K. C. D. & WEYERTS, W. (1). 'The Vacuum Fractionation of Phlegmatic Liquids.' *JACS*, 1930, 52, 4714.
- HIGHMORE, NATHANIEL (1). *The History of Generation, examining the several Opinions of divers Authors, especially that of Sir Kenelm Digby, in his Discourse of Bodies.* Martin, London, 1651.
- HILGENFELD, A. (1). *Die Ketzergeschichte des Urchristenthums.* Fues (Reisland), Leipzig, 1884.
- HILLEBRANDT, A. (1). *Vedische Mythologie.* Breslau, 1891-1902.
- HILTON-SIMPSON, M. W. (1). *Arab Medicine and Surgery; a Study of the Healing Art in Algeria.* Oxford, 1922.
- HIORDTHAL, T. See Hjortdahl, T.
- HIORNS, A. H. (1). *Metal-Colouring and Bronzing.* Macmillan, London and New York, 1892. 2nd ed. 1902.
- HIORNS, A. H. (2). *Mixed Metals or Metallic Alloys.* 3rd ed. Macmillan, London and New York, 1912.
- HIORNS, A. H. (3). *Principles of Metallurgy.* 2nd ed. Macmillan, London, 1914.
- HIRTH, F. (2) (tr.). 'The Story of Chang Chhien, China's Pioneer in West Asia.' *JAOB*, 1917, 37, 89. (Translation of ch. 123 of the *Shih Chi*, containing Chang Chhien's Report; from §18-52 inclusive and 101 to 103. §98 runs on to §104, 99 and 100 being a separate interpolation. Also tr. of ch. 111 containing the biogr. of Chang Chhien.)
- HIRTH, F. (7). *Chinesische Studien.* Hirth, München and Leipzig, 1890.
- HIRTH, F. (9). *Über fremde Einflüsse in der chinesischen Kunst.* G. Hirth, München and Leipzig, 1896.
- HIRTH, F. (11). 'Die Länder des Islam nach Chinesischen Quellen.' *TP*, 1894, 5 (Suppl.). (Translation of, and notes on, the relevant parts of the *Chu Fan Chih* of Chao Ju-Kua; subsequently incorporated in Hirth & Rockhill.)
- HIRTH, F. (25). 'Ancient Porcelain; a study in Chinese Mediaeval Industry and Trade.' G. Hirth, Leipzig and Munich; Kelly & Walsh, Shanghai, Hongkong, Yokohama and Singapore, 1888.
- HIRTH, F. & ROCKHILL, W. W. (1) (tr.). *Chau Ju-Kua; His work on the Chinese and Arab Trade in the 12th and 13th centuries, entitled 'Chu-Fan-Chi'.* Imp. Acad. Sci, St Petersburg, 1911. (Crit. G. Vacca *RSO*, 1913, 6, 209; P. Pelliot *TP*, 1912, 13, 446; E. Schaer, *AGNT*, 1913, 6, 329; O. Franke, *OAZ*, 1913, 2, 98; A. Vissière, *JA*, 1914 (11^e sér.), 3, 196.)
- HISCOX, G. D. (1) (ed.). *The Twentieth Century Book of Recipes, Formulas and Processes; containing nearly 10,000 selected scientific, chemical, technical and household recipes, formulas and processes for use in the laboratory, the office, the workshop and in the home.* Lockwood, London; Henley, New York, 1907. Lexicographically arranged. 4th ed., Lockwood, London; Henley, New York, 1914. Retitled *Henley's Twentieth Century Formulas, Recipes and Processes; containing 10,000 selected household and workshop formulas, recipes, processes and money-saving methods for the practical use of manufacturers, mechanics, housekeepers and home workers.* Spine title unchanged; index of contents added and 2 entries omitted.
- HITCHCOCK, E. A. (1). *Remarks upon Alchemy and the Alchemists, indicating a Method of discovering the True Nature of Hermetic Philosophy; and showing that the Search after the Philosopher's Stone had not for its Object the Discovery of an Agent for the Transmutation of Metals—Being also an attempt to rescue from undeserved opprobrium the reputation of a class of extraordinary thinkers in past ages.* Crosby & Nichols, Boston, 1857. 2nd ed. 1865 or 1866. See also Clymer (1); Croffut (1).
- HITCHCOCK, E. A. (2). *Remarks upon Alchemists, and the supposed Object of their Pursuit; showing that the Philosopher's Stone is a mere Symbol, signifying Something which could not be expressed openly without*

- incurring the Danger of an Auto-da-Fé. By an Officer of the United States Army. Pr. pr. Herald, Carlisle, Pennsylvania, 1855. This pamphlet was the first form of publication of the material enlarged in Hitchcock (1).*
- HJORTDAHL, T. (1). 'Chinesische Alchemie', art. in Kahlbaum Festschrift (1909), ed. Diergart (1): *Beiträge aus der Geschichte der Chemie*, pp. 215-24. Comm. by E. Chavannes, *TP*, 1909 (2^e sér.), 10, 389.
- HJORTDAHL, T. (2). 'Fremstilling af Kemiens Historie' (in Norwegian). *CVS*, 1905, 1 (no. 7).
- HO JU (1). *Poèmes de Mao Tse-Tung* (French translation). Foreign Languages Press, Peking, 1960. 2nd ed., enlarged, 1961.
- HO PENG YOKE. See Ho Ping-Yü.
- HO PING-YÜ (5). 'The Alchemical Work of Sun Ssu-Mo.' Communication to the American Chemical Society's Symposium on Ancient and Archaeological Chemistry, at the 142nd Meeting, Atlantic City, 1962.
- HO PING-YÜ (7). 'Astronomical Data in the Annamese *Đai Viêt Sú-Ký Toàn-thú*; an early Annamese Historical Text.' *JAO*, 1964, 84, 127.
- HO PING-YÜ (8). 'Draft translation of the *Thai-Chhing Shih Pi Chi* (Records in the Rock Chamber); an alchemical book (TT/874) of the Liang period (early +6th Century, but including earlier work as old as the late +3rd).' Unpublished.
- HO PING-YÜ (9). Précis and part draft translation of the *Thai Chi Chen-Jen Chiu Chuan Huan Tan Ching Yao Chieh* (Essential Teachings of the Manual of the Supreme-Pole Adept on the Ninefold Cyclically Transformed Elixir); an alchemical book (TT/882) of uncertain date, perhaps Sung but containing much earlier material.' Unpublished.
- HO PING-YÜ (10). 'Précis and part draft translation of the *Thai-Chhing Chin I Shen Tan Ching* (Manual of the Potable Gold and Magical Elixir; a Thai-Chhing Scripture); an alchemical book (TT/873) of unknown date and authorship but prior to +1022 when it was incorporated in the *Yün Chi Chhi Chhien*.' Unpublished.
- HO PING-YÜ (11). 'Notes on the *Pao Phu Tzu Shen Hsien Chin Shuo Ching* (The Preservation-of-Solidarity Master's Manual of the Bubbling Gold (Potion) of the Holy Immortals); an alchemical book (TT/910) attributed to Ko Hung (c. +320).' Unpublished.
- HO PING-YÜ (12). 'Notes on the *Chin Pi Wu Hsiang Lei Tshan Thung Chhi* (Gold and Caerulean Jade Treatise on the Similarities and Categories of the Five (Substances) and the Kinship of the Three); an alchemical book (TT/897) attributed to Yin Chhang-Shêng (H/Han, c. +200), but probably of somewhat later date.' Unpublished.
- HO PING-YÜ (13). 'Alchemy in Ming China (+1368 to +1644).' Communication to the XIIth International Congress of the History of Science, Paris, 1968. Abstract Vol. p. 174. Communications, Vol. 3A, p. 119.
- HO PING-YÜ (14). 'Taoism in Sung and Yuan China.' Communication to the First International Conference of Taoist Studies, Villa Serbelloni, Bellagio, 1968.
- HO PING-YÜ (15). 'The Alchemy of Stones and Minerals in the Chinese Pharmacopoeias.' *CCJ*, 1968, 7, 155.
- HO PING-YÜ (16). 'The System of the *Book of Changes* and Chinese Science.' *JSHS*, 1972, No. 11, 23.
- HO PING-YÜ & CHHEN THIEH-FAN (1) = (1). 'On the Dating of the *Shun-Yang Lü Chen-Jen Yao Shih Chih*, a Taoist Pharmaceutical and Alchemical Manual.' *JOSHK*, 1971, 9, 181 (229).
- HO PING-YÜ, KO THIEN-CHI & LIM, BEDA (1). 'Lu Yu (+1125 to 1209), Poet-Alchemist.' *AM*, 1972, 163.
- HO PING-YÜ, KO THIEN-CHI & PARKER, D. (1). 'Pai Chü-I's Poems on Immortality.' *HJAS*, 1974, 34, 163.
- HO PING-YÜ & LIM, BEDA (1). 'Tshui Fang, a Forgotten +11th-Century Alchemist [with assembly of citations, mostly from *Pên Tshao Kang Mu*, probably transmitted by *Kêng Hsin Yü Tshé*].' *JSHS*, 1972, No. 11, 103.
- HO PING-YÜ, LIM, BEDA & MORSINGH, FRANCIS (1) (tr.). 'Elixir Plants: the *Shun-Yang Lü Chen-Jen Yao Shih Chih* (Pharmaceutical Manual of the Adept Lü Shun-Yang)' [in verses]. Art. in Nakayama & Sivin (1), p. 153.
- HO PING-YÜ & NEEDHAM, JOSEPH (1). 'Ancient Chinese Observations of Solar Haloes and Parhelia.' *W*, 1959, 14, 124.
- HO PING-YÜ & NEEDHAM, JOSEPH (2). 'Theories of Categories in Early Mediaeval Chinese Alchemy' (with transl. of the *Tshan Thung Chhi Wu Hsiang Lei Pi Yao*, c. +6th to +8th cent.). *JWCI*, 1959, 22, 173.
- HO PING-YÜ & NEEDHAM, JOSEPH (3). 'The Laboratory Equipment of the Early Mediaeval Chinese Alchemists.' *AX*, 1959, 7, 57.
- HO PING-YÜ & NEEDHAM, JOSEPH (4). 'Elixir Poisoning in Mediaeval China.' *JAN*, 1959, 48, 221.
- HO PING-YÜ & NEEDHAM, JOSEPH. See Tshao Thien-Chhin, Ho Ping-Yü & Needham, J.

- HOEFER, F. (1). *Histoire de la Chimie*. 2 vols. Paris, 1842-3. 2nd ed. 2 vols. Paris, 1866-9.
- HOENIG, J. (1). 'Medical Research on Yoga.' *COPS*, 1968, **11**, 69.
- HOERNES, M. (1). *Natur- und Ur-geschichte der Menschen*. Vienna and Leipzig, 1909.
- HOERNLE, A. F. R. (1) (ed. & tr.). *The Bower Manuscript; Facsimile Leaves, Nagari Transcript, Romanised Transliteration and English Translation with Notes*. 2 vols. Govt. Printing office, Calcutta, 1893-1912. (Archaeol. Survey of India, New Imperial Series, no. 22.) Mainly pharmacological text of late 4th cent. but with some chemistry also.
- HOFF, H. H., GUILLEMIN, L. & GUILLEMIN, R. (1) (tr. and ed.). *The 'Cahier Rouge' of Claude Bernard*. Schenkman, Cambridge, Mass. 1967.
- HOFFER, A. & OSMOND, H. (1). *The Hallucinogens*. Academic Press, New York and London, 1968. With a chapter by T. Weckowicz.
- HOFFMANN, G. (1). Art. 'Chemie' in A. Ladenburg (ed.), *Handwörterbuch der Chemie*, Trewendt, Breslau, 1884, vol. 2, p. 516. This work forms Division 2, Part 3 of W. Förster (ed.), *Encyklopaedie der Naturwissenschaften* (same publisher).
- HOFMANN, K. B. (1). 'Zur Geschichte des Zinkes bei den Alten.' *BHMZ*, 1882, **41**, 492, 503.
- HOLGEN, H. J. (1). 'Iets over de Chineesche Alchemie.' *CW*, 1917, **24**, 400.
- HOLGEN, H. J. (2). 'Iets uit de Geschiedenis van de Chineesche Mineralogie en Chemische Technologie.' *CW*, 1917, **24**, 468.
- HOLLOWAY, M. (1). *Heavens on Earth; Utopian Communities in America, +1680 to 1880*. Turnstile, London, 1951. 2nd ed. Dover, New York, 1966.
- HOLMYARD, E. J. (1). *Alchemy*. Penguin, London, 1957.
- HOLMYARD, E. J. (2). 'Jābir ibn Ḥayyān [including a bibliography of the Jābirian corpus].' *PRSM*, 1923, **16** (Hist. Med. Sect.), 46.
- HOLMYARD, E. J. (3). 'Some Chemists of Islam.' *SPR*, 1923, **18**, 66.
- HOLMYARD, E. J. (4). 'Arabic Chemistry [and Cupellation].' *N*, 1922, **109**, 778.
- HOLMYARD, E. J. (5). '*Kitāb al-ʿIm al-Muktasab fī Zirāʿat al-Dhahab*' (*Book of Knowledge acquired concerning the Cultivation of Gold*), by Abū'l Qāsim Muḥammad ibn Aḥmad al-ʿIrāqī [d. c. +1300]; *the Arabic text edited with a translation and introduction*. Geuthner, Paris, 1923.
- HOLMYARD, E. J. (7). 'A Critical Examination of Berthelot's Work on Arabic Chemistry.' *ISIS*, 1924, **6**, 479.
- HOLMYARD, E. J. (8). 'The Identity of Geber.' *N*, 1923, **111**, 191.
- HOLMYARD, E. J. (9). 'Chemistry in Mediaeval Islam.' *CHIND*, 1923, **42**, 387. *SCI*, 1926, 287.
- H[OLMYARD], E. J. (10). 'The Accuracy of Weighing in the +8th Century.' *N*, 1925, **115**, 963.
- HOLMYARD, E. J. (11). 'Maslama al-Majrīṭī and the *Rubāt al-Ḥakīm* [(The Sage's Step)].' *ISIS*, 1924, **6**, 293.
- HOLMYARD, E. J. (12) (ed.). *The 'Ordinall of Alchimy' by Thomas Norton of Bristoll (c. +1440; facsimile reproduction from the Theatrum Chemicum Britannicum (+1652) with annotations by Elias Ashmole*. Arnold, London, 1928.
- HOLMYARD, E. J. (13). 'The Emerald Table.' *N*, 1923, **112**, 525.
- HOLMYARD, E. J. (14). 'Alchemy in China.' *AP*, 1932, **3**, 745.
- HOLMYARD, E. J. (15). 'Aidamir al-Jildakī [+14th-century alchemist].' *IRAQ*, 1937, **4**, 47.
- HOLMYARD, E. J. (16). 'The Present Position of the Geber Problem.' *SPR*, 1925, **19**, 415.
- HOLMYARD, E. J. (17). 'An Essay on Jābir ibn Ḥayyān.' Art. in *Studien z. Gesch. d. Chemie; Festgabe f. E. O. von Lippmann zum 70. Geburtstag*, ed. J. Ruska (37). Springer, Berlin, 1927, p. 28.
- HOLMYARD, E. J. & MANDEVILLE, D. C. (1). '*Avicennae De Congelatione et Conglutinatione Lapidum*', being Sections of the '*Kitāb al-Shifā'*'; the Latin and Arabic texts edited with an English translation of the latter and with critical notes. Geuthner, Paris, 1927. Rev. G. Sarton, *ISIS*, 1928, **11**, 134.
- HOLTORF, G. W. (1). *Hongkong—World of Contrasts*. Books for Asia, Hongkong, 1970.
- HOMANN, R. (1). *Die wichtigsten Körpergottheiten im 'Huang Ting Ching'* (Inaug. Diss. Tübingen). Kümmerle, Göppingen, 1971. (Göppinger Akademische Beiträge, no. 27.)
- HOMBERG, W. (1). Chemical identification of a carved realgar cup brought from China by the ambassador of Siam. *HRASP*, 1703, 51.
- HOMMEL, R. P. (1). *China at Work; an illustrated Record of the Primitive Industries of China's Masses, whose Life is Toil, and thus an Account of Chinese Civilisation*. Bucks County Historical Society, Doylestown, Pa.; John Day, New York, 1937.
- HOMMEL, W. (1). 'The Origin of Zinc Smelting.' *EMJ*, 1912, **93**, 1185.
- HOMMEL, W. (2). 'Über indisches und chinesisches Zink.' *ZAC*, 1912, **25**, 97.
- HOMMEL, W. (3). 'Chinesisches Zink.' *CHZ*, 1912, **36**, 905, 918.
- HOOVER, H. C. & HOOVER, L. H. (1) (tr.). *Georgius Agricola 'De Re Metallica' translated from the 1st Latin edition of 1556, with biographical introduction, annotations and appendices upon the development of mining methods, metallurgical processes, geology, mineralogy and mining law from the earliest times to the 16th century*. 1st ed. Mining Magazine, London, 1912; 2nd ed. Dover, New York, 1950.

- HOOPYKAAS, R. (1). 'The Experimental Origin of Chemical Atomic and Molecular Theory before Boyle.' *CHYM*, 1949, 2, 65.
- HOOPYKAAS, R. (2). 'The Discrimination between "Natural" and "Artificial" Substances and the Development of Corpuscular Theory.' *A/AIHS*, 1947, 1, 640.
- HOPFNER, T. (1). *Griechisch-Aegyptischer Offenbarungszauber*. 2 vols. photolitho script. (Studien z. Palaeogr. u. Papyrskunde, ed. C. Wessely, nos. 21, 23.)
- HOPKINS, A. J. (1). *Alchemy, Child of Greek Philosophy*. Columbia Univ. Press, New York, 1934. Rev. D. W. Singer, *A*, 1936, 18, 94; W. J. Wilson, *ISIS*, 1935, 24, 174.
- HOPKINS, A. J. (2). 'A Defence of Egyptian Alchemy.' *ISIS*, 1938, 28, 424.
- HOPKINS, A. J. (3). 'Bronzing Methods in the Alchemical Leiden Papyri.' *CN*, 1902, 85, 49.
- HOPKINS, A. J. (4). 'Transmutation by Colour; a Study of the Earliest Alchemy.' Art. in *Studien z. Gesch. d. Chemie* (von Lippmann Festschrift), ed. J. Ruska. Springer, Berlin, 1927, p. 9.
- HOPKINS, E. W. (3). 'Soma.' Art. in *ERE*, vol. xi, p. 685.
- HOPKINS, E. W. (4). 'The Fountain of Youth.' *J.AOS*, 1905, 26, 1-67.
- HOPKINS, L. C. (17). 'The Dragon Terrestrial and the Dragon Celestial; I, A Study of the *Lung* (terrestrial).' *JRAS*, 1931, 791.
- HOPKINS, L. C. (18). 'The Dragon Terrestrial and the Dragon Celestial; II, A Study of the *Chhen* (celestial).' *JRAS*, 1932, 91.
- HOPKINS, L. C. (25). 'Metamorphic Stylisation and the Sabotage of Significance; a Study in Ancient and Modern Chinese Writing.' *JRAS*, 1925, 451.
- HOPKINS, L. C. (26). 'Where the Rainbow Ends.' *JRAS*, 1931, 603.
- HORI ICHIRO (1). 'Self-Mummified Buddhas in Japan; an Aspect of the Shugen-dō ('Mountain Asceticism') Cult.' *HOR*, 1961, 1 (no. 2), 222.
- HORI ICHIRO (2). *Folk Religion in Japan; Continuity and Change*, ed. J. M. Kitagawa & A. L. Miller. Univ. of Tokyo Press, Tokyo and Univ. of Chicago Press, Chicago, 1968. (Haskell Lectures on the History of Religions, new series, no. 1.)
- D'HORME, E. & DUSSAUD, R. (1). *Les Religions de Babylonie et d'Assyrie, des Hittites et des Hourrites, des Phéniciens et des Syriens*. Presses Univ. de France, Paris, 1945. (Mana, Introd. à l'Histoire des Religions, no. 1, pt. 2.)
- D'HORMON, A. et al. (1) (ed. & tr.). 'Han Wu Ti Ku Shih; Histoire Anecdotique et Fabuleuse de l'Empereur Wou [Wu] des Han' in *Lectures Chinoises*. École Franco-Chinoise, Peiping, 1945 (no. 1), p. 28.
- D'HORMON, A. (2) (ed.). *Lectures Chinoises*. École Franco-Chinoise, Peiping, 1945-. No. 1 contains text and tr. of the *Han Wu Ti Ku Shih*, p. 28.
- HOURLANI, G. F. (1). *Arab Seafaring in the Indian Ocean in Ancient and Early Mediaeval Times*. Princeton Univ. Press, Princeton, N.J. 1951. (Princeton Oriental Studies, no. 13.)
- HOWARD-WHITE, F. B. (1). *Nickel, an Historical Review*. Methuen, London, 1963.
- HOWELL, E. B. (1) (tr.). 'Chin Ku Chhi Kuan; story no. XIII, the Persecution of Shen Lien.' *CJ*, 1925, 3, 10.
- HOWELL, E. B. (2) (tr.). *The Inconstancy of Madam Chuang, and other Stories from the Chinese...* (from the *Chin Ku Chhi Kuan*, c. + 1635). Laurie, London, n.d. (1925).
- HRISTOV, H., STOJKOV, G. & MIJATER, K. (1). *The Rila Monastery [in Bulgaria]; History, Architecture, Frescoes, Wood-Carvings*. Bulgarian Acad. of Sci., Sofia, 1959. (Studies in Bulgaria's Architectural Heritage, no. 6.)
- HSIA NAI (6). 'Archaeological Work during the Cultural Revolution.' *CREC*, 1971, 20 (no. 10), 31.
- HSIA NAI, KU YEN-WEN, LAN HSIN-WEN et al. (1). *New Archaeological Finds in China*. Foreign Languages Press, Peking, 1972. With colour-plates, and Chinese characters in footnotes.
- HSIAO WEN (1). 'China's New Discoveries of Ancient Treasures.' *UNESC*, 1972, 25 (no. 12), 12.
- HTIN AUNG, MAUNG (1). *Folk Elements in Burmese Buddhism*. Oxford, 1962. Rev. P. M. R[attansij], *AX*, 1962, 10, 142.
- HUANG TZU-CHHING (1). 'Über die alte chinesische Alchemie und Chemie.' *WA*, 1957, 6, 721.
- HUANG TZU-CHHING (2). 'The Origin and Development of Chinese Alchemy.' Unpub. MS. of a lecture in the Physiological Institute of Chhinghua University, c. 1942 (dated 1944). A preliminary form of Huang Tzu-Chhing (1) but with some material which was omitted from the German version, though that was considerably enlarged.
- HUANG TZU-CHHING & CHAO YÜN-TSHUNG (1) (tr.). 'The Preparation of Ferments and Wines [as described in the *Chhi Min Yao Shu* of] Chia Ssu-Hsieh of the Later Wei Dynasty [c. + 540]; with an introduction by T. L. Davis.' *HJAS*, 1945, 9, 24. Corrigenda by Yang Lien-Shêng, 1946, 10, 186.
- HUANG WEN (1). 'Nei Ching, the Chinese Canon of Medicine.' *CMJ*, 1950, 68, 17 (originally M.D. Thesis, Cambridge, 1947).
- HUANG WEN (2). *Poems of Mao Tsé-Tung, translated and annotated*. Eastern Horizon Press, Hongkong, 1966.

- HUARD, P. & HUANG KUANG-MING (M. WONG) (1). 'La Notion de Cercle et la Science Chinoise.' *A/AIHS*, 1956, 9, 111. (Mainly physiological and medical.)
- HUARD, P. & HUANG KUANG-MING (M. WONG) (2). *La Médecine Chinoise au Cours des Siècles*. Dacosta, Paris, 1959.
- HUARD, P. & HUANG KUANG-MING (M. WONG) (3). 'Évolution de la Matière Médicale Chinoise.' *JAN*, 1958, 47. Sep. pub. Brill, Leiden, 1958.
- HUARD, P. & HUANG KUANG-MING (M. WONG) (5). 'Les Enquêtes Françaises sur la Science et la Technologie Chinoises au 18^e Siècle.' *BEFEO*, 1966, 53, 137-226.
- HUARD, P. & HUANG KUANG-MING (M. WONG) (7). *Soins et Techniques du Corps en Chine, au Japon et en Inde; Ouvrage précédé d'une Étude des Conceptions et des Techniques de l'Éducation Physique, des Sports et de la Kinésithérapie en Occident depuis l'Antiquité jusqu'à l'Époque contemporaine*. Berg International, Paris, 1971.
- HUARD, P., SONOLET, J. & HUANG KUANG-MING (M. WONG) (1). 'Mesmer en Chine; Trois Lettres Médicales [MSS] du R. P. Amiot; rédigées à Pékin, de +1783 à +1790.' *RSH*, 1960, 81, 61.
- HUBER, E. (1). 'Die mongolischen Destillierapparate.' *CHA*, 1928, 15, 145.
- HUBER, E. (2). *Der Kampf um den Alkohol im Wandel der Kulturen*. Trowitsch, Berlin, 1930.
- HUBER, E. (3). *Bier und Bierbereitung bei den Völkern der Urzeit*,
Vol. 1. *Babylonien und Ägypten*.
Vol. 2. *Die Völker unter babylonischen Kultureinfluss; Auftreten des gehopften Bieres*.
Vol. 3. *Der ferne Osten und Äthiopien*.
Gesellschaft f. d. Geschichte und Bibliographie des Brauwesens, Institut f. Gärungsgewerbe, Berlin, 1926-8.
- HUBICKI, W. (1). 'The Religious Background of the Development of Alchemy and Chemistry at the Turn of the +16th and +17th Centuries.' Communication to the XIIth Internat. Congr. Hist. of Sci. Paris, 1968. Résumés, p. 102. Actes, vol. 3A, p. 81.
- HUFELAND, C. (1). *Makrobiotik; oder die Kunst das menschliche Leben zu verlängern*. Berlin, 1823. *The Art of Prolonging Life*. 2 vols. Tr. from the first German ed. London, 1797. Hebrew tr. Lemberg (Lwów), 1831.
- HUGHES, A. W. MCKENNY (1). 'Insect Infestation of Churches.' *JRIBA*, 1954.
- HUGHES, E. R. (1). *Chinese Philosophy in Classical Times*. Dent, London, 1942. (Everyman Library, no. 973.)
- HUGHES, M. J. & ODDY, W. A. (1). 'A Reappraisal of the Specific Gravity Method for the Analysis of Gold Alloys.' *AMY*, 1970, 12, 1.
- HUMBOLDT, J. P. L. (1). *Guide de la Conversation Arabe*. Paris, Bonn and Geneva, 1838.
- VON HUMBOLDT, ALEXANDER (1). *Cosmos; a Sketch of a Physical Description of the Universe*. 5 vols. Tr. E. Cotté, B. H. Paul & W. S. Dallas. Bohn, London, 1849-58.
- VON HUMBOLDT, ALEXANDER (3). *Examen Critique de l'Histoire de la Géographie du Nouveau Continent, et des Progrès de l'Astronomie Nautique au 15^e et 16^e Siècles*. 2 vols. Paris, 1837.
- VON HUMBOLDT, ALEXANDER (4). *Fragmens de Géologie et de Climatologie Asiatique*. 2 vols. Gide, de la Forest & Delaunay, Paris, 1831.
- HUMMEL, A. W. (6). 'Astronomy and Geography in the Seventeenth Century [in China].' (On Hsiung Ming-Yü's work.) *ARL/DO*, 1938, 226.
- HUNGER, H., STEGMÜLLER, O., ERBSE, H. et al. (1). *Geschichte der Textüberlieferung der antiken und mittelalterlichen Literatur*. 2 vols. Vol. 1, *Antiken Literatur*. Atlantis, Zürich, 1964. See Ineichen, Schindler, Bodmer et al. (1).
- HUSAIN, YUSUF (1) (ed. & tr.). 'Ḥawā' al-Ḥayāt [= *Bahr al-Ḥayāt* (The Ocean, or Water, of Life)], la Version Arabe de l'*Amrithunda* [text and French précis transl.]. *JA*, 1928, 213, 291.
- HUTTEN, E. H. (1). 'Culture, One and Indivisible.' *HUM*, 1971, 86 (no. 5), 137.
- HUZZAYIN, S. A. (1). *Arabia and the Far East; their commercial and cultural relations in Graeco-Roman and Irano-Arabian times*. Soc. Royale de Géogr. Cairo, 1942.
- ICHIDA, MIKINOSURE (1). 'The Hu Chi, mainly Iranian Girls, found in China during the Tang Period.' *MRDTB*, 1961, 20, 35.
- IDELER, J. L. (1) (ed.). *Physici et Medici Graeci Minores*. 2 vols. Reimer, Berlin, 1841.
- IHDE, A. J. (1). 'Alchemy in Reverse; Robert Boyle on the Degradation of Gold.' *CHYM*, 1964, 9, 47. Abstr. in Proc. Xth Internat. Congr. Hist. of Sci., Ithaca, N.Y., 1962, p. 907.
- ILG, A. (1). 'Theophilus Presbyter *Schedula Diversarum Artium*; I, Revidierter Text, Übersetzung und Appendix.' *QSKMR*, 1874, 7, 1-374.
- IMBAULT-HUART, C. (1). 'La Légende du premier Pape des Taoistes, et l'Histoire de la Famille Pontificale des Tchang [Chang], d'après des Documents Chinois, traduits pour la première fois.' *JA*, 1884 (8^e sér.), 4, 389. Sep. pub. Impr. Nat. Paris, 1885.
- IMBAULT-HUART, C. (2). 'Miscellanées Chinoises.' *JA*, 1881 (7^e sér.), 18, 255, 534.

- INEICHEN, G., SCHINDLER, A., BODMER, D. *et al.* (1). *Geschichte der Textüberlieferung der antiken und mittelalterlichen Literatur*. 2 vols. Vol. 2, *Mittelalterliche Literatur*. Atlantis, Zürich, 1964. See Hunger, Stegmüller, Erbse *et al.* (1).
- INTORCETTA, P., HERDRICH, C., [DE] ROUGEMONT, F. & COUPLET, P. (1) (tr.). 'Confucius Sinarum Philosophus, sive Scientia Sinensis, latine exposita'...; *Adjecta est: Tabula Chronologica Monarchiae Sinicae juxta cyclos annorum LX, ab anno post Christum primo, usque ad annum praesentis Saeculi 1683* [by P. Couplet, pr. 1686]. Horthemels, Paris, 1687. Rev. in *PTRS*, 1687, 16 (no. 189), 376.
- IYENGAR, B. K. S. (1). *Light on Yoga ('Yoga Bṛpika')*. Allen & Unwin, London, 2nd ed. 1968, 2nd imp. 1970.
- IYER, K. C. VIRARAGHAVA (1). 'The Study of Alchemy [in Tamilnad, South India].' Art. in *Acarya [P. C.] Ray Commemoration Volume*, ed. H. N. Datta, Meghned Saha, J. C. Ghosh *et al.* Calcutta, 1932, p. 460.
- JACKSON, R. D. & VAN BAVEL, C. H. M. (1). 'Solar distillation of water from Soil and Plant materials; a simple Desert Survival technique.' *S*, 1965, 149, 1377.
- JACOB, E. F. (1). 'John of Roquetaillade.' *BjRL*, 1956, 39, 75.
- JACOBI, HERMANN (3). '[The "Abode of the Blest" in] Hinduism.' *ERE*, vol. ii, p. 698.
- JACOBI, JOLANDE (1). *The Psychology of C. G. Jung; an Introduction with Illustrations*. Tr. from Germ. by R. Manheim. Routledge & Kegan Paul, London, 1942. 6th ed. (revised), 1962.
- JACQUES, D. H. (1). *Physical Perfection*. New York, 1859.
- JAGNAUX, R. (1). *Histoire de la Chimie*. 2 vols. Baudry, Paris, 1891.
- JAHN, K. & FRANKE, H. (1). *Die China-Geschichte des Raṣīd ad-Dīn [Rashīd al-Dīn]; Übersetzung, Kommentar, Facsimiletafeln*. Böhlau, Vienna, 1971. (Österreichische Akademie der Wissenschaften, Phil.-Hist. Kl., Denkschriften, no. 105; Veröffentl. d. Kommission für Gesch. Mittelasiens, no. 1.) This is the Chinese section of the *Jāmi' al-Tawārīkh*, finished in +1304, the whole by +1316. See Meredith-Owens (1).
- JAMES, MONTAGUE R. (1) (ed. & tr.). *The Apocryphal New Testament; being the Apocryphal Gospels, Acts, Epistles and Apocalypses, with other Narratives and Fragments, newly translated by...* Oxford, 1924, repr. 1926 and subsequently.
- JAMES, WILLIAM (1). *Varieties of Religious Experience; a Study in Human Nature*. Longmans Green, London, 1904. (Gifford Lectures, 1901-2.)
- JAMSHED BAKHT, HAKIM, S. & MAHDIHASSAN, S. (1). 'Calcined Metals or *kushtas*; a Class of Alchemical Preparations used in Unani-Ayurvedic Medicine.' *MED*, 1962, 24, 117.
- JAMSHED BAKHT, HAKIM, S. & MAHDIHASSAN, S. (2). 'Essences [*arāqiath*]; a Class of Alchemical Preparations [used in Unani-Ayurvedic Medicine].' *MED*, 1962, 24, 257.
- JANSE, O. R. T. (6). 'Rapport Préliminaire d'une Mission archéologique en Indochine.' *RAA/AMG*, 1935, 9, 144, 209; 1936, 10, 42.
- JEBB, S. (1). *Fratris Rogeri Bacon Ordinis Minorum 'Opus Majus' ad Clementem Quartum Pontificem Romanum* [r. +1265 to +1268] *ex MS. Codice Dublinensi, cum aliis quibusdam collato, nunc primum edidit...* Bowyer, London, 1733.
- JEFFERYS, W. H. & MAXWELL, J. L. (1). *The Diseases of China, including Formosa and Korea*. Bale & Danielsson, London, 1910. 2nd ed., re-written by Maxwell alone. ABC Press, Shanghai, 1929.
- JENYNS, R. SOAME (3). *Archaic [Chinese] Jades in the British Museum*. Brit. Mus. Trustees, London, 1951.
- JOACHIM, H. H. (1). 'Aristotle's Conception of Chemical Combination.' *JP*, 1904, 29, 72.
- JOHN OF ANTIOCH (fl. +610) (1). *Historias Chronikēs apo Adam*. See Valesius, Henricus (1).
- JOHN MALALA (prob. = Joh. Scholasticus, Patriarch of Byzantium, d. +577). *Chronographia*, ed. W. Dindorf. Weber, Bonn, 1831 (in *Corp. Script. Hist. Byz.* series).
- JOHNSON, A. CHANDRAHASAN & JOHNSON, SATYABAMA (1). 'A Demonstration of Oesophageal Reflux using Live Snakes.' *CLINR*, 1969, 20, 107.
- JOHNSON, C. (1) (ed.) (tr.). 'De Necessariis Observantiis Scaccarii Dialogus (Dialogus de Scaccario)', 'Discourse on the Exchequer', by Richard Fitznigel, Bishop of London and Treasurer of England [c. +1180], text and translation, with introduction. London, 1950.
- JOHNSON, OBED S. (1). *A Study of Chinese Alchemy*. Commercial Press, Shanghai, 1928. Ch. tr. by Huang Su-Fêng: *Chung-Kuo Ku-Tai Lien-Tan Shu*. Com. Press, Shanghai, 1936. Rev. B. Laufer, *ISIS*, 1929, 12, 330; H. Chatley, *JRAS/NCB*, 1928, *NCDN*, 9 May 1928. Cf. Waley (14).
- JOHNSON, R. P. (1). 'Note on some Manuscripts of the *Mappae Clavicula*.' *SP*, 1935, 10, 72.
- JOHNSON, R. P. (2). 'Compositiones Variæ'... *an Introductory Study*. Urbana, Ill. 1939. (Illinois Studies in Language and Literature, vol. 23, no. 3.)
- JONAS, H. (1). *The Gnostic Religion*. Beacon, Boston, 1958.
- JONES, B. E. (1). *The Freemason's Guide and Compendium*. London, 1950.
- JONES, C. P. (1) (tr.). *Philostratus' 'Life of Apollonius'*, with an introduction by G. W. Bowersock, Penguin, London, 1970.

- DE JONG, H. M. E. (1). *Michael Maier's 'Atalanta Fugiens'; Sources of an Alchemical Book of Emblems.* Brill, Leiden, 1969. (Janus Supplements, no. 8.)
- JOPE, E. M. (3). 'The Tinning of Iron Spurs; a Continuous Practice from the +10th to the +17th Century.' *OX*, 1956, 21, 35.
- JOSEPH, L. (1). 'Gymnastics from the Middle Ages to the Eighteenth Century.' *CIBA/S*, 1949, 10, 1030.
- JOSTEN, C. H. (1). 'The Text of John Dastin's "Letter to Pope John XXII".' *AX*, 1951, 4, 34.
- JOURDAIN, M. & JENYNS, R. SOAME (1). *Chinese Export Art.* London, 1950.
- JOYCE, C. R. B. & CURRY, S. H. (1) (ed.). *The Botany and Chemistry of Cannabis.* Williams & Wilkins, Baltimore, 1970. Rev. *SAM*, 1971, 224 (no. 3), 238.
- JUAN WEI-CHOU. See Wei Chou-Yuan.
- JULIEN, STANISLAS (1) (tr.). *Voyages des Pèlerins Bouddhistes.* Impr. Imp., Paris, 1853-8. 3 vols. (Vol. 1 contains Hui Li's Life of Hsüan-Chuang; Vols. 2 and 3 contain Hsüan-Chuang's *Hsi Yu Chi*.)
- JULIEN, STANISLAS (11). 'Substance anaesthésique employée en Chine dans le Commencement du 3e Siècle de notre ère pour paralyser momentanément la Sensibilité.' *CRAS*, 1849, 28, 195.
- JULIEN, STANISLAS & CHAMPION, P. (1). *Industries Anciennes et Modernes de l'Empire Chinois, d'après des Notices traduites du Chinois...* (paraphrased précis accounts based largely on *Thien Kung Khai Wu*; and eye-witness descriptions from a visit in 1867). Lacroix, Paris, 1869.
- JULIUS AFRICANUS. *Kestoi*. See Thevenot, D. (1).
- JUNG, C. G. (1). *Psychologie und Alchemie.* Rascher, Zürich, 1944. 2nd ed. revised, 1952. Eng. tr. R. F. C. Hull [& B. Hannah], *Psychology and Alchemy.* Routledge & Kegan Paul, London, 1953 (Collected Works, vol. 12). Rev. W. Pagel, *ISIS*, 1948, 39, 44; G. H[e]ym, *AX*, 1948, 3, 64.
- JUNG, C. G. (2). 'Synchronicity; an Acausal Connecting Principle' [on extra-sensory perception]; essay in the collection *The Structure and Dynamics of the Psyche.* Routledge & Kegan Paul, London, 1960 (Collected Works, vol. 8). Rev. C. Allen, *N*, 1961, 191, 1235.
- JUNG, C. G. (3). *Alchemical Studies.* Eng. tr. from the Germ., R. F. C. Hull, Routledge & Kegan Paul, London, 1968 (Collected Works, vol. 13). Contains the 'European commentary' on the *Thai-I Chin Hua Tsung Chih*, pp. 1-55, and the 'Interpretation of the Visions of Zosimos', pp. 57-108.
- JUNG, C. G. (4). *Aion; Researches into the Phenomenology of the Self.* Eng. tr. from the Germ., R. F. C. Hull, Routledge & Kegan Paul, London, 1959 (Collected Works, vol. 9, pt. 2).
- JUNG, C. G. (5). *Paracelsica.* Rascher, Zürich and Leipzig, 1942. Eng. tr. from the Germ., R. F. C. Hull.
- JUNG, C. G. (6). *Psychology and Religion; West and East.* Eng. tr. from the Germ., R. F. C. Hull. Routledge & Kegan Paul, London, 1958 (63 corr.) (Collected Works, vol. 11). Contains the essay 'Transformation Symbolism in the Mass'.
- JUNG, C. G. (7). *Memories, Dreams and Reflections.* Recorded by A. Jaffé, tr. R. & C. Winston. New York and London, 1963.
- JUNG, C. G. (8). *Mysterium Conjunctionis; an Enquiry into the Separation and Synthesis of Psychic Opposites in Alchemy.* Eng. tr. from the Germ., R. F. C. Hull, Routledge & Kegan Paul, London, 1963 (Collected Works, vol. 14). Orig. ed. *Mysterium Conjunctionis; Untersuchung ü. die Trennung u. Zusammensetzung der seelische Gegensätze in der Alchemie*, 2 vols. Rascher, Zürich, 1955, 1956 (Psychol. Abhandlungen, ed. C. G. J., nos. 10, 11).
- JUNG, C. G. (9). 'Die Erlösungsvorstellungen in der Alchemie.' *ERJB*, 1936, 13-111.
- JUNG, C. G. (10). *The Integration of the Personality.* Eng. tr. S. Dell, Farrar & Rinehart, New York and Toronto, 1939, Kegan Paul, Trench & Trübner, London, 1940, repr. 1941. Ch. 5, 'The Idea of Redemption in Alchemy' is the translation of Jung (9).
- JUNG, C. G. (11). 'Über Synchronizität.' *ERJB*, 1952, 20, 271.
- JUNG, C. G. (12). *Analytical Psychology; its Theory and Practice.* Routledge, London, 1968.
- JUNG, C. G. (13). *The Archetypes and the Collective Unconscious.* Eng. tr. by R. F. C. Hull. Routledge & Kegan Paul, London, 1959 (Collected Works, vol. 9, pt. 1).
- JUNG, C. G. (14). 'Einige Bemerkungen zu den Visionen des Zosimos.' *ERJB*, 1938. Revised and expanded as 'Die Visionen des Zosimos' in *Von der Wurzeln des Bewusstseins; Studien ü. d. Archetypus.* In *Psychologische Abhandlungen.* Zürich, 1954, vol. 9.
- JUNG, C. G. & PAULI, W. (1). *The Interpretation of Nature and the Psyche.*
 (a) 'Synchronicity; an Acausal Connecting Principle', by C. G. Jung.
 (b) 'The Influence of Archetypal Ideas on the Scientific Theories of Kepler', by W. Pauli.
 Tr. R. F. C. Hull, Routledge & Kegan Paul, London, 1955.
 Orig. pub. in German as *Naturerklärung und Psyche*, Rascher, Zürich, 1952 (Studien aus dem C. G. Jung Institut, no. 4).
- KAHLBAUM, G. W. A. See Diergart, P. (Kahlbaum Festschrift).
- KAHLE, P. (7). 'Chinese Porcelain in the Lands of Islam.' *TOCS*, 1942, 27. Reprinted in Kahle (3), p. 326, with Supplement, p. 351 (originally published in *WA*, 1953, 2, 179 and *JPHS*, 1953, 1, 1).

- KAHLE, P. (8). 'Islamische Quellen über chinesischen Porzellan.' *ZDMG*, 1934, **88**, 1, *OAZ*, 1934, **19** (N.F.), 69.
- KALTENMARK, M. (2) (tr.). *Le 'Lie Sien Tchouan' [Lieh Hsien Chuan]; Biographies Légendaires des Immortels Taoistes de l'Antiquité*. Centre d'Etudes Sinologiques Franco-Chinois (Univ. Paris), Peking, 1953. Crit. P. Demiéville, *TP*, 1954, **43**, 104.
- KALTENMARK, M. (4). 'Ling Pao; Note sur un Terme du Taoisme Religieux', in *Mélanges publiés par l'Inst. des Htes. Etudes Chin.* Paris, 1960, vol. 2, p. 559 (Bib. de l'Inst. des Htes. Et. Chin. vol. 14).
- KANGRO, H. (1). *Joachim Jungius' [+1587 to +1657] Experimente und Gedanken zur Begründung der Chemie als Wissenschaft; ein Beitrag zur Geistesgeschichte des 17. Jahrhunderts*. Steiner, Wiesbaden, 1968 (Boethius; *Texte und Abhandlungen z. Gesch. d. exakten Naturwissenschaften*, no. 7). Rev. R. Hooykaas, *A/AlHS*, 1970, **23**, 299.
- KAO LEI-SSU (1) (Aloysius Ko, S.J.). 'Remarques sur un Écrit de M. P[auw] intitulé "Recherches sur les Égyptiens et les Chinois" (1775).' *MCHSAMUC*, 1777, **2**, 365-574 (in some editions, 2nd pagination, 1-174).
- KAO, Y. L. (1). 'Chemical Analysis of some old Chinese Coins.' *JWCBS*, 1935, **7**, 124.
- KAPPERER, R. (1). 'Der Blutkreislauf im altchinesischen Lehrbuch *Huang Ti Nei Ching*.' *MMW*, 1939 (no. 18), 718.
- KARIMOV, U. I. (1) (tr.). *Neizvestnoe Sovrineniye al-Rāzī 'Kniga Taishvi Taishi' (A Hitherto Unknown Work of al-Rāzī, 'Book of the Secret of Secrets')*. Acad. Sci. Uzbek SSR, Tashkent, 1957. Rev. N. A. Figurovsky, tr. P. L. Wyvill, *AX*, 1962, **10**, 146.
- KARLGRÉN, B. (18). 'Early Chinese Mirror Inscriptions.' *BMFEA*, 1934, **6**, 1.
- KAROW, O. (2) (ed.). *Die Illustrationen des Arzneibuches der Periode Shao-Hsing (Shao-Hsing Pên Tshao Hua Thu) vom Jahre +1159, ausgewählt und eingeleitet*. Farbenfabriken Bayer Aktiengesellschaft (Pharmazeutisch-Wissenschaftliche Abteilung), Leverkusen, 1956. Album selected from the *Shao-Hsing Chiao-Ting Pên Tshao Chieh-Thi* published by Wada Toshihiko, Tokyo, 1933.
- KASAMATSU, A. & HIRAI, T. (1). 'An Electro-encephalographic Study of Zen Meditation (*zazen*).'
FPNŷ, 1966, **20** (no. 4), 315.
- KASSAU, E. (1). 'Charakterisierung einiger Steroidhormone durch Mikrosublimation.' *DAZ*, 1960, **100**, 1102.
- KAZANCHIAN, T. (1). *Laboratornaja Tehnika i Apparatura v Srednevekovoj Armenii po drevnim Armjanskim Alchimicheskim Rukopisjam* (in Armenian with Russian summary). *SNM*, 1949, **2**, 1-28.
- KEFERSTEIN, C. (1). *Mineralogia Polyglotta*. Anton, Halle, 1849.
- KEILIN, D. & MANN, T. (1). 'Laccase, a blue Copper-Protein Oxidase from the Latex of *Rhus succedanea*.'
N, 1939, **143**, 23.
- KEILIN, D. & MANN, T. (2). 'Some Properties of Laccase from the Latex of Lacquer-Trees.' *N*, 1940, **145**, 304.
- KEITH, A. BERRIEDALE (5). *The Religion and Philosophy of the Vedas and Upanishads*. 2 vols. Harvard Univ. Press, Cambridge (Mass.), 1925. (Harvard Oriental Series, nos. 31, 32.)
- KEITH, A. BERRIEDALE (7). '[The State of the Dead in] Hindu [Belief].'
ERE, vol. xi, p. 843.
- KELLING, R. (1). *Das chinesische Wohnhaus; mit einem II Teil über das frühchinesische Haus unter Verwendung von Ergebnissen aus Übungen von Conrady im Ostasiatischen Seminar der Universität Leipzig, von Rudolf Keller und Bruno Schindler*. Deutsche Gesellsch. für Nat. u. Völkerkunde Ostasiens, Tokyo, 1935 (*MDGNVO*, Supplementband no. 13). Crit. P. Pelliot, *TP*, 1936, **32**, 372.
- KENNEDY, J. (1). 'Buddhist Gnosticism, the System of Basilides.' *JRAS*, 1902, 377.
- KENNEDY, J. (2). 'The Gospels of the Infancy, the *Lalita Vistara*, and the *Vishnu Purana*; or, the Transmission of Religious Ideas between India and the West.' *JRAS*, 1917, 209, 469.
- KENT, A. (1). 'Sugar of Lead.' *MBLB*, 1961, **4** (no. 6), 85.
- KERNEIZ, C. (1). *Les 'Asanas', Gymnastique immobile du Hathayoga*. Tallandier, Paris, 1946.
- KERNEIZ, C. (2). *Le Yoga*. Tallandier, Paris, 1956. 2nd ed. 1960.
- KERR, J. G. (1). '[Glossary of Chinese] Chemical Terms', in Doolittle (1), vol. 2, p. 542.
- KEUP, W. (1) (ed.). *The Origin and Mechanisms of Hallucinations*. Plenum, New York and London, 1970.
- KEYNES, J. M. (Lord Keynes) (1) (posthumous). 'Newton the Man.' Essay in *Newton Tercentenary Celebrations* (July 1946). Royal Society, London, 1947, p. 27. Reprinted in *Essays in Biography*.
- KHORY, RUSTOMJEE NASERWANJEE & KATRAK, NANABHAI NAVROSI (1). *Materia Medica of India and their Therapeutics*. Times of India, Bombay, 1903.
- KHUNRATH, HEINRICH (1). *Amphitheatrum Sapientiae Aeternae Solius Verae, Christiano-Kabalisticum, Divino-Magicum, necnon Physico-Chymicum, Tetrinum, Catholicon...* Prague, 1598; Magdeburg, 1602; Frankfurt, 1608, and many other editions.
- KIDDER, J. E. (1). *Japan before Buddhism*. Praeger, New York; Thames & Hudson, London, 1959.
- KINCH, E. (1). 'Contributions to the Agricultural Chemistry of Japan.' *TASJ*, 1880, **8**, 369.

- KING, C. W. (1). *The Natural History of Precious Stones and of the Precious Metals*. Bell & Daldy, London, 1867.
- KING, C. W. (2). *The Natural History of Gems or Decorative Stones*. Bell & Daldy, London, 1867.
- KING, C. W. (3). *The Gnostics and their Remains*. 2nd ed. Nutt, London, 1887.
- KING, C. W. (4). *Handbook of Engraved Gems*. 2nd ed. Bell, London, 1885.
- KLAPROTH, J. (5). 'Sur les Connaissances Chimiques des Chinois dans le 8ème Siècle.' *MAIS/SP*, 1810, 2, 476. Ital. tr., S. Guareschi, *SAEC*, 1904, 20, 449.
- KLAPROTH, J. (6). *Mémoires relatifs à l'Asie*. . . 3 vols. Dondey Dupré, Paris, 1826.
- KLAPROTH, M. H. (1). *Analytical Essays towards Promoting the Chemical Knowledge of Mineral Substances*. 2 vols. Cadell & Davies, London, 1801.
- KNAUER, E. (1). 'Die Ovarientransplantation.' *AFG*, 1900, 60, 322.
- KNOX, R. A. (1). *Enthusiasm; a Chapter in the History of Religion, with special reference to the + 17th and + 18th Centuries*. Oxford, 1950.
- KO, ALOYSIUS. See Kao Lei-Ssu.
- KOBERT, R. (1). 'Chronische Bleivergiftung in klassischen Altertume.' Art. in Kahlbaum Festschrift (1909), ed. Diergart (1), pp. 103-19.
- KOPP, H. (1). *Geschichte d. Chemie*. 4 vols. 1843-7.
- KOPP, H. (2). *Beiträge zur Geschichte der Chemie*. Vieweg, Braunschweig, 1869.
- KRAMRISCH, S. (1). *The Art of India; Traditions of Indian Sculpture, Painting and Architecture*. Phaidon, London, 1954.
- KRAUS, P. (1). 'Der Zusammenbruch der Dschäbir-Legende; II, Dschäbir ibn Ḥajjān und die Isma'ilijja.' *JBFIGN*, 1930, 3, 23. Cf. Ruska (1).
- KRAUS, P. (2). 'Jābir ibn Ḥayyān; Contributions à l'Histoire des Idées Scientifiques dans l'Islam; I, Le Corpus des Écrits Jābiriens.' *MIE*, 1943, 44, 1-214. Rev. M. Meyerhof, *ISIS*, 1944, 35, 213.
- KRAUS, P. (3). 'Jābir ibn Ḥayyān; Contributions à l'Histoire des Idées Scientifiques dans l'Islam; II, Jābir et la Science Grecque.' *MIE*, 1942, 45, 1-406. Rev. M. Meyerhof, *ISIS*, 1944, 35, 213.
- KRAUS, P. (4) (ed.). *Jābir ibn Ḥayyān; Essai sur l'Histoire des Idées Scientifiques dans l'Islam*. Vol. 1. *Textes Choisis*. Maisonneuve, Paris and El-Kandgi, Cairo, 1935. No more appeared.
- KRAUS, P. (5). *L'Épître de Beruni sur al-Rāzī (Risālat al-Bīrūnī fī Fihrist Kutub Muḥammad ibn Zakariyā al-Rāzī)* [c. + 1036]. Paris, 1936.
- KRAUS, P. & PINES, S. (1). 'Al-Rāzī.' Art. in *EI*, vol. iii, pp. 1134 ff.
- KREBS, M. (1). *Der menschlichen Harn als Heilmittel; Geschichte, Grundlagen, Entwicklung, Praxis*. Marquardt, Stuttgart, 1942.
- KRENKOW, F. (2). 'The Oldest Western Accounts of Chinese Porcelain.' *IC*, 1933, 7, 464.
- KROLL, J. (1). *Die Lehren des Hermes Trismegistos*. Aschendorff, Münster i.W., 1914. (Beiträge z. Gesch. d. Philosophie des Mittelalters, vol. 12, no. 2.)
- KROLL, W. (1). 'Bolos und Demokritos.' *HERM*, 1934, 69, 228.
- KRÜNITZ, J. G. (1). *Ökonomisch-Technologische Enzyklopädie*. Berlin, 1773-81.
- KUBO NORITADA (1). 'The Introduction of Taoism to Japan.' In *Religious Studies in Japan*, no. 11 (no. 105), 457. See Soymié (5), p. 281 (10).
- KUBO NORITADA (2). 'The Transmission of Taoism to Japan, with particular reference to the *san shih* (three corpses theory).' *Proc. IXth Internat. Congress of the History of Religions*, Tokyo, 1958, p. 335.
- KUGENER, M. A. & CUMONT, F. (1). *Extrait de la CXXXIII ème 'Homélie' de Sévère d'Antioch*. Lamertin, Brussels, 1912. (Recherches sur le Manichéisme, no. 2.)
- KUGENER, M. A. & CUMONT, F. (2). *L'Inscription Manichéenne de Salone [Dalmatia]*. (A tombstone or consecration memorial of the Manichaean Virgin Bassa.) Lamertin, Brussels, 1912. (Recherches sur le Manichéisme, no. 3.)
- KÜHN, F. (3). *Die Dreizehnstöckige Pagode* (Stories translated from the Chinese). Steiniger, Berlin, 1940.
- KÜHNEL, P. (1). *Chinesische Novellen*. Müller, München, 1914.
- KUNCKEL, J. (1). 'Ars Vitriaria Experimentalis', oder *Vollkommene Glasmacher-Kunst*. . . Frankfurt and Leipzig; Amsterdam and Danzig, 1679. 2nd ed. Frankfurt and Leipzig, 1689. 3rd ed. Nuremberg, 1743, 1756. French tr. by the Baron d'Holbach, Paris, 1752.
- KUNCKEL, J. (2). 'Collegium Physico-Chemicum Experimentale', oder *Laboratorium Chymicum; in welchem deutlich und gründlich von den wahren Principiis in der Natur und denen gewürckten Dingen so wohl über als in der Erden, als Vegetabilien, Animalien, Mineralien, Metallen. . . , nebst der Transmutation und Verbesserung der Metallen gehandelt wird*. . . Heyl, Hamburg and Leipzig, 1716.
- KUNG, S. C., CHAO, S. W., PEI, Y. T. & CHANG, C. (1). 'Some Mummies Found in West China.' *JWCBS*, 1939, 11, 105.
- KUNG YO-THING, TU YÜ-TSHANG, HUANG WEI-TÊ, CHHEN CHHANG-CHHING & seventeen other collaborators (1). 'Total Synthesis of Crystalline Insulin.' *SCISA*, 1966, 15, 544.

- LACAZE-DUTHIERS, H. (1). 'Tyrian purple.' *ASN/Z*, 1859 (4e sér.), 12, 5.
- LACH, D. F. (5). *Asia in the Making of Europe*. 2 vols. in 5 parts. Univ. Chicago Press, Chicago and London, 1965-.
- LAGERCRANTZ, O. (1). *Papyrus Graecus Holmiensis*. Almqvist & Wiksells, Upsala, 1913. (The first publication of the +3rd-cent. technical and chemical Stockholm papyrus.) Cf. Caley (2).
- LAGERCRANTZ, O. (2). 'Über das Wort Chemie.' *KVSUA*, 1937-8, 25.
- LAMOTTE, E. (1) (tr.). *Le Traité de la Grande Vertu de Sagesse de Nāgārjuna (Mahāprajñāpāramitā-sūtra)*. 3 vols. Muséon, Louvain, 1944 (Bibl. Muséon, no. 18). Rev. P. Demiéville, *JJA*, 1950, 238, 375.
- LANDUR, N. (1). 'Compte Rendu de la Séance de l'Académie des Sciences [de France] du 24 Août 1868.' *LIN* (1^e section), 1868, 36 (no. 1808), 273. Contains an account of a communication by M. Chevreul on the history of alchemy, tracing it to the *Tīmaeus*; with a critical paragraph by Landur himself maintaining that in his view much (though not all) of ancient and mediaeval alchemy was disguised moral and mystical philosophy.
- LANE, E. W. (1). *An Account of the Manners and Customs of the Modern Egyptians (1833 to 1835)*. Ward Lock, London, 3rd ed. 1842; repr. 1890.
- LANGE, E. F. (1). 'Alchemy and the Sixteenth-Century Metallurgists.' *AX*, 1966, 13, 92.
- LATTIMORE, O. & LATTIMORE, E. (1) (ed.). *Silks, Spices and Empire; Asia seen through the Eyes of its Discoverers*. Delacorte, New York, 1968. (Great Explorers Series, no. 3.)
- LAUBRY, C. & BROUSSE, T. (1). 'Documents recueillis aux Indes sur les "Yoguis" par l'enregistrement simultané du pouls, de la respiration et de l'électrocardiogramme.' *PM*, 1936, 44 (no. 83), 1601 (14 Oct.). Rev. J. Filliozat, *JJA*, 1937, 521.
- LAUBRY, C. & BROUSSE, T. (2). 'Interférence de l'Activité Corticale sur le Système Végétatif Neurovasculaire.' *PM*, 1935, 43 (no. 84), (19 Oct.)
- LAUFER, B. (1). *Sino-Iranica; Chinese Contributions to the History of Civilisation in Ancient Iran*. *FMNHP/AS*, 1919, 15, no. 3 (Pub. no. 201). Rev. and crit. Chang Hung-Chao, *MGSC*, 1925 (ser. B), no. 5.
- LAUFER, B. (8). *Jade; a Study in Chinese Archaeology and Religion*. *FMNHP/AS*, 1912, 10, 1-370. Repub. in book form, Perkins, Westwood & Hawley, South Pasadena, 1946. Rev. P. Pelliot, *TP*, 1912, 13, 434.
- LAUFER, B. (10). 'The Beginnings of Porcelain in China.' *FMNHP/AS*, 1917, 15, no. 2 (Pub. no. 192), (includes description of +2nd-century cast-iron funerary cooking-stove).
- LAUFER, B. (12). 'The Diamond; a study in Chinese and Hellenistic Folk-Lore.' *FMNHP/AS*, 1915, 15, no. 1 (Pub. no. 184).
- LAUFER, B. (13). 'Notes on Turquoise in the East.' *FMNHP/AS*, 1913, 13, no. 1 (Pub. no. 169).
- LAUFER, B. (15). 'Chinese Clay Figures, Pt. I; Prolegomena on the History of Defensive Armor.' *FMNHP/AS*, 1914, 13, no. 2 (Pub. no. 177).
- LAUFER, B. (17). 'Historical Jottings on Amber in Asia.' *MAAA*, 1906, 1, 211.
- LAUFER, B. (24). 'The Early History of Felt.' *AAN*, 1930, 32, 1.
- LAUFER, B. (28). 'Christian Art in China.' *MSOS*, 1910, 13, 100.
- LAUFER, B. (40). 'Sex Transformation and Hermaphrodites in Ancient China.' *AJPA*, 1920, 3, 259.
- LAUFER, B. (41). 'Die Sage von der goldgrabenden Ameisen.' *TP*, 1908, 9, 429.
- LAUFER, B. (42). *Tobacco and its Use in Asia*. Field Mus. Nat. Hist., Chicago, 1924. (Anthropology Leaflet, no. 18.)
- LEADBEATER, C. W. (1). *The Chakras, a Monograph*. London, n.d.
- LECLERC, L. (1) (tr.). 'Le Traité des Simples par Ibn al-Beithar.' *MAI/NEM*, 1877, 23, 25; 1883, 26.
- LECOMTE, LOUIS (1). *Nouveaux Mémoires sur l'État présent de la Chine*. Anisson, Paris, 1696. (Eng. tr. *Memoirs and Observations Topographical, Physical, Mathematical, Mechanical, Natural, Civil and Ecclesiastical, made in a late journey through the Empire of China, and published in several letters, particularly upon the Chinese Pottery and Varnishing, the Silk and other Manufactures, the Pearl Fishing, the History of Plants and Animals, etc. translated from the Paris edition, etc.*, 2nd ed. London, 1698. Germ. tr. Frankfurt, 1699-1700. Dutch tr. 's Graevenhage, 1698.)
- VON LECOQ, A. (1). *Buried Treasures of Chinese Turkestan; an Account of the Activities and Adventures of the 2nd and 3rd German Turfan Expeditions*. Allen & Unwin, London, 1928. Eng. tr. by A. Barwell of *Auf Hellas Spuren in Ost-turkestan*. Berlin, 1926.
- VON LECOQ, A. (2). *Von Land und Leuten in Ost-Turkestan...* Hinrichs, Leipzig, 1928.
- LEDERER, E. (1). 'Odeurs et Parfums des Animaux.' *FCO*, 1950, 6, 87.
- LEDERER, E. & LEDERER, M. (1). *Chromatography; a Review of Principles and Applications*. Elsevier, Amsterdam and London, 1957.
- LEEDS, E. T. (1). 'Zinc Coins in Mediaeval China.' *NC*, 1955 (6th ser.), 14, 177.
- LEEMANS, C. (1) (ed. & tr.). *Papyri Graeci Musei Antiquarii Publici Lugduni Batavi...* Leiden, 1885. (Contains the first publication of the +3rd-cent. chemical papyrus Leiden X.) Cf. Caley (1).

- VAN LEERSUM, E. C. (1). *Préparation du Calomel chez les anciens Hindous*. Art. in Kahlbaum Festschrift (1909), ed. Diergart (1), pp. 120-6.
- LEFÈVRE, NICOLAS (1). *Traicté de la Chymie*. Paris, 1660, 2nd ed. 1674. Eng. tr. *A Compleat Body of Chymistry*. Pulleyn & Wright, London, 1664. repr. 1670.
- LEICESTER, H. M. (1). *The Historical Background of Chemistry*. Wiley, New York, 1965.
- LEICESTER, H. M. & KLICKSTEIN, H. S. (1). 'Tenney Lombard Davis and the History of Chemistry.' *CHYM*, 1950, 3, 1.
- LEICESTER, H. M. & KLICKSTEIN, H. S. (2) (ed.). *A Source-Book in Chemistry, +1400 to 1900*. McGraw-Hill, New York, 1952.
- LEISEGANG, H. (1). *Der Heilige Geist; das Wesen und Werden der mystisch-intuitiven Erkenntnis in der Philosophie und Religion der Griechen*. Teubner, Leipzig and Berlin, 1919; photolitho reprint, Wissenschaftliche Buchgesellschaft, Darmstadt, 1967. This constitutes vol. 1 of Leisegang (2).
- LEISEGANG, H. (2). 'Pneuma Hagion'; *der Ursprung des Geistbegriffs der synoptischen Evangelien aus d. griechischen Mystik*. Hinrichs, Leipzig, 1922. (Veröffentlichungen des Forschungsinstituts f. vergl. Religionsgeschichte an d. Univ. Leipzig, no. 4.) This constitutes vol. 2 of Leisegang (1).
- LEISEGANG, H. (3). *Die Gnosis*. 3rd ed. Kröner, Stuttgart, 1941. (Kröners Taschenausgabe, no. 32.) French tr.: 'La Gnose'. Paris, 1951.
- LEISEGANG, H. (4). 'The Mystery of the Serpent.' *ERYB*, 1955, 218.
- LENZ, H. O. (1). *Mineralogie der alten Griechen und Römer deutsch in Auszügen aus deren Schriften*. Thienemann, Gotha, 1861. Photo reprint, Sändig, Wiesbaden, 1966.
- LEPESME, P. (1). 'Les Coléoptères des Denrées alimentaires et des Produits industriels entreposés.' Art. in *Encyclopédie Entomologique*, vol. xxii, pp. 1-335. Lechevalier, Paris, 1944.
- LESSIUS, L. (1). *Hygiasticon; seu Vera Ratio Valetudinis Bonae et Vitae... ad extremam Senectute Conservandae*. Antwerp, 1614. Eng. tr. Cambridge, 1634; and two subsequent translations.
- LEVEY, M. (1). 'Evidences of Ancient Distillation, Sublimation and Extraction in Mesopotamia.' *CEN*, 1955, 4, 23.
- LEVEY, M. (2). *Chemistry and Chemical Technology in Ancient Mesopotamia*. Elsevier, Amsterdam and London, 1959.
- LEVEY, M. (3). 'The Earliest Stages in the Evolution of the Still.' *ISIS*, 1960, 51, 31.
- LEVEY, M. (4). 'Babylonian Chemistry; a Study of Arabic and - 2nd Millennium Perfumery.' *OSIS*, 1956, 12, 376.
- LEVEY, M. (5). 'Some Chemical Apparatus of Ancient Mesopotamia.' *JCE*, 1955, 32, 180.
- LEVEY, M. (6). 'Mediaeval Arabic Toxicology; the "Book of Poisons" of Ibn Wahshiya [+ 10th cent.] and its Relation to Early Indian and Greek Texts.' *TAPS*, 1966, 56 (no. 7), 1-130.
- LEVEY, M. (7). 'Some Objective Factors in Babylonian Medicine in the Light of New Evidence.' *BIHM*, 1961, 35, 61.
- LEVEY, M. (8). 'Chemistry in the *Kitāb al-Sumum* (Book of Poisons) by Ibn al-Wahshiya [al-Nabaṭī, fl. +912].' *CHYM*, 1964, 9, 33.
- LEVEY, M. (9). 'Chemical Aspects of Medieval Arabic Minting in a Treatise by Manṣūr ibn Ba'ra [c. +1230].' *JSHS*, 1971, Suppl. no. 1.
- LEVEY, M. & AL-KHALEDY, NOURY (1). *The Medical Formulary [Aqrābādihī] of [Muḥ. ibn 'Alī ibn 'Umar] al-Samarqandī [c. +1210], and the Relation of Early Arabic Simples to those found in the indigenous Medicine of the Near East and India*. Univ. Pennsylvania Press, Philadelphia, 1967.
- LÉVI, S. (2). 'Ceylan et la Chine.' *JĀ*, 1900 (9^e sér.), 15, 411. Part of Lévi (1).
- LÉVI, S. (4). 'On a Tantric Fragment from Kucha.' *IHQ*, 1936, 12, 207.
- LÉVI, S. (6). *Le Népal; Étude Historique d'un Royaume Hindou*. 3 vols. Paris, 1905-8. (Annales du Musée Guimet, Bib. d'Études, nos. 17-19.)
- LÉVI, S. (8). 'Un Nouveau Document sur le Bouddhisme de Basse Époque dans l'Inde.' *BLSOAS*, 1931, 6, 417. (Nāgārjuna and gold refining.)
- LÉVI, S. (9). 'Notes Chinoises sur l'Inde; V, Quelques Documents sur le Bouddhisme Indien dans l'Asie Centrale, pt. 1.' *BEFEO*, 1905, 5, 253.
- LÉVI, S. (10). 'Vajrabodhi à Ceylan.' *JĀ*, 1900, (9^e sér.) 15, 418. Part of Lévi (1).
- LEVOL, A. (1). 'Analyse d'un Échantillon de Cuivre Blanc de la Chine.' *RCA*, 1862, 4, 24.
- LEVY, ISIDORE (1). 'Sarapis; V, la Statue Mystérieuse.' *RHR/AMG*, 1911, 63, 124.
- LEWIS, BERNARD (1). *The Arabs in History*. London.
- LEWIS, M. D. S. (1). *Antique Paste Jewellery*. Faber, London, 1970. Rev. G. B. Hughes, *JRSA*, 1972, 120, 263.
- LEWIS, NORMAN (1). *A Dragon Apparent; Travels in Indo-China*. Cape, London, 1951.
- LI CHHIAO-PHING (1) = (2). *The Chemical Arts of Old China* (tr. from the 1st, unrevised, edition, Chhangsha, 1940, but with additional material). J. Chem. Ed., Easton, Pa. 1948. Revs. W. Willetts, *ORA*, 1949, 2, 126; J. R. Partington, *ISIS*, 1949, 40, 280; Li Cho-Hao, *JCE*, 1949, 26, 574. The Taipei ed. of 1955 (Chinese text) was again revised and enlarged.

- LI CHO-HAO (1). 'Les Hormones de l'Adénohypophyse.' *SCIS*, 1971, nos. 74-5, 69.
- LI CHO-HAO & EVANS, H. M. (1). 'Chemistry of the Anterior Pituitary Hormones.' Art. in *The Hormones*. . . Ed. G. Pincus, K. V. Thimann & E. B. Astwood. Academic Press, New York, 1948-64, vol. 1, p. 633.
- LI HUI-LIN (1). *The Garden Flowers of China*. Ronald, New York, 1959. (Chronica Botanica series, no. 19.)
- LI KUO-CHHIN & WANG CHHUNG-YU (1). *Tungsten, its History, Geology, Ore-Dressing, Metallurgy, Chemistry, Analysis, Applications and Economics*. Amer. Chem. Soc., New York, 1943 (Amer. Chem. Soc. Monographs, no. 94). 3rd ed. 1955 (A. C. S. Monographs, no. 130).
- LIANG, H. Y. (1). 'The Wah Chang [Hua-Chhang, Antimony] Mines.' *MSP*, 1915, **111**, 53. (The initials are given in the original as H. T. Liang, but this is believed to be a misprint.)
- LIANG, H. Y. (2). 'The Shui-khou Shan [Lead and Zinc] Mine in Hunan.' *MSP*, 1915, **110**, 914.
- LIANG PO-CHHIANG (1). 'Überblick ü. d. seltenste chinesische Lehrbuch d. Medizin *Huang Ti Nei Ching*.' *AGMN*, 1933, **26**, 121.
- LIBAVIUS, ANDREAS (1). *Alchemia. Andr. Libavii, Med. D[oct.], Poet. Physici Rotemburg. Operâ e Dispersis passim Optimorum Autorum, Veterum et Recentium exemplis potissimum, tum etian praeceptis quibusdam operosè collecta, adhibitiq; ratione et experientia, quanta potuit esse, methodo accuratâ explicata, et In Integrum Corpus Redacta*. . . Saur & Kopff, Frankfurt, 1597. Germ. tr. by F. Rex et al. Verlag Chemie, Weinheim, 1964.
- LIBAVIUS, ANDREAS (2). *Singularium Pars Prima: in qua de abstrusioribus difficiliusque nonnullis in Philosophia, Medicina, Chymia etc. Quaestionibus; utpote de Metallorum, Succinique Natura, de Carne fossili, ut credita est, de gestatione cacodaemomum, Veneno, aliisque rarioribus, quae versa indicat pagina, plurimis accuratè disseritur*. Frankfurt, 1599. Part II also 1599. Parts III and IV, 1601.
- LICHT, S. (1). 'The History [of Therapeutic Exercise].' Art. in *Therapeutic Exercise*, ed. S. Licht, Licht, New Haven, Conn. 1958, p. 380. (Physical Medicine Library, no. 3.)
- LIEBEN, F. (1). *Geschichte d. physiologische Chemie*. Deuticke, Leipzig and Vienna, 1935.
- LIN YÜ-THANG (1) (tr.). *The Wisdom of Laotse [and Chuang Tzu] translated, edited and with an introduction and notes*. Random House, New York, 1948.
- LIN YÜ-THANG (7). *Imperial Peking; Seven Centuries of China* (with an essay on the Art of Peking, by P. C. Swann). Elek, London, 1961.
- LIN YÜ-THANG (8). *The Wisdom of China*. Joseph, London (limited edition) 1944; (general circulation edition) 1949.
- LINDBERG, D. C. & STENECK, N. H. (1). 'The Sense of Vision and the Origins of Modern Science', art. in *Science, Medicine and Society in the Renaissance* (Pagel Presentation Volume), ed. Debus (20), vol. 1, p. 29.
- LINDEBOOM, G. A. (1). *Hermann Boerhaave; the Man and his Work*. Methuen, London, 1968.
- LING, P. H. (1). *Gymnastikens Allmänna Grunder*. . . (in Swedish). Leffler & Sebell, Upsala and Stockholm, 1st part, 1834, 2nd part, 1840 (based on observations and practice from 1813 onwards). Germ. tr.: *P. H. Ling's Schriften über Leibesübungen* (with posthumous additions), by H. F. Massmann, Heinrichshofen, Magdeburg, 1847. Cf. Cyriax (1).
- LINK, ARTHUR E. (1). 'The Taoist Antecedents in Tao-An's [+312 to +385] Prajñā Ontology.' Communication to the First International Conference of Taoist Studies, Villa Serbelloni, Bellagio, 1968.
- VON LIPPMANN, E. O. (1). *Entstehung und Ausbreitung der Alchemie, mit einem Anhang, Zur älteren Geschichte der Metalle; ein Beitrag zur Kulturgeschichte*. 3 vols. Vol. 1, Springer, Berlin, 1919. Vol. 2, Springer, Berlin, 1931. Vol. 3, Verlag Chemie, Weinheim, 1954 (posthumous, finished in 1940, ed. R. von Lippmann).
- VON LIPPMANN, E. O. (3). *Abhandlungen und Vorträge zur Geschichte d. Naturwissenschaften*. 2 vols. Vol. 1, Veit, Leipzig, 1906. Vol. 2, Veit, Leipzig, 1913.
- VON LIPPMANN, E. O. (4). *Geschichte des Zuckers, seiner Darstellung und Verwendung, seit den ältesten Zeiten bis zum Beginne der Rübenzuckerfabrikation; ein Beitrag zur Kulturgeschichte*. Hesse, Leipzig, 1890.
- VON LIPPMANN, E. O. (5). 'Chemisches bei Marco Polo.' *ZAC*, **21**, 1778. Repr. in (3), vol. 2, p. 258.
- VON LIPPMANN, E. O. (6). 'Die spezifische Gewichtsbestimmung bei Archimedes.' Repr. in (3), vol. 2, p. 168.
- VON LIPPMANN, E. O. (7). 'Zur Geschichte d. Saccharometers u. d. Senkspindel.' Repr. in (3), vol. 2, pp. 171, 177, 183.
- VON LIPPMANN, E. O. (8). 'Zur Geschichte der Kältemischungen.' Address to the General Meeting of the Verein Deutscher Chemiker, 1898. Repr. in (3), vol. 1, p. 110.
- VON LIPPMANN, E. O. (9). *Beiträge z. Geschichte d. Naturwissenschaften u. d. Technik*. 2 vols. Vol. 1, Springer, Berlin, 1925. Vol. 2, Verlag Chemie, Weinheim, 1953 (posthumous, ed. R. von Lippmann). Both vols. photographically reproduced, Sändig, Niederwalluf, 1971.

- VON LIPPMANN, E. O. (10). 'J. Ruska's Neue Untersuchungen ü. die Anfänge der Arabischen Alchemie.' *CHZ*, 1925, 2, 27.
- VON LIPPMANN, E. O. (11). 'Some Remarks on Hermes and Hermetica.' *AX*, 1938, 2, 21.
- VON LIPPMANN, E. O. (12). 'Chemisches u. Alchemisches aus Aristoteles.' *AGNT*, 1910, 2, 233-300.
- VON LIPPMANN, E. O. (13). 'Beiträge zur Geschichte des Alkohols.' *CHZ*, 1913, 37, 1313, 1348, 1358, 1419, 1428. Repr. in (9), vol. 1, p. 60.
- VON LIPPMANN, E. O. (14). 'Neue Beiträge zur Geschichte des Alkohols.' *CHZ*, 1917, 41, 865, 883, 911. Repr. in (9), vol. 1, p. 107.
- VON LIPPMANN, E. O. (15). 'Zur Geschichte des Alkohols.' *CHZ*, 1920, 44, 625. Repr. in (9), vol. 1, p. 123.
- VON LIPPMANN, E. O. (16). 'Kleine Beiträge zur Geschichte d. Chemie.' *CHZ*, 1933, 57, 433. 1. Zur Geschichte des Alkohols. 2. Der Essig des Hannibal. 3. Künstliche Perlen und Edelsteine. 4. Chinesische Ursprung der Alchemie.
- VON LIPPMANN, E. O. (17). 'Zur Geschichte des Alkohols und seines Namens.' *ZAC*, 1912, 25, 1179, 2061.
- VON LIPPMANN, E. O. (18). 'Einige Bemerkungen zur Geschichte der Destillation und des Alkohols.' *ZAC*, 1912, 25, 1680.
- VON LIPPMANN, E. O. (19). 'Zur Geschichte des Wasserbades vom Altertum bis ins 13. Jahrhundert.' Art. in Kahlbaum Festschrift (1909), ed. Diergart (1), pp. 143-57.
- VON LIPPMANN, E. O. (20). *Urzeugung und Lebenskraft; Zur Geschichte dieser Problem von den ältesten Zeiten an bis zu den Anfängen des 20. Jahrhunderts*. Springer, Berlin, 1933.
- VON LIPPMANN, E. O. Biography, see Partington (19).
- VON LIPPMANN, E. O. & SUDHOFF, K. (1). 'Thaddäus Florentinus (Taddeo Alderotti) über den Wein-geist.' *AGMW*, 1914, 7, 379. (Latin text, and comm. only.)
- LIPSUS, A. & BONNET, M. (1). *Acta Apostolorum Apocrypha*. 2 vols. in 3 parts. Mendelssohn, Leipzig, 1891-1903.
- LITTLE, A. G. (1) (ed.). *Part of the 'Opus Tertium' [c. +1268] of Roger Bacon*. Aberdeen, 1912.
- LITTLE, A. G. & WITHINGTON, E. (1) (ed.). *Roger Bacon's 'De Retardatione Accidentium Senectutis', cum aliis Opusculis de Rebus Medicinalibus*. Oxford, 1928. (Pubs. Brit. Soc. Franciscan Studies, no. 14.) Also printed as Fasc. 9 of Steele (1). Cf. the Engl. tr. of the *De Retardatione* by R. Browne, London, 1683.
- LIU MAO-TSAI (1). *Kutscha und seine Beziehungen zu China vom 2. Jahrhundert v. bis zum 6. Jh. n. Chr.* 2 vols. Harrassowitz, Wiesbaden, 1969. (Asiatische Forschungen [Bonn], no. 27.)
- LIU MAO-TSAI. See Liu Mao-Tsai.
- LIU PÊN-LI, HSING SHU-CHIEH, LI CHHËNG-CHHIU & CHANG TAO-CHUNG (1). 'True Hermaphroditism; a Case Report.' *CMJ*, 1959, 78, 449.
- LIU TSHUN-JEN (1). 'Lu Hsi-Hsing and his Commentaries on the *Tshan Thung Chhi*.' *CHJ/T*, 1968, (n.s.) 7, (no. 1), 71.
- LIU TSHUN-JEN (2). 'Lu Hsi-Hsing [+1520 to c. +1601]; a Confucian Scholar, Taoist Priest and Buddhist Devotee of the +16th Century.' *ASEA*, 1965, 18-19, 115.
- LIU TSHUN-JEN (3). 'Taoist Self-Cultivation in Ming Thought.' Art. in *Self and Society in Ming Thought*, ed. W. T. de Bary. Columbia Univ. Press, New York, 1970, p. 291.
- LIU TS'UN-YAN. See Liu Tshun-Jen.
- LLOYD, G. E. R. (1). *Polarity and Analogy; Two Types of Argumentation in Greek Thought*. Cambridge, 1971.
- LLOYD, SETON (2). 'Sultantepe, II.' *ANATS*, 1954, 4, 101.
- LLOYD, SETON & BRICE, W. (1), with a note by C. J. Gadd. 'Harrân.' *ANATS*, 1951, 1, 77-111.
- LLOYD, SETON & GÖKÇE, NURI (1), with notes by R. D. Barnett. 'Sultantepe, I.' *ANATS*, 1953, 3, 27.
- LO, L. C. (1) (tr.). 'Liu Hua-Yang; *Hui Ming Ching*, Das Buch von Bewusstsein und Leben.' In *Chinesische Blätter*, vol. 3, no. 1, ed. R. Wilhelm.
- LOEHR, G. (1). 'Missionary Artists at the Manchu Court.' *TOCS*, 1962, 34, 51.
- LOEWE, M. (5). 'The Case of Witchcraft in -91; its Historical Setting and Effect on Han Dynastic History' (*ku* poisoning). *AM*, 1970, 15, 159.
- LOEWE, M. (6). 'Khuang Hêng and the Reform of Religious Practices (-31)?' *AM*, 1971, 17, 1.
- LOEWE, M. (7). 'Spices and Silk; Aspects of World Trade in the First Seven Centuries of the Christian Era.' *JRAS*, 1971, 166.
- LOEWENSTEIN, P. J. (1). *Svastika and Yin-Yang*. China Society Occasional Papers (n. s.), China Society, London, 1942.
- VON LÖHNEYSS, G. E. (1). *Bericht vom Bergwerck, wie man dieselben bawen und in guten Wolstande bringen sol, sampt allen dazu gehörigen Arbeiten, Ordnung und Rechtlichen Processen beschrieben durch G.E.L. Zellerfeld*, 1617. 2nd ed. Leipzig, 1690.
- LONICERUS, ADAM (1). *Kräuterbuch*. Frankfurt, 1578.

- LORGNA, A. M. (1). 'Nuove Sperienze intorno alla Dolcificazione dell'Acqua del Mare.' *MSIV/MF*, 1786, 3, 375. 'Appendice alla Memoria intorno alla Dolcificazione dell'Acqua del Mare.' *MSIV/MF*, 1790, 5, 8.
- LOTHROP, S. (1). 'Coclé; an Archaeological Study of Central Panama.' *MPMH*, 1937, 7.
- LOUIS, H. (1). 'A Chinese System of Gold Milling.' *EMJ*, 1891, 640.
- LOUIS, H. (2). 'A Chinese System of Gold Mining.' *EMJ*, 1892, 629.
- LOVEJOY, A. O. & BOAS, G. (1). *A Documentary History of Primitivism and Related Ideas*. Vol. 1. *Primitivism and Related Ideas in Antiquity*. Johns Hopkins Univ. Press, Baltimore, 1935.
- LOWRY, T. M. (1). *Historical Introduction to Chemistry*. Macmillan, London, 1936.
- LU GWEI-DJEN (1). 'China's Greatest Naturalist; a Brief Biography of Li Shih-Chen.' *PHY*, 1966, 8, 383. Abridgment in Proc. XIth Internat. Congress of the History of Science, Warsaw, 1965, Summaries, vol. 2, p. 364; Actes, vol. 5, p. 50.
- LU GWEI-DJEN (2). 'The Inner Elixir (*Nei Tan*); Chinese Physiological Alchemy.' Art. in *Changing Perspectives in the History of Science*, ed. M. Teich & R. Young. Heinemann, London, 1973, p. 68.
- LU GWEI-DJEN & NEEDHAM, JOSEPH (1). 'A Contribution to the History of Chinese Dietetics.' *ISIS*, 1951, 42, 13 (submitted 1939, lost by enemy action; again submitted 1942 and 1948).
- LU GWEI-DJEN & NEEDHAM, JOSEPH (3). 'Mediaeval Preparations of Urinary Steroid Hormones.' *MH*, 1964, 8, 101. Prelim. pub. *N*, 1963, 200, 1047. Abridged account, *END*, 1968, 27 (no. 102), 130.
- LU GWEI-DJEN & NEEDHAM, JOSEPH (4). 'Records of Diseases in Ancient China', art. in *Diseases in Antiquity*, ed. D. R. Brothwell & A. T. Sandison. Thomas, Springfield, Ill. 1967, p. 222.
- LU GWEI-DJEN, NEEDHAM, JOSEPH & NEEDHAM, D. M. (1). 'The Coming of Ardent Water.' *AX*, 1972, 19, 69.
- LU KHUAN-YÜ (1). *The Secrets of Chinese Meditation; Self-Cultivation by Mind Control as taught in the Chhan, Mahāyāna and Taoist Schools in China*. Rider, London, 1964.
- LU KHUAN-YÜ (2). *Chhan and Zen Teaching* (Series Two). Rider, London, 1961.
- LU KHUAN-YÜ (3). *Chhan and Zen Teaching* (Series Three). Rider, London, 1962.
- LU KHUAN-YÜ (4) (tr.). *Taoist Yoga; Alchemy and Immortality—a Translation, with Introduction and Notes, of 'The Secrets of Cultivating Essential Nature and Eternal Life' (Hsing Ming Fa Chüeh Ming Chih) by the Taoist Master Chao Pi-Chhen, b. 1860*. Rider, London, 1970.
- LUCAS, A. (1). *Ancient Egyptian Materials and Industries*. Arnold, London (3rd ed.), 1948.
- LUCAS, A. (2). 'Silver in Ancient Times.' *JEA*, 1928, 14, 315.
- LUCAS, A. (3). 'The Occurrence of Natron in Ancient Egypt.' *JEA*, 1932, 18, 62.
- LUCAS, A. (4). 'The Use of Natron in Mummification.' *JEA*, 1932, 18, 125.
- LÖDY-TEGENER, F. (1). *Alchemistische und chemische Zeichen*. Berlin, 1928. Repr. Lisbing, Würzburg, 1972.
- LUK, CHARLES. See LU KHUAN-YÜ.
- LUMHOLTZ, C. S. (1). *Unknown Mexico; a Record of Five Years' Exploration among the Tribes of the Western Sierra Madre; in the Tierra Caliente of Tepic and Jalisco; and among the Tarascos of Michoacan*, 2 vols. Macmillan, London, 1903.
- LUTHER, MARTIN (1). *Werke*. Weimarer Ausgabe.
- MACALISTER, R. A. S. (2). *The Excavation of [Tel] Gezer, 1902-05 and 1907-09*. 3 vols. Murray, London, 1912.
- McAULIFFE, L. (1). *La Thérapeutique Physique d'Autrefois*. Paris, 1904.
- McCLURE, C. M. (1). 'Cardiac Arrest through Volition.' *CALM*, 1959, 90, 440.
- McCONNELL, R. G. (1). *Report on Gold Values in the Klondike High-Level Gravels*. Canadian Geol. Survey Reports, 1907, 34.
- McCULLOCH, J. A. (2). '[The State of the Dead in] Primitive and Savage [Cultures].' *ERE*, vol. xi, p. 817.
- McCULLOCH, J. A. (3). '[The "Abode of the Blest" in] Primitive and Savage [Cultures].' *ERE*, vol. ii, p. 680.
- McCULLOCH, J. A. (4). '[The "Abode of the Blest" in] Celtic [Legend].' *ERE*, vol. ii, p. 688.
- McCULLOCH, J. A. (5). '[The "Abode of the Blest" in] Japanese [Thought].' *ERE*, vol. ii, p. 700.
- McCULLOCH, J. A. (6). '[The "Abode of the Blest" in] Slavonic [Lore and Legend].' *ERE*, vol. ii, p. 706.
- McCULLOCH, J. A. (7). '[The "Abode of the Blest" in] Teutonic [Scandinavian, Belief].' *ERE*, vol. ii, p. 707.
- McCULLOCH, J. A. (8). 'Incense.' Art. in *ERE*, vol. vii, p. 201.
- McCULLOCH, J. A. (9). 'Eschatology.' Art. in *ERE*, vol. v, p. 373.
- McCULLOCH, J. A. (10). 'Vampires.' *ERE*, vol. xii, p. 589.
- McDONALD, D. (1). *A History of Platinum*. London, 1960.
- MACDONELL, A. A. (1). 'Vedic Religion.' *ERE*, vol. xii, p. 601.

- McGOVERN, W. M. (1). *Early Empires of Central Asia*. Univ. of North Carolina Press, Chapel Hill, 1939.
- McGOWAN, D. J. (2). 'The Movement Cure in China' (Taoist medical gymnastics). *CIMC/MR*, 1885 (no. 29), 42.
- McGUIRE, J. E. (1). 'Transmutation and Immutability; Newton's Doctrine of Physical Qualities.' *AX*, 1967, 14, 69.
- McGUIRE, J. E. (2). 'Force, Active Principles, and Newton's Invisible Realm.' *AX*, 1968, 15, 154.
- McGUIRE, J. E. & RATTANSI, P. M. (1). 'Newton and the "Pipes of Pan".' *NRRS*, 1966, 21, 108.
- McKENZIE, R. TAIT (1). *Exercise in Education and Medicine*. Saunders, Philadelphia and London, 1923.
- McKIE, D. (1). 'Some Notes on Newton's Chemical Philosophy, written upon the Occasion of the Tercentenary of his Birth.' *PMG*, 1942 (7th ser.), 33, 847.
- McKIE, D. (2). 'Some Early Chemical Symbols.' *AX*, 1937, 1, 75.
- McLACHLAN, H. (1). *Newton; the Theological Manuscripts*. Liverpool, 1950.
- MACQUER, P. J. (1). *Éléments de la Théorie et de la Pratique de la Chimie*. 2 vols, Paris, 1775. (The first editions, uncombined, had been in 1749 and 1751 respectively, but this contained accounts of the new discoveries.) Eng. trs. London, 1775, Edinburgh, 1777. Cf. Coleby (1).
- MADAN, M. (1) (tr.). *A New and Literal Translation of Juvenal and Persius, with Copious Explanatory Notes by which these difficult Satirists are rendered easy and familiar to the Reader*. 2 vols. Becket, London, 1789.
- MAENCHEN-HELFEN, O. (4). *Reise ins asiatische Tuwa*. Berlin, 1931.
- DE MAGALHAENS, GABRIEL (1). *Nouvelle Relation de la Chine*. Barbin, Paris, 1688 (a work written in 1668). Eng. tr. *A New History of China, containing a Description of the Most Considerable Particulars of that Vast Empire*. Newborough, London, 1688.
- MAGENDIE, F. (1). *Mémoire sur la Déglutition de l'Air atmosphérique*. Paris, 1813.
- MAHDIHASSAN, S. (2). 'Cultural Words of Chinese Origin' [*firoza* (Pers) = turquoise, *yashb* (Ar) = jade, *chamcha* (Pers) = spoon, *top* (Pers, Tk, Hind) = cannon, *silafchi* (Tk) = metal basin]. *BV*, 1950, 11, 31.
- MAHDIHASSAN, S. (3). 'Ten Cultural Words of Chinese Origin' [*huqqa* (Tk), *qaliyan* (Tk) = tobacco-pipe, *sunduq* (Ar) = box, *piali* (Pers), *findjan* (Ar) = cup, *jaushan* (Ar) = armband, *safa* (Ar) = turban, *qasai*, *qasab* (Hind) = butcher, *kah-kashan* (Pers) = Milky Way, *tugra* (Tk) = seal]. *JUB*, 1949, 18, 110.
- MAHDIHASSAN, S. (5). 'The Chinese Origin of the Words Porcelain and Polish.' *JUB*, 1948, 17, 89.
- MAHDIHASSAN, S. (6). 'Carboy as a Chinese Word.' *CS*, 1948, 17, 301.
- MAHDIHASSAN, S. (7). 'The First Illustrations of Stick-Lac and their probable origin.' *PKAWA*, 1947, 50, 793.
- MAHDIHASSAN, S. (8). 'The Earliest Reference to Lac in Chinese Literature.' *CS*, 1950, 19, 289.
- MAHDIHASSAN, S. (9). 'The Chinese Origin of Three Cognate Words: Chemistry, Elixir, and Genii.' *JUB*, 1951, 20, 107.
- MAHDIHASSAN, S. (11). 'Alchemy in its Proper Setting, with Jinn, Sufi, and Suffa as Loan-Words from the Chinese.' *IQB*, 1959, 7 (no. 3), 1.
- MAHDIHASSAN, S. (12). 'Alchemy and its Connection with Astrology, Pharmacy, Magic and Metallurgy.' *JAN*, 1957, 46, 81.
- MAHDIHASSAN, S. (13). 'The Chinese Origin of Alchemy.' *UNASIA*, 1953, 5 (no. 4), 241.
- MAHDIHASSAN, S. (14). 'The Chinese Origin of the Word Chemistry.' *CS*, 1946, 15, 136. 'Another Probable Origin of the Word Chemistry from the Chinese.' *CS*, 1946, 15, 234.
- MAHDIHASSAN, S. (15). 'Alchemy in the Light of its Names in Arabic, Sanskrit and Greek.' *JAN*, 1961, 49, 79.
- MAHDIHASSAN, S. (16). 'Alchemy a Child of Chinese Dualism as illustrated by its Symbolism.' *IQB*, 1959, 8, 15.
- MAHDIHASSAN, S. (17). 'On Alchemy, Kimiya and Iksir.' *PAKPJ*, 1959, 3, 67.
- MAHDIHASSAN, S. (18). 'The Genesis of Alchemy.' *IJHM*, 1960, 5 (no. 2), 41.
- MAHDIHASSAN, S. (19). 'Landmarks in the History of Alchemy.' *SCI*, 1963, 57, 1.
- MAHDIHASSAN, S. (20). 'Kimiya and Iksir; Notes on the Two Fundamental Concepts of Alchemy.' *MBLB*, 1962, 5 (no. 3), 38. *MBPB*, 1963, 12 (no. 5), 56.
- MAHDIHASSAN, S. (21). 'The Early History of Alchemy.' *JUB*, 1960, 29, 173.
- MAHDIHASSAN, S. (22). 'Alchemy; its Three Important Terms and their Significance.' *MJA*, 1961, 227.
- MAHDIHASSAN, S. (23). 'Der Chino-Arabische Ursprung des Wortes Chemikalie.' *PHI*, 1961, 23, 515.
- MAHDIHASSAN, S. (24). 'Das Hermetische Siegel in China.' *PHI*, 1960, 22, 92.
- MAHDIHASSAN, S. (25). 'Elixir; its Significance and Origin.' *JRAS/P*, 1961, 6, 39.
- MAHDIHASSAN, S. (26). 'Ouroboros as the Earliest Symbol of Greek Alchemy.' *IQB*, 1961, 9, 1.
- MAHDIHASSAN, S. (27). 'The Probable Origin of Kekulé's Symbol of the Benzene Ring.' *SCI*, 1960, 54, 1.

- MAHDIHASSAN, S., (28). 'Alchemy in the Light of Jung's Psychology and of Dualism.' *PAKPY*, 1962, 5, 95.
- MAHDIHASSAN, S. (29). 'Dualistic Symbolism; Alchemical and Masonic.' *IQB*, 1963, 55.
- MAHDIHASSAN, S. (30). 'The Significance of Ouroboros in Alchemy and Primitive Symbolism.' *IQB*, 1963, 18.
- MAHDIHASSAN, S. (31). 'Alchemy and its Chinese Origin as revealed by its Etymology, Doctrines and Symbols.' *IQB*, 1966, 22.
- MAHDIHASSAN, S. (32). 'Stages in the Development of Practical Alchemy.' *JRAS/P*, 1968, 13, 329.
- MAHDIHASSAN, S. (33). 'Creation, its Nature and Imitation in Alchemy.' *IQB*, 1968, 80.
- MAHDIHASSAN, S. (34). 'A Positive Conception of the Divinity emanating from a Study of Alchemy.' *IQB*, 1969, 10, 77.
- MAHDIHASSAN, S. (35). 'Kursi or throne; a Chinese word in the *Koran*.' *JRAS/BOM*, 1953, 28, 19.
- MAHDIHASSAN, S. (36). 'Khazana, a Chinese word in the *Koran*, and the associated word "Godown".' *JRAS/BOM*, 1953, 28, 22.
- MAHDIHASSAN, S. (37). 'A Cultural Word of Chinese Origin; ta'un meaning Plague in Arabic.' *JUB*, 1953, 22, 97. *CRESC*, 1950, 31.
- MAHDIHASSAN, S. (38). 'Cultural Words of Chinese Origin; qaba, aba, diba, kimkhwab (kincoab)'. *JKHRS*, 1950, 5, 203.
- MAHDIHASSAN, S. (39). 'The Chinese Origin of the Words Kimiya, Sufi, Dervish and Qalander, in the Light of Mysticism.' *JUB*, 1956, 25, 124.
- MAHDIHASSAN, S. (40). 'Chemistry a Product of Chinese Culture.' *PAKYS*, 1957, 9, 26.
- MAHDIHASSAN, S. (41). 'Lemnian Tablets of Chinese Origin.' *IQB*, 1960, 9, 49.
- MAHDIHASSAN, S. (42). 'Über einige Symbole der Alchemie.' *PHI*, 1962, 24, 41.
- MAHDIHASSAN, S. (43). 'Symbolism in Alchemy; Islamic and other.' *IC*, 1962, 36 (no. 1), 20.
- MAHDIHASSAN, S. (44). 'The Philosopher's Stone in its Original Conception.' *JRAS/P*, 1962, 7 (no. 2), 263.
- MAHDIHASSAN, S. (45). 'Alchemie im Spiegel hellenistisch-buddhistische Kunst d. 2. Jahrhunderts.' *PHI*, 1965, 27, 726.
- MAHDIHASSAN, S. (46). 'The Nature and Role of Two Souls in Alchemy.' *JRAS/P*, 1965, 10, 67.
- MAHDIHASSAN, S. (47). 'Kekulé's Dream of the Ouroboros, and the Significance of this Symbol.' *SCI*, 1961, 55, 187.
- MAHDIHASSAN, S. (48). 'The Natural History of Lac as known to the Chinese; Li Shih-Chen's Contribution to our Knowledge of Lac.' *IJE*, 1954, 16, 309.
- MAHDIHASSAN, S. (49). 'Chinese Words in the Holy *Koran*; qirtas (paper) and its Synonym *kagaz*.' *JUB*, 1955, 24, 148.
- MAHDIHASSAN, S. (50). 'Cultural Words of Chinese Origin; *kutcherry* (government office), *tusser* (silk).' Art. in *Karmarker Commemoration Volume*, Poona, 1947-8, p. 97.
- MAHDIHASSAN, S. (51). 'Union of Opposites; a Basic Theory in Alchemy and its Interpretation.' Art. in *Beiträge z. alten Geschichte und deren Nachleben*, Festschrift f. Franz Altheim, ed. R. Stiehl & H. E. Stier, vol. 2, p. 251. De Gruyter, Berlin, 1970.
- MAHDIHASSAN, S. (52). 'The Genesis of the Four Elements, Air, Water, Earth and Fire.' Art. in *Gulam Yazdani Commemoration Volume*, Hyderabad, Andhra, 1966, p. 251.
- MAHDIHASSAN, S. (53). 'Die frühen Bezeichnungen des Alchemisten, seiner Kunst und seiner Wunderdroge.' *PHI*, 1967, .
- MAHDIHASSAN, S. (54). 'The *Soma* of the Aryans and the *Chih* of the Chinese.' *MBPB*, 1972, 21 (no. 3), 30.
- MAHDIHASSAN, S. (55). 'Colloidal Gold as an Alchemical Preparation.' *JAN*, 1972, 58, 112.
- MAHLER, J. G. (1). *The Westerners among the Figurines of the Tang Dynasty of China*. Ist. Ital. per il Med. ed Estremo Or., Rome, 1959. (Ser. Orientale Rom, no. 20.)
- MAHN, C. A. F. (1). *Etymologische Untersuchung auf dem Gebiete der Romanischen Sprachen*. Dümmler, Berlin, 1858, repr. 1863.
- MAIER, MICHAEL (1). *Atalanta Fugiens*, 1618. Cf. Tenney Davis (1); J. Read (1); de Jong (1).
- MALHOTRA, J. C. (1). 'Yoga and Psychiatry; a Review.' *JNPS*, 1963, 4, 375.
- MANUEL, F. E. (1). *Isaac Newton, Historian*. Cambridge, 1963.
- MANUEL, F. E. (2). *The Eighteenth Century Confronts the Gods*. Harvard Univ. Press, Cambridge, Mass. 1959.
- MAQSOOD ALI, S. ASAD & MAHDIHASSAN, S. (4). 'Bazaar Medicines of Karachi; [IV], Inorganic Drugs.' *MED*, 1961, 23, 125.
- DE LA MARCHE, LECOY (1). 'L'Art d'Enluminer; Traité Italien du XV^e Siecle' (*De Arte Illuminandi*, Latin text with introduction). *MS-AP*, 1888, 47 (5^e sér.), 7, 248.
- MARÉCHAL, J. R. (3). *Reflections upon Prehistoric Metallurgy; a Research based upon Scientific Methods*. Brimberg, Aachen (for Junker, Lammersdorf), 1963. French and German editions appeared in 1962.

- MARSHALL, SIR JOHN (1). *Taxila; An Illustrated Account of Archaeological Excavations carried out at Taxila under the orders of the Government of India between the years 1913 and 1934*. 3 vols. Cambridge, 1951.
- MARTIN, W. A. P. (2). *The Lore of Cathay*. Revell, New York and Chicago, 1901.
- MARTIN, W. A. P. (3). *Hanlin Papers*. 2 vols. Vol. 1. Trübner, London; Harper, New York, 1880; Vol. 2. Kelly & Walsh, Shanghai, 1894.
- MARTIN, W. A. P. (8). 'Alchemy in China.' A paper read before the Amer. Or. Soc. 1868; abstract in *JAOS*, 1871, 9, xlvi. *CR*, 1879, 7, 242. Repr. in (3), vol. 1, p. 221; (2), pp. 44 ff.
- MARTIN, W. A. P. (9). *A Cycle of Cathay*. Oliphant, Anderson & Ferrier, Edinburgh and London; Revell New York, 1900.
- MARTINDALE, W. (1). *The Extra Pharmacopoeia; incorporating Squire's Companion to the Pharmacopoeia*. 1st edn. 1883. 25th edn., ed. R. G. Todd, Pharmaceutical Press, London, 1967.
- MARX, E. (2). Japanese peppermint oil still. *MDGNVO*, 1896, 6, 355.
- MARYON, H. (3). 'Soldering and Welding in the Bronze and Early Iron Ages.' *TSFPA*, 1936, 5 (no. 2).
- MARYON, H. (4). 'Prehistoric Soldering and Welding' (a précis of Maryon, 3). *AQ*, 1937, 11, 208.
- MARYON, H. (5). 'Technical Methods of the Irish Smiths.' *PRLA*, 1938, 44c, no. 7.
- MARYON, H. (6). *Metalworking and Enamelling; a Practical Treatise*. 3rd ed. London, 1954.
- MASON, G. H. (1). *The Costume of China*. Miller, London, 1800.
- MASON, H. S. (1). 'Comparative Biochemistry of the Phenolase Complex.' *AIENZ*, 1955, 16, 105.
- MASON, S. F. (2). 'The Scientific Revolution and the Protestant Reformation; I, Calvin and Servetus in relation to the New Astronomy and the Theory of the Circulation of the Blood.' *ANS*, 1953, 9 (no. 1).
- MASON, S. F. (3). 'The Scientific Revolution and the Protestant Reformation; II, Lutheranism in relation to Iatro-chemistry and the German Nature-philosophy.' *ANS*, 1953, 9 (no. 2).
- MASPERO, G. (2). *Histoire ancienne des Peuples d'Orient*. Paris, 1875.
- MASPERO, H. (7). 'Procédés de 'nourrir le principe vital' dans la Religion Taoïste Ancienne.' *JA*, 1937, 229, 177 and 353.
- MASPERO, H. (9). 'Notes sur la Logique de Mo-Tseu [Mo Tzu] et de son École.' *TP*, 1928, 25, 1.
- MASPERO, H. (13). *Le Taoïsme*. In *Mélanges Posthumes sur les Religions et l'Histoire de la Chine*, vol. 2, ed. P. Demiéville, SAEP, Paris, 1950. (Publ. du Mus. Guimet, Biblioth. de Diffusion, no 58.) Rev. J. J. L. Duyvendak, *TP*, 1951, 40, 372.
- MASPERO, H. (14). *Études Historiques*. In *Mélanges Posthumes sur les Religions et l'Histoire de la Chine*, vol. 3, ed. P. Demiéville. Civilisations du Sud, Paris, 1950. [Publ. du Mus. Guimet, Biblioth. de Diffusion, no. 59.] Rev. J. J. L. Duyvendak, *TP*, 1951, 40, 366.
- MASPERO, H. (19). 'Communautés et Moines Bouddhistes Chinois au 2^e et 3^e Siècles.' *BEFEO*, 1910, 10, 222.
- MASPERO, H. (20). 'Les Origines de la Communauté Bouddhiste de Loyang.' *JA*, 1934, 225, 87.
- MASPERO, H. (22). 'Un Texte Taoïste sur l'Orient Romain.' *MIFC*, 1937, 17, 377 (*Mélanges G. Maspero*, vol. 2). Reprinted in Maspero (14), pp. 95 ff.
- MASPERO, H. (31). Review of R. F. Johnston's *Buddhist China* (London, 1913). *BEFEO*, 1914, 14 (no. 9), 74.
- MASPERO, H. (32). *Le Taoïsme et les Religions Chinoises*. (Collected posthumous papers, partly from (12) and (13) reprinted, partly from elsewhere, with a preface by M. Kaltenmark.) Gallimard, Paris, 1971. (Bibliothèque des Histoires, no. 3.)
- MASSÉ, H. (1). *Le Livre des Merveilles du Monde*. Chêne, Paris, 1944. (Album of colour-plates from al-Qazwini's *Cosmography*, c. +1275, with introduction, taken from Bib. Nat. Suppl. Pers. MS. 332.)
- MASSIGNON, L. (3). 'The Qarmatians.' *EI*, vol. ii, pt. 2, p. 767.
- MASSIGNON, L. (4). 'Inventaire de la Littérature Hermétique Arabe.' App. iii in Festugière (1), 1944. (On the role of the Sabians of Harrân, who adopted the Hermetica as their Scriptures.)
- MASSIGNON, L. (5). 'The Idea of the Spirit in Islam.' *ERYB*, 1969, 6, 319 (*The Mystic Vision*, ed. J. Campbell). Tr. from the German in *ERYB*, 1945, 13, 1.
- MASSON, L. (1). 'La Fontaine de Jouvence.' *AESC*, 1937, 27, 244; 1938, 28, 16.
- MASSON-OURSSEL, P. (4). *Le Yoga*. Presses Univ. de France, Paris, 1954. (Que Sais-je? ser. no. 643.)
- AL-MAS'ŪDĪ. See de Meynard & de Courteille.
- MATCHETT, J. R. & LEVINE, J. (1). 'A Molecular Still designed for Small Charges.' *IEC/AE*, 1943, 15, 296.
- MATHIEU, F. F. (1). *La Géologie et les Richesses Minières de la Chine*. Impr. Comm. et Industr., la Louvière, n.d. (1924), paginated 283-529, with 4 maps (from Pub. de l'Assoc. des Ingénieurs de l'École des Mines de Mons).
- MATSUBARA, HISAKO (1) (tr.). *Die Geschichte von Bambus-sammler und dem Mädchen Kaguya* [the *Taketori Monogatari*, c. +866], with illustrations by Mastubara Naoko. Langewiesche-Brandt, Ebenhausen bei München, 1968.

- MATSUBARA, HISAKO (2). 'Dies-seitigkeit und Transzendenz im *Taketori Monogatari*.' Inaug. Diss. Ruhr Universität, Bochum, 1970.
- MATTHAEI, C. F. (1) (tr.). *Nemesius Emesenus 'De Natura Hominis' Graece et Latine (c. +400)*. Halae Magdeburgicae, 1802.
- MATTIOLI, PIERANDREA (2). *Commentarii in libros sex Pedacii Dioscoridis Anazarbei de materia medica...* Valgrisi, Venice, 1554, repr. 1565.
- MAUL, J. P. (1). 'Experiments in Chinese Alchemy.' Inaug. Diss., Massachusetts Institute of Technology, 1967.
- MAURIZIO, A. (1). *Geschichte der gegorenen Getränke*. Berlin and Leipzig, 1933.
- MAXWELL, J. PRESTON (1). 'Osteomalacia and Diet.' *NAR*, 1934, 4 (no. 1), 1.
- MAXWELL, J. PRESTON, HU, C. H. & TURNBULL, H. M. (1). 'Foetal Rickets [in China].' *JPB*, 1932, 35, 419.
- MAYERS, W. F. (1). *Chinese Reader's Manual*. Presbyterian Press, Shanghai, 1874; reprinted 1924.
- MAZZEO, J. A. (1). 'Notes on John Donne's Alchemical Imagery.' *ISIS*, 1957, 48, 103.
- MEAD, G. R. S. (1). *Thrice-Greatest Hermes; Studies in Hellenistic Theosophy and Gnosis—Being a Translation of the Extant Sermons and Fragments of the Trismegistic Literature, with Prolegomena, Commentaries and Notes*. 3 vols. Theosophical Pub. Soc., London and Benares, 1906.
- MEAD, G. R. S. (2) (tr.). 'Pistis Sophia'; a [Christian] Gnostic Miscellany; being for the most part Extracts from the 'Books of the Saviour', to which are added Excerpts from a Cognate Literature. 2nd ed. Watkins, London, 1921.
- MECHOULAM, R. & GAONI, Y. (1). 'Recent Advances in the Chemistry of Hashish.' *FCO*, 1967, 25, 175.
- MEHREN, A. F. M. (1) (ed. & tr.). *Manuel de la Cosmographie du Moyen-Âge, traduit de l'Arabe; 'Nokhbet ed-Dahr fi Adjaib-il-birr wal-Bahr [Nukhbat al-Dahr fi 'Ajâib al-Birr wa'l Bahr]' de Shems ed-Din Abou-Abdallah Mohammed de Damas [Shams al-Din Abū 'Abd-Allah al-Anṣārī al-Ṣūfī al-Dimashqī; The Choice of the Times and the Marvels of Land and Sea, c. +1310]...* St Petersburg, 1866 (text), Copenhagen, 1874 (translation).
- MELLE, P. (1). 'Apollonius de Tyane et les Rites Védiques.' *JA*, 1945, 234, 451.
- MEISSNER, B. (1). *Babylonien und Assyrien*. Winter, Heidelberg, 1920, Leipzig, 1925.
- MELLANBY, J. (1). 'Diphtheria Antitoxin.' *PRSB*, 1908, 80, 399.
- MELLOR, J. W. (1). *Modern Inorganic Chemistry*. Longmans Green, London, 1916; often reprinted.
- MELLOR, J. W. (2). *Comprehensive Treatise on Inorganic and Theoretical Chemistry*. 15 vols. Longmans Green, London, 1923.
- MELLOR, J. W. (3). 'The Chemistry of the Chinese Copper-red Glazes.' *TCS*, 1936, 35.
- DE MÉLY, F. (1) (with the collaboration of M. H. Courel). *Les Lapidaires Chinois*. Vol. 1 of *Les Lapidaires de l'Antiquité et du Moyen Age*. Leroux, Paris, 1896. (Contains facsimile reproduction of the mineralogical section of *Wakan Sanzai Zue*, chs. 59, 60, and 61.) Crit. rev. M. Berthelot, *JS*, 1896, 573).
- DE MÉLY, F. (6). 'L'Alchimie chez les Chinois et l'Alchimie Grecque.' *JA*, 1895 (9^e sér.), 6, 314.
- DE MENASCE, P. J. (2). 'The Cosmic Noria (Zodiac) in Parsi Thought.' *AN*, 1940, 35-6, 451.
- MEREDITH-OWENS, G. M. (1). 'Some Remarks on the Miniatures in the [Royal Asiatic] Society's *Yāmi' al-Tawārīkh* (MS, A27 of +1314) [by Rashīd al-Dīn, finished +1316]. *JRAS*, 1970 (no. 2, Wheeler Presentation Volume), 195. Includes a brief account of the section on the History of China; cf. Jahn & Franke (1).
- MERRIFIELD, M. P. (1). *Original Treatises dating from the +12th to the +18th Centuries on the Arts of Painting in Oil, Miniature, and the Preparation of Colour and Artificial Gems*. 2 vols. London, 1847, London, 1849.
- MERRIFIELD, M. P. (2). *A Treatise on Painting [Cennino Cennini's], translated from Tambroni's Italian text of 1821*. London, 1844.
- MERSENNE, MARIN (3). *La Verité des Sciences, contre les Sceptiques on Pyrrhoniens*. Paris, 1625. Facsimile repr. Frommann, Stuttgart and Bad Cannstatt, 1969. Rev. W. Pagel, *AX*, 1970, 17, 64.
- MERZ, J. T. (1). *A History of European Thought in the Nineteenth Century*. 2 vols. Blackwood, Edinburgh and London, 1896.
- METCHNIKOV, E. (= I. I.) (1). *The Nature of Man; Studies in Optimistic Philosophy*. Tr. P. C. Mitchell, New York, 1903, London, 1908; rev. ed. by C. M. Beadnell, London, 1938.
- METTLER, CECILIA C. (1). *A History of Medicine*. Blakiston, Toronto, 1947.
- METZGER, H. (1). *Newton, Stahl, Boerhaave et la Doctrine Chimique*. Alcan, Paris, 1930.
- DE MEURON, M. (1). 'Yoga et Médecine; propos du Dr J. G. Henrotte recueillis par...' *MEDA*, 1968 (no. 69), 2.
- MEYER, A. W. (1). *The Rise of Embryology*. Stanford Univ. Press, Palo Alto, Calif. 1939.
- VON MEYER, ERNST (1). *A History of Chemistry, from earliest Times to the Present Day; being also an Introduction to the Study of the Science*. 2nd ed., tr. from the 2nd Germ. ed. by G. McGowan. Macmillan, London, 1898.

- MEYER, H. H. & GOTTLIEB, R. (1). *Die experimentelle Pharmakologie als Grundlage der Arzneibehandlung*. 9th ed. Urban & Schwarzenberg, Berlin and Vienna, 1936.
- MEYER, P. (1). *Alexandre le Grand dans la Littérature Française du Moyen Age*. 2 vols. Paris, 1886.
- MEYER, R. M. (1). *Goethe*. 3 vols. Hofmann, Berlin, 1905.
- MEYER-STEINER, T. & SUDHOFF, K. (1). *Illustrierte Geschichte der Medizin*. 5th ed. revised and enlarged, ed. R. Herrlinger & F. Kudlien. Fischer, Stuttgart, 1965.
- MEYERHOF, M. (3). 'On the Transmission of Greek and Indian Science to the Arabs.' *IC*, 1937, **11**, 17.
- MEYERHOF, M. & SOBKH, G. P. (1) (ed. & tr.). *The Abridged Version of the 'Book of Simple Drugs' of Ahmad ibn Muhammad al-Ghāfiqī of Andalusia by Gregorius Abu'l-Faraj (Bar Hebraeus)*. Govt. Press, Cairo, 1938. (Egyptian University Faculty of Med. Pubs. no. 4.)
- DE MEYNARD, C. BARBIER (3). "'L'Alchimiste'", Comédie en Dialecte Turc Azeri [Azerbaijani]. *J.A.*, 1886 (8^e sér.), **7**, 1.
- DE MEYNARD, C. BARBIER & DE COURTEILLE, P. (1) (tr.). *Les Prairies d'Or* (the *Murūj al-Dhahab* of al-Mas'ūdī, +947). 9 vols. Paris, 1861-77.
- MIALL, L. C. (1). *The Early Naturalists, their Lives and Work* (+1530 to +1789). Macmillan, London, 1912.
- MICHELL, H. (1). *The Economics of Ancient Greece*. Cambridge, 1940. 2nd ed. 1957.
- MICHELL, H. (2). 'Oreichalcos.' *CLR*, 1955, **69** (n.s. 5), 21.
- MIELI, A. (1). *La Science Arabe, et son Rôle dans l'Évolution Scientifique Mondiale*. Brill, Leiden, 1938. Repr. 1966, with additional bibliography and analytic index by A. Mazaheri.
- MIELI, A. (3). *Pagine di Storia della Chimica*. Rome, 1922.
- MIGNE, J. P. (1) (ed.). *Dictionnaire des Apocryphes; ou, Collection de tous les Livres Apocryphes relatifs à l'Ancien et au Nouveau Testament, pour la plupart, traduits en Français pour la première fois sur les textes originaux; et enrichie de préfaces, dissertations critiques, notes historiques, bibliographiques, géographiques et théologiques...* 2 vols. Migne, Paris, 1856. Vols. 23 and 24 of his *Troisième et Dernière Encyclopédie Théologique*, 60 vols.
- MILES, L. M. & FÈNG, C. T. (1). 'Osteomalacia in Shansi.' *JEM*, 1925, **41**, 137.
- MILES, W. (1). 'Oxygen-consumption during Three Yoga-type Breathing Patterns.' *JAP*, 1964, **19**, 75.
- MILLER, J. INNES (1). *The Spice Trade of the Roman Empire, -29 to +641*. Oxford, 1969.
- MILLS, J. V. (1). *Ma Huan*[s] 'Ying Yai Shêng Lan', 'The Overall Survey of the Ocean's Shores' [1433]; translated from the Chinese text edited by Fêng Chhêng-Chün, with Introduction, Notes and Appendices... Cambridge, 1970. (Hakluyt Society Extra Series, no. 42.)
- MINGANA, A. (1) (tr.). *An Encyclopaedia of the Philosophical and Natural Sciences, as taught in Baghdad about +817; or, the 'Book of Treasures' by Job of Edessa: the Syriac Text Edited and Translated...* Cambridge, 1935.
- MITCHELL, C. W. (1). *St Ephraim's Prose Refutations of Mani, Marcion and Bardaisan;... from the Palimpsest MS. Brit. Mus. Add. 14623...* Vol. 1. *The Discourses addressed to Hypatius*. Vol. 2. *The Discourse called 'Of Domnus', and Six other Writings*. Williams & Norgate, London, 1912-21. (Text and Translation Society Series.)
- MITRA, RAJENDRALALA (1). 'Spirituos Drinks in Ancient India.' *JRAS/B*, 1873, **42**, 1-23.
- MIYASHITA SABURŌ (1). 'A Link in the Westward Transmission of Chinese Anatomy in the Later Middle Ages.' *ISIS*, 1968, **58**, 486.
- MIYUKI MOKUSEN (1). 'Taoist Zen Presented in the *Hui Ming Ching*.' Communication to the First International Conference of Taoist Studies, Villa Serbelloni, Bellagio, 1968.
- MIYUKI MOKUSEN (2). 'The "Secret of the Golden Flower", Studies and [a New] Translation.' Inaug. Diss., Jung Institute, Zürich, 1967.
- MODEL, J. G. (1). *Versuche und Gedanken über ein natürliches oder gewachsenes Salmiak*. Leipzig, 1758.
- MODI, J. J. (1). 'Haoma.' Art. in *ERE*, vol. vi, p. 506.
- MOISSAN, H. (1). *Traité de Chimie Minérale*. 5 vols. Masson, Paris, 1904.
- MONTAGU, B. (1) (ed.). *The Works of Lord Bacon*. 16 vols. in 17 parts. Pickering, London, 1825-34.
- MONTELLI, G. (2). 'Distilling in Mongolia.' *ETH*, 1937 (no. 5), **2**, 321.
- DE MONTFAUCON, B. (1). *L'Antiquité Expliquée et Représentée en Figures*. 5 vols. with 5-vol. supplement. Paris, 1719. Eng. tr. by D. Humphreys, *Antiquity Explained, and Represented in Sculptures, by the Learned Father Montfaucon*. 5 vols. Tonson & Watts, London, 1721-2.
- MONTGOMERY, J. W. (1). 'Cross, Constellation and Crucible; Lutheran Astrology and Alchemy in the Age of the Reformation.' *AX*, 1964, **11**, 65.
- MOODY, E. A. & CLAGETT, MARSHALL (1) (ed. and tr.). *The Mediaeval Science of Weights ('Scientia de Ponderibus')*; Treatises ascribed to Euclid, Archimedes, Thabit ibn Qurra, Jordanus de Nemore, and Blasius of Parma. Univ. of Wisconsin Press, Madison, Wis., 1952. Revs. E. J. Dijksterhuis, *A/AHS*, 1953, **6**, 504; O. Neugebauer, *SP*, 1953, **28**, 596.
- MOORE-BENNETT, A. J. (1). 'The Mineral Areas of Western China.' *FER*, 1915, 225.
- MORAN, S. F. (1). 'The Gilding of Ancient Bronze Statues in Japan.' *AA*, 1969, **30**, 55.

- DE MORANT, G. SOULIÉ (2). *L'Acupuncture Chinoise*. 4 vols.
 I. *l'Énergie (Points, Méridiens, Circulation)*.
 II. *Le Maniement de l'Énergie*.
 III. *Les Points et leurs Symptômes*.
 IV. *Les Maladies et leurs Traitements*.
 Mercure de France, Paris, 1939-. Re-issued as 5 vols. in one, with 1 vol. of plates, Maloine, Paris, 1972.
- MORERY, L. (1). *Grand Dictionnaire Historique; ou le Mélange Curieux de l'Histoire Sacrée et Profane*. . . 1688, Supplement 1689. Later editions revised by J. Leclerc. 9th ed. Amsterdam and The Hague, 1702. Eng. tr. revised by Jeremy Collier, London, 1701.
- MORET, A. (1). 'Mysteries, Egyptian.' *ERE*, vol. ix, pp. 74-5.
- MORET, A. (2). *Kings and Gods in Egypt*. London, 1912.
- MORET, A. (3). 'Du Caractère Religieux de la Royauté Pharaonique.' *BE/AMG*, 1902, 15, 1-344.
- MORFILL, W. R. & CHARLES, R. H. (1) (tr.). *The 'Book of the Secrets of Enoch' [2 Enoch], translated from the Slavonic*. . . Oxford, 1896.
- MORGENSTERN, P. (1) (ed.). '*Turba Philosophorum*'; *Das ist, Das Buch von der güldenen Kunst, neben andern Authoribus, welche mit einander 36 Bücher in sich haben. Darinn die besten vrältesten Philosophi zusammen getragen, welche tractiren alle einhellig von der Universal Medicin, in zwey Bücher abgetheilt, unnd mit Schönen Figuren gezieret. Jetzundt newlich zu Nutz und Dienst allen waren Kunstliebenden der Natur (so der Lateinischen Sprach unerfahren) mit besondern Fleiß, mühe unnd Arbeit trewlich an tag geben*. . . König, Basel, 1613. 2nd ed. Krauss, Vienna, 1750. Cf. Ferguson (1), vol. 2, pp. 106 ff.
- MORRIS, IVAN I. (1). *The World of the Shining Prince; Court Life in Ancient Japan* [in the Heian Period, +782 to +1167, here particularly referring to Late Heian, +967 to +1068]. Oxford, 1964.
- MORRISON, P. & MORRISON, E. (1). 'High Vacuum.' *SAM*, 1950, 182 (no. 5), 20.
- MORTIER, F. (1). 'Les Procédés Taoistes en Chine pour la Prolongation de la Vie Humaine.' *BSAB*, 1930, 45, 118.
- MORTON, A. A. (1). *Laboratory Technique in Organic Chemistry*. McGraw-Hill, New York and London, 1938.
- MOSS, A. A. (1). 'Niello.' *SCON*, 1955, 1, 49.
- M[OUFET], T[HOMAS] (of Caius, d. +1605)? (1). '*Letter [of Roger Bacon] concerning the Marvellous Power of Art and Nature*'. London, 1659. (Tr. of *De Mirabili Potestate Artis et Naturae, et de Nullitate Magiae*.) French. tr. of the same work by J. Girard de Tournus, Lyons, 1557, Billaine, Paris, 1628. Cf. Ferguson (1), vol. 1, pp. 52, 63-4, 318, vol. 2, pp. 114, 438.
- MOULE, A. C. & PELLIOT, P. (1) (tr. & annot.). *Marco Polo (+1254 to +1325); The Description of the World*. 2 vols. Routledge, London, 1938. Further notes by P. Pelliot (posthumously pub.). 2 vols. Impr. Nat. Paris, 1960.
- MUCCIOLI, M. (1). 'Intorno ad una Memoria di Giulio Klaproth sulle "Conoscenze Chimiche dei Cinesi nell'8 Secolo".' *A*, 1926, 7, 382.
- MUELLER, K. (1). 'Die Golemsage und die sprechenden Statuen.' *MSGVK*, 1918, 20, 1-40.
- MUIR, J. (1). *Original Sanskrit Texts*. 5 vols. London, 1858-72.
- MUIR, M. M. PATTISON (1). *The Story of Alchemy and the Beginnings of Chemistry*. Hodder & Stoughton, London, 1902. 2nd ed. 1913.
- MUIRHEAD, W. (1). '[Glossary of Chinese] Mineralogical and Geological Terms. In Doolittle (1), vol. 2, p. 256.
- MUKAND SINGH, THAKUR (1). *Ilajul Awham (On the Treatment of Superstitions)*. Jagat, Aligarh, 1893 (in Urdu).
- MUKERJI, KAVIRAJ B. (1). *Rasa-jala-nidhi; or, Ocean of Indian Alchemy*. 2 vols. Calcutta, 1927.
- MULTHAUF, R. P. (1). 'John of Rupescissa and the Origin of Medical Chemistry.' *ISIS*, 1954, 45, 359.
- MULTHAUF, R. P. (2). 'The Significance of Distillation in Renaissance Medical Chemistry.' *BIHM*, 1956, 30, 329.
- MULTHAUF, R. P. (3). 'Medical Chemistry and "the Paracelsians".' *BIHM*, 1954, 28, 101.
- MULTHAUF, R. P. (5). *The Origins of Chemistry*. Oldbourne, London, 1967.
- MULTHAUF, R. P. (6). 'The Relationship between Technology and Natural Philosophy, c. +1250 to +1650, as illustrated by the Technology of the Mineral Acids.' Inaug. Diss., Univ. California, 1953.
- MULTHAUF, R. P. (7). 'The Beginnings of Mineralogical Chemistry.' *ISIS*, 1958, 49, 50.
- MULTHAUF, R. P. (8). 'Sal Ammoniac; a Case History in Industrialisation.' *TCULT*, 1965, 6, 569.
- MUS, P. (1). 'La Notion de Temps Réversible dans la Mythologie Bouddhique.' *AEPHE/SSR*, 1939, 1.
- AL-NADĪM, ABŪ'L-FARAJ IBN ABŪ YA'QŪB. See Flügel, G. (1).
- NADKARNI, A. D. (1). *Indian Materia Medica*. 2 vols. Popular, Bombay, 1954.

- NAGEL, A. (1). 'Die Chinesischen Kuchengott.' *AR*, 1908, **11**, 23.
- NAKAYAMA SHIGERU & SIVIN, N. (1) (ed.). *Chinese Science; Explorations of an Ancient Tradition*. M.I.T. Press, Cambridge, Mass., 1973. (M.I.T. East Asian Science Ser. no. 2.)
- NANJIO, B. (1). *A Catalogue of the Chinese Translations of the Buddhist Tripitaka*. Oxford, 1883. (See Ross, E. D., 3.)
- NARDI, S. (1) (ed.). *Taddeo Alderotti's Consilia Medicinalia*, c. +1280. Turin, 1937.
- NASR, SEYYED HOSSEIN. See Said Husain Nasr.
- NAU, F. (2). 'The translation of the *Tabula Smaragdina* by Hugo of Santalla (mid +12th century).' *ROC*, 1907 (2e sér.), **2**, 105.
- NEAL, J. B. (1). 'Analyses of Chinese Inorganic Drugs.' *CMY*, 1889, **2**, 116; 1891, **5**, 193.
- NEBBIA, G. & NEBBIA-MENOZZI, G. (1). 'A Short History of Water Desalination.' Art. from *Acqua Dolce dal Mare*. II^a Inchiesta Internazionale, Milan, Fed. delle Associazioni Sci. e Tecniche, 1966, pp. 129-172.
- NEBBIA, G. & NEBBIA-MENOZZI, G. (2). 'Early Experiments on Water Desalination by Freezing.' *DS*, 1968, **5**, 49.
- NEEDHAM, DOROTHY M. (1). *Machina Carnis; the Biochemistry of Muscle Contraction in its Historical Development*. Cambridge, 1971.
- NEEDHAM, JOSEPH (2). *A History of Embryology*. Cambridge, 1934. 2nd ed., revised with the assistance of A. Hughes. Cambridge, 1959; Abelard-Schuman, New York, 1959.
- NEEDHAM, JOSEPH (25). 'Science and Technology in China's Far South-East.' *N*, 1946, **157**, 175. Reprinted in Needham & Needham (1).
- NEEDHAM, JOSEPH (27). 'Limiting Factors in the Advancement of Science as observed in the History of Embryology.' *YJBM*, 1935, **8**, 1. (Carmalt Memorial Lecture of the Beaumont Medical Club of Yale University.)
- NEEDHAM, JOSEPH (30). 'Prospection Géobotanique en Chine Médiévale.' *JATBA*, 1954, **1**, 143.
- NEEDHAM, JOSEPH (31). 'Remarks on the History of Iron and Steel Technology in China (with French translation; 'Remarques relatives à l'Histoire de la Sidérurgie Chinoise'). In *Actes du Colloque International 'Le Fer à travers les Ages'*, pp. 93, 103. Nancy, Oct. 1955. (*AEST*, 1956, Mémoire no. 16.)
- NEEDHAM, JOSEPH (32). *The Development of Iron and Steel Technology in China*. Newcomen Soc. London, 1958. (Second Biennial Dickinson Memorial Lecture, Newcomen Society.) Précis in *TNS*, 1960, **30**, 141; rev. L. C. Goodrich, *ISIS*, 1960, **51**, 108. Repr. Heffer, Cambridge, 1964. French tr. (unrevised, with some illustrations omitted and others added by the editors), *RHSID*, 1961, **2**, 187, 235; 1962, **3**, 1, 62.
- NEEDHAM, JOSEPH (34). 'The Translation of Old Chinese Scientific and Technical Texts.' Art. in *Aspects of Translation*, ed. A. H. Smith, Secker & Warburg, London, 1958. p. 65. (Studies in Communication, no. 22.) Also in *BABEL*, 1958, **4** (no. 1), 8.
- NEEDHAM JOSEPH (36). *Human Law and the Laws of Nature in China and the West*. Oxford Univ. Press, London, 1951. (Hobhouse Memorial Lectures at Bedford College, London, no. 20.) Abridgement of (37).
- NEEDHAM, JOSEPH (37). 'Natural Law in China and Europe.' *JHI*, 1951, **12**, 3 & 194 (corrigenda, 628).
- NEEDHAM, JOSEPH (45). 'Poverties and Triumphs of the Chinese Scientific Tradition.' Art. in *Scientific Change; Historical Studies in the Intellectual, Social and Technical Conditions for Scientific Discovery and Technical Invention from Antiquity to the Present*, ed. A. C. Crombie, p. 117. Heinemann, London, 1963. With discussion by W. Hartner, P. Huard, Huang Kuang-Ming, B. L. van der Waerden and S. E. Toulmin (Symposium on the History of Science, Oxford, 1961). Also, in modified form: 'Glories and Defects...' in *Neue Beiträge z. Geschichte d. alten Welt*, vol. 1, *Alter Orient und Griechenland*, ed. E. C. Welskopf, Akad. Verl. Berlin, 1964. French tr. (of paper only) by M. Charlot, 'Grandeurs et Faiblesses de la Tradition Scientifique Chinoise', *LP*, 1963, no. 111. Abridged version; 'Science and Society in China and the West', *SPR*, 1964, **52**, 50.
- NEEDHAM, JOSEPH (47). 'Science and China's Influence on the West.' Art. in *The Legacy of China*, ed. R. N. Dawson. Oxford, 1964, p. 234.
- NEEDHAM, JOSEPH (48). 'The Prenatal History of the Steam-Engine.' (Newcomen Centenary Lecture.) *TNS*, 1963, **35**, 3-58.
- NEEDHAM, JOSEPH (50). 'Human Law and the Laws of Nature.' Art. in *Technology, Science and Art; Common Ground*. Hatfield Coll. of Technol., Hatfield, 1961, p. 3. A lecture based upon (36) and (37), revised from Vol. 2, pp. 518 ff. Repr. in *Social and Economic Change* (Essays in Honour of Prof. D. P. Mukerji), ed. B. Singh & V. B. Singh. Allied Pubs. Bombay, Delhi etc., 1967, p. 1.
- NEEDHAM, JOSEPH (55). 'Time and Knowledge in China and the West.' Art. in *The Voices of Time; a Cooperative Survey of Man's Views of Time as expressed by the Sciences and the Humanities*, ed. J. T. Fraser. Braziller, New York, 1966, p. 92.

- NEEDHAM, JOSEPH (56). *Time and Eastern Man*. (Henry Myers Lecture, Royal Anthropological Institute, 1964.) Royal Anthropological Institute, London, 1965.
- NEEDHAM, JOSEPH (58). 'The Chinese Contribution to Science and Technology.' Art. in *Reflections on our Age* (Lectures delivered at the Opening Session of UNESCO at the Sorbonne, Paris, 1946), ed. D. Hardman & S. Spender. Wingate, London, 1948, p. 211. Tr. from the French *Conférences de l'Unesco*. Fontaine, Paris, 1947, p. 203.
- NEEDHAM, JOSEPH (59). 'The Roles of Europe and China in the Evolution of Oecumenical Science.' *JAHIST*, 1966, 1, 1. As Presidential Address to Section X, British Association, Leeds, 1967, in *ADVS*, 1967, 24, 83.
- NEEDHAM, JOSEPH (60). 'Chinese Priorities in Cast Iron Metallurgy.' *TCULT*, 1964, 5, 398.
- NEEDHAM, JOSEPH (64). *Clerks and Craftsmen in China and the West* (Collected Lectures and Addresses). Cambridge, 1970.
- NEEDHAM, JOSEPH (65). *The Grand Titration; Science and Society in China and the West*. (Collected Addresses.) Allen & Unwin, London, 1969.
- NEEDHAM, JOSEPH (67). *Order and Life* (Terry Lectures). Yale Univ. Press, New Haven, Conn.; Cambridge, 1936. Paperback edition (with new foreword), M.I.T. Press, Cambridge, Mass. 1968. Italian tr. by M. Aloisi, *Ordine e Vita*, Einaudi, Turin, 1946 (Biblioteca di Cultura Scientifica, no. 14).
- NEEDHAM, JOSEPH (68). 'Do the Rivers Pay Court to the Sea? The Unity of Science in East and West.' *TTT*, 1971, 5 (no. 2), 68.
- NEEDHAM, JOSEPH (70). 'The Refiner's Fire; the Enigma of Alchemy in East and West.' Ruddock, for Birkbeck College, London, 1971 (Bernal Lecture). French tr. (with some additions and differences), 'Artisans et Alchimistes en Chine et dans le Monde Hellénistique.' *LP*, 1970, no. 152, 3 (Rapkiné Lecture, Institut Pasteur, Paris).
- NEEDHAM, JOSEPH (71). 'A Chinese Puzzle—Eighth or Eighteenth?', art. in *Science, Medicine and Society in the Renaissance* (Pagel Presentation Volume), ed. Debus (20), vol. 2, p. 251.
- NEEDHAM, JOSEPH & LU GWEI-DJEN (1). 'Hygiene and Preventive Medicine in Ancient China.' *JHMAS*, 1962, 17, 429; abridged in *HEJ*, 1959, 17, 170.
- NEEDHAM, JOSEPH & LU GWEI-DJEN (3). 'Proto-Endocrinology in Mediaeval China.' *JSHS*, 1966, 5, 150.
- NEEDHAM, JOSEPH & NEEDHAM, DOROTHY M. (1) (ed.). *Science Outpost*. Pilot Press, London, 1948.
- NEEDHAM, JOSEPH & ROBINSON, K. (1). 'Ondes et Particules dans la Pensée Scientifique Chinoise.' *SCIS*, 1960, 1 (no. 4), 65.
- NEEDHAM, JOSEPH, WANG LING & PRICE, D. J. DE S. (1). *Heavenly Clockwork; the Great Astronomical Clocks of Mediaeval China*. Cambridge, 1960. (Antiquarian Horological Society Monographs, no. 1.) Prelim. pub. *AHOR*, 1956, 1, 153.
- NEEF, H. (1). *Die im 'Tao Tsang' enthaltenen Kommentare zu 'Tao-Tê-Ching' Kap. VI*. Inaug. Diss. Bonn, 1938.
- NEOGI, P. (1). *Copper in Ancient India*. Sarat Chandra Roy (Anglo-Sanskrit Press), Calcutta, 1918. (Indian Assoc. for the Cultivation of Science, Special Pubs. no. 1.)
- NEOGI, P. & ADHIKARI, B. B. (1). 'Chemical Examination of Ayurvedic Metallic Preparations; I, *Shata-puta lauha* and *Shahashra-puta lauha* (Iron roasted a hundred or a thousand times).' *JRAS/B*, 1910 (n.s.), 6, 385.
- NERI, ANTONIO (1). *L'Arte Vetraria distinta in libri sette*. . . Giunti, Florence, 1612. 2nd ed. Rabbuiati, Florence, 1661, Batti, Venice, 1663. Latin tr. *De Arte Vitraria Libri Septem, et in eisdem Christoph. Merretti*. . . *Observationes et Notae*. Amsterdam, 1668. German tr. by F. Geissler, Frankfurt and Leipzig, 1678. English tr. by C. Merrett, London, 1662. Cf. Ferguson (1), vol. 2, pp. 134 ff.
- NEUBAUER, C. & VOGEL, H. (1). *Handbuch d. Analyse d. Harns*. 1860, and later editions, including a revision by A. Huppert, 1910.
- NEUBURGER, A. (1). *The Technical Arts and Sciences of the Ancients*. Methuen, London, 1930. Tr. by H. L. Brose from *Die Technik d. Altertums*. Voigtländer, Leipzig, 1919. (With a drastically abbreviated index and the total omission of the bibliographies appended to each chapter, the general bibliography, and the table of sources of the illustrations).
- NEUBURGER, M. (1). 'Théophile de Bordeu (1722 bis 1776) als Vorläufer d. Lehre von der inneren Sekretion.' *WKW*, 1911 (pt. 2), 1367.
- NEUMANN, B. (1). 'Messing.' *ZAC*, 1902, 15, 511.
- NEUMANN, B. & KOTYGA, G. (1) (with the assistance of M. Rupprecht & H. Hoffmann). 'Antike Gläser.' *ZAC*, 1925, 38, 776, 857; 1927, 40, 963; 1928, 41, 203; 1929, 42, 835.
- NEWALL, L. C. (1). 'Newton's Work in Alchemy and Chemistry.' Art. in *Sir Isaac Newton, 1727 to 1927*, Hist. Sci. Soc. London, 1928, pp. 203-55.
- NGUYEN DANG TÂM (1). 'Sur les Bokétonosides, Saponosides du Boket ou *Gleditschia fera* Merr. (*australis* Hemsl.; *sinensis* Lam.).' *CRAS*, 1967, 264, 121.

- NIU CHING-I, KUNG YO-THING, HUANG WEI-TÊ, KO LIU-CHÜN & eight other collaborators (1). 'Synthesis of Crystalline Insulin from its Natural A-Chain and the Synthetic B-Chain.' *SCISA*, 1966, 15, 231.
- NOBLE, S. B. (1). 'The Magical Appearance of Double-Entry Book-keeping' (derivation from the mathematics of magic squares). Unpublished MS., priv. comm.
- NOCK, A. D. & FESTUGIÈRE, A. J. (1). *Corpus Hermeticum* [Texts and French translation]. Belles lettres, Paris, 1945-54.
 Vol. 1, Texts I to XII; text established by Nock, tr. Festugière.
 Vol. 2, Texts XIII to XVIII, Asclepius; text established by Nock, tr. Festugière.
 Vol. 3, Fragments from Stobaeus I to XXII; text estab. and tr. Festugière.
 Vol. 4, Fragments from Stobaeus XXIII to XXIX (text estab. and tr. Festugière) and Miscellaneous Fragments (text estab. Nock, tr. Festugière).
 (Coll. Universités de France, Assoc. G. Budé.)
- NOEL, FRANCIS (2). *Philosophia Sinica; Tribus Tractatibus primo Cognitionem primi Entis, secundo Ceremonias erga Defunctos, tertio Ethicam juxta Sinarum mentem complectens*. Univ. Press, Prague, 1711. Cf. Pinot (2), p. 116.
- NOEL, FRANCIS (3) (tr.). *Sinensis Imperii Libri Classici Sex; nimirum: Adulorum Schola [Ta Hsiieh], Immutabile Medium [Chung Yung], Liber Sententiarum [Lun Yü], Mencius [Mêng Tzu], Filialis Observantia [Hsiao Ching], Parvulorum Schola [San Tzu Ching], e Sinico Idiome in Latinum traducti*. . . . Univ. Press, Prague, 1711. French tr. by Pluquet, *Les Livres Classiques de l'Empire de la Chine, précédés d'observations sur l'Origine, la Nature et les Effets de la Philosophie Morale et Politique dans cet Empire*. 7 vols. De Bure & Barrois, Didot, Paris, 1783-86. The first three books had been contained in Intorcetta et al. (1) *Confucius Sinarum Philosophus*. . . , the last three were now for the first time translated.
- NOEL, FRANCIS (5) (tr.). MS. translation of the *Tao Tê Ching*, sent to Europe between +1690 and +1702. Present location unknown. See Pfister (1), p. 418.
- NORDHOFF, C. (1). *The Communistic Societies of the United States, from Personal Visit and Observation*. Harper, New York, 1875, 2nd ed. Dover, New York, 1966, with an introduction by M. Holloway.
- NORIN, E. (1). 'Tzu Chin Shan, an Alkali-Syenite Area in Western Shansi; Preliminary Notes.' *BGSC*, 1921, no. 3, 45-70.
- NORPOTH, L. (1). 'Paracelsus—a Mannerist?', art. in *Science, Medicine and Society in the Renaissance* (Pagel Presentation Volume), ed. Debus (20), vol. 1, p. 127.
- NORTON, T. (1). *The Ordinal of Alchimy* (c. 1 + 440). See Holmyard (12).
- NOYES, J. H. [of Oneida] (1). *A History of American Socialisms*. Lippincott, Philadelphia, 1870, 2nd ed. Dover, New York, 1966, with an introduction by M. Holloway.
- O'FLAHERTY, W. D. (1). 'The Submarine Mare in the Mythology of Siva.' *JRAS*, 1971, 9.
- O'LEARY, DE LACY (1). *How Greek Science passed to the Arabs*. Routledge & Kegan Paul, London, 1948.
- OAKLEY, K. P. (2). 'The Date of the "Red Lady" of Paviland.' *AQ*, 1968, 42, 306.
- ÖBUCHI, NINJI (1). 'How the *Tao Tsang* Took Shape.' Contribution to the First International Conference of Taoist Studies, Villa Serbelloni, Bellagio, 1958.
- OESTERLEY, W. O. E. & ROBINSON, T. H. (1). *Hebrew Religion; its Origin and Development*. SPCK, London, 2nd ed. 1937, repr. 1966.
- OGDEN, W. S. (1). 'The Roman Mint and Early Britain.' *BNJ*, 1908, 5, 1-50.
- OHSAWA, G. See Sakurazawa, Nyôiti (1).
- D'OLLONE, H., VISSIÈRE, A., BLOCHET, E. et al. (1). *Recherches sur les Mussulmans Chinois*. Leroux, Paris, 1911. (Mission d'Ollone, 1906-1909; cf. d'Ollone, H.: *In Forbidden China*, tr. B. Miall, London, 1912.)
- OLSKHI, L. (4). *Guillaume Boucher; a French Artist at the Court of the Khans*. Johns Hopkins Univ. Press, Baltimore, 1946 (rev. H. Franke, *OR*, 1950, 3, 135).
- OLSKHI, L. (7). *The Myth of Felt*. Univ. of California Press, Los Angeles, Calif., 1949.
- ONG WÊN-HAO (1). 'Les Provinces Métallogéniques de la Chine.' *BGSC*, 1920, no. 2, 37-59.
- ONG WÊN-HAO (2). 'On Historical Records of Earthquakes in Kansu.' *BGSC*, 1921, no. 3, 27-44.
- OPPERT, G. (2). 'Mitteilungen zur chemisch-technischen Terminologie im alten Indien; (1) Über die Metalle, besonders das Messing, (2) der Indische Ursprung der Kadmia (Calaminaris) und der Tutia.' Art. in *Kahlbaum Festschrift* (1909), ed. Diergart (1), pp. 127-42.
- ORSCHALL, J. C. (1). 'Sol sine Veste'; *Oder dreysig Experimenta dem Gold seinen Purpur auszuziehen*. . . . Augsburg, 1684. Cf. Partington (7), vol. 2, p. 371; Ferguson (1), vol. 2, pp. 156 ff.
- DA ORTA, GARCIA (1). *Coloquios dos Simples e Drogas he cousas medicinais da India compostos pello Doutor Garcia da Orta*. de Endem, Goa, 1563. Latin epitome by Charles de l'Escluze, Plantin, Antwerp, 1567. Eng. tr. *Colloquies on the Simples and Drugs of India* with the annotations of the Conde de Ficalho, 1895, by Sir Clements Markham. Sotheran, London, 1913.

- OSMOND, H. (1) 'Ololiuqui; the Ancient Aztec Narcotic.' *JMS*, 1955, **101**, 526.
- OSMOND, H. (2). 'Hallucinogenic Drugs in Psychiatric Research.' *MLB*, 1964, **6** (no. 1), 2.
- OST, H. (1). *Lehrbuch der chemischen Technologie*. 11th ed. Jänecke, Leipzig, 1920.
- OTA, K. (1). 'The Manufacture of Sugar in Japan.' *TASJ*, 1880, **8**, 462.
- OU YUN-JOEH. See Wu Yün-Jui in Roi & Wu (1).
- OUSELEY, SIR WILLIAM (1) (tr.). *The 'Oriental Geography' of Ebn Haukal, an Arabian Traveller of the Tenth Century* [Abū al-Qāsim Muḥammad Ibn Ḥawqal, fl. +943 to +977]. London, 1800. (This translation, done from a Persian MS., is in fact an abridgement of the *Kitāb al-Masālik wa'l-Mamālik*, 'Book of the Roads and the Countries', of Ibn Ḥawqal's contemporary, Abū Ishāq Ibrāhīm ibn Muḥammad al-Fārisī al-Iṣṭakhrī.)
- PAAL, H. (1). *Johann Heinrich Cohausen, +1665 bis +1750; Leben und Schriften eines bedeutenden Arztes aus der Blütezeit des Hochstiftes Münster, mit kulturhistorischen Betrachtungen*. Fischer, Jena, 1931. (Arbeiten z. Kenntnis d. Gesch. d. Medizin im Rheinland und Westfalen, no. 6.)
- PAGEL, W. (1). 'Religious Motives in the Medical Biology of the Seventeenth Century.' *BIHM*, 1935, **3**, 97.
- PAGEL, W. (2). 'The Religious and Philosophical Aspects of van Helmont's Science and Medicine.' *BIHM*, Suppl. no. 2, 1944.
- PAGEL, W. (10). *Paracelsus; an Introduction to Philosophical Medicine in the Era of the Renaissance*. Karger, Basel and New York, 1958. Rev. D. G[eoghegan], *AX*, 1959, **7**, 169.
- PAGEL, W. (11). 'Jung's Views on Alchemy.' *ISIS*, 1948, **39**, 44.
- PAGEL, W. (12). 'Paracelsus; Traditionalism and Mediaeval Sources.' Art. in *Medicine, Science and Culture*, O. Temkin Presentation Volume, ed. L. G. Stevenson & R. P. Multhauf. Johns Hopkins Press, Baltimore, Md. 1968, p. 51.
- PAGEL, W. (13). 'The Prime Matter of Paracelsus.' *AX*, 1961, **9**, 117.
- PAGEL, W. (14). 'The "Wild Spirit" (Gas) of John-Baptist van Helmont (+1579 to +1644), and Paracelsus.' *AX*, 1962, **10**, 2.
- PAGEL, W. (15). 'Chemistry at the Cross-Roads; the Ideas of Joachim Jungius.' *AX*, 1969, **16**, 100. (Essay-review of Kangro, 1.)
- PAGEL, W. (16). 'Harvey and Glisson on Irritability, with a Note on van Helmont.' *BIHM*, 1967, **41**, 497.
- PAGEL, W. (17). 'The Reaction to Aristotle in Seventeenth-Century Biological Thought.' Art. in *Singer Commemoration Volume, Science, Medicine and History*, ed. E. A. Underwood. Oxford, 1953, vol. 1, p. 489.
- PAGEL, W. (18). 'Paracelsus and the Neo-Platonic and Gnostic Tradition.' *AX*, 1960, **8**, 125.
- PALÉOLOGUE, M. G. (1). *L'Art Chinois*. Quantin, Paris, 1887.
- PALLAS, P. S. (1). *Sammlungen historischen Nachrichten ü. d. mongolischen Völkerschaften*. St Petersburg, 1776. Fleischer, Frankfurt and Leipzig, 1779.
- PALMER, A. H. (1). 'The Preparation of a Crystalline Globulin from the Albumin fraction of Cow's Milk.' *JBC*, 1934, **104**, 359.
- [PALMGREN, N.] (1). 'Exhibition of Early Chinese Bronzes arranged on the Occasion of the 13th International Congress of the History of Art.' *BMFEA*, 1934, **6**, 81.
- PÁLOS, S. (2). *Atem und Meditation; Moderne chinesische Atemtherapie als Vorschule der Meditation—Theorie, Praxis, Originaltexte*. Barth, Weilheim, 1968.
- PARANAVITANA, S. (4). *Ceylon and Malaysia*. Lake House, Colombo, 1966.
- DE PAREDES, J. (1). *Recopilacion de Leyes de los Reynos de las Indias*. Madrid, 1681.
- PARENIN, D. (1). 'Lettre à Mons. [J. J.] Dortous de Mairan, de l'Académie Royale des Sciences (on demonstrations to Chinese scholars of freezing-point depression, fulminate explosions and chemical precipitation, without explanations but as a guarantee of theological veracity; on causes of the alleged backwardness of Chinese astronomy, including imperial displeasure at ominous celestial phenomena; on the pretended origin of the Chinese from the ancient Egyptians; on famines and scarcities in China; and on the aurora borealis)'. *LEC*, 1781, vol. 22, pp. 132 ff., dated 28 Sep. 1735.
- PARKES, S. (1). *Chemical Essays, principally relating to the Arts and Manufactures of the British Dominions*. 5 vols. Baldwin, Cradock & Joy, London, 1815.
- PARTINGTON, J. R. (1). *Origins and Development of Applied Chemistry*. Longmans Green, London, 1935.
- PARTINGTON, J. R. (2). 'The Origins of the Atomic Theory.' *ANS*, 1939, **4**, 245.
- PARTINGTON, J. R. (3). 'Albertus Magnus on Alchemy.' *AX*, 1937, **1**, 3.
- PARTINGTON, J. R. (4). *A Short History of Chemistry*. Macmillan, London, 1937, 3rd ed. 1957.
- PARTINGTON, J. R. (5). *A History of Greek Fire and Gunpowder*. Heffer, Cambridge, 1960.
- PARTINGTON, J. R. (6). 'The Origins of the Planetary Symbols for Metals.' *AX*, 1937, **1**, 61.
- PARTINGTON, J. R. (7). *A History of Chemistry*.
Vol. 1, pt. 1. *Theoretical Background* [Greek, Persian and Jewish].

- Vol. 2. +1500 to +1700.
 Vol. 3. +1700 to 1800.
 Vol. 4. 1800 to the Present Time.
 Macmillan, London, 1961-. Rev. W. Pagel, *MH*, 1971, **15**, 406.
- PARTINGTON, J. R. (8). 'Chinese Alchemy.'
 (a) *N*, 1927, **119**, 11.
 (b) *N*, 1927, **120**, 878; comment on B. E. Read (11).
 (c) *N*, 1931, **128**, 1074; dissent from von Lippmann (1).
- PARTINGTON, J. R. (9). 'The Relationship between Chinese and Arabic Alchemy.' *N*, 1928, **120**, 158.
- PARTINGTON, J. R. (10). *General and Inorganic Chemistry*. . . 2nd ed. Macmillan, London, 1951.
- PARTINGTON, J. R. (11). 'Trithemius and Alchemy.' *AX*, 1938, **2**, 53.
- PARTINGTON, J. R. (12). 'The Discovery of Mosaic Gold.' *ISIS*, 1934, **21**, 203.
- PARTINGTON, J. R. (13). 'Bygone Chemical Technology.' *CHIND*, 1923 (n.s.), **42** (no. 26), 636.
- PARTINGTON, J. R. (14). 'The Kerotakis Apparatus.' *N*, 1947, **159**, 784.
- PARTINGTON, J. R. (15). 'Chemistry in the Ancient World.' Art. in *Science, Medicine and History*, Singer Presentation Volume, ed. E. A. Underwood. Oxford, 1953, vol. 1, p. 35. Repr. with slight changes, 1959, 241.
- PARTINGTON, J. R. (16). 'An Ancient Chinese Treatise on Alchemy [the *Tshan Thung Chhi* of Wei Po-Yang].' *N*, 1935, **136**, 287.
- PARTINGTON, J. R. (17). 'The Chemistry of al-Rāzī.' *AX*, 1938, **1**, 192.
- PARTINGTON, J. R. (18). 'Chemical Arts in the Mount Athos Manual of Christian Iconography [prob. +13th cent., MSS of +16th to +18th centuries].' *ISIS*, 1934, **22**, 136.
- PARTINGTON, J. R. (19). 'E. O. von Lippmann [biography].' *OSIS*, 1937, **3**, 5.
- PASSOW, H., ROTHSTEIN, A. & CLARKSON, T. W. (1). 'The General Pharmacology of the Heavy Metals.' *PHREV*, 1961, **13**, 185
- PASTAN, I. (1). 'Biochemistry of the Nitrogen-containing Hormones.' *ARB*, 1966, **35** (pt. 1), 367.
- DE PAUW, C. (1). *Recherches Philosophiques sur les Égyptiens et les Chinois*. . . (vols. IV and V of *Oeuvres Philosophiques*), Cailler, Geneva, 1774. 2nd ed. Bastien, Paris, Rep. An. III (1795). Crit. Kao Lei-Ssu [Aloysius Ko, S.J.], *MCHSAMUC*, 1777, **2**, 365, (2nd pagination) 1-174.
- PECK, E. S. (1). 'John Francis Vigani, first Professor of Chemistry in the University of Cambridge, +1703 to +1712, and his Cabinet of Materia Medica in the Library of Queens' College.' *PCASC*, 1934, **34**, 34.
- PELLIOT, P. (1). Critical Notes on the Earliest Reference to Tea. *TP*, 1922, **21**, 436.
- PELLIOT, P. (3). 'Notes sur Quelques Artistes des Six Dynasties et des Thang.' *TP*, 1923, **22**, 214. (On the Bodhidharma legend and the founding of Shao-lin Ssu on Sung Shan, pp. 248 ff., 252 ff.)
- PELLIOT, P. (8). 'Autour d'une Traduction Sanskrite du *Tao-tō-king* [*Tao Tê Ching*].' *TP*, 1912, **13**, 350.
- PELLIOT, P. (10). 'Les Mongols et la Papauté.'
 Pt. 1 'La Lettre du Grand Khan Güyük à Innocent IV [+1246].'
 Pt. 2a 'Le Nestorien Siméon Rabban-Ata.'
 Pt. 2b 'Ascelin [Azellino of Lombardy, a Dominican, leader of the first diplomatic mission to the Mongols, +1245 to +1248].'
 Pt. 2c 'André de Longjumeau [Dominican envoy, +1245 to +1247].'
ROC, 1922, **23** (sér. 3, 3), 3-30; 1924, **24** (sér. 3, 4), 225-335; 1931, **28** (sér. 3, 8), 3-84.
- PELLIOT, P. (47). *Notes on Marco Polo; Ouvrage Posthume*. 2 vols. Impr. Nat. and Maisonneuve, Paris, 1959.
- PELLIOT, P. (54). 'Le Nom Persan du Cinabre dans les Langues "Altaïques".' *TP*, 1925, **24**, 253.
- PELLIOT, P. (55). 'Henri Bosmans, S.J.' *TP*, 1928, **26**, 190.
- PELLIOT, P. (56). Review of Cordier (12), *l'Imprimerie Sino-Européenne en Chine*. *BEFEO*, 1903, **3**, 108.
- PELLIOT, P. (57). 'Le *Kin Kou K'i Kouan* [*Chin Ku Chhi Kuan*, Strange Tales New and Old, c. +1635]' (review of E. B. Howell, 2). *TP*, 1925, **24**, 54.
- PELLIOT, P. (58). Critique of L. Wiegier's *Taoïsme*. *JA*, 1912 (10^e sér.), **20**, 141.
- PELSENEER, J. (3). 'La Réforme et l'Origine de la Science Moderne.' *RUB*, 1954, **5**, 406.
- PELSENEER, J. (4). 'L'Origine Protestante de la Science Moderne.' *LYCH*, 1947, 246. Repr. *GEW*, **47**.
- PELSENEER, J. (5). 'La Réforme et le Progrès des Sciences en Belgique au 16^e Siècle.' Art. in *Science, Medicine and History*, Charles Singer Presentation Volume, ed. E. A. Underwood, Oxford, 1953, vol. 1, p. 280.
- PENZER, N. M. (2). *Poison-Damsels; and other Essays in Folklore and Anthropology*. Pr. pr. Sawyer, London, 1952.
- PERCY, J. (1). *Metallurgy; Fuel, Fire-Clays, Copper, Zinc and Brass*. Murray, London, 1861.
- PERCY, J. (2). *Metallurgy; Iron and Steel*. Murray, London, 1864.
- PERCY, J. (3). *Metallurgy; Introduction, Refractories, Fuel*. Murray, London, 1875.
- PERCY, J. (4). *Metallurgy; Silver and Gold*. Murray, London, 1880.

- PEREIRA, J. (1). *Elements of Materia Medica and Therapeutics*. 2 vols. Longman, Brown, Green & Longman, London, 1842.
- PERKIN, W. H. & KIPPING, F. S. (1). *Organic Chemistry*, rev. ed. Chambers, London and Edinburgh, 1917.
- PERRY, E. S. & HECKER, J. C. (1). 'Distillation under High Vacuum.' Art. in *Distillation*, ed. A. Weissberger (*Technique of Organic Chemistry*, vol. 4), p. 495. Interscience, New York, 1951.
- PERTOLD, O. (1). 'The Liturgical Use of *mahuda* liquor among the Bhils.' *ARO*, 1931, 3, 406.
- PETERSON, E. (1). 'La Libération d'Adam de l'*Avávykē*.' *RB*, 1948, 55, 199.
- PETRIE, W. M. FLINDERS (5). 'Egyptian Religion.' Art. in *ERE*, vol. v, p. 236.
- PETTUS, SIR JOHN (1). *Fleta Minor; the Laws of Art and Nature, in Knowing, Judging, Assaying, Fining, Refining and Inlarging the Bodies of confin'd Metals*. . . The first part is a translation of Ercker (1), the second contains: *Essays on Metallic Words, as a Dictionary to many Pleasing Discourses*. Dawkes, London, 1683; reissued 1686. See Sisco & Smith (1); Partington (7), vol. 2, pp. 104 ff.
- PETTUS, SIR JOHN (2). *Fodinae Regales; or, the History, Laws and Places of the Chief Mines and Mineral Works in England, Wales and the English Pale in Ireland; as also of the Mint and Mony; with a Clavis explaining some difficult Words relating to Mines, Etc.* London, 1670. See Partington (7), vol. 2, p. 106.
- PFISTER, R. (1). 'Teinture et Alchimie dans l'Orient Hellénistique.' *SK*, 1935, 7, 1-59.
- PFIZMAIER, A. (95) (tr.). 'Beiträge z. Geschichte d. Edelsteine u. des Goldes.' *SWAW/PH*, 1867, 58, 181, 194, 211, 217, 218, 223, 237. (Tr. chs. 807 (coral), 808 (amber), 809 (gems), 810, 811 (gold), 813 (in part), *Thai-Phing Yü Lan*.)
- PHARRIS, B. B., WYNGARDEN, L. J. & GUTKNECHT, G. D. (1). Art. in *Gonadotrophins*, 1968, ed. E. Rosenberg, p. 121.
- PHILALETHA, EIRENAEUS (OR IRENAEUS PHILOPONUS). Probably pseudonym of George Starkey (c. +1622 to +1665, *q.v.*). See Ferguson (1), vol. 2, pp. 194, 403.
- PHILALETHES, EUGENIUS. See Vaughan, Thomas (+1621 to +1665), and Ferguson (1), vol. 2, p. 197.
- PHILIPPE, M. (1). 'Die Braukunst der alten Babylonier im Vergleich zu den heutigen Braumethoden.' In Huber, E. (3), *Bier und Bierbereitung bei den Völkern d. Urzeit*, vol. 1, p. 29.
- PHILIPPE, M. (2). 'Die Braukunst der alten Ägypter im Lichte heutiger Brautechnik.' In Huber, E. (3), *Bier und Bierbereitung bei den Völkern d. Urzeit*, vol. 1, p. 55.
- PHILLIPPS, T. (SIR THOMAS) (1). 'Letter. . . communicating a Transcript of a MS. Treatise on the Preparation of Pigments, and on Various Processes of the Decorative Arts practised in the Middle Ages, written in the +12th Century and entitled *Mappae Clavicula*.' *AAA*, 1847, 32, 183.
- PHILOSTRATUS OF LEMNOS. See Conybeare (1); Jones (1).
- PIANKOFF, A. & RAMBOVA, N. (1). *Egyptian Mythological Papyri*. 2 vols. Pantheon, New York, 1957 (Bollingen Series, no. 40).
- PINCHES, T. G. (1). 'Tammuz.' *ERE*, vol. xii, p. 187. 'Heroes and Hero-Gods (Babylonian).' *ERE*, vol. vi, p. 642.
- PINCUS, G., THIMANN, K. V. & ASTWOOD, E. B. (1) (ed.). *The Hormones; Physiology, Chemistry and Applications*. 5 vols. Academic Press, New York, 1948-64.
- PINOT, V. (2). *Documents Inédits relatifs à la Connaissance de la Chine en France de 1685 à 1740*. Geuthner, Paris, 1932.
- PITTS, F. N. (1). 'The Biochemistry of Anxiety.' *SAM*, 1969, 220 (no. 2), 69.
- PIZZIMENTI, D. (1) (ed. & tr.). *Democritus 'De Arte Magna' sive 'De Rebus Naturalibus', necnon Synesii et Pelagii et Stephani Alexandrini et Michaelis Pselli in eundem Commentaria*. Padua, 1572, 1573, Cologne, 1572, 1574 (cf. Ferguson (1), vol. 1, p. 205). Repr. J. D. Tauber: *Democritus Abderyta Graecus 'De Rebus Sacris Naturalibus et Mysticis', cum Notis Synesii et Pelagii*. . . Nuremberg, 1717.
- PLESSNER, M. (1). 'Picatrix' Book on Magic and its Place in the History of Spanish Civilisation.' Communication to the IXth International Congress of the History of Science, Barcelona and Madrid, 1959. Abstract in *Guiones de las Comunicaciones*, p. 78. A longer German version appears in the subsequent *Actes* of the Congress, p. 312.
- PLESSNER, M. (2). 'Hermes Trismegistus and Arab Science.' *SI*, 1954, 2, 45.
- PLESSNER, M. (3). 'Neue Materialien z. Geschichte d. *Tabula Smaragdina*.' *DI*, 1927, 16, 77. (A critique of Ruska, 8.)
- PLESSNER, M. (4). 'Jābir ibn Ḥayyān und die Zeit der Entstehung der arabischen Jābir-schriften.' *ZDMG*, 1965, 115, 23.
- PLESSNER, M. (5). 'The Place of the *Turba Philosophorum* in the Development of Alchemy.' *ISIS*, 1954, 45, 331.
- PLESSNER, M. (7). 'The *Turba Philosophorum*; a Preliminary Report on Three Cambridge Manuscripts.' *AX*, 1959, 7, 159. (These MSS are longer than that used by Ruska (6) in his translation, but the authenticity of the additional parts has not yet been established.)

- PLESSNER, M. (8). 'Geber and Jābir ibn Ḥayyān; an Authentic + 16th-Century Quotation from Jābir.' *AX*, 1969, 16, 113.
- PLOSS, E. E., ROOSEN-RUNGE, H., SCHIPPERGES, H. & BUNTZ, H. (1). *Alchimia; Ideologie und Technologie*. Moos, München, 1970.
- POISSON, A. (1). *Théories et Symboles des Alchimistes, le Grand Oeuvre; suivi d'un Essai sur la Bibliographie Alchimique du XIXe Siècle*. Paris, 1891. Repr. 1972.
- POISSONNIER, P. J. (1). *Appareil Distillatoire présenté au Ministre de la Marine*. Paris, 1779.
- POKORA, T. (4). 'An Important Crossroad of Chinese Thought' (Huan Than, the first coming of Buddhism; and Yogistic trends in ancient Taoism). *ARO*, 1961, 29, 64.
- POLLARD, A. W. (2) (ed.). *The Travels of Sir John Mandeville; with Three Narratives in illustration of it—The Voyage of Johannes de Plano Carpini, the Journal of Friar William de Rubruquis, the Journal of Friar Odoric*. Macmillan, London, 1900. Repr. Dover, New York; Constable, London, 1964.
- POMET, P. (1). *Histoire Générale des Drogues*. Paris, 1694. Eng. tr. *A Compleat History of Druggs*. 2 vols. London, 1735.
- DE PONCINS, GONTRAN (1). *From a Chinese City*. New York, 1957.
- POPE, J. A., GETTENS, R. J., CAHILL, J. & BARNARD, N. (1). *The Freer Chinese Bronzes*. Vol. 1, Catalogue. Smithsonian Institution, Washington, D.C. 1967. (Freer Gallery of Art Oriental Studies, no. 7; Smithsonian Publication, no. 4706.) See also Gettens, Fitzhugh, Bene & Chase (1).
- POPE-HENNESSY, U. (1). *Early Chinese Jades*. Benn, London, 1923.
- PORKERT, MANFRED (1). *The Theoretical Foundations of Chinese Medicine*. M.I.T. Press, Cambridge, Mass. 1973. (M.I.T. East Asian Science and Technology Series, no. 3.)
- PORKERT, MANFRED (2). 'Untersuchungen einiger philosophisch-wissenschaftlicher Grundbegriffe und Beziehungen in Chinesischen.' *ZDMG*, 1961, 110, 422.
- PORKERT, MANFRED (3). 'Wissenschaftliches Denken im alten China—das System der energetischen Beziehungen.' *ANT*, 1961, 2, 532.
- DELLA PORTA, G. B. (3). *De distillatione libri IX; Quibus certa methodo, multiplici artificii: penitioribus naturae arcanis detectis cuius libet mixti, in propria elementa resolutio perfectur et docetur*. Rome and Strassburg, 1609.
- POSTLETHWAYT, MALACHY (1). *The Universal Dictionary of Trade and Commerce; translated from the French of Mons. [Jacques] Savary [des Bruslons], with large additions*. 2 vols. London, 1751–5. 4th ed. London, 1774.
- POTT, A. F. (1). 'Chemie oder Chymie?' *ZDMG*, 1876, 30, 6.
- POTTIER, E. (1). 'Observations sur les Couches profondes de l'Acropole [& Nécropole] à Suse.' *MDP*, 1912, 13, 1, and pl. xxxvii, 8.
- POUGH, F. H. (1). 'The Birth and Death of a Volcano [Paricutin in Mexico].' *END*, 1951, 10, 50.
- [VON PRANTL, K.] (1). 'Die Keime d. Alchemie bei den Alten.' *DV*, 1856 (no. 1), no. 73, 135.
- PREISENDANZ, K. (1). 'Ostanes.' Art. in Pauly-Wissowa, *Real-Encyklop. d. class. Altertumswiss.* Vol. xviii, pt. 2, cols. 1609 ff.
- PREISENDANZ, K. (2). 'Ein altes Ewigkeitssymbol als Signet und Druckermarke.' *GUJ*, 1935, 143.
- PREISENDANZ, K. (3). 'Aus der Geschichte des Uroboros; Brauch und Sinnbild.' Art. in *E. Fehrle Festschrift*, Karlsruhe, 1940, p. 194.
- PREUSCHEN, E. (1). 'Die Apocryphen Gnostischen Adamschriften aus dem Armenischen übersetzt und untersucht.' Art. in *Festschrift f. Bernhard Stade*, sep. pub. Ricker (Töpelmann), Giessen, 1900.
- PRYOR, M. G. M. (1). 'On the Hardening of the Ootheca of *Blatta orientalis* (and the cuticle of insects in general).' *PRSB*, 1940, 128, 378, 393.
- PRZYŁUSKI, J. (1). 'Les Unipèdes.' *MCB*, 1933, 2, 307.
- PRZYŁUSKI, J. (2). (a) 'Une Cosmogonie Commune à l'Iran et à l'Inde.' *JA*, 1937, 229, 481. (b) 'La Théorie des Eléments.' *SCI*, 1933.
- PUECH, H. C. (1). *Le Manichéisme; son Fondateur, sa Doctrine*. Civilisations du Sud, SAEP, Paris, 1949. (Musée Guimet, Bibliothèque de Diffusion, no. 56.)
- PUECH, H. C. (2). 'Catharisme Médiéval et Bogomilisme.' Art. in *Atti dello Convegno di Scienze Morali, Storiche e Filologiche—'Oriente ed Occidente nel Medio Evo'*. Accad. Naz. di Lincei, Rome, 1956 (Atti dei Convegni Alessandro Volta, no. 12), p. 56.
- PUECH, H. C. (3). 'The Concept of Redemption in Manichaeism.' *ERYB*, 1969, 6, 247 (*The Mystic Vision*, ed. J. Campbell). Tr. from the German in *ERYB*, 1936, 4, 1.
- PUFF VON SCHRICK, MICHAEL. See von Schrick.
- PULLEYBLANK, E. G. (11). 'The Consonantal System of Old Chinese.' *AM*, 1964, 9, 206.
- PULSIFER, W. H. (1). *Notes for a History of Lead; and an Enquiry into the Development of the Manufacture of White Lead and Lead Oxides*. New York, 1888.
- PUMPELLY, R. (1). 'Geological Researches in China, Mongolia and Japan, during the years 1862 to 1865.' *SCK*, 1866, 202, 77.

- PUMPELLY, R. (2). 'An Account of Geological Researches in China, Mongolia and Japan during the Years 1862 to 1865.' *ARSI*, 1866, **15**, 36.
- PURKINJE, J. E. (PURKYŇĚ). See Teich (1).
- DU PUY-SANIERES, G. (1). 'La Modification Volontaire du Rhythme Respiratoire et les Phenomènes qui s'y rattachent.' *RPCHG*, 1937 (no. 486).
- QUIRING, H. (1). *Geschichte des Goldes; die goldenen Zeitalter in ihrer kulturellen und wirtschaftlichen Bedeutung*. Enke, Stuttgart, 1948.
- QUISPEL, G. (1). 'Gnostic Man; the Doctrine of Basilides.' *ERYB*, 1969, **6**, 210 (*The Mystic Vision*, ed. J. Campbell). Tr. from the German in *ERJB*, 1948, **16**, 1.
- RAMAMURTHI, B. (1). 'Yoga; an Explanation and Probable Neurophysiology.' *JIMA*, 1967, **48**, 167.
- RANKING, G. S. A. (1). 'The Life and Works of Rhazes.' (Biography and Bibliography of al-Rāzī.) Proc. XVIIIth Internat. Congress of Medicine, London, 1913. Sect. 23, pp. 237-68.
- RAO, GUNDU H. V., KRISHNASWAMY, M., NARASIMHAIYA, R. L., HOENIG, J. & GOVINDASWAMY, M. V. (1). 'Some Experiments on a Yogi in Controlled States.' *JALMH*, 1958, **1**, 99.
- RAO, SHANKAR (1). 'The Metabolic Cost of the (Yogi) Head-stand Posture.' *JAP*, 1962, **17**, 117.
- RAO, SHANKAR (2). 'Oxygen-consumption during Yoga-type Breathing at Altitudes of 520 m. and 3800 m.' *IJMR*, 1968, **56**, 701.
- RATLEDGE, C. (1). 'Cooling Cells for Smashing.' *NS*, 1964, **22**, 693.
- RATTANSI, P. M. (1). 'The Literary Attack on Science in the Late Seventeenth and Eighteenth Centuries.' Inaug. Diss. London, 1961.
- RATTANSI, P. M. (2). 'The Intellectual Origins of the Royal Society.' *NRRS*, 1968, **23**, 129.
- RATTANSI, P. M. (3). 'Newton's Alchemical Studies', art. in *Science, Medicine and Society in the Renaissance* (Pagel Presentation Volume), ed. Debus (20), vol. 2, p. 167.
- RATTANSI, P. M. (4). 'Some Evaluations of Reason in +16th- and +17th-Century Natural Philosophy', art. in *Changing Perspectives in the History of Science*, ed. M. Teich & R. Young. Heinemann, London, 1973, p. 148.
- RATZEL, F. (1). *History of Mankind*. Tr. A. J. Butler, with introduction by E. B. Tylor. 3 vols. London, 1896-8.
- RAWSON, P. S. (1). *Tantra*. (Catalogue of an Exhibition of Indian Religious Art, Hayward Gallery, London, 1971.) Arts Council of Great Britain, London, 1971.
- RAY, P. (1). 'The Theory of Chemical Combination in Ancient Indian Philosophies.' *IJHS*, 1966, **1**, 1.
- RAY, P. C. (1). *A History of Hindu Chemistry, from the Earliest Times to the middle of the 16th cent. A.D., with Sanskrit Texts, Variants, Translation and Illustrations*. 2 vols. Chuckerverti & Chatterjee, Calcutta, 1902, 1904, repr. 1925. New enlarged and revised edition in one volume, ed. P. Ray, retitled *History of Chemistry in Ancient and Medieval India*, Indian Chemical Society, Calcutta, 1956. Revs. J. Filliozat, *ISIS*, 1958, **49**, 362; A. Rahman, *VK*, 1957, 18.
- RAY, P. C. See Tenney L. Davis' biography (obituary), with portrait. *JCE*, 1934, **11** (535).
- RAY, T. (1) (tr.). *The 'Ananga Ranga'* [written by Kalyana Malla, for Lad Khan, a son of Ahmed Khan Lodi, c. +1500], pref. by G. Bose. Med. Book Co. Calcutta, 1951 (3rd ed.).
- RAZDAN, R. K. (1). 'The Hallucinogens.' *ARMC*, 1970 (1971), **6**.
- RAZOOK. See Razuq.
- RAZUQ, FARAJ RAZUQ (1). 'Studies on the Works of al-Tughra'i.' Inaug. Diss., London, 1963.
- READ, BERNARD E. (with LIU JU-CHHIANG) (1). *Chinese Medicinal Plants from the 'Pên Tshao Kang Mu', A.D. 1596 . . . a Botanical, Chemical and Pharmacological Reference List*. (Publication of the Peking Nat. Hist. Bull.) French Bookstore, Peiping, 1936 (chs. 12-37 of *PTKM*). Rev. W. T. Swingle, *ARLC/DO*, 1937, 191. Originally published as *Flora Sinensis*, Ser. A, vol. 1, *Plantae Medicinalis Sinensis*, 2nd ed., *Bibliography of Chinese Medicinal Plants from the Pên Tshao Kang Mu, A.D. 1596*, by B. E. Read & Liu Ju-Chhiang. Dept. of Pharmacol. Peking Union Med. Coll. & Peking Lab. of Nat. Hist. Peking, 1927. First ed. Peking Union Med. Coll. 1923.
- READ, BERNARD E. (2) (with LI YÜ-THIEN). *Chinese Materia Medica; Animal Drugs*.

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Pt. VIII Reptiles and Invertebrates
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| READ, BERNARD E. (6) (with YU CHING-MEI). <i>Chinese Materia Medica; Fish Drugs.</i>
Pt. IX Fishes (incl. some amphibia, octopoda and crustacea)
<i>PNHB</i> (Suppl.), 1939. (Sep. issued, French Bookstore, Peiping, n.d. prob. 1939.) | 128-199 | 44 |
| READ, BERNARD E. (7) (with YU CHING-MEI). <i>Chinese Materia Medica; Insect Drugs.</i>
Pt. X Insects (incl. arachnidae etc.)
<i>PNHB</i> (Suppl.), 1941. (Sep. issued, Lynn, Peiping, 1941.) | 1-101 | 39, 40, 41, 42 |
| READ, BERNARD E. (10). 'Contributions to Natural History from the Cultural Contacts of East and West.'
<i>PNHB</i> , 1929, 4 (no. 1), 57. | | |
| READ, BERNARD E. (11). 'Chinese Alchemy.' <i>N</i> , 1927, 120, 877. | | |
| READ, BERNARD E. (12). 'Inner Mongolia; China's Northern Flowery Kingdom.' (This title is a reference to the abundance of wild flowers on the northern steppes, but the article also contains an account of the saltpetre industry and other things noteworthy at Hochien in S.W. Hopei.) <i>PY</i> , 1926, 61, 570. | | |
| READ, BERNARD E. & LI, C. O. (1). 'Chinese Inorganic Materia Medica.' <i>CMJ</i> , 1925, 39, 23. | | |
| READ, BERNARD E. & PAK, C. (PAK KYEBYÖNG) (1). <i>A Compendium of Minerals and Stones used in Chinese Medicine, from the 'Pên Tshao Kang Mu'</i> . <i>PNHB</i> , 1928, 3 (no. 2), i-vii, 1-120. Revised and enlarged, issued separately, French Bookstore, Peiping, 1936 (2nd ed.). Serial nos. 1-135, corresp. with chaps. of <i>Pên Tshao Kang Mu</i> , 8, 9, 10, 11. | | |
| READ, J. (1). <i>Prelude to Chemistry; an Outline of Alchemy, its Literature and Relationships</i> . Bell, London, 1936. | | |
| READ, J. (2). 'A Musical Alchemist [Count Michael Maier].' Abstract of Lecture, Royal Institution, London, 22 Nov. 1935. | | |
| READ, J. (3). <i>Through Alchemy to Chemistry</i> . London, 1957. | | |
| READ, T. T. (1). 'The Mineral Production and Resources of China' (metallurgical notes on tours in China, with analyses by C. F. Wang, C. H. Wang & F. N. Lu). <i>TAIMME</i> , 1912, 43, 1-53. | | |
| READ, T. T. (2). 'Chinese Iron castings.' <i>CWR</i> , 1931 (16 May). | | |
| READ, T. T. (3). 'Metallurgical Fallacies in Archaeological Literature.' <i>AJA</i> , 1934, 38, 382. | | |
| READ, T. T. (4). 'The Early Casting of Iron; a Stage in Iron Age Civilisation.' <i>GR</i> , 1934, 24, 544. | | |
| READ, T. T. (5). 'Iron, Men and Governments.' <i>CUQ</i> , 1935, 27, 141. | | |
| READ, T. T. (6). 'Early Chinese Metallurgy.' <i>MI</i> , 1936 (6 March), p. 308. | | |
| READ, T. T. (7). 'The Largest and the Oldest Iron Castings.' <i>IA</i> , 1936, 136 (no. 18, 30 Apr.), 18 (the lion of Tshang-chou, +954, the largest). | | |
| READ, T. T. (8). 'China's Civilisation Simultaneous, not Osmotic' (letter). <i>AMS</i> , 1937, 6, 249. | | |
| READ, T. T. (9). 'Ancient Chinese Castings.' <i>TAFS</i> , 1937 (Preprint no. 37-29 of June), 30. | | |
| READ, T. T. (10). 'Chinese Iron—A Puzzle.' <i>HJAS</i> , 1937, 2, 398. | | |
| READ, T. T. (11). Letter on 'Pure Iron—Ancient and Modern'. <i>MM</i> , 1940 (June), p. 294. | | |
| READ, T. T. (12). 'The Earliest Industrial Use of Coal.' <i>TNS</i> , 1939, 20, 119. | | |
| READ, T. T. (13). 'Primitive Iron-Smelting in China.' <i>IA</i> , 1921, 108, 451. | | |
| REDGROVE, H. STANLEY (1). 'The Phallic Element in Alchemical Tradition.' <i>JALCHS</i> , 1915, 3, 65. Discussion, pp. 88 ff. | | |

- REGEL, A. (1). 'Reisen in Central-Asien, 1876-9.' *MYPGA*, 1879, 25, 376, 408. 'Turfan.' *MYPGA*, 1880, 26, 205. 'Meine Expedition nach Turfan.' *MYPGA*, 1881, 27, 380. Eng. tr. *PRGS*, 1881, 340.
- REID, J. S. (1). '[The State of the Dead in] Greek [Thought].' *ERE*, vol. xi, p. 838.
- REID, J. S. (2). '[The State of the Dead in] Roman [Culture].' *ERE*, vol. xi, p. 839.
- REINAUD, J. T. & FAVÉ, I. (1). *Du Feu Grégeois, des Feux de Guerre, et des Origines de la Poudre à Canon, d'après des Textes Nouveaux*. Dumaine, Paris, 1845. Crit. rev. by D[efrémer]y, *JA*, 1846 (4^e sér.), 7, 572; E. Chevreul, *JS*, 1847, 87, 140, 209.
- REINAUD, J. T. & FAVÉ, I. (2). 'Du Feu Grégeois, des Feux de Guerre, et des Origines de la Poudre à Canon chez les Arabes, les Persans et les Chinois.' *JA*, 1849 (4^e sér.), 14, 257.
- REINAUD, J. T. & FAVÉ, I. (3). Controverse à propos du Feu Grégeois; Réponse aux Objections de M. Ludovic Lalanne.' *BEC*, 1847 (2^e sér.), 3, 427.
- REITZENSTEIN, R. (1). *Die Hellenistischen Mysterienreligionen, nach ihren Grundgedanken und Wirkungen*. Leipzig, 1910. 3rd, enlarged and revised ed. Teubner, Berlin and Leipzig, 1927.
- REITZENSTEIN, R. (2). *Das iranische Erlösungsmysterium; religionsgeschichtliche Untersuchungen*. Marcus & Weber, Bonn, 1921.
- REITZENSTEIN, R. (3). 'Poimandres'; *Studien zur griechisch-ägyptischen und frühchristlichen Literatur*. Teubner, Leipzig, 1904.
- REITZENSTEIN, R. (4). *Hellenistische Wundererzählungen*.
Pt. I *Die Aretologie* [Thaumaturgical Fabulists]; *Ursprung, Begriff, Umbildung ins Weltliche*.
Pt. II *Die sogenannte Hymnus der Seele in den Thomas-Akten*.
Teubner, Leipzig, 1906.
- RÉMUSAT, J. P. A. (7) (tr.). *Histoire de la Ville de Khotan, tirée des Annales de la Chine et traduite du Chinois; suivie de Recherches sur la Substance Minérale appelée par les Chinois Pierre de Ju [Jade] et sur le Jaspe des Anciens*. [Tr. of *TSCC*, *Pien i tien*, ch. 55.] Doublet, Paris, 1820. Crit. rev. J. Klaproth (6), vol. 2, p. 281.
- RÉMUSAT, J. P. A. (9). 'Notice sur l'Encyclopédie Japonaise et sur Quelques Ouvrages du Même Genre' (mostly on the *Wakan Sansai Zue*). *MAI/NEM*, 1827, 11, 123. Botanical lists, with Linnaean Latin identifications, pp. 269-305; list of metals, p. 231, precious stones, p. 232; ores, minerals and chemical substances, pp. 233-5.
- RÉMUSAT, J. P. A. (10). 'Lettre de Mons. A. R... à Mons. L. Cordier... sur l'Existence de deux Volcans brûlans dans la Tartarie Centrale [a translation of passages from *Wakan Sansai Zue*].' *JA*, 1824, 5, 44. Repr. in (11), vol. 1, p. 209.
- RÉMUSAT, J. P. A. (11). *Mélanges Asiatiques; ou, Choix de Morceaux de Critique et de Mémoires relatifs aux Religions, aux Sciences, aux Coutumes, à l'Histoire et à la Géographie des Nations Orientales*. 2 vols. Dondey-Dupré, Paris, 1825-6.
- RÉMUSAT, J. P. A. (12). *Nouveaux Mélanges Asiatiques; ou, Recueil de Morceaux de Critique et de Mémoires relatifs aux Religions, aux Sciences, aux Coutumes, à l'Histoire et à la Géographie des Nations Orientales*. 2 vols. Schubart & Heideloff and Dondey-Dupré, Paris, 1829.
- RÉMUSAT, J. P. A. (13). *Mélanges Posthumes d'Histoire et de Littérature Orientales*. Imp. Roy., Paris, 1843.
- RENAULD, E. (1) (tr.). *Michel Psellus' 'Chronographie', ou Histoire d'un Siècle de Byzance, +976 à +1077; Texte établi et traduit...* 2 vols. Paris, 1938. (Collection Byzantine Budé, nos. 1, 2.)
- RENFREW, C. (1). 'Cycladic Metallurgy and the Aegean Early Bronze Age.' *AJA*, 1967, 71, 1. See Charles (1).
- RENOU, L. (1). *Anthologie Sanskrite*. Payot, Paris, 1947.
- RENOU, L. & FILLIOZAT, J. (1). *L'Inde Classique; Manuel des Études Indiennes*. Vol. 1, with the collaboration of P. Meile, A. M. Esnoul & L. Silburn. Payot, Paris, 1947. Vol. 2, with the collaboration of P. Demiéville, O. Lacombe & P. Meile. École Française d'Extrême Orient, Hanoi; Impr. Nationale, Paris, 1953.
- RETI, LADISLAO (6). *Van Helmont, Boyle, and the Alkahest*. Clark Memorial Library, Univ. of California, Los Angeles, 1969. (In *Some Aspects of Seventeenth-Century Medicine and Science*, Clark Library Seminar, no. 27, 1968.)
- RETI, LADISLAO (7). 'Le Arte Chimiche di Leonardo da Vinci.' *LCHIND*, 1952, 34, 655, 721.
- RETI, LADISLAO (8). 'Taddeo Alderotti and the Early History of Fractional Distillation' (in Spanish). MS. of a Lecture in Buenos Aires, 1960.
- RETI, LADISLAO (10). 'Historia del Atanor desde Leonardo da Vinci hasta "l'Encyclopédie" de Diderot.' *INDQ*, 1952, 14 (no. 10), 1.
- RETI, LADISLAO (11). 'How Old is Hydrochloric Acid?' *CHYM*, 1965, 10, 11.
- REUVENS, C. J. C. (1). *Lettres à Mons. Letronne... sur les Papyrus Bilingues et Grecs et sur Quelques Autres Monumens Gréco-Égyptiens du Musée d'Antiquités de l'Université de Leide*. Luchtman, Leiden, 1830. Pagination separate for each of the three letters.

- REX, FRIEDEMANN, ATTERER, M., DEICHGRÄBER, K. & RUMPF, K. (1). *Die 'Alchemie' des Andreas Libavius, ein Lehrbuch der Chemie aus dem Jahre 1597, zum ersten mal in deutscher Übersetzung... herausgegeben...* Verlag Chemie, Weinheim, 1964.
- REY, ABEL (1). *La Science dans l'Antiquité*. Vol. 1 *La Science Orientale avant les Grecs*, 1930, 2nd ed. 1942; Vol. 2 *La Jeunesse de la Science Grecque*, 1933; Vol. 3 *La Maturité de la Pensée Scientifique en Grèce*, 1939; Vol. 4 *L'Apogée de la Science Technique Grecque (Les Sciences de la Nature et de l'Homme, les Mathématiques, d'Hippocrate à Platon)*, 1946. Albin Michel, Paris. (Evol. de l'Hum. Ser. Complémentaire.)
- RHENANUS, JOH. (1). *Harmoniae Imperscrutabilis Chymico-Philosophicae Decades duae*. Frankfurt, 1625. See Ferguson (1), vol. 2, p. 264.
- RIAD, H. (1). 'Quatre Tombeaux de la Nécropole ouest d'Alexandrie.' (Report of the 2nd-century *sāqiya* fresco at Wardian.) *B.S.A.A.*, 1967, 42, 89. Prelim. pub., with cover colour photograph, *AAAA*, 1964, 17 (no. 3).
- RIBÉREAU-GAYON, J. & PEYNARD, E. (1). *Analyse et Contrôle des Vins...* 2nd ed. Paris, 1958.
- RICE, D. S. (1). 'Mediaeval Harrān; Studies on its Topography and Monuments.' *ANATS*, 1952, 2, 36-83.
- RICE, TAMARA T. (1). *The Scythians*. 3rd ed. London, 1961.
- RICE, TAMARA T. (2). *Ancient Arts of Central Asia*. Thames & Hudson, London, 1965.
- RICHET, C. (1) (ed.). *Dictionnaire de Physiologie*. 6 vols. Alcan, Paris, 1895-1904.
- RICHIE, D. & ITO KENKICHI (1) = (1). *The Erotic Gods; Phallicism in Japan* (English and Japanese text and captions). Zufushinsha, Tokyo, 1967.
- VON RICHTHOFEN, F. (2). *China; Ergebnisse eigener Reisen und darauf gegründeter Studien*. 5 vols. and Atlas. Reimer, Berlin, 1877-1911.
- Vol. 1 Einleitender Teil
Vol. 2 Das nördliche China
Vol. 3 Das südliche China (ed. E. Tiessen)
Vol. 4 Palaeontologischer Teil (with contributions by W. Dames *et al.*)
Vol. 5 Abschliessende palaeontologischer Bearbeitung der Sammlung... (by F. French). (Teggart Bibliography says 5 vols. + 2 Atlas Vols.)
- VON RICHTHOFEN, F. (6). *Letters on Different Provinces of China*. 6 parts, Shanghai, 1871-2.
- RICKARD, T. A. (2). *Man and Metals*. Fr. tr. by F. V. Laparra, *L'Homme et les Métaux*. Gallimard, Paris, 1938. Rev. L. Febvre, *AHES/AHS*, 1940, 2, 243.
- RICKARD, T. A. (3). *The Story of the Gold-Digging Ants*. UCC, 1930.
- RICKETT, W. A. (1) (tr.). *The 'Kuan Tzu' Book*. Hongkong Univ. Press, Hong Kong, 1965. Rev. T. Pokora, *ARO*, 1967, 35, 169.
- RIDDELL, W. H. (2). Earliest representations of dragon and tiger. *AQ*, 1945, 19, 27.
- RIECKERT, H. (1). 'Plethysmographische Untersuchungen bei Konzentrations- und Meditations-Übungen.' *AF*, 1967, 21, 61.
- RIEGEL, BEISWANGER & LANZL (1). Molecular stills. *IEC/A*, 1943, 15, 417.
- RIETHÉ, P. (1). 'Amalgamfüllung Anno Domini 1528' [A MS. of therapy and pharmacy drawn from the practice of Johannes Stocker, d. + 1513]. *DZZ*, 1966, 21, 301.
- RITTER, H. (1) (ed.). *Pseudo-al-Majrifi 'Das Ziel des Weisen' [Ghāyat al-Ḥakīm]*. Teubner, Leipzig, 1933. (Studien d. Bibliothek Warburg, no. 12.)
- RITTER, H. (2). '*Picatrix*, ein arabisches Handbuch hellenistischer Magie.' *VBW*, 1923, 1, 94. A much enlarged and revised form of this lecture appears as the introduction to vol. 2 of Ritter & Plessner (1), pp. xx ff.
- RITTER, H. (3) (tr.). *Al-Ghazzālī's (al-'Tūsī, +1058 to +1112) 'Das Elixir der Glückseligkeit' [Kīmīyā al-Sa'āda]*. Diederichs, Jena, 1923. (Religiöse Stimmen der Völker; die Religion der Islam, no. 3.)
- RITTER, H. & PLESSNER, M. (1). '*Picatrix*'; das 'Ziel des Weisen' [Ghāyat al-Ḥakīm] von Pseudo-Majrifi 2 vols. Vol. 1, Arabic text, ed. H. Ritter. Teubner, Leipzig and Berlin, 1933 (Studien der Bibliothek Warburg, no. 12). Vol. 2, German translation, with English summary (pp. lix-lxxv), by H. Ritter & M. Plessner. Warburg Inst. London, 1962 (Studies of the Warburg Institute, no. 27). Crit. rev. W. Hartner, *DI*, 1966, 41, 175, repr. Hartner (12), p. 429.
- RITTER, K. (1). *Die Erdkunde im Verhältnis z. Natur und z. Gesch. d. Menschen; oder, Allgemeine Vergleichende Geographie*. Reimer, Berlin, 1822-59. 19 vols., the first on Africa, all the rest on Asia. Indexes after vols. 5, 13, 16 and 17.
- RITTER, K. (2). *Die Erdkunde von Asien*. 5 vols. Reimer, Berlin, 1837 (part of Ritter, 1).
- RIVET, P. (2). 'Le Travail de l'Or en Colombie.' *IPEK*, 1926, 2, 128.
- RIVET, P. (3). 'L'Orfèvrerie Colombienne; Technique, Aire de Dispersion, Origines.' Communication to the XXIst International Congress of Americanists, The Hague, 1924.
- RIVET, P. & ARSENDAUX, H. (1). 'La Métallurgie en Amérique pre-Colombienne.' *TMIE*, 1946, no. 39.

- ROBERTS [-AUSTEN], W. C. (1). 'Alloys used for Coinage' (Cantor Lectures). *JRSA*, 1884, **32**, 804, 835, 881.
- ROBERTS-AUSTEN, W. C. (2). 'Alloys' (Cantor Lectures). *JRSA*, 1888, **36**, 1111, 1125, 1137.
- ROBERTSON, T. BRAILSFORD & RAY, L. A. (1). 'An Apparatus for the Continuous Extraction of Solids at the Boiling Temperature of the Solvent.' *RAAAS*, 1924, **17**, 264.
- ROBINSON, B. W. (1). 'Royal Asiatic Society MS. no. 178; an unrecorded Persian Painter.' *JRAS*, 1970 (no. 2, Wheeler Presentation Volume), 203. ('Abd al Karim, active c. +1475, who illustrated some East Asian subjects.)
- ROBINSON, G. R. & DEAKERS, T. W. (1). 'Apparatus for sublimation of anthracene.' *JCE*, 1932, **9**, 1717.
- DE ROCHAS D'AIGLUN, A. (1). *La Science des Philosophes et l'Art des Thaumaturges dans l'Antiquité*. Dorbon, Paris. 1st ed. n.d. (1882), 2nd ed. 1912.
- DE ROCHEMONTEIX, C. (1). *Joseph Amiot et les Derneirs Survivants de la Mission Française à Pékin (1750 à 1795); Nombreux Documents inédits, avec Carte*. Picard, Paris, 1915.
- ROCKHILL, W. W. (1). 'Notes on the Relations and Trade of China with the Eastern Archipelago and the Coast of the Indian Ocean during the +15th Century.' *TP*, 1914, **15**, 419; 1915, **16**, 61, 236, 374, 435, 604.
- ROCKHILL, W. W. (5) (tr. & ed.). *The Journey of William of Rubruck to the Eastern Parts of the World (+1253 to +1255) as narrated by himself; with Two Accounts of the earlier Journey of John of Pian de Carpine*. Hakluyt Soc., London, 1900 (second series, no. 4).
- RODWELL, G. F. (1). *The Birth of Chemistry*. London, 1874.
- RODWELL, J. M. (1). *Aethiopic and Coptic Liturgies and Prayers*. Pr. pr. betw. 1870 and 1886.
- ROGERS, R. W. (1). '[The State of the Dead in] Babylonian [and Assyrian Culture].' *ERE*, vol. xi, p. 828.
- ROI, J. (1). *Traité des Plantes Médicinales Chinoises*. Lechevalier, Paris, 1955. (Encyclopédie Biologique ser. no. 47.) No Chinese characters, but a photocopy of those required is obtainable from Dr Claude Michon, 8 bis, Rue Desilles, Nancy, Meurthe & Moselle, France.
- ROI, J. & WU YÜN-JUI (OU YÜN-JOËI) (1). 'Le Taoïsme et les Plantes d'Immortalité.' *BUA*, 1941 (3^e sér.), **2**, 535.
- ROLANDI, G. & SCACCIATI, G. (1). 'Ottone e Zinco presso gli Antichi' (Brass and Zinc in the Ancient World). *IMIN*, 1956, **7** (no. 11), 759.
- ROLFINCK, WERNER (1). *Chimia in Artis Formam Redacta*. Geneva, 1661, 1671, Jena, 1662, and later editions.
- ROLLESTON, SIR HUMPHREY (1). *The Endocrine Organs in Health and Disease, with an Historical Review*. London, 1936.
- RÖLLIG, W. (1). 'Das Bier im alten Mesopotamien.' *JGGBB*, 1970 (for 1971), 9-104.
- RONCHI, V. (5). 'Scritti di Ottica; Tito Lucrezio Caro, Leonardo da Vinci, G. Rucellai, G. Fracastoro, G. Cardano, D. Barbaro, F. Maurolico, G. B. della Porta, G. Galilei, F. Sizi, E. Torricelli, F. M. Grimaldi, G. B. Amici [a review].' *AFGR/CINO*, 1969, **24** (no. 3), 1.
- RONCHI, V. (6). 'Philosophy, Science and Technology.' *AFGR/CINO*, 1969, **24** (no. 2), 168.
- RONCHI, V. (7). 'A New History of the Optical Microscope.' *IJHS*, 1966, **1**, 46.
- RONCHI, V. (8). 'The New History of Optical Microscopy.' *ORG*, 1968, **5**, 191.
- RORET, N. E. (1) (ed.). *Manuel de l'Orfèvre*, part of *Encyclopédie Roret* (or *Manuels Roret*). Roret, Paris, 1825-. Berthelot (1, 2) used the ed. of 1832.
- ROSCOE, H. E. & SCHORLEMMER, C. (1). *A Treatise on Chemistry*. Macmillan, London, 1923.
- ROSENBERG, E. (1) (ed.). *Gonadotrophins*, 1968, 1969.
- ROSENBERG, M. (1). *Geschichte der Goldschmiedekunst auf technische Grundlage*. Frankfurt-am-Main. Vol. 1 *Einführung*, 1910. Vol. 2 *Niello*, 1908. Vol. 3 (in 3 parts) *Zellenschmelz*, 1921, 1922, 1925. Re-issued in one vol., 1972.
- VON ROSENROTH, K. & VAN HELMONT, F. M. (1) (actually anon.). *Kabbala Denudata, seu Doctrina Hebraeorum Transcendentalis et Metaphysica*, etc. Lichtenthaler, Sulzbach, 1677.
- ROSENTHAL, F. (1) (tr.). *The 'Muqaddimah' [of Ibn Khaldun]; an Introduction to History*. Bollingen, New York, 1958. Abridgement by N. J. Dawood, London, 1967.
- ROSS, E. D. (3). *Alphabetical List of the Titles of Works in the Chinese Buddhist Tripitaka*. Indian Govt. Calcutta, 1910. (See Nanjio, B.)
- ROSSETTI, GABRIELE (1). *Disquisitiones on the Anti-Papal spirit which produced the Reformation; its Secret Influence on the Literature of Europe in General and of Italy in Particular*. Tr. C. Ward from the Italian. 2 vols. Smith & Elder, London, 1834.
- ROSSI, P. (1). *Francesco Bacone; dalla Magia alla Scienza*. Laterza, Bari, 1957. Eng. tr. by Sacha Rabino-vitch, *Francis Bacon; from Magic to Science*. Routledge & Kegan Paul, London, 1968.

- ROTH, H. LING (1). *Oriental Silverwork, Malay and Chinese; a Handbook for Connoisseurs, Collectors, Students and Silversmiths*. Truslove & Hanson, London, 1910, repr. Univ. Malaya Press, Kuala Lumpur, 1966.
- ROTH, MATHIAS (1). *The Prevention and Cure of Many Chronic Diseases by Movements*. London, 1851.
- ROTHSCHUH, K. E. (1). *Physiologie; der Wandel ihrer Konzepte, Probleme und Methoden vom 16. bis 19. Jahrhundert*. Alber, Freiburg and München, 1968. (Orbis Academicus, Bd. 2, no. 15.)
- DES ROTOURS, R. (3). 'Quelques Notes sur l'Anthropophagie en Chine.' *TP*, 1963, 50, 386. 'Encore Quelques Notes...' *TP*, 1968, 54, 1.
- ROUSSELLE, E. (1). 'Der lebendige Taoismus im heutigen China.' *SA*, 1933, 8, 122.
- ROUSSELLE, E. (2). 'Yin und Yang vor ihrem Auftreten in der Philosophie.' *SA*, 1933, 8, 41.
- ROUSSELLE, E. (3). 'Das Primat des Weibes im alten China.' *SA*, 1941, 16, 130.
- ROUSSELLE, E. (4a). 'Seelische Führung im lebenden Taoismus.' *ERJB*, 1933, 1 (a reprint of (6), with (5) intercalated). Eng. tr., 'Spiritual Guidance in Contemporary Taoism.' *ERYB*, 1961, 4, 59 ('Spiritual Disciplines', ed. J. Campbell). Includes footnotes but no Chinese characters.
- ROUSSELLE, E. (4b). *Zur Seelischen Führung im Taoismus; Ausgewählte Aufsätze*. Wissenschaftl. Buchgesellschaft, Darmstadt, 1962. (A collection of three reprinted articles (7), (5) and (6), including footnotes, and superscript references to Chinese characters, but omitting the characters themselves.)
- ROUSSELLE, E. (5). 'Nei Ging Tu [Nei Ching Thu], "Die Tafel des inneren Gewebes"; ein Taoistisches Meditationsbild mit Beschriftung.' *SA*, 1933, 8, 207.
- ROUSSELLE, E. (6). 'Seelische Führung im lebenden Taoismus.' *CDA*, 1934, 21.
- ROUSSELLE, E. (7). 'Die Achse des Lebens.' *CDA*, 1933, 25.
- ROUSSELLE, E. (8). 'Dragon and Mare; Figures of Primordial Chinese Mythology' (personifications and symbols of Yang and Yin, and the *kua* Chhien and Khun), *ERYB*, 1969, 6, 103 (*The Mystic Vision*, ed. J. Campbell). Tr. from the German in *ERJB*, 1934, 2, 1.
- RUDDY, J. (1). 'The Big Bang at Sudbury.' *INM*, 1971 (no. 4), 22.
- RUDELSEBERGER, H. (1). *Chinesische Novellen aus dem Urtext übertragen*. Insel Verlag, Leipzig, 1914. 2nd ed., with two tales omitted, Schroll, Vienna, 1924.
- RUFUS, W. C. (2). 'Astronomy in Korea.' *JRAS/KB*, 1936, 26, 1. Sep. pub. as *Korean Astronomy*. Literary Department, Chosen Christian College, Seoul (Eng. Pub. no. 3), 1936.
- RUHLAND, MARTIN (RULAND) (1). *Lexicon Alchemiae, sive Dictionarium Alchemisticum, cum obscuriorum Verborum et rerum Hermeticarum, tum Theophrast-Paracelsicarum Phrasium, Planam Explicationem Continens*. Palthenius, Frankfurt, 1612; 2nd ed. Frankfurt, 1661. Photolitho repr., Olms, Hildesheim, 1964. Cf. Ferguson (1), vol. 2, p. 303.
- RULAND, M. See Ruhland, Martin.
- RUSH, H. P. (1) Biography of A. A. Berthold. *AMH*, 1929, 1, 208.
- RUSKA, J. For bibliography see Winderlich (1).
- RUSKA, J. (1). 'Die Mineralogie in d. arabischen Litteratur.' *ISIS*, 1913, 1, 341.
- RUSKA, J. (2). 'Der Zusammenbruch der Dschäbir-Legende; I, die bisherigen Versuche das Dschäbirproblem zu lösen.' *JBFIGN*, 1930, 3, 9. Cf. Kraus (1).
- RUSKA, J. (3). 'Die Siebzig Bücher des Ġābir ibn Ḥajjān.' Art. in *Studien z. Gesch. d. Chemie; Festgabe f. E. O. von Lippmann zum 70. Geburtstag*, ed. J. Ruska. Springer, Berlin, 1927, p. 38.
- RUSKA, J. (4). *Arabische Alchemisten*. Vol. 1, *Chālid [Khālid] ibn Jaʿūd [Muʿāwīya]* [Muʿāwīya]. Winter, Heidelberg, 1924 (Heidelberger Akten d. von Portheim Stiftung, no. 6). Rev. von Lippmann (10); *ISIS*, 1925, 7, 183. Repr. with Ruska (5), Sändig, Wiesbaden, 1967.
- RUSKA, J. (5). *Arabische Alchemisten*. Vol. 2, *Ġaʿfar [Jaʿfar] al-Sādīq, der sechste Imām*. Winter, Heidelberg, 1924 (Heidelberger Akten d. von Portheim Stiftung, no. 10). Rev. von Lippmann (10). Repr. with Ruska (4), Sändig, Wiesbaden, 1967.
- RUSKA, J. (6). 'Turba Philosophorum; ein Beitrag z. Gesch. d. Alchemie.' *QSGNM*, 1931, 1, 1-368.
- RUSKA, J. (7). 'Chinesisch-arabische technische Rezepte aus der Zeit der Karolinger.' *CHZ*, 1931, 55, 297.
- RUSKA, J. (8). 'Tabula Smaragdina'; ein Beitrag z. Gesch. d. Hermetischen Literatur. Winter, Heidelberg, 1926 (Heidelberger Akten d. von Portheim Stiftung, no. 16).
- RUSKA, J. (9). 'Studien zu Muḥammad ibn ʿUmail al-Tamīnī's *Kitāb al-Māʿal al-Waraqat wa'l-ʿArd al-Najmīyah*.' *ISIS*, 1936, 24, 310.
- RUSKA, J. (10). 'Der Urtext der *Tabula Chemica*.' *A*, 1934, 16, 273.
- RUSKA, J. (11). 'Neue Beiträge z. Gesch. d. Chemie (1. Die Namen der Goldmacherkunst, 2. Die Zeichen der griechischen Alchemie, 3. Griechischen Zeichen in Syrischer Überlieferung, 4. U. d. Ursprung der neueren chemischen Zeichen, 5. Kataloge der Decknamen, 6. Die metallurgischen Künste). *QSGNM*, 1942, 8, 305.
- RUSKA, J. (12). 'Über das Schriftenverzeichniss des Ġābir ibn Ḥajjān [Ġābir ibn Ḥayyān] und die Unechtheit einiger ihm zugeschriebenen Abhandlungen.' *AGMN*, 1923, 15, 53.
- RUSKA, J. (13). 'Sal Ammoniacus, Nušādīr und Salmiak.' *SHAW/PH*, 1923 (no. 5), 1-23.

- RUSKA, J. (14). 'Übersetzung und Bearbeitungen von al-Rāzī's Buch "Geheimnis der Geheimnisse" [*Kitāb Sirr al-Asrār*].' *QSGNM*, 1935, 4, 153-238; 1937, 6, 1-246.
- RUSKA, J. (15). 'Die Alchemie al-Rāzī's.' *DI*, 1935, 22, 281.
- RUSKA, J. (16). 'Al-Bīrūnī als Quelle für das Leben und die Schriften al-Rāzī's.' *ISIS*, 1923, 5, 26.
- RUSKA, J. (17). 'Ein neuer Beitrag zur Geschichte des Alkohols.' *DI*, 1913, 4, 320.
- RUSKA, J. (18). 'Über die von Abulqāsim al-Zuhrāwī beschriebene Apparatur zur Destillation des Rosenwassers.' *CHA*, 1937, 24, 313.
- RUSKA, J. (19) (tr.). *Das Steinbuch des Aristoteles; mit literargeschichtlichen Untersuchungen nach der arabischen Handschrift der Bibliothèque Nationale herausgegeben und übersetzt*. Winter, Heidelberg, 1912. (This early 9th-century text, the earliest of the Arabic lapidaries and widely known later as (Lat.) *Lapidarium Aristotelis*, must be termed Pseudo-Aristotle; it was written by some Syrian who knew both Greek and Eastern traditions, and was translated from Syriac into Arabic by Luka bar Serapion, or Lūqā ibn Sarāfyūn.)
- RUSKA, J. (20). 'Über Nachahmung von Edelsteinen.' *QSGNM*, 1933, 3, 316.
- RUSKA, J. (21). *Das 'Buch der Alaune und Salze'; ein Grundwerk der spät-lateinischen Alchemie* [Spanish origin, 11th cent.]. Verlag Chemie, Berlin, 1935.
- RUSKA, J. (22). 'Wem verdankt Man die erste Darstellung des Weingeists?' *DI*, 1913, 4, 162.
- RUSKA, J. (23). 'Weinbau und Wein in den arabischen Bearbeitungen der Geoponika.' *AGNT*, 1913, 6, 305.
- RUSKA, J. (24). *Das Steinbuch aus der 'Kosmographie' des Zakariya ibn Maḥmūd al-Qazwīnī [c. 1250] übersetzt und mit Anmerkungen versehen...* Schmersow (Zahn & Baendel), Kirchhain N-L, 1897. (Beilage zum Jahresbericht 1895-6 der prov. Oberrealschule Heidelberg.)
- RUSKA, J. (25). 'Der Urtext d. *Tabula Smaragdina*.' *OLZ*, 1925, 28, 349.
- RUSKA, J. (26). 'Die Alchemie des Avicenna.' *ISIS*, 1934, 21, 14.
- RUSKA, J. (27). 'Über die dem Avicenna zugeschriebenen alchemistischen Abhandlungen.' *FF*, 1934, 10, 293.
- RUSKA, J. (28). 'Alchemie in Spanien.' *ZAC/AC*, 1933, 46, 337; *CHZ*, 1933, 57, 523.
- RUSKA, J. (29). 'Al-Rāzī (Rhazes) als Chemiker.' *ZAC*, 1922, 35, 719.
- RUSKA, J. (30). 'Über die Anfänge der wissenschaftlichen Chemie.' *FF*, 1937, 13.
- RUSKA, J. (31). 'Die Aufklärung des Jābir-Problems.' *FF*, 1930, 6, 265.
- RUSKA, J. (32). 'Über die Quellen von Jābir's Chemische Wissen.' *A*, 1926, 7, 267.
- RUSKA, J. (33). 'Über die Quellen des [Geber's] *Liber Claritatis*.' *A*, 1934, 16, 145.
- RUSKA, J. (34). 'Studien zu den chemisch-technischen Rezeptsammlungen des *Liber Sacerdotum* [one of the texts related to *Mappae Clavicula*, etc.].' *QSGNM*, 1936, 5, 275 (83-125).
- RUSKA, J. (35). 'The History and Present Status of the Jābir Problem.' *JCE*, 1929, 6, 1266 (tr. R. E. Oesper); *IC*, 1937, 11, 303.
- RUSKA, J. (36). 'Alchemy in Islam.' *IC*, 1937, 11, 30.
- RUSKA, J. (37) (ed.). *Studien z. Geschichte d. Chemie; Festgabe E. O. von Lippmann zum 70. Geburtstage...* Springer, Berlin, 1927.
- RUSKA, J. (38). 'Das Giftbuch des Ġābir ibn Ḥajjān.' *OLZ*, 1928, 31, 453.
- RUSKA, J. (39). 'Der Salmiak in der Geschichte der Alchemie.' *ZAC*, 1928, 41, 1321; *FF*, 1928, 4, 232.
- RUSKA, J. (40). 'Studien zu Severus [or Jacob] bar Shakkō's "Buch der Dialoge".' *ZASS*, 1897, 12, 8, 145.
- RUSKA, J. & GARBERS, K. (1). 'Vorschriften z. Herstellung von scharfen Wässern bei Jābir und Rāzī.' *DI*, 1939, 25, 1.
- RUSKA, J. & WIEDEMANN, E. (1). 'Beiträge z. Geschichte d. Naturwissenschaften, LXVII; Alchemistische Decknamen.' *SPMSE*, 1924, 56, 17. Repr. in Wiedemann (23), vol. 2, p. 596.
- RUSSELL, E. S. (1). *Form and Function; a Contribution to the History of Animal Morphology*. Murray, London, 1916.
- RUSSELL, E. S. (2). *The Interpretation of Development and Heredity; a Study in Biological Method*. Clarendon Press, Oxford, 1930.
- RUSSELL, RICHARD (1) (tr.). *The Works of Geber, the Most Famous Arabian Prince and Philosopher...* [containing *De Investigatione, Summa Perfectionis, De Inventione and Liber Fornacum*]. James, London, 1678. Repr., with an introduction by E. J. Holmyard, Dent, London, 1928.
- RYCAUT, SIR PAUL (1). *The Present State of the Greek Church*. Starkey, London, 1679.
- SACHAU, E. (1) (tr.). *Alberuni's India*. 2 vols. London, 1888; repr. 1910.
- DE SACY, A. I. SILVESTRE (1). 'Le "Livre du Secret de la Création", par le Sage Bélinous [Balīnās; Apollonius of Tyana, attrib.].' *MAI/NEM*, 1799, 4, 107-58.
- DE SACY, A. I. SILVESTRE (2). *Chrestomathie Arabe; ou, Extraits de Divers Écrivains Arabes, tant en Prose qu'en Vers...* 3 vols. Impr. Imp. Paris, 1806. 2nd ed. Impr. Roy. Paris, 1826-7.

- SAEKI, P. Y. (1). *The Nestorian Monument in China*. With an introductory note by Lord William Gascoyne-Cecil and a pref. by Rev. Prof. A. H. Sayce. SPCK, London, 1916.
- SAEKI, P. Y. (2). *The Nestorian Documents and Relics in China*. Maruzen, for the Toho Bunkwa Gakuin, Tokyo, 1937, second (enlarged) edn. Tokyo, 1951.
- SAGE, B. M. (1). 'De l'Emploi du Zinc en Chine pour la Monnaie.' *JPH*, 1804, 59, 216. Eng. tr. in Leeds (1) from *PMG*, 1805, 21, 242.
- SAHLIN, C. (1). 'Cementkopper, en historiske Översikt.' *HF*, 1938, 9, 100. Résumé in Lindroth (1) and *SILL*, 1954.
- SAID HUSAIN NASR (1). *Science and Civilisation in Islam* (with a preface by Giorgio di Santillana). Harvard University Press, Cambridge, Mass. 1968.
- SAID HUSAIN NASR (2). *The Encounter of Man and Nature; the Spiritual Crisis of Modern Man*. Allen & Unwin, London, 1968.
- SAID HUSAIN NASR (3). *An Introduction to Islamic Cosmological Doctrines*. Cambridge, Mass. 1964.
- SAKURAZAWA, NYOITI [OHSAWA, G.] (1). *La Philosophie de la Médecine d'Extrême-Orient; le Livre du Jugement Suprême*. Vrin, Paris, 1967.
- SALAZARO, D. (1). *L'Arte della Miniatura nel Secolo XIV, Codice della Biblioteca Nazionale di Napoli*. . . Naples, 1877. The MS. Anonymus, *De Arte Illuminandi* (so entitled in the Neapolitan Library Catalogue, for it has no title itself). Cf. Partington (12).
- SALMONY, A. (1). *Carved Jade of Ancient China*. Gillick, Berkeley, Calif., 1938.
- SALMONY, A. (2). 'The Human Pair in China and South Russia.' *GBA*, 1943 (6^e sér.), 24, 321.
- SALMONY, A. (4). *Chinese Jade through [i.e. until the end of] the [Northern] Wei Dynasty*. Ronald, New York, 1963.
- SALMONY, A. (5). *Archaic Chinese Jades from the Edward and Louise B. Sonnenschein Collection*. Chicago Art Institute, Chicago, 1952.
- SAMBURSKY, S. (1). *The Physical World of the Greeks*. Tr. from the Hebrew edition by M. Dagut. Routledge & Kegan Paul, London, 1956.
- SAMBURSKY, S. (2). *The Physics of the Stoics*. Routledge & Kegan Paul, London, 1959.
- SAMBURSKY, S. (3). *The Physical World of Late Antiquity*. Routledge & Kegan Paul, London, 1962. Rev. G. J. Whitrow, *A/AIHS*, 1964, 17, 178.
- SANDYS, J. E. (1). *A History of Classical Scholarship*. 3 vols. Cambridge, 1908. Repr. New York, 1964.
- DI SANTILLANA, G. (2). *The Origins of Scientific Thought*. University of Chicago Press, Chicago, 1961.
- DI SANTILLANA, G. & VON DECHEND, H. (1). *Hamlet's Mill; an Essay on Myth and the Frame of Time*. Gambit, Boston, 1969.
- SARLET, H., FAIDHERBE, J. & FRENCK, G. 'Mise en évidence chez différents Arthropodes d'un Inhibiteur de la D-acidaminoxydase.' *AIP*, 1950, 58, 356.
- SARTON, GEORGE (1). *Introduction to the History of Science*. Vol. 1, 1927; Vol. 2, 1931 (2 parts); Vol. 3, 1947 (2 parts). Williams & Wilkins, Baltimore, (Carnegie Institution Pub. no. 376.)
- SARTON, GEORGE (13). Review of W. Scott's 'Hermetica' (1). *ISIS*, 1926, 8, 342.
- SARWAR, G. & MAHDHASSAN, S. (1). 'The Word *Kimīya* as used by Firdousi.' *IQB*, 1961, 9, 21.
- SASO, M. R. (1). 'The Taoists who did not Die.' *AFRA*, 1970, no. 3, 13.
- SASO, M. R. (2). *Taoism and the Rite of Cosmic Renewal*. Washington State University Press, Seattle, 1972.
- SASO, M. R. (3). 'The Classification of Taoist Sects and Ranks observed in Hsinchu and other parts of Northern Taiwan.' *AS/BIE* 1971, 30 (vol. 2 of the Presentation Volume for Ling Shun-Shêng).
- SASO, M. R. (4). 'Lu Shan, Ling Shan (Lung-hu Shan) and Mao Shan; Taoist Fraternities and Rivalries in Northern Taiwan.' Unpubl. MS. 1973.
- SASTRI, S. S. SURYANARAYANA (1). *The 'Sāṃkhya Kārikā' of Īśvarakṛṣṇa*. University Press, Madras, 1930.
- SATYANARAYANAMURTHI, G. G. & SHASTRY, B. P. (1). 'A Preliminary Scientific Investigation into some of the unusual physiological manifestations acquired as a result of Yogic Practices in India.' *WZNHK*, 1958, 15, 239.
- SAURBIER, B. (1). *Geschichte der Leibesübungen*. Frankfurt, 1961.
- SAUVAGET, J. (2) (tr.). *Relation de la Chine et de l'Inde, rédigée en +857 (Akhbār al-Šīn wa'l-Hind)*. Belles Lettres, Paris, 1948. (Budé Association, Arab Series.)
- SAVILLE, M. H. (1). *The Antiquities of Manabi, Ecuador*. 2 vols. New York, 1907, 1910.
- SAVILLE, M. H. (2). *Indian Notes*. New York, 1920.
- SCHAEFER, H. (1). *Die Mysterien des Osiris in Abydos*. Leipzig, 1901.
- SCHAEFER, H. W. (1). *Die Alchemie; ihr ägyptisch-griechischer Ursprung und ihre weitere historische Entwicklung*. Programm-Nummer 260, Flensburg, 1887; phot. reprod. Sändig, Wiesbaden, 1967.
- SCHAFFER, E. H. (1). 'Ritual Exposure [Nudity, etc.] in Ancient China.' *HYAS*, 1951, 14, 130.
- SCHAFFER, E. H. (2). 'Iranian Merchants in Thang Dynasty Tales.' *SOS*, 1951, 11, 403.
- SCHAFFER, E. H. (5). 'Notes on Mica in Medieval China.' *TP*, 1955, 43, 265.

- SCHAFFER, E. H. (6). 'Orpiment and Realgar in Chinese Technology and Tradition.' *JAOS*, 1955, **75**, 73.
- SCHAFFER, E. H. (8). 'Rosewood, Dragon's-Blood, and Lac.' *JAOS*, 1957, **77**, 129.
- SCHAFFER, E. H. (9). 'The Early History of Lead Pigments and Cosmetics in China.' *TP*, 1956, **44**, 413.
- SCHAFFER, E. H. (13). *The Golden Peaches of Samarkand; a Study of Thang Exotics*. Univ. of Calif. Press, Berkeley and Los Angeles, 1963. Rev. J. Chmielewski, *OLZ*, 1966, **61**, 497.
- SCHAFFER, E. H. (16). *The Vermilion Bird; Thang Images of the South*. Univ. of Calif. Press, Berkeley and Los Angeles, 1967. Rev. D. Holzman, *TP*, 1969, **55**, 157.
- SCHAFFER, E. H. (17). 'The Idea of Created Nature in Thang Literature' (on the phrases *tsao wu ché* and *tsao hua ché*). *PEW*, 1965, **15**, 153.
- SCHAFFER, E. H. & WALLACKER, B. E. (1). 'Local Tribute Products of the Thang Dynasty.' *JOSHK*, 1957, **4**, 213.
- SCHÉFER, C. (2). 'Notice sur les Relations des Peuples Mussulmans avec les Chinois depuis l'Extension de l'Islamisme jusqu'à la fin du 15e Siècle.' In *Volume Centenaire de l'École des Langues Orientales Vivantes, 1795-1895*. Leroux, Paris, 1895, pp. 1-43.
- SCHÉLENZ, H. (1). *Geschichte der Pharmazie*. Berlin, 1904; photographic reprint, Olms, Hildesheim, 1962.
- SCHÉLENZ, H. (2). *Zur Geschichte der pharmazeutisch-chemischen Destilliergeräte*. Miltitz, 1911. Reproduced photographically, Olms, Hildesheim, 1964. (Publication supported by Schimmel & Co., essential oil distillers, Miltitz.)
- SCHIERN, F. (1). *Über den Ursprung der Sage von den goldgrabenden Ameisen*. Copenhagen and Leipzig, 1873.
- SCHIPPER, K. M. (1) (tr.). *L'Empereur Wou des Han dans la Légende Taoïste; le 'Han Wou-Ti Nei-Tchouan [Han Wu Ti Nei Chuan]*'. Maisonneuve, Paris, 1965. (Pub. de l'École Française d'Extrême Orient, no. 58.)
- SCHIPPER, K. M. (2). 'Priest and Liturgy; the Live Tradition of Chinese Religion.' MS. of a Lecture at Cambridge University, 1967.
- SCHIPPER, K. M. (3). 'Taoism; the Liturgical Tradition.' Communication to the First International Conference of Taoist Studies, Villa Serbelloni, Bellagio, 1968.
- SCHIPPER, K. M. (4). 'Remarks on the Functions of "Inspector of Merits" [in Taoist ecclesiastical organisation; with a description of the Ordination ceremony in Taiwan Chéng-I Taoism].' Communication to the Second International Conference of Taoist Studies, Chino (Tateshina), Japan, 1972.
- SCHLEGEL, G. (10). 'Scientific Confectionery' (a criticism of modern chemical terminology in Chinese). *TP*, 1894 (1^e sér.), **5**, 147.
- SCHLEGEL, G. (11). 'Le Tchien [Chien] en Chine.' *TP*, 1897 (1^e sér.), **8**, 455.
- SCHLEIFER, J. (1). 'Zum Syrischen Medizinbuch; II, Der therapeutische Teil.' *RSO*, 1939, **18**, 341. (For Pt I see *ZS*, 1938 (n.s.), **4**, 70.)
- SCHMAUDERER, E. (1). 'Kenntnisse ü. das Ultramarin bis zur ersten künstlichen Darstellung um 1827.' *BGTI/TG*, 1969, **36**, 147.
- SCHMAUDERER, E. (2). 'Künstliches Ultramarin im Spiegel von Preisaufgaben und der Entwicklung der Mineralanalyse im 19. Jahrhundert.' *BGTI/TG*, 1969, **36**, 314.
- SCHMAUDERER, E. (3). 'Die Entwicklung der Ultramarin-fabrikation im 19. Jahrhundert.' *TRAD*, 1969, **3-4**, 127.
- SCHMAUDERER, E. (4). 'J. R. Glaubers Einfluss auf die Frühformen der chemischen Technik.' *CIT*, 1970, **42**, 687.
- SCHMAUDERER, E. (5). 'Glaubers Alkahest; ein Beispiel für die Fruchtbarkeit alchemischer Denkansätze im 17. Jahrhundert.'; in the press.
- SCHMIDT, C. (1) (ed.). *Koptisch-Gnostische Schriften [including Pistis Sophia]*. Hinrichs, Leipzig, 1905 (Griech. Christliche Schriftsteller, vol. 13). 2nd ed. Akad. Verlag, Berlin, 1954.
- SCHMIDT, R. (1) (tr.). *Das 'Kāmasūtram' des Vātsyāyana; die indische Ars Amatoria nebst dem vollständigen Kommentare (Jayamangalā) des Yasodhara—aus dem Sanskrit übersetzt und herausgegeben...* Berlin, 1912. 7th ed. Barsdorf, Berlin, 1922.
- SCHMIDT, R. (2). *Beiträge z. Indischen Erotik; das Liebesleben des Sanskritvolkes, nach den Quellen dargestellt von R. S...* 2nd ed. Barsdorf, Berlin, 1911. Reissued under the imprint of Linser, in the same year.
- SCHMIDT, R. (3) (tr.). *The 'Rati Rahasyam' of Kokkoka [said to be + 11th cent. under Rāja Bhōja]*. Med. Book Co. Calcutta, 1949. (Bound with Tatojaya (1), q.v.)
- SCHMIDT, W. A. (1). *Die Griechischen Papyruskunden der K. Bibliothek Berlin; III, Die Purpurfärberei und der Purpurhandel in Altertum*. Berlin, 1842.
- SCHMIEDER, K. C. (1). *Geschichte der Alchemie*. Halle, 1832.

- SCHRIMPF, R. (1). 'Bibliographie Sommaire des Ouvrages publiés en Chine durant la Période 1950-60 sur l'Histoire du Développement des Sciences et des Techniques Chinoises.' *BEFEO*, 1963, 51, 615. Includes chemistry and chemical industry.
- SCHNEIDER, W. (1). 'Über den Ursprung des Wortes "Chemie".' *PHI*, 1959, 21, 79.
- SCHNEIDER, W. (2). 'Kekule und die organische Strukturchemie.' *PHI*, 1958, 20, 379.
- SCHOLEM, G. (3). *Jewish Gnosticism, Merkabah [apocalyptic or Messianic] Mysticism, and the Talmudic Tradition*. New York, 1960.
- SCHOLEM, G. (4). 'Zur Geschichte der Anfänge der Christlichen Kabbala.' Art. in *L. Baeck Presentation Volume*, London, 1954.
- SCHOTT, W. (2). 'Ueber ein chinesisches Mengwerk, nebst einem Anhang linguistischer Verbesserungen zu zwei Bänden der Erdkunde Ritters' [the *Yeh Huo Pien* of Shen Tê-Fu (Ming)]. *APAW/PH*, 1880, no. 3.
- SCHRAMM, M. (1). 'Aristotelianism; Basis of, and Obstacle to, Scientific Progress in the Middle Ages—Some Remarks on A. C. Crombie's "From Augustine to Galileo".' *HOSEA*, 1963, 2, 91; 1965, 4, 70.
- VON SCHRICK, MICHAEL PUFF (1). *Hienach volget ein nützliche Materi von manigerley ausgeprägten Wasser, wie Man die nützen und pruchen sol zu Gesuntheit der Menschen; Un das Puchlein hat Meiyster Michel Schrick, Doctor der Erczney durch liebe und gepet willen erberen Personen ausz den Püchern zu sammen colligiert un beschrieben*. Augsburg, 1478, 1479, 1483, etc.
- SCHUBARTH, DR (1). 'Ueber das chinesisches Weisskupfer und die vom Vereine angestellten Versuche dasselbe darzustellen.' *VVBGP*, 1824, 3, 134. (The Verein in question was the Verein z. Beförderung des Gewerbeleisses in Preussen.)
- SCHULTES, R. E. (1). *A Contribution to our Knowledge of Rivea corymbosa, the narcotic Ololiuqui of the Aztecs*. Botanical Museum, Harvard Univ. Cambridge, Mass. 1941.
- SCHULTZE, S. See Aigremont, Dr.
- SCHURHAMMER, G. (2). 'Die Yamabushis nach gedrückten und ungedrückten Berichten d. 16. und 17. Jahrhunderts.' *MDGNVO*, 1965, 46, 47.
- SCOTT, HUGH (1). *The Golden Age of Chinese Art; the Lively Thang Dynasty*. Tuttle, Rutland, Vt. and Tokyo, 1966.
- SCOTT, W. (1) (ed.). *Hermetica*. 4 vols. Oxford, 1924-36.
Vol 1, Introduction, Texts and Translation, 1924.
Vol 2, Notes on the Corpus Hermeticum, 1925.
Vol 3, Commentary; Latin Asclepius and the Hermetic Excerpts of Stobaeus, 1926 (posthumous ed. A. S. Ferguson).
Vol 4, Testimonia, Addenda, and Indexes (posthumous, with A. S. Ferguson).
Repr. Dawson, London, 1968. Rev. G. Sarton, *ISIS*, 1926, 8, 342.
- SÉBILLOT, P. (1). *Les Travaux Publics et les Mines dans les Traditions et les Superstitions de tous les Peuples*. Paris, 1894.
- SEGAL, J. B. (1). 'Pagan Syrian Monuments in the Vilayet of Urfa [Edessa].' *ANATS*, 1953, 3, 97.
- SEGAL, J. B. (2). 'The Šābian Mysteries; the Planet Cult of Ancient Ḥarrān.' Art. in *Vanished Civilisations*, ed. E. Bacon. 1963.
- SEIDEL, A. (1). 'A Taoist Immortal of the Ming Dynasty; Chang San-Fêng.' Art. in *Self and Society in Ming Thought*, ed. W. T. de Bary. Columbia Univ. Press, New York, 1970, p. 483.
- SEIDEL, A. (2). *La Divinisation de Lao Tseu [Lao Tzu] dans le Taoisme des Han*. École Française de l'Extrême Orient, Paris, 1969. (Pub. de l'Éc. Fr. de l'Extr. Or., no. 71.) A Japanese version is in *DK*, 1968, 3, 5-77, with French summary, p. ii.
- SELMKHOV, I. R. (1). 'Spectral Analysis of Metal Articles from Archaeological Monuments of the Caucasus.' *PPHS*, 1962, 38, 68.
- SELYE, H. (1). *Textbook of Endocrinology*. Univ. Press and *Acta Endocrinologica*, Montreal, 1947.
- SEN, SATIRANJAN (1). 'Two Medical Texts in Chinese Translation.' *VBA*, 1945, 1, 70.
- SENCOURT, ROBERT (1). *Outflying Philosophy; a Literary Study of the Religious Element in the Poems and Letters of John Donne and in the Works of Sir Thomas Browne and Henry Vaughan the Silurist, together with an Account of the Interest of these Writers in Scholastic Philosophy, in Platonism and in Hermetic Physic; with also some Notes on Witchcraft*. Simpkin, Marshall, Hamilton & Kent, London, n.d. (1923).
- SENGUPTA, KAVIRAJ N. N. (1). *The Ayurvedic System of Medicine*. 2 vols. Calcutta, 1925.
- SERRUYS, H. (1) (tr.). 'Pei Lu Fêng Su; Les Coutumes des Esclaves Septentrionaux [Hsiao Ta-Hêng's book on the Mongols, +1594].' *MS*, 1945, 10, 117-208.
- SEVERINUS, PETRUS (1). *Idea Medicinae Philosophicae*, 1571. 3rd ed. The Hague, 1660.
- SEWTER, E. R. A. (1) (tr.). *Fourteen Byzantine Rulers; the 'Chronographia' of Michael Psellus [+1063, the last part by +1078]*. Routledge & Kegan Paul, London; Yale Univ. Press, New Haven, Conn., 1953. 2nd revised ed. Penguin, Baltimore, and London, 1966.

- SEYBOLD, C. F. (1). Review of J. Lippert's 'Ibn al-Qiftī's *Ta'riḫ al-Ḥukamā'*, auf Grund der Vorarbeiten Aug. Müller (Dieter, Leipzig, 1903).' *ZDMG*, 1903, **57**, 805.
- SEYYED HOSSEIN NASR. See Said Husain Nasr.
- SEZGIN, F. (1). 'Das Problem des Jābir ibn Ḥayyān im Lichte neu gefundener Handschriften.' *ZDMG*, 1964, **114**, 255.
- SHANIN, T. (1) (ed.). *The Rules of the Game; Cross-Disciplinary Essays on Models in Scholarly Thought*. Tavistock, London, 1972.
- SHAPIRO, J. (1). 'Freezing-out, a Safe Technique for Concentration of Dilute Solutions.' *S*, 1961, **133**, 2063.
- SHASTRI, KAVIRAJ KALIDAS (1). *Catalogue of the Rasashala Aushadhashram Gondal* (Ayurvedic Pharmaceutical Works of Gondal), [founded by the Maharajah of Gondal, H. H. Bhagvat Singhji]. 22nd ed. Gondal, Kathiawar, 1936. 40th ed. 1952.
- SHAW, THOMAS (1). *Travels or Observations relating to several parts of Barbary and the Levant*. Oxford, 1738; London, 1757; Edinburgh, 1808. *Voyages dans la Régence d'Alger*. Paris, 1830.
- SHEA, D. & FRAZER, A. (1) (tr.). *The 'Dabistan', or School of Manners* [by Mubed Shah, +17th Cent.], translated from the original Persian, with notes and illustrations. . . 2 vols. Paris, 1843.
- SHEAR, T. L. (1). 'The Campaign of 1939 [excavating the ancient Athenian agora].' *HE*, 1940, **9**, 261.
- SHEN TSUNG-HAN (1). *Agricultural Resources of China*. Cornell Univ. Press, Ithaca, N.Y., 1951.
- SHÉNG WU-SHAN (1). *Érotologie de la Chine; Tradition Chinoise de l'Érotisme*. Pauvert, Paris, 1963. (Bibliothèque Internationale d'Érotologie, no. 11.) Germ. tr. *Die Erotik in China*, ed. Lo Duca. Desch, Basel, 1966. (Welt des Eros, no. 5.)
- SHEPPARD, H. J. (1). 'Gnosticism and Alchemy.' *AX*, 1957, **6**, 86. 'The Origin of the Gnostic-Alchemical Relationship.' *SCI*, 1962, **56**, 1.
- SHEPPARD, H. J. (2). 'Egg Symbolism in Alchemy.' *AX*, 1958, **6**, 140.
- SHEPPARD, H. J. (3). 'A Survey of Alchemical and Hermetic Symbolism.' *AX*, 1960, **8**, 35.
- SHEPPARD, H. J. (4). 'Ouroboros and the Unity of Matter in Alchemy; a Study in Origins.' *AX*, 1962, **10**, 83. 'Serpent Symbolism in Alchemy.' *SCI*, 1966, **60**, 1.
- SHEPPARD, H. J. (5). 'The Redemption Theme and Hellenistic Alchemy.' *AX*, 1959, **7**, 42.
- SHEPPARD, H. J. (6). 'Alchemy; Origin or Origins?' *AX*, 1970, **17**, 69.
- SHEPPARD, H. J. (7). 'Egg Symbolism in the History of the Sciences.' *SCI*, 1960, **54**, 1.
- SHEPPARD, H. J. (8). 'Colour Symbolism in the Alchemical Opus.' *SCI*, 1964, **58**, 1.
- SHERLOCK, T. P. (1). 'The Chemical Work of Paracelsus.' *AX*, 1948, **3**, 33.
- SHIH YU-CHUNG (1). 'Some Chinese Rebel Ideologies.' *TP*, 1956, **44**, 150.
- SHIMAO EIKOH (1). 'The Reception of Lavoisier's Chemistry in Japan.' *ISIS*, 1972, **63**, 311.
- SHIRAI, MITSUTARŌ (1). 'A Brief History of Botany in Old Japan.' Art. in *Scientific Japan, Past and Present*, ed. Shinjo Shinzo. Kyoto, 1926. (Commemoration Volume of the 3rd Pan-Pacific Science Congress.)
- SIGERIST, HENRY E. (1). *A History of Medicine*. 2 vols. Oxford, 1951. Vol. 1, *Primitive and Archaic Medicine*. Vol. 2, *Early Greek, Hindu and Persian Medicine*. Rev. (vol. 2), J. Filiozat, *J.AOS*, 1926, **82**, 575.
- SIGERIST, HENRY E. (2). *Landmarks in the History of Hygiene*. London, 1956.
- SIGGEL, A. (1). *Die Indischen Bücher aus dem 'Paradies d. Weisheit über d. Medizin' des 'Alī Ibn Sahl Rabban al-Ṭabarī*. Steiner, Wiesbaden, 1950. (Akad. d. Wiss. u. d. Lit. in Mainz; Abhdl. d. geistes- und sozial-wissenschaftlichen Klasse, no. 14.) Crit. O. Temkin, *BIHM*, 1953, **27**, 489.
- SIGGEL, A. (2). *Arabisch-Deutsches Wörterbuch der Stoffe aus den drei Natur-reichen die in arabischen alchemistischen Handschriften vorkommen; nebst Anhang, Verzeichnis chemischer Geräte*. Akad. Verlag, Berlin, 1950. (Deutsche Akad. der Wissenschaften zu Berlin; Institut f. Orientforschung, Veröffentl. no. 1.)
- SIGGEL, A. (3). *Decknamen in der arabischen Alchemistischen Literatur*. Akad. Verlag, Berlin, 1951. (Deutsche Akad. der Wissenschaften zu Berlin; Institut f. Orientforschung, Veröffentl. no. 5.) Rev. M. Plessner, *OR*, **7**, 368.
- SIGGEL, A. (4). 'Das Sendschreiben "Das Licht über das Verfahren des Hermes der Hermesse dem, der es begehrt".' (*Qabas al-Qabīs ft Tadbīr Ḥarnas al-Ḥarāmīs*, early +13th cent.) *DI*, 1937, **24**, 287.
- SIGGEL, A. (5) (tr.). 'Das Buch der Gifte' [*Kitāb al-Sumūm wa daf 'maḍārrihā*] des Jābir ibn Ḥayyān [Kr/2145]; *Arabische Text in Faksimile. . . übers. u. erläutert. . .* Steiner, Wiesbaden, 1958. (Veröffentl. d. Orientalischen Komm. d. Akad. d. Wiss. u. d. Lit. no. 12.) Cf Kraus (2), pp. 156 ff.
- SIGGEL, A. (6). 'Gynäkologie, Embryologie und Frauenhygiene aus dem "Paradies der Weisheit [*Firdaws al-Ḥikma*] über die Medizin" des Abū Ḥasan 'Alī ibn Sahl Rabban al-Ṭabarī [d. c. +860], nach der Ausgabe von Dr. M. Zubair al-Ṣiddīqī (Sonne, Berlin-Charlottenberg, 1928).' *QSGNM*, 1942, **8**, 217.
- SILBERER, H. (1). *Probleme der Mystik und ihrer Symbolik*. Vienna, 1914. Eng. tr. S. E. Jelliffe, *Problems of Mysticism, and its Symbolism*. Moffat & Yard, New York, 1917.

- SINGER, C. (1). *A Short History of Biology*. Oxford, 1931.
- SINGER, C. (3). 'The Scientific Views and Visions of St. Hildegard.' Art. in Singer (13), vol. 1, p. 1. Cf. Singer (16), a parallel account.
- SINGER, C. (4). *From Magic to Science; Essays on the Scientific Twilight*. Benn, London, 1928.
- SINGER, C. (8). *The Earliest Chemical Industry; an Essay in the Historical Relations of Economics and Technology, illustrated from the Alum Trade*. Folio Society, London, 1948.
- SINGER, C. (13) (ed.). *Studies in the History and Method of Science*. Oxford, vol. 1, 1917; vol. 2, 1921. Photolitho reproduction, Dawson, London, 1955.
- SINGER, C. (16). 'The Visions of Hildegard of Bingen.' Art. in Singer (4), p. 199.
- SINGER, C. (23). 'Alchemy' (art. in *Oxford Classical Dictionary*). Oxford.
- SINGER, CHARLES (25). *A Short History of Anatomy and Physiology from the Greeks to Harvey*. Dover, New York, 1957. Revised from *The Evolution of Anatomy*. Kegan Paul, Trench, & Trubner, London, 1925.
- SINGER, D. W. (1). *Giordano Bruno; His Life and Thought, with an annotated Translation of his Work 'On the Infinite Universe and Worlds'*. Schuman, New York, 1950.
- SINGER, D. W. (2). 'The Alchemical Writings attributed to Roger Bacon.' *SP*, 1932, 7, 80.
- SINGER, D. W. (3). 'The Alchemical Testament attributed to Raymund Lull.' *A*, 1928, 9, 43. (On the pseudepigraphic nature of the Lullian corpus.)
- SINGER, D. W. (4). 'l'Alchimie.' Communication to the IVth International Congress of the History of Medicine, Brussels, 1923. Sep. pub. de Vlijt, Antwerp, 1927.
- SINGER, D. W., ANDERSON, A. & ADDIS, R. (1). *Catalogue of Latin and Vernacular Alchemical Manuscripts in Great Britain and Ireland before the 16th Century*. 3 vols. Lamertin, Brussels, 1928-31 (for the Union Académique Internationale).
- SINGLETON, C. S. (1) (ed.). *Art, Science and History in the Renaissance*. Johns Hopkins, Baltimore, 1968.
- SISCO, A. G. & SMITH, C. S. (1) (tr.). *Lazarus Ercker's Treatise on Ores and Assaying, translated from the German edition of +1580*. Univ. Chicago Press, Chicago, 1951.
- SISCO, A. G. & SMITH, C. S. (2). 'Bergwerk- und Prober-büchlein'; a Translation from the German of the 'Berg-büchlein', a Sixteenth-Century Book on Mining Geology, by A. G. Sisco, and of the 'Prober-büchlein', a Sixteenth-Century Work on Assaying, by A. G. Sisco & C. S. Smith; with technical annotations and historical notes. Amer. Institute of Mining and Metallurgical Engineers, New York, 1949.
- SIVIN, N. (1). 'Preliminary Studies in Chinese Alchemy; the *Tan Ching Yao Chüeh* attributed to Sun Ssu-Mo (+581? to after +674).' Inaug. Diss., Harvard University, 1965. Published as: *Chinese Alchemy; Preliminary Studies*. Harvard Univ. Press, Cambridge, Mass. 1968. (Harvard Monographs in the History of Science, no. 1.) Ch. 1 sep. pub. *JSHS*, 1967, 6, 60. Revs. J. Needham, *JAS*, 1969, 850; Ho Ping-Yü, *HJAS*, 1969, 29, 297; M. Eliade, *HOR*, 1970, 10, 178.
- SIVIN, N. (1a). 'On the Reconstruction of Chinese Alchemy.' *JSHS*, 1967, 6, 60 (essentially ch. 1 of Sivin, 1).
- SIVIN, N. (2). 'Quality and Quantity in Chinese Alchemy.' Priv. circ. 1966; expanded as: 'Reflections on Theory and Practice in Chinese Alchemy.' Contribution to the First International Conference of Taoist Studies, Villa Serbelloni, Bellagio, 1968.
- SIVIN, N. (3). Draft Translation of *Thai-Shang Wei Ling Shen Hua Chiu Chuan Tan Sha Fa (TT/885)*. Unpublished MS., copy deposited in Harvard-Yenching Library for circulation.
- SIVIN, N. (4). Critical Editions and Draft Translations of the Writings of Chhen Shao-Wei (TT/883 and 884, and YCCC, chs. 68-9). Unpublished MS.
- SIVIN, N. (5). Critical Edition and Draft Translation of *Tan Lun Chüeh Chih Hsin Ching (TT/928 and YCCC, ch. 66)*. Unpublished MS.
- SIVIN, N. (6). 'William Lewis as a Chemist.' *CHYM*, 1962, 8, 63.
- SIVIN, N. (7). 'On the *Pao Phu Tzu (Nei Phien)* and the Life of Ko Hung (+283 to +343).' *ISIS*, 1969, 60, 388.
- SIVIN, N. (8). 'Chinese Concepts of Time.' *EARLH*, 1966, 1, 82.
- SIVIN, N. (9). *Cosmos and Computation in Chinese Mathematical Astronomy*. Brill, Leiden, 1969. Reprinted from *TP*, 1969, 55.
- SIVIN, N. (10). 'Chinese Alchemy as a Science.' Contrib. to 'Nothing Concealed' (Wu Yin Lu); *Essays in Honour of Liu (Aisin-Goro) Yü-Yün*, ed. F. Wakeman, Chinese Materials and Research Aids Service Centre, Taipei, Taiwan, 1970, p. 35.
- SKRINE, C. P. (1). 'The Highlands of Persian Baluchistan.' *GJ*, 1931, 78, 321.
- DE SLANE, BARON MCGUCKIN (2) (tr.). *Ibn Khallikan's Dictionary* (translation of Ibn Khallikān's *Kitāb Wafayāt al-A'yān*, a collection of 865 biographies, +1278). 4 vols. Paris, 1842-71.
- SMEATON, W. A. (1). 'Guyton de Morveau and Chemical Affinity.' *AX*, 1963, 11, 55.
- SMITH, ALEXANDER (1). *Introduction to Inorganic Chemistry*. Bell, London, 1912.
- SMITH, C. S. (4). 'Matter versus Materials; a Historical View.' *SC*, 1968, 162, 637.

- SMITH, C. S. (5). 'A Historical View of One Area of Applied Science—Metallurgy.' Art. in *Applied Science and Technological Progress*. A Report to the Committee on Science and Astronautics of the United States House of Representatives by the National Academy of Sciences, Washington, D.C. 1967.
- SMITH, C. S. (6). 'Art, Technology and Science; Notes on their Historical Interaction.' *TCULT*, 1970, **11**, 493.
- SMITH, C. S. (7). 'Metallurgical Footnotes to the History of Art.' *PAPS*, 1972, **116**, 97. (Penrose Memorial Lecture, Amer. Philos. Soc.)
- SMITH, C. S. & GNUDI, M. T. (1) (tr. & ed.). *Biringuccio's 'De La Pirotechnia' of +1540, translated with an introduction and notes*. Amer. Inst. of Mining and Metallurgical Engineers, New York, 1942, repr. 1943. Reissued, with new introductory material. Basic Books, New York, 1959.
- SMITH, F. PORTER (1). *Contributions towards the Materia Medica and Natural History of China, for the use of Medical Missionaries and Native Medical Students*. Amer. Presbyt. Miss. Press, Shanghai; Trübner, London, 1871.
- SMITH, F. PORTER (2). 'Chinese Chemical Manufactures.' *JRAS/NCB*, 1870 (n.s.), **6**, 139.
- SMITH, R. W. (1). 'Secrets of Shao-Lin Temple Boxing.' Tuttle, Rutland, Vt. and Tokyo, 1964.
- SMITH, T. (1) (tr.). *The 'Recognitiones' of Pseudo-Clement of Rome* [c. +220]. In Ante-Nicene Christian Library, ed. A. Roberts & J. Donaldson, Clark, Edinburgh, 1867. vol. 3, p. 297.
- SMITH, T., PETERSON, P. & DONALDSON, J. (1) (tr.). *The Pseudo-Clementine Homilies* [c. +190, attrib. Clement of Rome, fl. +96]. In Ante-Nicene Christian Library, ed. A. Roberts & J. Donaldson, Clark, Edinburgh, 1867. vol. 17.
- SMITHELLS, C. J. (1). 'A New Alloy of High Density.' *N*, 1937, **139**, 490.
- SMYTHE, J. A. (1). *Lead; its Occurrence in Nature, the Modes of its Extraction, its Properties and Uses, with Some Account of its Principal Compounds*. London and New York, 1923.
- SNAPPER, I. (1). *Chinese Lessons to Western Medicine; a Contribution to Geographical Medicine from the Clinics of Peiping Union Medical College*. Interscience, New York, 1941.
- SNELGROVE, D. (1). *Buddhist Himalaya; Travels and Studies in Quest of the Origins and Nature of Tibetan Religion*. Oxford, 1957.
- SNELGROVE, D. (2). *The 'Hevajra Tantra', a Critical Study*. Oxford, 1959.
- SODANO, A. R. (1) (ed. & tr.). *Porfirio* [Porphyry of Tyre]; *Lettera ad Anebo* (Greek text and Italian tr.). Arte Tip., Naples, 1958.
- SOLLERS, P. (1). 'Traduction et Presentation de quelques Poèmes de Mao Tsé-Tung.' *TQ*, 1970, no. 40, 38.
- SOLLMANN, T. (1). *A Textbook of Pharmacology and some Allied Sciences*. Saunders, 1st ed. Philadelphia and London, 1901. 8th ed., extensively revised and enlarged, Saunders, Philadelphia and London, 1957.
- SOLOMON, D. (1) (ed.). *LSD, the Consciousness-Expanding Drug*. Putnam, New York, 1964. Rev. W. H. McGlothlin, *NN*, 1964, **199** (no. 15), 360.
- SOYMIÉ, M. (4). 'Le Lo-feou Chan (Lo-fou Shan); Étude de Géographie Religieuse.' *BEFEO*, 1956, **48**, 1-139.
- SOYMIÉ, M. (5). 'Bibliographie du Taoïsme; Études dans les Langues Occidentales' (pt. 2). *DK*, 1971, **4**, 290-225 (1-66); with Japanese introduction, p. 288 (3).
- SOYMIÉ, M. (6). 'Histoire et Philologie de la Chine Médiévale et Moderne; Rapport sur les Conférences' (on the date of *Pao Phu Tzu*). *AEPHE/SHP*, 1971, 759.
- SOYMIÉ, M. & LITSCH, F. (1). 'Bibliographie du Taoïsme; Études dans les Langues Occidentales' (pt. 1). *DK*, 1968, **3**, 318-247 (1-72); with Japanese introduction, p. 316 (3).
- SPEISER, E. A. (1). *Excavations at Tepe Gawra*. 2 vols. Philadelphia, 1935.
- SPENCER, J. E. (3). 'Salt in China.' *GR*, 1935, **25**, 353.
- SPENGLER, O. (1). *The Decline of the West*, tr. from the German, *Die Untergang des Abendlandes*, by C. F. Atkinson. 2 vols. Vol. 1, *Form and Actuality*; vol. 2, *Perspectives of World History*. Allen & Unwin, London, 1926, 1928.
- SPERBER, D. (1). 'New Light on the Problem of Demonetisation in the Roman Empire.' *NC*, 1970 (7th ser.), **10**, 112.
- SPIETER, M. (1). 'Zur Geschichte der Wasserbad-destillation; das "Berchile" Abul Kasims.' *APHL*, 1930, **5** (no. 8), 116.
- SPIZEL, THEOPHILUS (1). *De Re Literaria Sinensium Commentarius*... Leiden, 1660 (frontispiece, 1661).
- SPOONER, R. C. (1). 'Chang Tao-Ling, the first Taoist Pope.' *JCE*, 1938, **15**, 503.
- SPOONER, R. C. (2). 'Chinese Alchemy.' *JWCBS*, 1940 (A), **12**, 82.
- SPOONER, R. C. & WANG, C. H. (1). 'The Divine Nine-Turn Tan-Sha Method, a Chinese Alchemical Recipe.' *ISIS*, 1948, **28**, 235.
- VAN DER SPRENKEL, O. (1). 'Chronology, Dynastic Legitimacy, and Chinese Historiography' (mimeographed). Paper contributed to the Study Conference at the London School of Oriental Studies

- 1956, but not included with the rest in *Historians of China and Japan*, ed. W. G. Beasley & E. G. Pulleybank, 1961.
- SQUIRE, S. (1) (tr.). *Plutarch 'De Iside et Osiride', translated into English* (sep. pagination, text and tr.). Cambridge, 1744.
- STADLER, H. (1) (ed.). *Albertus Magnus 'De Animalibus, libri XXVI.'* 2 vols. Münster i./W., 1916-21.
- STANLEY, R. C. (1). *Nickel, Past and Present*. Proc. IInd Empire Mining and Metallurgical Congress, 1928, pt. 5, Non-Ferrous Metallurgy, 1-34.
- STANNUS, H. S. (1). 'Notes on Some Tribes of British Central Africa [esp. the Anyanja of Nyasaland]. *JRAI*, 1912, 40, 285.
- STAPLETON, H. E. (1). 'Sal-Ammoniac; a Study in Primitive Chemistry.' *MAS/B*, 1905, 1, 25.
- STAPLETON, H. E. (2). 'The Probable Sources of the Numbers on which Jābirian Alchemy was based.' *A/AIHS*, 1953, 6, 44.
- STAPLETON, H. E. (3). 'The Gnomon as a possible link between one type of Mesopotamian *Ziggurat* and the Magic Square Numbers on which Jābirian Alchemy was based.' *AX*, 1957, 6, 1.
- STAPLETON, H. E. (4). 'The Antiquity of Alchemy.' *AX*, 1953, 5, 1. The Summary also printed in *A/AIHS*, 1953, 4 (no. 14), 35.
- STAPLETON, H. E. (5). 'Ancient and Modern Aspects of Pythagoreanism; I, The Babylonian Sources of Pythagoras' Mathematical Knowledge; II, The Part Played by the Human Hand with its Five Fingers in the Development of Mathematics; III, Sumerian Music as a possible intermediate Source of the Emphasis on Harmony that characterises the -6th-century Teaching of both Pythagoras and Confucius; IV, The Belief of Pythagoras in the Immaterial, and its Co-existence with Natural Phenomena.' *OSIS*, 1958, 13, 12.
- STAPLETON, H. E. & AZO, R. F. (1). 'Alchemical Equipment in the +11th Century.' *MAS/B*, 1905, 1, 47. (Account of the 'Ainu al-San'ah wa-l 'Aunu al-Sana'ah (Essence of the Art and Aid to the Workers) by Abū-l Ḥakīm al-Sāliḥī al-Kāthī, +1034.) Cf. Ahmad & Datta (1).
- STAPLETON, H. E. & AZO, R. F. (2). 'An Alchemical Compilation of the +13th Century.' *MAS/B*, 1910, 3, 57. (A florilegium of extracts gathered by an alchemical copyist travelling in Asia Minor and Mesopotamia about +1283.)
- STAPLETON, H. E., AZO, R. F. & HUSAIN, M. H. (1). 'Chemistry in Iraq and Persia in the +10th Century.' *MAS/B*, 1927, 8, 315-417. (Study of the *Madkhal al-Ta'limī* and the *Kitāb al-Asrār* of al-Rāzī (d. +925), the relation of Arabic alchemy with the Sabians of Ḥarrān, and the role of influences from Hellenistic culture, China and India upon it.) Revs. G. Sarton, *ISIS*, 1928, 11, 129; J. R. Partington, *N*, 1927, 120, 243.
- STAPLETON, H. E., AZO, R. F., HUSAIN, M. H. & LEWIS, G. L. (1). 'Two Alchemical Treatises attributed to Avicenna.' *AX*, 1962, 10, 41.
- STAPLETON, H. E. & HUSAIN, H. (1) (tr.). 'Summary of the Cairo Arabic MS. of the "Treatise of Warning (*Risālat al-Ḥaḍar*)" of Agathodaimon, his Discourse to his Disciples when he was about to die.' Published as Appendix B in Stapleton (4), pp. 40 ff.
- STAPLETON, H. E., LEWIS, G. L. & TAYLOR, F. SHERWOOD (1). 'The Sayings of Hermes as quoted in the *Mā al-Waraqāt* of Ibn Umail' (c. +950). *AX*, 1949, 3, 69.
- STARKEY, G. [Eirenaeus Philaletha] (1). *Secrets Revealed; or, an Open Entrance to the Shut-Palace of the King; Containing the Greatest Treasure in Chymistry, Never yet so plainly Discovered. Composed by a most famous English-man styling himself Anonymus, or Eyrenaeus Philaletha Cosmopolita, who by Inspiration and Reading attained to the Philosophers Stone at his Age of Twenty-three Years, A.D. 1645. . . Godbid for Cooper*, London, 1669. Eng. tr. of first Latin ed. *Introitus Apertus. . . Jansson & Weyerstraet*, Amsterdam, 1667. See Ferguson (1), vol. 2, p. 192.
- STARKEY, G. [Eirenaeus Philaletha] (2). *Arcanum Liquoris Immortalis, Ignis-Aquae Seu Alkehest*. London, 1683, Hamburg, 1688. Eng. tr. 1684.
- STAUDENMEIER, LUDWIG (1). *Die Magie als experimentelle Wissenschaft*. Leipzig, 1912.
- STEELE, J. (1) (tr.). *The 'I Li', or Book of Etiquette and Ceremonial*. 2 vols. London, 1917.
- STEELE, R. (1) (ed.). *Opera Hactenus Inedita Rogeri Baconi*. 9 fascicles in 3 vols. Oxford, 1914-.
- STEELE, R. (2). 'Practical Chemistry in the +12th Century; Rasis *De Aluminibus et Salibus*, the [text of the] Latin translation by Gerard of Cremona, [with an English précis].' *ISIS*, 1929, 12, 10.
- STEELE, R. (3) (tr.). *The Discovery of Secrets* [a Jābirian Corpus text]. Luzac (for the Geber Society), London, 1892.
- STEELE, R. & SINGER, D. W. (1). 'The Emerald Table [*Tabula Smaragdina*].' *PRSM*, 1928, 21, 41.
- STEIN, O. (1). 'References to Alchemy in Buddhist Scriptures.' *BLSOAS*, 1933, 7, 263.
- STEIN, R. A. (5). 'Remarques sur les Mouvements du Taoisme Politico-Religieux au 2e Siècle ap. J. C.' *TP*, 1963, 50, 1-78. Japanese version revised by the author, with French summary of the alterations. *DK*, 1967, 2.
- STEIN, R. A. (6). 'Spéculations Mystiques et Thèmes relatifs aux "Cuisines" [*chhu*] du Taoisme.' *ACF*, 1972, 72, 489.

- STEINGASS, F. J. (1). *A Comprehensive Persian-English Dictionary*. Routledge & Kegan Paul, London, 1892, repr. 1957.
- STEININGER, H. (1). *Hauch- und Körper-seele, und der Dämon, bei 'Kuan Yin Tzu'*. Harrassowitz, Leipzig, 1953. (Sammlung orientalistischer Arbeiten, no. 20.)
- STEINSCHNEIDER, M. (1). 'Die Europäischen Übersetzungen aus dem Arabischen bis mitte d. 17. Jahrhunderts. A. Schriften bekannter Übersetzer; B. Übersetzungen von Werken bekannter Autoren deren Übersetzer unbekannt oder unsicher sind.' *SWAW/PH*, 1904, 149 (no. 4), 1-84; 1905, 151 (no. 1), 1-108. Also sep. issued. Repr. Graz, 1956.
- STEINSCHNEIDER, M. (2). 'Über die Mondstationen (Naxatra) und das Buch Arcandam.' *ZDMG*, 1864, 18, 118. 'Zur Geschichte d. Übersetzungen ans dem Indischen in Arabische und ihres Einflusses auf die Arabische Literatur, insbesondere über die Mondstationen (Naxatra) und daraufbezüglicher Loosbücher.' *ZDMG*, 1870, 24, 325; 1871, 25, 378. (The last of the three papers has an index for all three.)
- STEINSCHNEIDER, M. (3). 'Euklid bei den Arabern.' *ZMP*, 1886, 31 (Hist. Lit. Abt.), 82.
- STEINSCHNEIDER, M. (4) *Gesammelte Schriften*, ed. H. Malter & A. Marx. Poppelauer, Berlin, 1925.
- STENRING, K. (1) (tr.). *The Book of Formation, 'Sefer Yetzirah'*, by R. Akiba ben Joseph... With introd. by A. E. Waite, Rider, London, 1923.
- STEPHANIDES, M. K. (1). *Symbolai eis ten Historikē tōn Physikōn Epistēmōn kai Idiōs tēs Chymeias* (in Greek). Athens, 1914. See Zacharias (1).
- STEPHANIDES, M. K. (2). Study of Aristotle's views on chemical affinity and reaction. *RSCI*, 1924, 62, 626.
- STEPHANIDES, M. K. (3). *Psammourgikē kai Chymeia (Ψαμμουργική και Χυμεία)* [in Greek]. Mytilene, 1909.
- STEPHANIDES, M. K. (4). 'Chymeutische Miscellen.' *AGNWT*, 1912, 3, 180.
- STEPHANUS OF ALEXANDRIA. *Megalēs kai Hieras Technēs [Chymeia]*. Not in the *Corpus Alchem. Gr.* (Berthelot & Ruelle) but in Ideler (1), vol. 2.
- STEPHANUS, HENRICUS. See Estienne, H. (1).
- STILLMAN, J. M. (1). *The Story of Alchemy and Early Chemistry*. Constable, London and New York, 1924. Repr. Dover, New York, 1960.
- STRASSMEIER, J. N. (1). *Inschriften von Nabuchodonosor* [-6th cent.]. Leipzig, 1889.
- STRASSMEIER, J. N. (2). *Inschriften von Nabonidus* [c. -555 to -538]. Leipzig, 1889.
- STRAUSS, BETTINA (1). 'Das Giftbuch des Shānāq; eine literaturgeschichtliche Untersuchung.' *QSGNM*, 1934, 4, 89-152.
- VON STRAUSS-&-TORNEY, V. (1). 'Bezeichnung der Farben Blau und Grün in Chinesischen Alterthum.' *ZDMG*, 1879, 33, 502.
- STRICKMANN, M. (1). 'Notes on Mushroom Cults in Ancient China.' Rijksuniversiteit Gent (Gand), 1966. (Paper to the 4^e Journée des Orientalistes Belges, Brussels, 1966.)
- STRICKMANN, M. (2). 'On the Alchemy of Thao Hung-Ching.' Unpub. MS. Revised version contributed to the 2nd International Conference of Taoist Studies, Tateshina, Japan, 1972.
- STRICKMANN, M. (3). 'Taoism in the Lettered Society of the Six Dynasties.' Contribution to the 2nd International Conference of Taoist Studies, Chino (Tateshina), Japan, 1972.
- STROTHMANN, R. (1). 'Gnosis Texte der Ismailiten; Arabische Handschrift Ambrosiana H 75.' *AGWG/PH*, 1943 (3rd ser.), no. 28.
- STRZODA, W. (1). *Die gelben Orangen der Prinzessin Dschau, aus dem chinesischen Urtext*. Hyperion Verlag, München, 1922.
- STUART, G. A. (1). *Chinese Materia Medica; Vegetable Kingdom, extensively revised from Dr F. Porter Smith's work*. Amer. Presbyt. Mission Press, Shanghai, 1911. An expansion of Smith, F.P. (1).
- STUART, G. A. (2). 'Chemical Nomenclature.' *CRR*, 1891; 1894, 25, 88; 1901, 32, 305.
- STUHLMANN, C. C. (1). 'Chinese Soda.' *JPOS*, 1895, 3, 566.
- SUBBARAYAPPA, B. V. (1). 'The Indian Doctrine of Five Elements.' *IJHS*, 1966, 1, 60.
- SUDBOROUGH, J. J. (1). *A Textbook of Organic Chemistry; translated from the German of A. Bernthsen, edited and revised*. Blackie, London, 1906.
- SUDHOFF, K. (1). 'Eine alchemistische Schrift des 13. Jahrhunderts betitelt *Speculum Alkimie Minus*, eines bisher unbekanntenen Mönches Simeon von Köln.' *AGNT*, 1922, 9, 53.
- SUDHOFF, K. (2). 'Alkoholrezept aus dem 8. Jahrhundert?' [The earliest version of the *Mappae Clavicula*, now considered c. +820.] *NW*, 1917, 16, 681.
- SUDHOFF, K. (3). 'Weiteres zur Geschichte der Destillationstechnik.' *AGNT*, 1915, 5, 282.
- SUDHOFF, K. (4). 'Eine Herstellungsanweisung für "Aurum Potabile" und "Quinta Essentia" von dem herzogliche Leibarzt Albini di Moncalieri (14ter Jahrh.)' *AGNT*, 1915, 5, 198.
- SÜHEYL ÜNVER, A. (1). *Tanksuknamei Ilhan der Fünnumu Ulumu Hatai Mukaddinesi* (Turkish tr.) T. C. Istanbul Üniversitesi Tib Tarihi Enstitüsü Adet 14. Istanbul, 1939.
- SÜHEYL ÜNVER, A. (2). *Wang Shu-ho eseri hakkında* (Turkish with Eng. summary). Tib. Fak. Mecmuası. Yıl 7, Sayı 2, Umumi no. 28. Istanbul, 1944.

- AL-SUHRAWARDY, ALLAMA SIR ABDULLAH AL-MAMUN (1) (ed.). *The Sayings of Muhammad* [hadith]. With foreword by M. K. (Mahatma) Gandhi. Murray, London, 1941. (Wisdom of the East series.)
- SUIDAS (1). *Lexicon Graece et Latine*. . . (c. +1000), ed. Aemilius Portus & Ludolph Kuster, 3 vols. Cambridge, 1705.
- SULLIVAN, M. (8). 'Kendi' (drinking vessels, Skr. *kundika*, with neck and side-spout). *ACASA*, 1957, **11**, 40.
- SUN JEN I-TU & SUN HSÜEH-CHUAN (1) (tr.). 'Thien Kung Khai Wu', *Chinese Technology in the Seventeenth Century*, by Sung Ying-Hsing. Pennsylvania State Univ. Press; University Park & London, Penn. 1966.
- SUTER, H. (1). *Die Mathematiker und Astronomen der Araber und ihre Werke*. Teubner, Leipzig, 1900. (Abhdl. z. Gesch. d. Math. Wiss. mit Einschluss ihrer Anwendungen, no. 10; supplement to *ZMP*, 45.) Additions and corrections in *AGMW*, 1902, no. 14.
- SUZUKI SHIGEAKI (1). 'Milk and Milk Products in the Ancient World.' *JSHS*, 1965, **4**, 135.
- SWEETSER, WM. (1). *Human Life*. New York, 1867.
- SWINGLE, W. T. (12). 'Notes on Chinese Accessions; chiefly Medicine, Materia Medica and Horticulture.' *ARLC/DO*, 1928/1929, 311. (On the *Pên Tshao Yen I Pu I*, the *Yeh Tshai Phu*, etc.; including translations by M. J. Hagerty.)
- SYNCELLOS, GEORGIOS (1). *Chronographia* (c. +800), ed. W. Dindorf. Weber, Bonn, 1829 (in *Corp. Script. Hist. Byz.* series). Ed. P. J. Goar, Paris, 1652.
- TANAKA, M. (1). *The Development of Chemistry in Modern Japan*. Proc. XIIth Internat. Congr. Hist. of Sci., Paris, 1968. Abstracts & Summaries, p. 232; Actes, vol. 6, p. 107.
- TANAKA, M. (2). 'A Note to the History of Chemistry in Modern Japan, [with a Select List of the most important Contributions of Japanese Scientists to Modern Chemistry].' *SHST/T*, Special Issue for the XIIth Internat. Congress of the Hist. of Sci., Paris, 1968.
- TANAKA, M. (3). 'Einige Probleme der Vorgeschichte der Chemie in Japan; Einführung und Aufnahme der modernen Materiebegriffe.' *JSHS*, 1967, **6**, 96.
- TANAKA, M. (4). 'Ein Hundert Jahre der Chemie in Japan.' *JSHS*, 1964, **3**, 89.
- TARANZANO, C. (1). *Vocabulaire des Sciences Mathématiques, Physiques et Naturelles*. 2 vols. Hsien-hsien, 1936.
- TARN, W. W. (1). *The Greeks in Bactria and India*. Cambridge, 1951.
- TASLIMI, MANUCHEHR (1). 'An Examination of the *Nihāyat al-Talab* (The End of the Search) [by 'Izz al-Dīn Aidamur ibn 'Alī ibn Aidamur al-Jildakī, c. +1342] and the Determination of its Place and Value in the History of Islamic Chemistry.' Inaug. Diss. London, 1954.
- TATARINOV, A. (2). 'Bemerkungen ü. d. Anwendung schmerzstillender Mittel bei den Operationen, und die Hydropathie, in China.' Art. in *Arbeiten d. k. Russischen Gesandtschaft in Peking über China, sein Volk, seine Religion, seine Institutionen, socialen Verhältnisse, etc.*, ed. C. Abel & F. A. Mecklenburg. Heimicke, Berlin, 1858. Vol. 2, p. 467.
- TATOJAYA, YATODHARMA (1) (tr.). *The 'Kokkokam' of Ativira Rama Pandian* [a Tamil prince at Madura, late +16th cent.]. Med. Book Co., Calcutta, 1949. Bound with R. Schmidt (3).
- TAYLOR, F. SHERWOOD (2). 'A Survey of Greek Alchemy.' *JHS*, 1930, **50**, 109.
- TAYLOR, F. SHERWOOD (3). *The Alchemists*. Heinemann, London, 1951.
- TAYLOR, F. SHERWOOD (4). *A History of Industrial Chemistry*. Heinemann, London, 1957.
- TAYLOR, F. SHERWOOD (5). 'The Evolution of the Still.' *ANS*, 1945, **5**, 185.
- TAYLOR, F. SHERWOOD (6). 'The Idea of the Quintessence.' Art. in *Science, Medicine and History* (Charles Singer Presentation Volume), ed. E. A. Underwood, Oxford, 1953. Vol. 1, p. 247.
- TAYLOR, F. SHERWOOD (7). 'The Origins of Greek Alchemy.' *AX*, 1937, **1**, 30.
- TAYLOR, F. SHERWOOD (8) (tr. and comm.). 'The Visions of Zosimos [of Panopolis].' *AX*, 1937, **1**, 88.
- TAYLOR, F. SHERWOOD (9) (tr. and comm.). 'The Alchemical Works of Stephanos of Alexandria.' *AX*, 1937, **1**, 116; 1938, **2**, 38.
- TAYLOR, F. SHERWOOD (10). 'An Alchemical Work of Sir Isaac Newton.' *AX*, 1956, **5**, 59.
- TAYLOR, F. SHERWOOD (11). 'Symbols in Greek Alchemical Writings.' *AX*, 1937, **1**, 64.
- TAYLOR, F. SHERWOOD & SINGER, CHARLES (1). 'Pre-scientific Industrial Chemistry [in the Mediterranean Civilisations and the Middle Ages].' Art. in *A History of Technology*, ed. C. Singer et al. Oxford, 1956. Vol. 2, p. 347.
- TAYLOR, J. V. (1). *The Primal Vision; Christian Presence amid African Religion*. SCM Press, London, 1963.
- TEGENGREN, F. R. (1). 'The Iron Ores and Iron Industry of China; including a summary of the Iron situation of the Circum-Pacific Region.' *MGSC*, 1921 (Ser. A), no. 2, pt. I, pp. 1-180, with Chinese abridgement of 120 pp. 1923 (Ser. A), no. 2, pt. II, pp. 181-457, with Chinese abridgement of 190 pp. The section on the Iron Industry starts from p. 297: 'General Survey; Historical Sketch' [based

- mainly on Chang Hung-Chao (1), pp. 297-314; 'Account of the Industry [traditional] in different Provinces', pp. 315-64; 'The Modern Industry', pp. 365-404; 'Circum-Pacific Region', pp. 405-end.
- TEGENGREN, F. R. (2). 'The Hsi-khuang Shan Antimony Mining Fields in Hsin-hua District, Hunan.' *BGSC*, 1921, no. 3, 1-25.
- TEGENGREN, F. R. (3). 'The Quicksilver Deposits of China.' *BGSC*, 1920, no. 2, 1-36.
- TEGGART, F. J. (1). *Rome and China; a Study of Correlations in Historical Events*. Univ. of California Press, Berkeley, Calif. 1939.
- TEICH, MIKULÁŠ (1) (ed.). *J. E. Purkyně, 'Opera Selecta'*. Prague, 1948.
- TEICH, MIKULÁŠ (2). 'From "Enchyme" to "Cyto-Skeleton"; the Development of Ideas on the Chemical Organisation of Living Matter.' Art. in *Changing Perspectives in the History of Science...*, ed. M. Teich & R. Young, Heinemann, London, 1973, p. 439.
- TEICH, MIKULÁŠ & YOUNG, R. (1) (ed.). *Changing Perspectives in the History of Science...* Heinemann, London, 1973.
- TEMKIN, O. (3). 'Medicine and Graeco-Arabic Alchemy.' *BIHM*, 1955, 29, 134.
- TEMKIN, O. (4). 'The Classical Roots of Glisson's Doctrine of Irritation.' *BIHM*, 1964, 38, 297.
- TEMPLE, SIR WM. (3). 'On Health and Long Life.' In *Works*, 1770 ed. vol. 3, p. 266.
- TESTE, A. (1). *Homoeopathic Materia Medica, arranged Systematically and Practically*. Eng. tr. from the French, by C. J. Hempel. Rademacher & Shelk, Philadelphia, 1854.
- TESTI, G. (1). *Dizionario di Alchimia e di Chimica Antiquaria*. Mediterranean, Rome, 1950. Rev. F. S[herwood] T[taylor], *AX*, 1953, 5, 55.
- THACKRAY, A. (1). "'Matter in a Nut-shell"; Newton's "Opticks" and Eighteenth-Century Chemistry.' *AX*, 1968, 15, 29.
- THELWALL, S. & HOLMES, P. (1) (tr.). *The Writings of Tertullian [c. +200]*. In Ante-Nicene Christian Library, ed. A. Roberts & J. Donaldson. Clark, Edinburgh, 1867, vols. 11, 15 and 18.
- THEOBALD, W. (1). 'Der Herstellung der Bronzefarbe in Vergangenheit und Gegenwart.' *POLYU*, 1913, 328, 163.
- THEOPHANES (+758 to +818) (1). *Chronographia*, ed. Classen (in *Corp. Script. Hist. Byz.* series).
- [THEVENOT, D.] (1) (ed.). *Scriptores Graeci Mathematici, Veterum Mathematicorum Athenaei, Bitonisi, Apollodori, Heronis et aliorum Opera Gr. et Lat. pleraque nunc primum edita* [including the *Kestoi* of Julius Africanus]. Paris, 1693.
- THOMAS, E. J. (2). '[The State of the Dead in] Buddhist [Belief].' *ERE*, vol. xi, p. 829.
- THOMAS, SIR HENRY (1). 'The Society of Chymical Physitians; an Echo of the Great Plague of London, +1665.' Art. in Singer Presentation Volume, *Science, Medicine and History*, ed. E. A. Underwood, 2 vols. Oxford, 1953. Vol. 2, p. 56.
- THOMPSON, D. V. (1). *The Materials of Mediaeval Painting*. London, 1936.
- THOMPSON, D. V. (2) (tr.). *The 'Libro dell Arte' of Cennino Cennini [+1437]*. Yale Univ. Press, New Haven, Conn. 1933.
- THOMPSON, NANCY (1). 'The Evolution of the Thang Lion-and-Grapevine Mirror.' *AA*, 1967, 29. Sep. pub. Ascona, 1968; with an addendum on the Jen Shou Mirrors by A. C. Soper.
- THOMPSON, R. CAMPBELL (5). *On the Chemistry of the Ancient Assyrians* (mimeographed, with plates of Assyrian cuneiform tablets, romanised transcriptions and translations). Luzac, London, 1925.
- THOMS, W. J. (1). *Human Longevity; its Facts and Fictions*. London, 1873.
- THOMSEN, V. (1). 'Ein Blatt in türkische "Runen"-schrift aus Turfan.' *SPAW/PH*, 1910, 296. Followed by F. C. Andreas: 'Zwei Soghdische Exkurse zu V. Thomsen's "Ein Blatt..."' 307.
- THOMSON, JOHN (2). '[Glossary of Chinese Terms for] Photographic Chemicals and Apparatus.' In Doolittle (1), vol. 2, p. 319.
- THOMSON, T. (1). *A History of Chemistry*. 2 vols. Colburn & Bentley, London, 1830.
- THORNDIKE, LYNN (1). *A History of Magic and Experimental Science*. 8 vols. Columbia Univ. Press, New York:
 Vols. 1 & 2 (The First Thirteen Centuries), 1923, repr. 1947;
 Vols. 3 and 4 (Fourteenth and Fifteenth Centuries), 1934;
 Vols. 5 and 6, (Sixteenth Century), 1941;
 Vols. 7 and 8 (Seventeenth Century), 1958.
 Rev. W. Pagel, *BIHM*, 1959, 33, 84.
- THORNDIKE, LYNN (6). 'The *cursus philosophicus* before Descartes.' *A/AIHS*, 1951, 4 (30), 16.
- THORPE, SIR EDWARD (1). *History of Chemistry*. 2 vols. in one. Watts, London, 1921.
- THURSTON, H. (1). *The Physical Phenomena of Mysticism*, ed. J. H. Crehan. Burns & Oates, London, 1952. French tr. by M. Weill, *Les Phénomènes Physiques du Mysticisme aux Frontières de la Science*. Gallimard, Paris, 1961.
- TIEFENSEE, F. (1). *Wegweiser durch die chinesischen Höflichkeits-Formen*. Deutschen Gesellsch. f. Natur- u. Völkerkunde Ostasiens, Tokyo, 1924 (*MDGNVO*, 18), and Behrend, Berlin, 1924.
- TIMKOVSKY, G. (1). *Travels of the Russian Mission through Mongolia to China, and Residence in Peking in*

- the Years 1820-1*, with corrections and notes by J. von Klaproth. Longmans, Rees, Orme, Brown & Green, London, 1827.
- TIMMINS, S. (1). 'Nickel German Silver Manufacture', art. in *The Resources, Products and Industrial History of Birmingham and the Midland Hardware District*, ed. S. Timmins. London, 1866, p. 671.
- TOBLER, A. J. (1). *Excavations at Tepe Gawra*. 2 vols. Philadelphia, 1950.
- TOLL, C. (1). *Al-Hamdānī, 'Kitāb al-Jawharatāin' etc., 'Die beiden Edelmetalle Gold und Silber', herausgegeben u. übersetzt...* University Press, Uppsala, 1968 (*UUA, Studia Semitica*, no. 1).
- TOLL, C. (2). 'Minting Technique according to Arabic Literary Sources.' *ORS*, 1970, 19-20, 125.
- TORGASHEV, B. P. (1). *The Mineral Industry of the Far East*. Chali, Shanghai, 1930.
- DE TOURNUS, J. GIRARD (1) (tr.). *Roger Bachon de l'Admirable Pouvoir et Puissance de l'Art et de Nature, ou est traité de la pierre Philosophale*. Lyons, 1557, Billaine, Paris, 1628. Tr. of *De Mirabili Potestate Artis et Naturae, et de Nullitate Magiae*.
- TRIGAULT, NICHOLAS (1). *De Christiana Expeditione apud Sinas*. Vienna, 1615; Augsburg, 1615. Fr. tr.: *Histoire de l'Expédition Chrétienne au Royaume de la Chine, entrepris par les PP. de la Compagnie de Jésus, comprise en cinq livres...* tirée des Commentaires du P. Matthieu Riccius, etc. Lyon, 1616; Lille, 1617; Paris, 1618. Eng. tr. (partial): *A Discourse of the Kingdom of China, taken out of Riccius and Trigaultius*, In *Purchas his Pilgrimes*. London, 1625, vol. 3, p. 380. Eng. tr. (full): see Gallagher (1). Trigault's book was based on Ricci's *I Commentarj della Cina* which it follows very closely, even verbally, by chapter and paragraph, introducing some changes and amplifications, however. Ricci's book remained unprinted until 1911, when it was edited by Venturi (1) with Ricci's letters; it has since been more elaborately and sumptuously edited alone by d'Elia (2).
- TSHAO THHEN-CHHIN, HO PING-YÜ & NEEDHAM, JOSEPH (1). 'An Early Mediaeval Chinese Alchemical Text on Aqueous Solutions' (the *San-shih-liu Shui Fa*, early +6th century). *AX*, 1959, 7, 122. Chinese tr. by Wang Khuei-Kho (1), *KHSC*, 1963, no. 5, 67.
- TSO, E. (1). 'Incidence of Rickets in Peking; Efficacy of Treatment with Cod-liver Oil.' *CMJ*, 1924, 38, 112.
- TSUKAHARA, T. & TANAKA, M. (1). 'Edward Divers; his Work and Contribution to the Foundation of [Modern] Chemistry in Japan.' *SHST/T*, 1965, 4.
- TU YÜ-TSHANG, CHIANG JUNG-CHHENG & TSOU CHHËNG-LU (1). 'Conditions for the Successful Resynthesis of Insulin from its Glycyl and Phenylalanyl Chains.' *SCISA*, 1965, 14, 229.
- TUCCI, G. (4). 'Animadversiones Indicae; VI, A Sanskrit Biography of the Siddhas, and some Questions connected with Nāgārjuna.' *JRAS/B*, 1930, 26, 138.
- TUCCI, G. (5). *Teoria e Practica del Maṇḍala*. Rome, 1949. Eng. tr. London, 1961.
- ULSTADT, PHILIP (1). *Coelum Philosophorum seu de Secretis Naturae Liber*. Strassburg, 1526 and many subsequent eds.
- UNDERWOOD, A. J. V. (1). 'The Historical Development of Distilling Plant.' *TICE*, 1935, 13, 34.
- URDANG, G. (1). 'How Chemicals entered the Official Pharmacopoeias.' *A/AHS*, 1954, 7, 303.
- URE, A. (1). *A Dictionary of Arts, Manufactures and Mines*. 1st ed., 2 vols, London, 1839. 5th ed. 3 vols. ed. R. Hunt, Longman, Green, Longman & Roberts, London, 1860.
- VACCA, G. (2). 'Nota Cinesi.' *RSO*, 1915, 6, 131. (1) A silkworm legend from the *Sou Shen Chi*. (2) The fall of a meteorite described in *Mêng Chhi Pi Than*. (3) Invention of movable type printing (*Mêng Chhi Pi Than*). (4) A problem of the mathematician I-Hsing (chess permutations and combinations) in *Mêng Chhi Pi Than*. (5) An alchemist of the +11th century (*Mêng Chhi Pi Than*).
- VAILLANT, A. (1) (tr.). *Le Livre des Secrets d'Hénoch; Texte Slave et Traduction Française*. Inst. d'Études Slaves, Paris, 1952. (Textes Publiés par l'Inst. d'Ét. Slaves, no. 4.)
- VALESIUS, HENRICUS (1). *Polybii, Diodori Siculi, Nicolai Damasceni, Dionysii Halicarnassii, Appiani, Alexandri Dionisii et Joannis Antiochani, Excerpta et Collectaneis Constantini Augusti [VII] Porphyrogenetae...* nunc primum Graece edidit, Latine vertit, Notisque illustravit. Du Puis, Paris, 1634.
- DE LA VALLÉE-POUSSIN, L. (9). '[The "Abode of the Blest" in] Buddhist [Belief].' *ERE*, vol. ii, p. 686.
- VANDERMONDE, J. F. (1). 'Eaux, Feu (et Cautères), Terres etc., Métaux, Minéraux et Sels, du *Pên Ts'ao Kang Mou*.' MS., accompanied by 80 (now 72) specimens of inorganic substances collected and studied at Macao or on Poulou Condor Island in +1732, then presented to Bernard de Jussieu, who deposited them in the Musée d'Histoire Naturelle at Paris. The samples were analysed for E. Biot (22) by Alexandre Brongniart (in 1835 to 1840), and the MS. text (which had been acquired from the de Jussieu family by the Museum in 1857) printed in excerpt form by de Mély (1), pp. 156-248. Between 1840 and 1895 the collection was lost, but found again by Lacroix, and the MS. text, not catalogued at the time of acquisition, was also lost, but found again by Deniker; both in time for the work of de Mély.
- VARENIUS, BERNARD (1). *Descriptio Regni Japoniae et Siam; item de Japoniorum Religione et Siamensium; de Diversis Omnium Gentium Religionibus...* Hayes, Cambridge, 1673.

- VARENIUS, BERNARD (2). *Geographiae Generalis, in qua Affectiones Generales Telluris explicantur summa cura quam plurimus in locis Emendata, et XXXIII Schematibus Novis, aere incisus, una cum Tabb. alicquot quae desiderabantur Aucta et Illustrata, ab Isaaco Newton, Math. Prof. Luciano apud Cantabrigiensi.* Hayes, Cambridge, 1672. 2nd ed. (*Auctior et Emendatior*), 1681.
- VÄTH, A. (1) (with the collaboration of L. van Hée). *Johann Adam Schall von Bell, S. J., Missionar in China, Kaiserlicher Astronom und Ratgeber am Hofe von Peking; ein Lebens- und Zeit-bild.* Bachern, Köln, 1933. (Veröffentlichungen des Rheinischen Museums in Köln, no. 2.) Crit. P. Pelliot, *TP*, 1934, 31, 178.
- VAUGHAN, T. [Eugenius Philalethes] (1), (attrib.), *A Brief Natural History, intermixed with a Variety of Philosophical Discourses, and Observations upon the Burning of Mount Aetna; with Refutations of such vulgar Errors as our Modern Authors have omitted.* Smelt, London, 1669. See Ferguson (1), vol. 2, p. 197; Waite (4), p. 492.
- VAUGHAN, T. (Eugenius Philalethes) (2). *Magia Adamica; or, the Antiquitie of Magic, and the Descent thereof from Adam downwards proved; Whereunto is added, A Perfect and True Discoverie of the True Coelum Terrae, or the Magician's Heavenly Chaos, and First Matter of All Things.* London, 1650. Repr. in Waite (5). Germ. ed. Amsterdam, 1704. See Ferguson (1), vol. 2, p. 196.
- DE VAUX, B. CARRA (5). 'L'Abrégé des Merveilles' (*Mukhtaşaru'l-'Ajā'ib*) traduit de l'Arabe... (A work attributed to al-Mas'ūdī.) Klincksieck, Paris, 1898.
- VAVILOV, S. I. (1). 'Newton and the Atomic Theory.' Essay in *Newton Tercentenary Celebrations Volume* (July 1946). Royal Society, London, 1947, p. 43.
- DE VEER, GERARD (1). 'The Third Voyage Northward to the Kingdoms of Cathaia, and China, Anno 1596.' In *Purchas his Pilgrimes, 1625 ed.*, vol. 3, pt. 2, bk. iii. p. 482; ed. of McLehose, Glasgow, 1906, vol. 13, p. 91.
- WEI CHOW JUAN. See Wei Chou-Yuan.
- VELER, C. D. & DOISY, E. A. (1). 'Extraction of Ovarian Hormone from Urine.' *PSEBM*, 1928, 25, 806.
- VON VELTHEIM, COUNT (1). *Von den goldgrabenden Ameisen und Greiffen der Alten; eine Vermuthung.* Helmstadt, 1799.
- VERHAEREN, H. (1). *L'Ancienne Bibliothèque du Pé-T'ang.* Lazaristes Press, Peking, 1940.
- DI VILLA, E. M. (1). *The Examination of Mines in China.* North China Daily Mail, 'Tientsin, 1919.
- DE VILLARD, UGO MONNERET (2). *Le Leggende Orientali sui Magi Evangelici.* Vatican City, 1952. (Studie Testi, no. 163.)
- DE VISSER, M. W. (2). *The Dragon in China and Japan.* Müller, Amsterdam, 1913. Orig. in *VKAWA/L*, 1912 (n. r.), 13 (no. 2.).
- V[OGT], E. (1). 'The Red Colour Used in [Palaeolithic and Neolithic] Graves.' *CIBA/T*, 1947, 5 (no. 54), 1968.
- VOSSIUS, G. J. (1). *Etymologicon Linguae Latinae.* Martin & Allestry, London, 1662; also Amsterdam, 1695, etc.
- WADDELL, L. A. (4). '[The State of the Dead in] Tibetan [Religion].' *ERE*, vol. xi, p. 853.
- WAITE, A. E. (1). *Lives of Alchemystical Philosophers, based on Materials collected in 1815 and supplemented by recent Researches; with a Philosophical Demonstration of the True Principles of the Magnum Opus or Great Work of Alchemical Re-construction, and some Account of the Spiritual Chemistry...; to Which is added, a Bibliography of Alchemy and Hermetic Philosophy.* Redway, London, 1888. Based on: [Barrett, Francis], (attrib.). *The Lives of Alchemystical Philosophers; with a Critical Catalogue of Books in Occult Chemistry, and a Selection of the most Celebrated Treatises on the Theory and Practice of the Hermetic Art.* Lackington & Allen, London, 1814, with title-page slightly changed, 1815. See Ferguson (1), vol. 2, p. 41. The historical material in both these works is now totally unreliable and outdated; two-thirds of it concerns the 17th century and later periods, even as enlarged and re-written by Waite. The catalogue is 'about the least critical compilation of the kind extant'.
- WAITE, A. E. (2). *The Secret Tradition in Alchemy; its Development and Records.* Kegan Paul, Trench & Trübner, London; Knopf, New York, 1926.
- WAITE, A. E. (3). *The Hidden Church of the Holy Graal [Grail]; its Legends and Symbolism considered in their Affinity with certain Mysteries of Initiation and Other Traces of a Secret Tradition in Christian Times.* Rebman, London, 1909.
- WAITE, A. E. (4) (ed.). *The Works of Thomas Vaughan; Eugenius Philalethes...* Theosophical Society, London, 1919.
- WAITE, A. E. (5) (ed.). *The Magical Writings of Thomas Vaughan (Eugenius Philalethes); a verbatim reprint of his first four treatises; 'Anthroposophia Theomagica', 'Anima Magica Abscondita', 'Magia Adamica' and the 'Coelum Terrae'.* Redway, London, 1888.

- WAITE, A. E. (6) (tr.). *The Hermetic and Alchemical Writings of Aureolus Philippus Theophrastus Bombast of Hohenheim, called Paracelsus the Great*. . . 2 vols. Elliott, London, 1894. A translation of the Latin Works, Geneva, 1658.
- WAITE, A. E. (7) (tr.). *The 'New Pearl of Great Price', a Treatise concerning the Treasure and most precious Stone of the Philosophers* [by P. Bonus of Ferrara, c. + 1330]. Elliott, London, 1894. Tr. from the Aldine edition (1546).
- WAITE, A. E. (8) (tr.). *The Hermetic Museum Restored and Enlarged; most faithfully instructing all Disciples of the Sopho-Spagyric Art how that Greatest and Truest Medicine of the Philosophers' Stone may be found and held; containing Twenty-two most celebrated Chemical Tracts*. 2 vols. Elliott, London, 1893, later repr. A translation of Anon. (87).
- WAITE, A. E. (9). *The Brotherhood of the Rosy Cross; being Records of the House of the Holy Spirit in its Inward and Outward History*. Rider, London, 1924.
- WAITE, A. E. (10). *The Real History of the Rosicrucians*. London, 1887.
- WAITE, A. E. (11) (tr.). *The 'Triumphal Chariot of Antimony', by Basilius Valentinus, with the Commentary of Theodore Kerckringius*. London, 1893. A translation of the Latin *Curus Triumphalis Antimonii*, Amsterdam, 1685.
- WAITE, A. E. (12). *The Holy Kabbalah; a Study of the Secret Tradition in Israel as unfolded by Sons of the Doctrine for the Benefit and Consolation of the Elect dispersed through the Lands and Ages of the Greater Exile*. Williams & Norgate, London, 1929.
- WAITE, A. E. (13) (tr.). *The 'Turba Philosophorum', or, 'Assembly of the Sages'; called also the 'Book of Truth in the Art' and the Third Pythagorical Synod; an Ancient Alchemical Treatise translated from the Latin, [together with] the Chief Readings of the Shorter Codex, Parallels from the Greek Alchemists, and Explanations of Obscure Terms*. Redway, London, 1896.
- WAITE, A. E. (14). 'The Canon of Criticism in respect of Alchemical Literature.' *JALCHS*, 1913, 1, 17. His reply to the discussion, p. 32.
- WAITE, A. E. (15). 'The Beginnings of Alchemy.' *JALCHS*, 1915, 3, 90. Discussion, pp. 101 ff.
- WAITE, A. E. See also Stenring (1).
- WAKEMAN, F. (1) (ed.). *Wu Yin Lu, 'Nothing Concealed'; Essays in Honour of Liu (Aisin-Gioro) Yü-Yün*. Chinese Materials and Research Aids Service Centre, Taipei, Taiwan, 1970.
- WALAAS, O. (1) (ed.). *The Molecular Basis of Some Aspects of Mental Activity*. 2 vols. Academic Press, London and New York, 1966-7.
- WALDEN, P. (1). *Mass, Zahl und Gewicht in der Chemie der Vergangenheit; ein Kapitel aus der Vorgeschichte des Sogenannten quantitative Zeitalters der Chemie*. Enke, Stuttgart, 1931. Repr. Liebing, Würzburg, 1970. (Samml. chem. u. chem. techn. Vorträge, N.F. no. 8.)
- WALDEN, P. (2). 'Zur Entwicklungsgeschichte d. chemischen Zeichen.' Art. in *Studien z. Gesch. d. Chemie* (von Lippmann Festschrift), ed. J. Ruska. Springer, Berlin, 1927, p. 80.
- WALDEN, P. (3). *Geschichte der Chemie*. Universitätsdruckerei, Bonn, 1947. 2nd ed. Athenäum, Bonn, 1950.
- WALDEN, P. (4). 'Paracelsus und seine Bedeutung für die Chemie.' *ZAC/AC*, 1941, 54, 421.
- WALEY, A. (1) (tr.). *The Book of Songs*. Allen & Unwin, London, 1937.
- WALEY, A. (4) (tr.). *The Way and its Power; a Study of the 'Tao Tê Ching' and its Place in Chinese Thought*. Allen & Unwin, London, 1934. Crit. Wu Ching-Hsiang, *TH*, 1935, 1, 225.
- WALEY, A. (10) (tr.). *The Travels of an Alchemist; the Journey of the Taoist [Chhiu] Chhang-Chhun from China to the Hindu-Kush at the summons of Chingiz Khan, recorded by his disciple Li Chih-Chhang*. Routledge, London, 1931. (Broadway Travellers Series.) Crit. P. Pelliot, *TP*, 1931, 28, 413.
- WALEY, A. (14). 'Notes on Chinese Alchemy, supplementary to Johnson's "Study of Chinese Alchemy"' *BLSOAS*, 1930, 6, 1. Revs. P. Pelliot, *TP*, 1931, 28, 233; Tenney L. Davis, *ISIS*, 1932, 17, 440.
- WALEY, A. (17). *Monkey*, by Wu Chhêng-ên. Allen & Unwin, London, 1942.
- WALEY, A. (23). *The Nine Songs; a study of Shamanism in Ancient China* [the *Chiu Ko* attributed traditionally to Chhü Yuan]. Allen & Unwin, London, 1955.
- WALEY, A. (24). 'References to Alchemy in Buddhist Scriptures.' *BLSOAS*, 1932, 6, 1102.
- WALEY, A. (27) (tr.). *The Tale of Genji*. 6 vols. Allen & Unwin, London; Houghton Mifflin, New York, 1925-33.
- Vol. 1 *The Tale of Genji*.
- Vol. 2 *The Sacred Tree*.
- Vol. 3 *A Wreath of Cloud*.
- Vol. 4 *Blue Trousers*.
- Vol. 5 *The Lady of the Boat*.
- Vol. 6 *The Bridge of Dreams*.
- WALKER, D. P. (1). 'The Survival of the "Ancient Theology" in France, and the French Jesuit Missionaries in China in the late Seventeenth Century.' MS. of Lecture at the Cambridge History of Science Symposium, Oct. 1969. Pr. in Walker (2) pp. 194 ff.

- WALKER, D. P. (2). *The Ancient Theology; Studies in Christian Platonism from the +15th to the +18th Century*. Duckworth, London, 1972.
- WALKER, D. P. (3). 'Francis Bacon and *Spiritus*', art. in *Science, Medicine and Society in the Renaissance* (Pagel Presentation Volume), ed. Debus (20), vol. 2, p. 121.
- WALKER, W. B. (1). 'Luigi Cornaro; a Renaissance Writer on Personal Hygiene.' *BIHM*, 1954, 28, 525.
- WALLACE, R. K. (1). 'Physiological Effects of Transcendental Meditation.' *SC*, 1970, 167, 1751.
- WALLACE, R. K. & BENSON, H. (1). 'The Physiology of Meditation.' *SAM*, 1972, 226 (no. 2), 84.
- WALLACE, R. K., BENSON, H. & WILSON, A. F. (1). 'A Wakeful Hypometabolic Physiological State.' *AJOP*, 1971, 221, 795.
- WALLACKER, B. E. (1) (tr.). *The 'Huai Nan Tzu' Book*, [Ch.] 11; *Behaviour, Culture and the Cosmos*. Amer. Oriental Soc., New Haven, Conn. 1962. (Amer. Oriental Series, no. 48.)
- VAN DE WALLE, B. (1). 'Le Thème de la Satire des Métiers dans la Littérature Egyptienne.' *CEG*, 1947, 43, 50.
- WALLESER, M. (3). 'The Life of Nāgārjuna from Tibetan and Chinese Sources.' *AM* (Hirth Anniversary Volume), 1, 1.
- WALSHE, W. G. (1). '[Communion with the Dead in] Chinese [Thought and Liturgy].' *ERE*, vol. iii, p. 728.
- WALTON, A. HULL. See Davenport, John.
- WANG, CHHUNG-YU (1). *Bibliography of the Mineral Wealth and Geology of China*. Griffin, London, 1912.
- WANG, CHHUNG-YU (2). *Antimony; its History, Chemistry, Mineralogy, Geology, Metallurgy, Uses, Preparations, Analysis, Production and Valuation; with Complete Bibliographies*. Griffin, London, 1909.
- WANG CHHUNG-YU (3). *Antimony; its Geology, Metallurgy, Industrial Uses and Economics*. Griffin, London, 1952. ('3rd edition' of Wang Chhung-Yu(2), but it omits the chapters on the history, chemistry, mineralogy and analysis of antimony, while improving those that are retained.)
- WANG CHI-MIN & WU LIEN-TÊ (1). *History of Chinese Medicine*. Nat. Quarantine Service, Shanghai, 1932, 2nd ed. 1936.
- WANG CHIUNG-MING (1). 'The Bronze Culture of Ancient Yunnan.' *PKR*, 1960 (no. 2), 18. Reprinted in mimeographed form, Collet's Chinese Bookshop, London, 1960.
- WANG LING (1). 'On the Invention and Use of Gunpowder and Firearms in China.' *ISIS*, 1947, 37, 160.
- WARE, J. R. (1). 'The *Wei Shu* and the *Sui Shu* on Taoism.' *JAS*, 1933, 53, 215. Corrections and emendations in *JAS*, 1934, 54, 290. Emendations by H. Maspero, *JAS*, 1935, 226, 313.
- WARE, J. R. (5) (tr.). *Alchemy, Medicine and Religion in the China of +320; the 'Nei Phien' of Ko Hung ('Pao Phu Tzu')*. M.I.T. Press, Cambridge, Mass. and London, 1966. Revs. Ho Ping-Yü, *JAS*, 1967, 27, 144; J. Needham, *TCULT*, 1969, 10, 90.
- WARREN, W. F. (1). *The Earliest Cosmologies; the Universe as pictured in Thought by the Ancient Hebrews, Babylonians, Egyptians, Greeks, Iranians and Indo-Aryans—a Guidebook for Beginners in the Study of Ancient Literatures and Religions*. Eaton & Mains, New York; Jennings & Graham, Cincinnati, 1909.
- WASHBURN, E. W. (1). 'Molecular Stills.' *BSJR*, 1929, 2 (no. 3), 476. Part of a collective work by E. W. Washburn, J. H. Bruun & M. M. Hicks: *Apparatus and Methods for the Separation, Identification and Determination of the Chemical Constituents of Petroleum*, p. 467.
- WASITZKY, A. (1). 'Ein einfacher Mikro-extraktionsapparat nach dem Soxhlet-Prinzip.' *MIK*, 1932, 11, 1.
- WASSON, R. G. (1). 'The Hallucinogenic Fungi of Mexico; an Enquiry into the Origins of the Religious Idea among Primitive Peoples.' *HU/BML*, 1961, 19, no. 7. (Ann. Lecture, Mycol. Soc. of America.)
- WASSON, R. G. (2). '*Ling Chih* [the Numinous Mushroom]; Some Observations on the Origins of a Chinese Conception.' Unpub. MS. Memorandum, 1962.
- WASSON, R. G. (3). *Soma; Divine Mushroom of Immortality*. Harcourt, Brace & World, New York; Mouton, The Hague, 1968. (Ethno-Mycolological Studies, no. 1.) With extensive contributions by W. D. O'Flaherty. Rev. F. B. J. Kuiper, *IJF*, 1970, 12 (no. 4), 279; followed by comments by R. G. Wasson, 286.
- WASSON, R. G. (4). 'Soma and the Fly-Agaric; Mr Wasson's Rejoinder to Prof. Brough.' *Bot. Mus. Harvard Univ. Cambridge, Mass.* 1972. (Ethno-Mycolological Studies, no. 2.)
- WASSON, R. G. & INGALLS, D. H. H. (1). 'The Soma of the *Rig Veda*; what was it?' (Summary of his argument by Wasson, followed by critical remarks by Ingalls.) *JAS*, 1971, 91 (no. 2). Separately issued as: *R. Gordon Wasson on Soma and Daniel H. H. Ingalls' Response*. Amer. Oriental Soc. New Haven, Conn. 1971. (Essays of the Amer. Orient. Soc. no. 7.)
- WASSON, R. G. & WASSON, V. P. (1). *Mushrooms, Russia and History*. 2 vols. Pantheon, New York, 1957.

- WATERMANN, H. I. & ELSBACH, E. B. (1). 'Molecular stills.' *CW*, 1929, **26**, 469.
- WATSON, BURTON (1) (tr.). 'Records of the Grand Historian of China', translated from the 'Shih Chi' of *Ssuma Chhien*. 2 vols. Columbia University Press, New York, 1961.
- WATSON, R., Bp of Llandaff (1). *Chemical Essays*. 2 vols. Cambridge, 1781; vol. 3, 1782; vol. 4, 1786; vol. 5, 1787. 2nd ed. 3 vols. Dublin, 1783. 5th ed. 5 vols., Evans, London, 1789. 3rd ed. Evans, London, 1788. 6th ed. London, 1793-6.
- WATSON, WM. (4). *Ancient Chinese Bronzes*. Faber & Faber, London, 1962.
- WATTS, A. W. (2). *Nature, Man and Woman; a New Approach to Sexual Experience*. Thames & Hudson, London; Pantheon, New York, 1958.
- WAYMAN, A. (1). 'Female Energy and Symbolism in the Buddhist Tantras.' *HOR*, 1962, **2**, 73.
- WESBTER, C. (1). 'English Medical Reformers of the Puritan Revolution; a Background to the "Society of Chymical Physitians".' *AX*, 1967, **14**, 16.
- WEEKS, M. E. (1). *The Discovery of the Elements; Collected Reprints of a series of articles published in the Journal of Chemical Education; with Illustrations collected by F. B. Dains*. Mack, Easton, Pa. 1933. Chinese tr. *Yuan Su Fa-Hsien Shih* by Chang Tzu-Kung, with additional material. Shanghai, 1941.
- WEI CHOU-YUAN (VEI CHOU JUAN) (1). 'The Mineral Resources of China.' *EG*, 1946, **41**, 399-474.
- VON WEIGEL, C. E. (1). *Observationes Chemicæ et Mineralogicæ*. Pt. 1, Göttingen, 1771; pt. 2, Gryphiae, 1773.
- WEISS, H. B. & CARRUTHERS, R. H. (1). *Insect Enemies of Books* (63 pp. with extensive bibliography). New York Public Library, New York, 1937.
- WELCH, HOLMES, H. (1). *The Parting of the Way; Lao Tzu and the Taoist Movement*. Beacon Press, Boston, Mass. 1957.
- WELCH, HOLMES H. (2). 'The Chang Thien Shih ["Taoist Pope"] and Taoism in China.' *JOSHK*, 1958, **4**, 188.
- WELCH, HOLMES H. (3). 'The Bellagio Conference on Taoist Studies.' *HOR*, 1970, **9**, 107.
- WELLMANN, F. (1). 'Die Stein- u. Gemmen-Bücher d. Antike.' *QSGNM*, 1935, **4**, 86.
- WELLMANN, M. (2). 'Die $\Phi\upsilon\sigma\iota\kappa\acute{\alpha}$ des Bolos Democritos und der Magier Anaxilaos aus Larissa.' *APAW/PH*, 1928 (no. 7).
- WELLMANN, M. (3). 'Die "Georgika" des [Bolos] Demokritos.' *APAW/PH*, 1921 (no. 4), 1-.
- WELLS, D. A. (1). *Principles and Applications of Chemistry*. Ivison, Blakeman & Taylor, New York and Chicago, 1858. Chinese tr. by J. Fryer & Hsü Shou, Shanghai, 1871.
- WELTON, J. (1). *A Manual of Logic*. London, 1896.
- WENDTNER, K. (1). 'Assaying in the Metallurgical Books of the +16th Century.' Inaug. Diss. London, 1952.
- WENGER, M. A. & BAGCHI, B. K. (1). 'Studies of Autonomic Functions in Practitioners of Yoga in India.' *BS*, 1961, **6**, 312.
- WENGER, M. A., BAGCHI, B. K. & ANAND, B. K. (1). 'Experiments in India on the "Voluntary" Control of the Heart and Pulse.' *CIRC*, 1961, **24**, 1319.
- WENSINCK, A. J. (2). *A Handbook of Early Muhammadan Tradition, Alphabetically Arranged*. Brill, Leiden, 1927.
- WENSINCK, A. J. (3). 'The Etymology of the Arabic Word *djinn*.' *VMAWA*, 1920, 506.
- WERTHEIMER, E. (1). Art. 'Arsenic' in *Dictionnaire de Physiologie*, ed. C. Richet, vol. i. Paris.
- WERTIME, T. A. (1). 'Man's First Encounters with Metallurgy.' *SC*, 1964, **146**, 1257.
- WEST, M. (1). 'Notes on the Importance of Alchemy to Modern Science in the Writings of Francis Bacon and Robert Boyle.' *AX*, 1961, **9**, 102.
- WEST, M. L. (1). *Early Greek Philosophy and the Orient*. Oxford, 1971.
- WESTBERG, F. (1). *Die Fragmente des Toparcha Gothicus (Anonymus Tauricus, 'Zapisk got'skogo toparcha')*; Nachdruck der Ausgabe St. Petersburg, 1901, mit einem wissenschafts-geschichtlichen Vorwort in englischer Sprache von Ihor Ševčenko (Washington). Zentralantiquariat der D. D. R., Leipzig, 1971. (Subsidia Byzantina, no. 18.)
- WESTBROOK, J. H. (1). 'Historical Sketch [of Intermetallic Compounds].' Xerocopy of art. without indication of place or date of pub., comm. by the author, General Electric Co., Schenectady, N.Y.
- WESTERBLAD, C. A. (1). *Pehr Henrik Ling; en Lefnadsteckning och några Sympunkter* [in Swedish]. Norstedt, Stockholm, 1904. *Ling, the Founder of the Swedish Gymnastics*. London, 1909.
- WESTERBLAD, C. A. (2). *Ling; Tidshistoriska Undersökningar* [in Swedish]. Norstedt, Stockholm. Vol. 1, *Den Lingska Gymnastiken i dess Upphovsmans Dagar*, 1913. Vol. 2, *Personlig och allmän Karakteristik samt Litterär Analys*, 1916.
- WESTFALL, R. S. (1). 'Newton and the Hermetic Tradition', art. in *Science, Medicine and Society in the Renaissance* (Pagel Presentation Volume), ed. Debus (20), vol. 2, p. 183.
- WEULE, K. (1). *Chemische Technologie der Naturvölker*. Stuttgart, 1922.

- WEYNANTS-RONDAY, M. (1). *Les Statues Vivantes; Introduction à l'Étude des Statues Égyptiennes*. . . Fond. Egyptol. Reine Elis., Brussels, 1926.
- WHEELER, A. S. (1). 'Antimony Production in Hunan Province.' *TIMM*, 1916, 25, 366.
- WHEELER, A. S. & LI, S. Y. (1). 'The Shui-ko-shan [Shui-khou Shan] Zinc and Lead Mine in Hunan [Province].' *MIMG*, 1917, 16, 91.
- WHITE, J. H. (1). *The History of the Phlogiston Theory*. Arnold, London, 1932.
- WHITE, LYNN (14). *Machina ex Deo; Essays in the Dynamism of Western Culture*. M.I.T. Press, Cambridge, Mass. 1968.
- WHITE, LYNN (15). 'Mediaeval Borrowings from Further Asia.' *MRS*, 1971, 5, 1.
- WHITE, W. C., Bp. of Honan (3). *Bronze Culture of Ancient China; an archaeological Study of Bronze Objects from Northern Honan dating from about -1400 to -771*. Univ. of Toronto Press, Toronto, 1956 (Royal Ontario Museum Studies, no. 5).
- WHITFORD, J. (1). 'Preservation of bodies after arsenic poisoning.' *BMJ*, 1884, pt. 1, 504.
- WHITLA, W. (1). *Elements of Pharmacy, Materia Medica and Therapeutics*. Renshaw, London, 1903.
- WHITNEY, W. D. & LANMAN, C. R. (1) (tr.). *Atharva-veda Samhitā*. 2 vols. Harvard Univ. Press, Cambridge, Mass. 1905. (Harvard Oriental Series, nos. 7, 8.)
- WIBERG, A. (1). 'Till Frågan om Destilleringsförfarandets Genesis; en Etnologisk-Historisk Studie' [in Swedish]. *SBM*, 1937 (nos. 2-3), 67, 105.
- WIDENGREN, GEO. (1). 'The King and the Tree of Life in Ancient Near Eastern Religion.' *UUA*, 1951, 4, 21.
- WIEDEMANN, E. (7). 'Beiträge z. Gesch. d. Naturwiss.; VI, Zur Mechanik und Technik bei d. Arabern.' *SPMSE*, 1906, 38, 1. Repr. in (23), vol. 1, p. 173.
- WIEDEMANN, E. (11). 'Beiträge z. Gesch. d. Naturwiss.; XV, Über die Bestimmung der Zusammensetzung von Legierungen.' *SPMSE*, 1908, 40, 105. Repr. in (23), vol. 1, p. 464.
- WIEDEMANN, E. (14). 'Beiträge z. Gesch. d. Naturwiss.; XXV, Über Stahl und Eisen bei d. muslimischen Völkern.' *SPMSE*, 1911, 43, 114. Repr. in (23), vol. 1, p. 731.
- WIEDEMANN, E. (15). 'Beiträge z. Gesch. d. Naturwiss.; XXIV, Zur Chemie bei den Arabern' (including a translation of the chemical section of the *Mafāhīh al-'Ulūm* by Abū 'Abdallah al-Khwārizmī al-Kātib, c. +976). *SPMSE*, 1911, 43, 72. Repr. in (23), vol. 1, p. 689.
- WIEDEMANN, E. (21). 'Zur Alchemie bei den Arabern.' *JPC*, 1907, 184 (N.F. 76), 105.
- WIEDEMANN, E. (22). 'Über chemische Apparate bei den Arabern.' Art. in the Kahlbaum Gedächtnisschrift: *Beiträge aus d. Gesch. d. Chemie*. . . ed. P. Diergart (1), 1909, p. 234.
- WIEDEMANN, E. (23). *Aufsätze zur arabischen Wissenschaftsgeschichte* (a reprint of his 79 contributions in the series 'Beiträge z. Geschichte d. Naturwissenschaften' in *SPMSE*), ed. W. Fischer, with full indexes. 2 vols. Olm, Hildesheim and New York, 1970.
- WIEDEMANN, E. (24). 'Beiträge z. Gesch. d. Naturwiss.; I, Beiträge z. Geschichte der Chemie bei den Arabern.' *SPMSE*, 1902, 34, 45. Repr. in (23), vol. 1, p. 1.
- WIEDEMANN, E. (25). 'Beiträge z. Gesch. d. Naturwiss.; LXIII, Zur Geschichte der Alchemie.' *SPMSE*, 1921, 53, 97. Repr. in (23), vol. 2, p. 545.
- WIEDEMANN, E. (26). 'Beiträge z. Mineralogie u.s.w. bei den Arabern.' Art. in *Studien z. Gesch. d. Chemie* (von Lippmann Festschrift), ed. J. Ruska. Springer, Berlin, 1927, p. 48.
- WIEDEMANN, E. (27). 'Beiträge z. Gesch. d. Naturwiss.; II, 1. Einleitung, 2. Ü. elektrische Erscheinungen, 3. Ü. Magnetismus, 4. Optische Beobachtungen, 5. Ü. einige physikalische usf. Eigenschaften des Goldes, 6. Zur Geschichte d. Chemie (a) Die Darstellung der Schwefelsäure durch Erhitzen von Vitriolen, die Wärme-entwicklung beim Mischen derselben mit Wasser, und ü. arabische chemische Bezeichnungen, (b) Astrologie und Alchemie, (c) Anschauungen der Araber ü. die Metallverwandlung und die Bedeutung des Wortes al-Kimiya.' *SPMSE*, 1904, 36, 309. Repr. in (23), vol. 1, p. 15.
- WIEDEMANN, E. (28). 'Beiträge z. Gesch. d. Naturwiss.; XL, Über Verfälschungen von Drogen usw. nach Ibn Bassām und Nabarāwī.' *SPMSE*, 1914, 46, 172. Repr. in (23), vol. 2, p. 102.
- WIEDEMANN, E. (29). 'Zur Chemie d. Araber.' *ZDMG*, 1878, 32, 575.
- WIEDEMANN, E. (30). 'Al-Kimīyā.' Art. in *Encyclopaedia of Islam*, vol. ii, p. 1010.
- WIEDEMANN, E. (31). 'Beiträge zur Gesch. der Naturwiss.; LVII, Definition verschiedener Wissenschaften und über diese verfasste Werke.' *SPMSE*, 1919, 50-51, 1. Repr. in (23), vol. 2, p. 431.
- WIEDEMANN, E. (32). *Zur Alchemie bei den Arabern*. Mencke, Erlangen, 1922. (Abhandlungen zur Gesch. d. Naturwiss. u. d. Med., no. 5.) Translation of the entry on alchemy in Haji Khalifa's Bibliography and of excerpts from al-Jildaki, with a biographical glossary of Arabic alchemists.
- WIEDEMANN, E. (33). 'Beiträge zur Gesch. der Naturwiss.; V, Auszüge aus arabischen Enzyklopädien und anderes.' *SPMSE*, 1905, 37, 392. Repr. in (23), vol. 1, p. 109.
- WIEGER, L. (2). *Textes Philosophiques*. (Ch and Fr.) Mission Press, Hsien-hsien, 1930.
- WIEGER, L. (3). *La Chine à travers les Ages; Précis, Index Biographique et Index Bibliographique*. Mission Press, Hsien-hsien, 1924. Eng. tr. E. T. C. Werner.

- WIEGER, L. (6) *Taoisme*. Vol. 1. *Bibliographie Générale*: (1) Le Canon (Patrologie); (2) Les Index Officiels et Privés. Mission Press, Hsien-hsien, 1911. Crit. P. Pelliot, *JA*, 1912 (10^e Sér.) 20, 141.
- WIEGER, L. (7) *Taoisme*. Vol. 2. *Les Pères du Système Taoïste* (tr. selections of Lao Tzu, Chuang Tzu, Lieh Tzu). Mission Press, Hsien-hsien, 1913.
- WIEGLEB, J. C. (1). *Historisch-kritische Untersuchung der Alchemie, oder den eingebildeten Goldmacherskunst; von ihrem Ursprunge sowohl als Fortgange, und was nun von ihr zu halten sey*. Hoffmanns Wittve und Erben, Weimar, 1777. 2nd ed. 1793. Photolitho repr. of the original ed., Zentral-Antiquariat D.D.R. Leipzig, 1965. Cf. Ferguson (1), vol. 2, p. 546.
- WIGGLESWORTH, V. B. (1). 'The Insect Cuticle.' *BR*, 1948, 23, 408.
- WILHELM, HELLMUT (6). 'Eine Chou-Inschrift über Atemtechnik.' *MS*, 1948, 13, 385.
- WILHELM, RICHARD & JUNG, C. G. (1). *The Secret of the Golden Flower; a Chinese Book of Life* (including a partial translation of the *Thai-I Chin Hua Tsung Chih* by R. W. with notes, and a 'European commentary' by C. G. J.).
Eng. ed. tr. C. F. Baynes, (with C. G. J.'s memorial address for R. W.). Kegan Paul, London and New York, 1931. From the Germ. ed. *Das Geheimnis d. goldenen Blute; ein chinesisches Lebensbuch*. Munich, 1929.
Abbreviated preliminary version: 'Tschang Scheng Shu [*Chhang Shêng Shu*]; die Kunst das menschlichen Leben zu verlängern.' *EURR*, 1929, 5, 530.
Revised Germ. ed. with new foreword by C. G. J., Rascher, Zürich, 1938. Repr. twice, 1944.
New Germ. ed. entirely reset, with new foreword by Salome Wilhelm, and the partial translation of a Buddhist but related text, the *Hui Ming Ching*, from R. W.'s posthumous papers, Zürich, 1957.
New Eng. ed. including all the new material, tr. C. F. Baynes. Harcourt, New York and Routledge, London, 1962, repr. 1965, 1967, 1969. Her revised tr. of the 'European commentary' alone had appeared in an anthology: *Psyche und Symbol*, ed. V. S. de Laszlo. Anchor, New York, 1958. Also tr. R. F. C. Hull for C. G. J.'s *Collected Works*, vol. 13, pp. 1-55, i.e. Jung (3).
- WILLETTS, W. Y. (1). *Chinese Art*. 2 vols. Penguin, London, 1958.
- WILLETTS, W. Y. (3). *Foundations of Chinese Art; from Neolithic Pottery to Modern Architecture*. Thames & Hudson, London, 1965. Revised, abridged and re-written version of (1), with many illustrations in colour.
- WILLIAMSON, G. C. (1). *The Book of 'Famille Rose'* [polychrome decoration of Chinese Porcelain]. London, 1927.
- WILSON, R. McLACHLAN (1). *The Gnostic Problem; a Study of the Relations between Hellenistic Judaism and the Gnostic Heresy*. Mowbray, London, 1958.
- WILSON, R. McLACHLAN (2). *Gnosis and the New Testament*. Blackwell, Oxford, 1968.
- WILSON, R. McLACHLAN (3) (ed. & tr.). *New Testament Apocrypha* (ed. E. Hennecke & W. Schneemelcher). 2 vols. Lutterworth, London, 1965.
- WILSON, W. (1) (tr.). *The Writings of Clement of Alexandria* (b. c. + 150] (including *Stromata*, c. + 200). In Ante-Nicene Christian Library, ed. A. Roberts & J. Donaldson. Clark, Edinburgh, 1867, vols 4 and 12.
- WILSON, W. J. (1). 'The Origin and Development of Graeco-Egyptian Alchemy.' *CIBA/S*, 1941, 3, 926.
- WILSON, W. J. (2) (ed.). 'Alchemy in China.' *CIBA/S*, 1940, 2 (no. 7), 594.
- WILSON, W. J. (2a). 'The Background of Chinese Alchemy.' *CIBA/S*, 1940, 2 (no. 7), 595.
- WILSON, W. J. (2b). 'Leading Ideas of Early Chinese Alchemy.' *CIBA/S*, 1940, 2 (no. 7), 600.
- WILSON, W. J. (2c). 'Biographies of Early Chinese Alchemists.' *CIBA/S*, 1940, 2 (no. 7), 605.
- WILSON, W. J. (2d). 'Later Developments of Chinese Alchemy.' *CIBA/S*, 1940, 2 (no. 7), 610.
- WILSON, W. J. (2e). 'The Relation of Chinese Alchemy to that of other Countries.' *CIBA/S*, 1940, 2 (no. 7), 618.
- WILSON, W. J. (3). 'An Alchemical Manuscript by Arnaldus [de Lishout] de Bruxella [written from +1473 to +1490].' *OSIS*, 1936, 2, 220.
- WINDAUS, A. (1). 'Über d. Entgiftung der Saponine durch Cholesterin.' *BDCG*, 1909, 42, 238.
- WINDAUS, A. (2). 'Über d. quantitative Bestimmung des Cholesterins und der Cholesterinester in einigen normalen und pathologischen Nieren.' *ZPC*, 1910, 65, 110.
- WINDERLICH, R. (1) (ed.). *Julius Ruska und die Geschichte d. Alchemie, mit einem Völlständigen Verzeichnis seiner Schriften; Festgabe zu seinem 70. Geburtstage...* Ebering, Berlin, 1937. (Abhdl. z. Gesch. d. Med. u. d. Naturwiss., no. 19).
- WINDERLICH, R. (2). 'Verschüttete und wieder aufgegrabene Quellen der Alchemie des Abendlandes' (a biography of J. Ruska and an account of his work). Art. in Winderlich (1), the Ruska Presentation Volume.
- WINKLER, H. A. (1). *Siegel und Charaktere in der Mohammedanische Zauberei*. De Gruyter, Berlin and Leipzig, 1930. (*DI* Beiheft, no. 7.)

- WISE, T. A. (1). *Commentary on the Hindu System of Medicine*. Thacker, Ostell & Lepage, Calcutta; Smith Elder, London, 1845.
- WISE, T. A. (2). *Review of the History of Medicine [among the Asiatic Nations]*, 2 vols. Churchill, London, 1867.
- WOLF, A. (1) (with the co-operation of F. Dannemann & A. Armitage). *A History of Science, Technology, and Philosophy in the 16th and 17th Centuries*. Allen & Unwin, London, 1935; 2nd ed., revised by D. McKie, London, 1950. Rev. G. Sarton, *ISIS*, 1935, 24, 164.
- WOLF, A. (2). *A History of Science, Technology and Philosophy in the 18th Century*. Allen & Unwin, London, 1938; 2nd ed. revised by D. McKie, London, 1952.
- WOLF, JOH. CHRISTOPH (1). *Manichaeismus ante Manichaeos, et in Christianismo Redivivus; Tractatus Historico-Philosophicus* . . . Liebezeit & Stromer, Hamburg, 1707. Repr. Zentralantiquariat D. D. R., Leipzig, 1970.
- WOLF, T. (1). *Viajes Cientificos*. 3 vols. Guayaquil, Ecuador, 1879.
- WOLFF, CHRISTIAN (1). 'Rede über die Sittenlehre der Sineser', pub. as *Oratio de Sinarum Philosophia Practica* [that morality is independent of revelation]. Frankfurt a/M, 1726. The lecture given in July 1721 on handing over the office of Pro-Rector, for which Christian Wolff was expelled from Halle and from his professorship there. See Lach (6). The German version did not appear until 1740 in vol. 6 of Wolff's *Kleine Philosophische Schriften*, Halle.
- WOLTERS, O. W. (1). 'The "Po-Ssu" Pine-Trees.' *BLSOAS*, 1960, 23, 323.
- WONG K. CHIMIN. See Wang Chi-Min.
- WONG, M. or MING. See Huang Kuang-Ming, Huard & Huang Kuang-Ming.
- WONG MAN. See Huang Wên.
- WONG WÊN-HAO. See Ong Wên-Hao.
- WOOD, I. F. (1). '[The State of the Dead in] Hebrew [Thought].' *ERE*, vol. xi, p. 841.
- WOOD, I. F. (2). '[The State of the Dead in] Muhammadan [Muslim, Thought].' *ERE*, vol. xi, p. 849.
- WOOD, R. W. (1). 'The Purple Gold of Tur'an-khamên.' *JEA*, 1934, 20, 62.
- WOODCROFT, B. (1) (tr.). *The 'Pneumatics' of Heron of Alexandria*. Whittingham, London, 1851.
- WOODROFFE, SIR J. G. (ps. A. Avalon) (1). *Sakti and Śakta; Essays and Addresses on the Śakta Tantra-śāstra*. 3rd ed. Ganesh, Madras; Luzac, London, 1929.
- WOODROFFE, SIR J. G. (ps. A. Avalon) (2). *The Serpent Power [Kundalini Yoga], being the Śat-cakramirūpana [i.e. ch. 6 of Pūrṇānanda's Tattva-chintāmaṃ] and 'Pādūkā-panchaka', two works on Laya Yoga* . . . Ganesh, Madras; Luzac, London, 1931.
- WOODROFFE, SIR J. G. (ps. A. Avalon) (3) (tr.). *The Tantra of the Great Liberation, 'Mahā-nirvāna Tantra', a translation from the Sanskrit*. London, 1913. Ganesh, Madras, 1929 (text only).
- WOODS, J. H. (1). *The Yoga System of Patañjali; or, the Ancient Hindu Doctrine of Concentration of Mind* . . . Harvard Univ. Press, Cambridge, Mass. 1914. (Harvard Oriental Series, no. 17.)
- WOODWARD, J. & BURNETT, G. (1). *A Treatise on Heraldry, British and Foreign* . . . 2 vols. Johnston, Edinburgh and London, 1892.
- WOOLLEY, C. L. (4). 'Excavations at Ur, 1926-7, Part II.' *ANTY*, 1928, 8, 1 (24), pl. viii, 2.
- WOLFE, P. (1). 'Experiments to show the Nature of *Aurum Mosaicum*.' *PTRS*, 1771, 61, 114.
- WRIGHT, SAMSON, (1). *Applied Physiology*. 7th ed. Oxford, 1942.
- WU KHANG (1). *Les Trois Politiques du Tchoum Tsiou [Chhun Chhiu] interprétées par Tong Tchong-Chou [Tung Chung-Shu] d'après les principes de l'école de Kong-Yang [Kungyang]*. Leroux, Paris, 1932. (Includes tr. of ch. 121 of *Shih Chi*, the biography of Tung Chung-Shu.)
- WU LU-CHHIANG. See Tenney L. Davis' biography (obituary). *JCE*, 1936, 13, 218.
- WU LU-CHHIANG & DAVIS, T. L. (1) (tr.). 'An Ancient Chinese Treatise on Alchemy entitled *Tshan Thung Chhi*, written by Wei Po-Yang about +142 . . .' *ISIS*, 1932, 18, 210. Critique by J. R. Partington, N, 1935, 136, 287.
- WU LU-CHHIANG & DAVIS, T. L. (2) (tr.). 'An Ancient Chinese Alchemical Classic; Ko Hung on the Gold Medicine, and on the Yellow and the White; being the 4th and 16th chapters of *Pao Phu Tzu* . . .' *PAAAS*, 1935, 70, 221.
- WU YANG-TSANG (1). 'Silver Mining and Smelting in Mongolia.' *TAIME*, 1903, 33, 755. With a discussion by B. S. Lyman, pp. 1038 ff. (Contains an account of the recovery of silver from argentiferous lead ore, and cupellation by traditional methods, at the mines of Ku-shan-tzu and Yen-tung Shan in Jehol province. The discussion adds a comparison with traditional Japanese methods observed at Hosokura). Abridged version in *EMY*, 1903, 75, 147.
- WULF, H. E. (1). *The Traditional [Arts and] Crafts of Persia; their Development, Technology and Influence on Eastern and Western Civilisations*. M.I.T. Press, Cambridge, Mass. 1966. Inaug. Diss. Univ. of New South Wales, 1964.
- WUNDERLICH, E. (1). 'Die Bedeutung der roten Farbe im Kultus der Griechen und Römer.' *RGVV* 1925, 20, 1.

- YABUUCHI KIYOSHI (9). 'Astronomical Tables in China, from the Han to the Thang Dynasties.' Eng. art. in Yabuuchi Kiyoshi (25) (ed.), *Chūgoku Chūsei Kagaku Gijutsushi no Kenkyū* (Studies in the History of Science and Technology in Mediaeval China). Jimbun Kagaku Kenkyūso, Tokyo, 1963.
- YAMADA KENTARO (1). *A Short History of Ambergris [and its Trading] by the Arabs and the Chinese in the Indian Ocean*. Kinki University, 1955, 1956. (Reports of the Institute of World Economics, *KKD*, nos. 8 and 11.)
- YAMADA KENTARO (2). *A Study of the Introduction of 'An-hsi-hsiang' into China and of Gum Benzoin into Europe*. Kinki University, 1954, 1955. (Reports of the Institute of World Economics, *KKD*, nos. 5 and 7.)
- YAMASHITA, A. (1). 'Wilhelm Nagayoshi Nagai [Nakai Nakayoshi], Discoverer of Ephredrin; his Contributions to the Foundation of Organic Chemistry in Japan.' *SHST/T*, 1965, 11.
- YAMAZAKI, T. (1). 'The Characteristic Development of Chemical Technology in Modern Japan, chiefly in the Years between the two World Wars.' *SHST/T*, 1965, 7.
- YAN Tsz CHIU. See Yang Tzu-Chiu (1).
- YANG LIEN-SHENG (8). 'Notes on Maspero's "Les Documents Chinois de la Troisième Expédition de Sir Aurel Stein en Asie Centrale".' *HJAS*, 1955, 18, 142.
- YANG TZU-CHIU (1). 'Chemical Industry in Kuangtung Province.' *JRAS/NCB*, 1919, 50, 133.
- YATES, FRANCES A. (1). *Giordano Bruno and the Hermetic Tradition*. Routledge & Kegan Paul, London, 1964. Rev. W. P[age], *AX*, 1964, 12, 72.
- YATES, FRANCES A. (2). 'The Hermetic Tradition in Renaissance Science.' Art. in *Art, Science and History in the Renaissance*, ed. C. S. Singleton. Johns Hopkins Univ. Press, Baltimore, 1968, p. 255.
- YATES, FRANCES A. (3). *The Rosicrucian Enlightenment*. Routledge & Kegan Paul, London, 1972.
- YEN CHI (1). 'Ancient Arab Coins in North-West China.' *AQ*, 1966, 40, 223.
- YETTS, W. P. (4). 'Taoist Tales; III, Chhin Shih Huang's Ti's Expeditions to Japan.' *NCR*, 1920, 2, 290.
- YOUNG, S. & GARNER, SIR HARRY M. (1). 'An Analysis of Chinese Blue-and-White [Porcelain]', with 'The Use of Imported and Native Cobalt in Chinese Blue-and-White [Porcelain].' *ORA*, 1956 (n. s.), 2 (no. 2).
- YOUNG, W. C. (1) (ed.). *Sex and Internal Secretions*. 2 vols. Williams & Wilkins, Baltimore, 1961.
- YÜ YING-SHIH (2). 'Life and Immortality in the Mind of Han China.' *HJAS*, 1965, 25, 80.
- YUAN WEI-CHOU. See Wei Chou-Yuan.
- YULE, SIR HENRY (1) (ed.). *The Book of Ser Marco Polo the Venetian, concerning the Kingdoms and Marvels of the East, translated and edited, with Notes, by H. Y. . .*, 1st ed. 1871, repr. 1875. 2 vols. ed. H. Cordier. Murray, London, 1903 (reprinted 1921). 3rd ed. also issued Scribners, New York, 1929. With a third volume, *Notes and Addenda to Sir Henry Yule's Edition of Ser Marco Polo*, by H. Cordier. Murray, London, 1920.
- YULE, SIR HENRY (2). *Cathay and the Way Thither; being a Collection of Mediaeval Notices of China*. 2 vols. Hakluyt Society Pubs. (2nd ser.) London, 1913-15. (1st ed. 1866.) Revised by H. Cordier, 4 vols. Vol. 1 (no. 38), *Introduction; Preliminary Essay on the Intercourse between China and the Western Nations previous to the Discovery of the Cape Route*. Vol. 2 (no. 33), *Odoric of Pordenone*. Vol. 3 (no. 37), *John of Monte Corvino and others*. Vol. 4 (no. 41), *Ibn Battūta and Benedict of Goes*. (Photolitho reprint, Peiping, 1942.)
- YULE, H. & BURNELL, A. C. (1). *Hobson-Jobson; being a Glossary of Anglo-Indian Colloquial Words and Phrases. . .* Murray, London, 1886.
- YULE & CORDIER. See Yule (1).
- ZACHARIAS, P. D. (1). 'Chymeutike, the real Hellenic Chemistry.' *AX*, 1956, 5, 116. Based on Stephanides (1), which it expounds.
- ZIMMER, H. (1). *Myths and Symbols in Indian Art and Civilisation*, ed. J. Campbell. Pantheon (Bollingen), Washington, D.C., 1947.
- ZIMMER, H. (3). 'On the Significance of the Indian Tantric Yoga.' *ERYB*, 1961, 4, 3, tr. from German in *ERYB*, 1933, 1.
- ZIMMER, H. (4). 'The Indian World Mother.' *ERYB*, 1969, 6, 70 (*The Mystic Vision*, ed. J. Campbell). Tr. from the German in *ERYB*, 1938, 6, 1.
- ZIMMERN, H. (1). 'Assyrische Chemische-Technische Rezepte; insbesondere f. Herstellung farbiger glasierter Ziegel, im Umschrift und Übersetzung.' *ZASS*, 1925, 36 (N.F. 2), 177.
- ZIMMERN, H. (2). 'Babylonian and Assyrian [Religion].' *ERE*, vol. ii, p. 309.
- ZONDEK, B. & ASCHHEIM, S. (1). 'Hypophysenvorderlappen und Ovarium; Beziehungen der endokrinen Drüsen zur Ovarialfunktion.' *AFG*, 1927, 130, 1.
- ZURETTI, C. O. (1). *Alchemistica Signa; Glossary of Greek Alchemical Symbols*. Vol. 8 of Bidez, Cumont, Delatte, Heiberg *et al.* (1).
- ZURETTI, C. O. (2). *Anonymus 'De Arte Metallica seu de Metallorum Conversione in Aurum et Argentum'* [early + 14th cent. Byzantine]. Vol. 7 of Bidez, Cumont, Delatte, Heiberg *et al.* (1), 1926.

ADDENDA TO BIBLIOGRAPHY C

- ABRAMS, S. I. (1). 'Synchronicity and Alchemical Psychology.' Unpub. book.
- ADLER, JEREMY (1). 'A Study in the Chemistry of Goethe's *Die Wahlverwandtschaften*.' Inaug. Diss. London (Westfield College), 1974.
- ALLEAU, RENÉ (1) (ed.). *L'Alchimie des Philosophes* [a florilegium]. (Passages from Arabic translated by Y. Marquet & V. Monteil, from Indian languages by G. Mazars, and from Chinese by M. Kaltenmark & K. Schipper.) pr. pr., Art et Valeur, Paris, 1978.
- ANON. (135). *An Outline of Chinese Acupuncture* (Compiled by the Chinese academy of Traditional Medicine). Foreign Languages Press, Peking, 1975.
- ANON. (148). 'Chhi-Kung [respiratory physiotherapy] and Mental Stress.' *EHOR*, 1961, 1 (no. 11), 29.
- ANON. (155). 'Aspects of Sexual Medicine' (Collected papers from *BMJ*). Brit. Med. Assoc., London, 1976.
- ANON. (156). *Rosarium Philosophorum* (author and date unknown, probably c. +1500) in *De Alchimia Opuscula . . .* Cyriaci Jacobi, Frankfurt, 1550, vol. 2, *Artis Auriferae . . .* Waldschrch, Basel, 1610, vol. 2, and *Bibliotheca Chemica Curiosa . . .* (ed. J. J. Manget), Chouet et al., Geneva, 1702 (without the illustrations). Cf. Ferguson (1), vol. 1, pp. 19, 51, vol. 2, pp. 68, 287.
- ARMSTRONG, J. W. (1). *The Water of Life; a Treatise on Urine Therapy*. Homoeopathic Pub. Co., London, 1944 repr. Heath Pub. Co., London, 1949.
- AUSTIN, C. R. & SHORT, R. V. (1) (ed.). *Hormones in [Mammalian] Reproduction*. Cambridge, 1972 (Reproduction in Mammals, no. 3).
- BAGCHI, P. C. (1). *India and China: a Thousand Years of Sino-Indian Cultural Relations*, Hind Kitabs, Bombay, 2nd ed., 1950.
- BATRA, SATISH & BENGTSOON, L. P. (1). 'A Mechanism for the Increased Production of Prostaglandins in Labour.' *LT*, 1976, pt. 1, 1164.
- BERGSTRÖM, S., CARLSON, L. A. & WEEKS, J. R. (1). 'The Prostaglandins; a Family of Biologically Active Lipids.' *PHREV*, 1968, 20, 1.
- BIANCHI, UGO (1). *Selected Essays on Gnosticism, Dualism and Mysticism*. Brill, Leiden, 1978.
- BEYER, S. (1). *The Cult of Tārā; Magic and Ritual in Tibet*. Univ. California Press, Berkeley and Los Angeles, 1973. (Includes material on alchemy in Tibet.)
- BHARATI, AGHEHENANDA (1). *Tantrika Tradition*. London, 1965.
- BHATTACHARYA, B. (3) (ed.). *The Sādhana-mālā, edited with introduction*. 2 vols., Baroda Oriental Institute, Baroda, 1925.
- BOEHMER, T. (1). 'Taoist Alchemy; a Sympathetic Approach through Symbols' art. in *Buddhist and Taoist Studies*, I. ed. Michael Saso & David W. Chappell. Univ. Press, Hawaii, 1977, p. 55.
- BORNKAMM, G. (1) (tr.). 'The "Acts of Thomas,"' in Hennecke & Schneemelcher (1), Eng. ed., vol. 2, p. 425.
- BOSE, M. M. (1). *The Post-Caitanya Sahajīya Cult of Bengal*. Univ. Press, Calcutta, 1930.
- BOWERS, K. S. & BOWERS, P. G. (1). 'Hypnosis and Creativity; a Theoretical and Empirical Rapprochement'. Art. in *Hypnosis: Research Developments and Perspectives*, ed. E. Fromm & R. E. Shor (q.v.), p. 255.
- BULLING, A. (16). 'Ancient Chinese Maps; two Maps discovered in a Han Dynasty Tomb from the -2nd Century.' *EXPED*, 1978, 20 (no. 2), 16.
- DI CARA, LEO V. (1). 'Learning in the Autonomic Nervous System.' *SAM*, 1970, 222 (no. 1), 30.
- CHAKRAVARTY, CHINTAHARAN (1). *The Tantras; Studies on their Religion and Literature*. Punthi Pustak, Calcutta, 1963, repr. 1972.
- CHANG CHUNG-LAN (1). *The Tao of Love and Sex; the Ancient Chinese Way to Ecstasy*. Wildwood, London, 1977. French tr. by M. F. di Paloméra: *Le Tao de l'Art d'Aimer*. Calmann-Lévy, Paris, 1977. German tr. by L. Tannenbaum, *Das Tao der Liebe; Unterweisungen in altchinesische Liebeskunst*. Rowohlt, Hamburg, 1978.
- CHANG CHUNG-YUAN (2). *Creativity and Taoism; a Study of Chinese Philosophy, Art and Poetry*. Wildwood, London, 1975.
- CHANG, JOLAN. see Chang Chung-Lan.
- CHANSON, PAUL (1). *L'Accord Charnel*. Levain, Paris, 1961.
- CHATTOPADHYAYA, S. (1). *Reflections on the Tantras*. Motilal Banarsidass, Delhi, Varanasi and Patna, 1978.
- CHAVANNES, E. (9). *Mission Archéologique dans la Chine Septentrionale*. 2 vols. & portfolios of plates. Leroux, Paris 1909-15. (Publ. de l'École France, d'Extr. Orient, no. 13).
- CHHEN JUNG-CHIEH (3). 'An Outline and a Bibliography of Chinese Philosophy.' (Mimeographed notes), Dartmouth College, Hanover, New Hampshire, 1953; also *PEW*, 1954, 3, 241, 337; rev. W. E. Hocking & R. Hocking, *PEW*, 1954, 4, 175.
- CHHEN JUNG-CHIEH (7). 'The Neo-Confucian Solution of the Problem of Evil' *AS/BIHP* (Taiwan) 1957, 28, 773.
- CHHEN JUNG-CHIEH (8). 'The Concept of Man in Chinese Thought.' Art. in *The Concept of Man; a Study in Comparative Philosophy*. ed. S. Radhakrishnan & P. T. Raju. Allen & Unwin, London, 1960, p. 158.

- CHHEN JUNG-CHIEH (9). *An Outline and an Annotated Bibliography of Chinese Philosophy*. Far Eastern Publications, Yale Univ., New Haven, Conn. 1961. Revision and expansion of Chhen Jung-Chieh (3).
- CHHEN JUNG-CHIEH (10). *A Source-Book of Chinese Philosophy*. University Press, Princeton, 1963. Rev. T. Pokora, *ARO*, 1966, 34, 285.
- CHHEN JUNG-CHIEH (11) (tr.). 'Reflections on Things at Hand' [*Chin Ssu Lu*]; *The Neo-Confucian Anthology compiled by Chu Hsi and Lu Tsu-Chhien, translated with notes*. . . . Columbia Univ. Press, New York and London, 1967.
- CHOU, ERIC (1). *The Dragon and the Phoenix; Love, Sex and the Chinese*. Arbor House, New York; Joseph, London, 1971. (No exact reference, no index.)
- CRISCIANI, C. (1). 'The Conception of Alchemy as expressed in the *Pretiosa Margarita* of Petrus Bonus of Ferrara.' *AX* 1973, 20, 165.
- CRISCIANI, C. (2) (ed.). *The Preziosa Margarita Novella (New Pearl of Great Price)* by Pietro Bono da Ferrara [Italian translation of the +15th century of Petrus Bonus' book of +1330]. Nuova Italia, Firenze, 1976. (Centro di Studi del Pensiero Filosofico del Cinquecento e del Seicento in Relazione al Problemi della Scienza, Pubs.) Rev. A. G. Keller, *AX* 1978, 25, 148.
- CRISTOFALO, V. J. & HOLEČKOVÁ, E. (1) (ed.). *Cell Impairment in Ageing and Development*. Plenum, New York, 1975. (Symposium at Hrubá Skála Castle, Czechoslovakia; *Advances in Exp. Med. and Biol.* no. 53).
- CRISTOFALO, V. J., ROBERTS, J. & ADELMAN, R. C. (1) (ed.). *Explorations in Ageing*. Plenum, New York, 1975. *Advances in Exp. Med. and Biol.* no. 61).
- CURTIS, H. J. (1). *The Biological Mechanism of Ageing*, Thomas, Springfield, Ill., 1966.
- DASGUPTA, SHASHI BHUSHAN (1). *An Introduction to Tantric Buddhism*. Univ. of Calcutta Press, Calcutta, 1950. (Inaug-Diss., Calcutta, 1937). Offset repr., Shambhala, Berkeley and London, 1974. Routledge & Kegan Paul, London, 1974.
- DASGUPTA, S. N. (1). *History of Indian Philosophy*. 5 vols. Cambridge, 1932-55.
- DASGUPTA, S. N. (2). *Philosophical Essays*. Univ. Calcutta Press, Calcutta, 1950.
- DASGUPTA, S. N. (4). *Yoga as Philosophy and Religion*. London, 1924. Reprint, 1978.
- DIMOCK, E. C. (1). *The Place of the Hidden Moon*. Univ. Chicago Press, Chicago, 1966.
- DIMOCK, E. C. (2). "Doctrine and Practice among the Vaisnavas of Bengal." Art. in *Krishna; Myths, Rites and Attitudes*. ed. M. Singer.
- DOBBS, B. J. T. (4). *The Foundations of Newton's Alchemy; or, 'The Hunting of the Greene Lyon'*. Cambridge, 1975. Cf. Figala (1). Rev. D. T. Whiteside, *ISIS*, 1977, 68, 116.
- DORESSE, J. (1). *Les Livres Secrets des Gnostiques d'Égypte*. Plon, Paris, 1958-.
- Vol. 1 'Introduction aux Écrits Gnostiques Coptes découverts a Khénoboskion.'
- Vol. 2 'L'Évangile selon Thomas,' ou 'les Paroles Secrètes de Jésus.'
- Vol. 3 "'Le Livre Secret de Jean"; "l'Hypostase des Archontes" ou "Lirre de Nōréa."'
- Vol. 4 "'Le Livre Sacré du Grand Esprit Inrisible" ou "Évangile des Égyptiens"; "l'Épître d'Eugnoste le Bienheureux"; "La Sagesse de Jésus."'
- Vol. 5 "'L'Évangile selon Philippe."'
- Eng. tr. of the first two volumes, by P. Mairer: "The Secret Books of the Egyptian Gnostics; an Introduction to the Gnostic Coptic Manuscripts discovered at Chenoboskion; with an English Translation and Critical Evaluation of the 'Gospel according to Thomas.'" Hollis & Carter, London, 1960.
- DUNCAN, A. M. (3). 'William Keir's *De Attractione Chemica* (1778), and the Concepts of Chemical Saturation, Attraction and Repulsion' *ANS*, 1967, 23, 149.
- DUNCKER, H. G. L. & SCHUDEWIN, F. G. (1). *Sancti Hippolyti Episcopi et Martyris 'Refutationis Omnium Haeresium' Librorum Decem quae Supersunt*. . . . (Greek and Latin texts). Dieterich, Göttingen, 1859.
- EDWARDS, JOHN (1). *A Compleat Survey of all the Dispensations and Methods of Religion*. 2 vols. London, 1699.
- ESSFELDT, O. (1). *The Old Testament; an Introduction—including the Apocrypha and Pseudepigrapha, and also Works of similar type from Qumran. The History of the Formation of the Old Testament*. Tr. from the German by P. R. Ackroyd. Blackwell, Oxford, 1965.
- ELIADE, MIRCEA (9). 'The Myth of Alchemy'. *PAR*, 1978, 3 (no. 3), 6.
- ELLIS, H. HAVELOCK (1). *Affirmations*, London, 1898.
- ELLIS, H. HAVELOCK (2). *Man and Woman; a Study of Human Secondary Sexual Characters*. London, 1926. 8th. ed. London, 1934.
- ELLIS, H. HAVELOCK (3). *Studies in the Psychology of Sex*. 7 volumes. London, Davis, Philadelphia, 1901-28.
- ELORDUY, CARMELO (1) (tr.). *Chuang Tzu, Literato, Filosofo y Místico Taoista*. 2nd. ed. Monte Avila, Caracas, Venezuela, 1972. 1st ed. Manila, 1967.
- ENGLE, E. T. & PINCUS, GREGORY (1). *Hormones and the Ageing Process*. Acad. Press, New York, 1956.
- ERACLE, J. (1). *L'Art des Thanka et le Bouddhisme Tantrique; d'après les Peintures du Musée d'Ethnographie de Genève et quelques autres Pièces*. With photographs by P. de Chastonay. Musée d'Ethnographie, Geneva, 1970.
- VON EULER, U. S. (1). 'Über die spezifische Blutdrucksenkende Substanz des menschlichen Protata- und Samenblasen-sekretes'. *KW*, 1935, 14, 1182.

- EVOLA, J. (G. C. E.) (2). *Lo Yoga della Potenza, saggio sui tantra*. Bocca, Milan, 1949. Orig. pub. as *L'Uomo come Potenza*. French tr. by G. Robinet *Le Yoga Tantrique; sa Métaphysique, ses Pratiques*. Fayard, Paris, 1971.
- EVOLA, J. (G. C. E.) (4). *La Tradition Hermétique; les Symboles et la Doctrine de 'l'Art Royal' Hermétique*. Tr. from Italian by Y. J. Tortat. Villain & Belhomme, Paris, 1974.
- FABRICIUS, JOHANNES (1). *Alchemy; the Mediaeval Alchemists and their Royal Art*. Rosenkilde & Bagger, Copenhagen, 1976.
- FÈNG LU-CHUAN (1). 'Theoretical Foundations of the Medieval Preparations of Urinary Derivatives'. *AJCM*, 1976, 4 (no. 4), 347.
- FÈNG LU-JEAN. See Fèng Lu-Chuan.
- FÈNG YU-LAN (5) (Tr.). *Chuang Tzu; a new selected translation with an exposition of the philosophy of Kuo Hsiang*. Commercial Press, Shanghai, 1933.
- FENWICK, P. B. C. & HEBDEN, A. (1). 'Meditation Study; a Computer Analysis of the Electro-encephalogram during Mantra Meditation' Address at the *Symposium on Meditation, Concentration and Attention*, Marseilles, 1968.
- FIGALA, K. (2). 'Newtons rationales System der Alchemie'. *CUZ*, 1978, 12 (no. 4), 101.
- FIGUIER, (1). *L'Alchimie et les Alchimistes*. Paris, 1854.
- FILLIOZAT, J. (8). 'La Pensée Scientifique en Asie Ancienne.' *BSEIC*, 1953, 28, 5.
(On transmissions from Mesopotamia to China and India, on pneumatic medicine, the lunar mansions and the mathematical zero.)
- FINCKH, E. (1). 'L'Acupuncture dans la Perspective des chakras'. *RIAC*, 1957, 10, no. 39, 8.
- FITZGERALD, EDWARD (1). *The Rubáiyát of Omar Khayyám rendered into English verse by E. F., followed by Euphranor, a Dialogue on Youth, and Salámán and Absál, an Allegory translated from the Persian of Jami*. Edited by G. F. Maine, with an Introduction by L. Housman. Collins, London and Glasgow, 1953.
- FOERSTER, W. (1), assisted by E. HAENCHEN, M. KRAUSE & K. RUDOLPH. *Die Gnosis*. 2 vols. Artemis, Zürich, 1969-71. (Bibl. d. alten Welt, Reihe Antike und Christentum. Eng. tr. by P. W. Coxon & K. H. Kuhn, ed. R. McLachlan Wilson, *Gnosis: a Selection of Gnostic Texts*. 2 vols. Oxford, 1972-4.)
- FROMM, E. & SHOR, R. E. (1) (ed.). *Hypnosis; Research Developments and Perspectives*. Aldine-Atherton, New York; Elek, London, 1973. Rev. P. Morrison, *SAM*, 1973, 229 (no. 2), 112.
- GAERTNER, BERTIL E. (1). 'The Pauline and Johannine Idea of "to know God" against the Hellenistic Background; the Greek philosophical Principle 'Like by Like' in Paul and John.' *NTS*, 1968, 14, 209.
- GILES, H. A. (15) (tr.). *Chuang Tzu, Taoist Philosopher and Chinese Mystic*. London, 1889; 2nd. ed. London, 1926; repr. Allen & Unwin, London, 1961, in paperback, 1980.
- GIRARDOT, N. J. (1). "'Returning to the Beginning" and the Arts of Mr Hun-Tun in the *Chuang Tzu* book'. *JCPH*, 1978, 5, 21.
- GOLDBLATT, M. W. (1). 'Properties of Human Seminal Plasma'. *JOP*, 1935, 84, 208.
- GOLDMAN, R., ROCKSTEIN, M. & SUSSMAN, M. L. (1) (ed.). *The Physiology and Pathology of Human Ageing*. Acad. Press, New York, 1975.
- GOODMAN, L. S. (1) (ed.). *The Pharmacological Basis of Therapeutics*. Macmillan, New York, 1975.
- GRAF, O. (2). *Dschu Hsi [Chu Hsi]'s Djin-Si Lu [Chin Ssu Lu]; die Sungkonfuzianische Summa mit dem Kommentar des Yü Tsai [Yeh Tshai] Übersetzt und erläutert . . .* 3 vols. Sophia Univ. Press, Tokyo, 1953. (Monumenta Nipponica Monographs, no. 12)
Vol. 1 'Einleitung'; 2 (pts 1 and 2) 'Text'; 3 'Anmerkungen'.
- GRANET, M. (1). *Danses et Légendes de la Chine Ancienne*. 2 vols. Alcan, Paris, 1926.
- GUENTHER, H. V. (1). *The Tantric View of Life*. Shambala, Berkeley and London, 1972. First published as *Yugānādhā; the Tantric View of Life*. Chowkhamba Sanskrit Series, Banaras, 1952.
- VAN GULIK, R. H. (7). *Siddham; an Essay on the History of Sanskrit Studies in China and Japan*. International Academy of Indian Culture, Nagpur, 1956. (Sarasvati-Vihara Series, no. 36.)
- HARLAND, W. A. (1). "The Manufacture of Magnetic Needles and Vermilion [in China]." *JRAS* (Trans./NCB, 1850, 1 (no. 2), 163. (Extracts from the *Thung Thien Hsiao*.)
- HARLEY, G. W. (1). *Native African Medicine, with special reference to its practice in the Mano Tribe of Liberia*. Harvard Univ. Press, Cambridge, Mass., 1941.
- HARPER, D. J. (1). 'Ma-wang-tui Tomb Three; Documents, the Medical Texts.' *EARLC*, 1976, no. 2, 68.
- HARTMANN, FRANZ (1). *Paracelsus' Life and Prophecies*. Steiner, New York, 1973.
- HEDQVIST, P. (1). 'Basic Mechanisms of Prostaglandin Action on Autonomic Neuro-transmission.' *ARPH*, 1977, 17, 259.
- HENNECKE, E. & SCHNEEMELCHER (1) (ed.). *Neutestamentliche Apokryphen in deutscher Übersetzung*. 3rd revised edition, 2 vols. Mohr (Siebeck), Tübingen, 1959-64. Eng. tr., ed. R. McLachlan Wilson (3), 2 vols. Lutterworth, London, 1963-5.
- HERBERT, GEORGE (1). *The Temple*. Edited, with the 'Life of Mr G. H. [+1593 to +1632]' by Izaak Walton, by E. C. S. Gibson Methuen, London, 1905.
- HESLINGA, K., SCHELLEN, A. M. C. M. & VERKUYL, A. (1). *Not Made of Stone; the Sexual Problems of Handicapped People*. Stafleu, Leiden, 1973. Thomas, Springfield, Ill., 1974.

- HIRAI, T. (1). *Zen Meditation Therapy*. Japan Pubs., Tokyo, 1975.
- HITCHCOCK, E. A. (3). *Swedenborg, a Hermetic Philosopher; being a sequel to 'Remarks upon Alchemy and the Alchemists,' showing that . . . his Writings may be interpreted from the Point of View of Hermetic Philosophy, with a chapter comparing Swedenborg and Spinoza*. Boston, 1858.
- HOMANN, R. (2) (tr.). *Pai Wên Phien; or, the Hundred Questions; a Dialogue between two Taoists* [Chungli Chhüan and Lü Tung-Pin] on the Macrocosmic and Microcosmic System of Correspondences. Brill, Leiden, 1976 (Nisaba Religious Texts Translation Series, no. 4). Rev. J. Major, *JAOS*, 1978, 98, 341.
- HOU CHIN-LANG (1). *Monnaies d'Offrande et la Notion de Trésorerie dans la Religion Chinoise*. Collège de France (Inst. des Hautes Études Chinoises), Presses Universitaires de France and Moissonneuve, Paris, n.d. (1975) (Mémoires de l'Inst des Htes Ét. Chinoises, no. 1).
- HSIAS, P. S. Y. & STIEFVATER, E. W. (1). *Übungsheft zur chinesischen Gynmastik* Haug, Ulm (Donau), 1962.
- HSÜ MEI-LING (1). 'The Han maps and Early Chinese Cartography' *AAAG*, 1978, 68 (no. 1), 45.
- HUMMEL, A. W. (2) (ed.). *Eminent Chinese of the Chhing Period*. 2 vols. Library of Congress, Washington, 1944.
- HUXLEY, ALDOUS (1). *The Doors of Perception; and, Heaven and Hell*. Penguin, London, 1959. Many times reprinted. The first orig. pub. Chatto & Windus, London, 1954, the second, Chatto & Windus, London, 1956. Cf. pt. 2, p. 116.
- HYDE, MARGARET O. (1). *Mind Drugs*. McGraw Hill, New York, 1972; 2nd ed., revised and enlarged, Simon & Schuster (Pocket Books), New York, 1973. Cf. pt. 2, pp. 116, 150.
- INGLIS, BRIAN (1). *Fringe Medicine*. Faber & Faber, London, 1964.
- ISHIHARA, AKIRA & LEVY, H. S. (1). 'The Tao of Sex; a Chinese Introduction to the Bedroom Arts—an Annotated Translation of the Twenty-eighth Section of the 'Essence of Medical Prescriptions' (Ishimpō [I Hsin Fang]).' Harper & Row, New York, 1968. Orig. pub. Shibundo, Tokyo, 1968.
- JABŁOŃSKI, W., CHMIELEWSKI, JANUSZ, WOJASIEWICZ, O. & ŻBIKOWSKI, T. (1) (tr.). *Czuang-Tsy. Nan-Hua-Czên-King* [Chuang Tzu; *Nan Hua Chen Ching*], Prawaziwa Księga Potudniewego Kwiatu. Państwowe Wydawnictwo Naukowe, Warsaw, 1953.
- JAGGI, O. P. (1). *History of Science and Technology in India*. 5 vols. Atma Ram, Delhi, Jaipur, Chandigash and Lucknow, 1969–1973.
 Vol. 1 'Dawn of Indian Technology (Pre- and Proto-Historic Period).'
 Vol. 2 'Dawn of Indian Science (Vedic and Upanishadic Period).'
 Vol. 3 'Folk Medicine.'
 Vol. 4 'Indian System of Medicine.'
 Vol. 5 'Yogic and Tantric Medicine.'
- JUNG, C. G. (16). *The Practice of Psycho-therapy*. Routledge & Kegan Paul, London, 1954. (Collected Works, no. 16).
- KADOWITZ, P. (1). 'The Physiological and Pharmacological Role of the Prostaglandins' *ARPH*, 1975, 15, 285.
- KALTENMARK, M. (5). 'Hygiène et Mystique en Chine'. *BSAC*, 1959, (no. 33), 21.
- KALTENMARK, M. (6). 'L'Alchimie en Chine'. *BSAC*, 1960, (no. 37), 21.
- KANESAR, T. (1). 'Tantrism; the Proto-scientific Thought of India'. Unpub. MS (Paper read at the South Asian Studies Seminar, Jaffna, 1975).
- KARLGRÉN B. (1). *Grammata Serica; Script and Phonetics in Chinese and Sino-Japanese*. *BMFEA*, 1940, 12, 1. (Photographically reproduced as separate volume, Peiping 1941.) Revised edition, *Grammata Serica Recensa*, Stockholm, 1957.
- KNOX, W. L. (1). *Meditation and Mental Prayer*. Allan, London, 1927.
- KOTTEGODA, S. R. (1). 'Prostaglandins; a Review'. Unpub. Ms (Address to the Ceylon Academy of Post-Graduate Medicine, Colombo, July, 1976).
- KUNST, R. A. (1). 'More on *hsiu* and *wu hsing*, with an Addendum on the Use of Archaic Reconstructions.' *EARLC*, 1977, no. 3, 67. With a reply by John S. Major, p. 69.
- LACH, D. F. (6). 'The Sinophilism of Christian Wolff (+1679 to +1754)'. *JHI*, 1953, 14, 561.
- LEE HU'ONG & BARUCH, J. (1) (tr.). *Lien Tao Chhang Shêng Fa; Guide de la Méthode de Longue Vie par la Pratique du Tao*. Than-Long, Brussels, 1972. A combination of the eight exercises of Chungli Chhüan's *Pa Tuan Chin* with the twenty-four *hsiu* of Chhen Tuan.
- LEGGÉ, F. (1) (tr.). *Philosophumena; or, the Refutation of all Heresies; formerly attributed to Origen but now to Hippolytus, Bishop and Martyr, who flourished about +220*. 2 vols. SPCK, London, 1921 (Translations of Christian Literature; I, Greek Texts, no. 14). For text see Duncker & Scheidewin (1).
- LEGGÉ, J. (7) (tr.). *The Texts of Confucianism: Pt. III. The 'Li Chi.'* 2 vols. Oxford, 1885; reprint, 1926. (SBE, nos. 27 and 28.)
- LESLIE, D. (2). 'The Problem of Action at a Distance in Early Chinese Thought' (discussion on lecture by J. Needham). *Actes du VIIe Congrès International d'Historie des Sciences, Jerusalem*, 1953 (1954), p. 186.
- LESLIE, D. (7). 'Les Théories de Wang Tch'ong [Wang Chhung] sur la Causalité.' Art. in *Mélanges offertes à Monsieur Paul Demiéville*. Paris, 1974, p. 79.
- LIU TSÉ-HUA (1) (tr.). *Le Secret de la Fleur d'Or; suivi du 'Livre de la Conscience et de la Vie'*. Introduction by P. Couronne. Librairie de Médecins, Paris, 1969.

- LOEWE, M. (10). 'Manuscripts found recently in China; a Preliminary Survey'. *TP*, 1978, 63, 99.
- LONDON, J. K. (1) (ed. & tr.). *The Splendor Solis of Salomon Trismorin*. Yogi Pub. Soc, Des Plaines, Ill., 1976. First published, 1920.
- LONGO, V. G. (1). *Neuropharmacology and Behaviour*. Freeman, New York, 1973. Rev. *SAM*, 1973, 229 (no. 4), 129. Cf. pt. 2, p. 116.
- LU GWEI-DJEN & NEEDHAM, JOSEPH (5). *Celestial Lancets: a History and Rationale of Acupuncture and Moxa*. Cambridge, CUP, 1980.
- [LUPTON, THOMAS], (1). *A Thousand Notable Things of Sundrie Sorts . . .* first pub. Charlwood & Spooner, London, 1579; reprinted, enlarged and altered numerous times subsequently, e.g. Roberts & White, London, 1601. Bruges & Wright, London, 1675. Conyers, London, 1700. Wilkie, London, 1793 and 1815.
- MCKERUS, K. S. (1) (ed.). *The Structure and Function of the Gonadotrophins*. Plenum, New York, 1978.
- MCMAHON, J. H. & SALMOND, S. D. F. (1) (tr.). *The 'Refutation of All Heresies' by Hippolytus; with Fragments from his Commentaries on Various Books of Scripture*. 2 vols. Clark, Edinburgh, 1868. (Ante-Nicene Christian Library, nos. 6 and 9). For text see Duncker & Scheidewin (1).
- MAJOR, JOHN S. (2). 'A Note on the Translation of Two Technical Terms in Chinese Science; *wu hsing* and *hsiu*.' *EARLC*, 1976, no. 2, 1.
- MAJUMDAR, R. C. (1). 'The Classical [Greek and Latin] Accounts of India'. Mukhopadhyay, Calcutta, 1960.
- MAJUMDAR, R. C. (2). '[Indian] Medicine'. Art. in *Concise History of Science in India*. ed. Bose, Sen & Subbarayappa (1), p. 213.
- MAJUMDAR, R. C. (3). *History and Culture of the Indian People*. 5 vols. Bharatiya Vidya Bhavan, Bombay, 1947-61.
- Vol. 1 'The Vedic Age'
- Vol. 2 'The Age of Imperial Unity'
- Vol. 3 'The Classical Age'
- Vol. 4 'The Age of Imperial Kanauj'
- Vol. 5 'The British Paramountcy and Indian Renaissance'
- MALONEY, G. A. (1). 'The 'Jesus Prayer' and Early Christian Spirituality'. *SOB*, 1967, 5 (no. 5), 310.
- MARTIN, L. H. (1). 'A History of the Psychological Interpretation of Alchemy'. *AX*, 1975, 22, 10.
- MÉNARD, J. É. (1) (ed. & tr.). *L'Évangile selon Thomas*. Brill, Leiden, 1975. (Nag Hammadi Studies, no. 5).
- MENDELSON, J. H., ROSSI, A. M. & MEYER, R. E. (1) (ed.). *The Use of Marihuana; a Psychological and Physiological Inquiry*. Plenum, New York, 1974.
- MITTER, PARTHA (1). *Much-Maligned Monsters; a History of European Reactions to Indian Art*. Oxford, 1977.
- MOOKERJI, AJIT & KHANNA, MADHU (1). *The Tantric Way—Art, Science, Ritual*. Thames & Hudson, London, 1977.
- MOUDGAL, N. R. (1) (ed.). *Gonadotrophins and Gonadal Function*. Acad. Press, New York, 1974.
- MUKHERJI, P. N. (1) (tr.). *The Yoga Philosophy of Patanjali*.
- MURAKAMI YOSHIMI (1). 'The Affirmation of Desire in Taoism.' *ACTAS*, 1974, no. 27, 57.
- NEEDHAM, JOSEPH (76). 'The Institute's Symbol'. (A note on the origins of the traditional *liang i* symbol of Yin and Yang, incorporated in the device of the Institute of Biology, London.) *BIOL*, 1977.
- NEYT, F. (1). 'The 'Jesus Prayer' and the Gaza Tradition.' *SOB*, 1974, 6 (no. 9), 641.
- ORDY, J. M. & BRIZZEE, K. R. (1) (ed.). *The Neuro-biology of Ageing*. Plenum, New York, 1975. (Advances in Behavioral Biology, no. 16).
- OTIS, L. S. (1). 'Changes in Drug Usage Patterns and other Benefits derived by Practitioners of Transcendental Meditation'. Unpub. MS. 1973. (Stanford Research Institute Report).
- PAGELS, ELAINE H. (1). 'The Gnostic Vision; Varieties of Androgyny illustrated by Texts from the Nag Hammadi Library'. *PAR*, 1978, 3 (no. 4), 6.
- PEARSON, BIRGER A. (1). 'The Figure of Norea in Gnostic Literature'. Art. in *Proc. Internat. Colloquium on Gnosticism*, Stockholm, 1973, ed. G. Widengren & D. Hellholm, p. 143. (Kungl. Vitterhets Historie och Antikvitets Akademiens Handlingar, Filol.-Filos. Ser., no. 17).
- PEEL, J. & POTTS, M. (1). *Textbook of Contraceptive Practice*. Cambridge, 1969.
- PICKLES, V. R. (1). 'Prostaglandins and Contraception'. *RREP*, 1973.
- PINOT, V. (1). *La Chine et la Formation de l'Esprit Philosophique en France (1640-1740)*. Geuthner, Paris, 1932.
- POIX, D. (1). 'Hygiène Sexuelle Traditionelle'. (Chinese and Indian physiological alchemy, Tantric yoga etc.) *BSAC*, 1962, (no. 44), 33.
- POKORA, T. (3). 'Huan Than's *Fu* on Looking for the Immortals' [*Wang Hsien Fu*, - 14]. *ARO*, 1960, 28, 353.
- PUECH, H. C. (4) (tr.). *Gnostic Gospels and Related Documents*. In Hennecke & Schneemelcher (1), Eng. ed. vol. 1, p. 231.
- PUECH, H. C. (5). 'La Gnose et le Temps.' *ERJB*, 1952, 20, 57.
- RAMWELL, P. W. & PHARRISS, B. B. (1) (ed.). *Prostaglandins in Cellular Biology*. Plenum, New York, 1972 (ALZA Corporation Conference Series, no. 1).

- RATHER, L. J. (1). 'Alchemy, the Kabbala, the Analogy of the 'Creative Word' and the Origins of Molecular Biology'. *EPL*, 1972, 6, 83.
- RAWSON, P. (2). *Tantra, the Indian Cult of Ecstasy*. Thames & Hudson, London, 1973.
- RIEGEL, J. K. (1). 'A Summary of some Recent *Wên Wu* and *Khao Ku*. Articles on Ma-wang-tui Tombs nos. 2 and 3'. *EARLC*, 1975, no. 1, 10.
- RIEGEL, J. K. (2). 'Ma-wang-tui Tomb Three: Documents, the Maps'. *EARLC*, 1976, no. 2, 69.
- ROBINSON, J. M. (1) (ed.). *The Nag Hammadi Library in English; translated by members of the Coptic Gnostic Library Project of the Institute for Antiquity and Christianity* [Claremont, California], Brill, Leiden, Harper & Row, San Francisco, 1977.
- ROCKSTEIN, M. & BAKER, G. T. (1) (ed.). *Molecular Genetic Mechanisms in Development and Ageing*. Acad. Press, New York, 1972.
- ROCKSTEIN, M. & SUSSMAN, M. L. (1) (ed.). *Nutrition, Longevity and Ageing*. Acad. Press, New York, 1976. (Symposium at the University of Miami, Florida).
- ROCKSTEIN, M. & SUSSMAN, M. L. (2) (ed.). *Development and Ageing in the Nervous System*. Acad. Press, New York, 1973.
- ROCKSTEIN, M., SUSSMAN, M. L. & CHESKY, J. (1) (ed.). *Theoretical Aspects of Ageing*. Academic Press, New York, 1974.
- ROSENCREUTZ, CHRISTIAN (1). *Chymische Hochzeit. Zetzner, Strasburg, 1616. Eng. tr.: The Hermetic Romance; Or, The Chymical Wedding; written in high Dutch by Christian Rosencreutz. Translated by E. Foxcroft, late Fellow of King's College in Cambridge*. Sowle, London, 1690.
- ROSENFELD, ALBERT (1). *Prolongevity; a Report on the Scientific Discoveries now being made about Ageing and Dying, and their Promise of an Extended Human Life Span—without Old Age*. Knopf, New York, 1976.
- RUDOLPH, K. (1) et al. *Gnosis und Gnostizismus*. Wissenschaftliche Buchgesellschaft, Darmstadt, 1975. (Wege der Forschung, no. 262).
- SALMON, WILLIAM (1). *Seplisium: The Compleat English Physician; or, the Druggist's Shop Opened*. London, 1693.
- SASO, M. R. (4). 'Lu Shan, Ling Shan (Lung-hu Shan) and Mao Shan; Taoist Fraternities and Rivalries in Northern Taiwan'. *AS/BIE*, 1974, 33, 119.
- SASO, M. R. (5). *The Goma Rite; a Comparative Study of the Esoteric Tradition [in Taoism and Shingon Buddhism]*. Unpub. MS. 1976.
- SASO, M. R. (6). 'Buddhist and Taoist Notions of Transcendence; a Study in Philosophical Contrast.' Art. in *Buddhist and Taoist Studies*, I ed. Michael Saso & David W. Chappell. Univ. Press, Hawaii, 1977, p. 3. Paper delivered at the Asian Studies Pacific Area Conference, Honolulu, Hawaii, 1975.
- SASO, M. R. (7). 'On the Meditative Use of the "Yellow Court Canon"'. *JCST*, 1974, 9, 1.
- SASO, M. R. (8). 'On Ritual Meditation in Orthodox Taoism'. *JCST*, 1971, 8, 1.
- SASO, M. R. (9). *Chinese Religion in Modern Garb; the Cultural Heritage of Taiwan*. Communication to the Conference on Asian Religions. Univ. of Alberta, 1975.
- SASO, M. R. (10). 'Orthodoxy and Heterodoxy in Taoist Ritual.' Art. in *Religion and Ritual in Chinese Society*. ed. A. P. Wolf, Stanford Univ. Press, Calif. 1974, p. 325.
- SASO, M. R. (11) (ed.). *Chuang-Lin Hsü Tao Tsang: an Encyclopaedia of Taoist Ritual, or, Collection of Taoist Manuals*. Chhêng-Wên Press, Taipei, 1975.
- SASO, M. R. & CHAPPELL, D. W. (1). *Buddhist and Taoist Studies*, I. Univ. Press, Hawaii, 1977 (Asian Studies at Hawaii, no. 18).
- SCHIPPER, K. M. (5). "The Taoist Body". *HOR*, 1978, 17, 355.
- SCHIPPER, K. M. (6). *Concordance du Houang-T'ing King [Huang Ting Ching] Nei-King [Nei Ching] et Wai-King [Wai Ching], [Internal and External Radiances of the Yellow Courts]*. École Française d'Extrême Orient, Paris, 1975. (Publications, no. 104).
- SCHIPPER, K. M. (7). *Le Fên Têng [Lighting of the Lamps, or New Fire]; Rituel Taoiste*. École Française d'Extrême Orient, Paris, 1975. (Publications, no. 103).
- SCHIPPER, K. M. (8). 'The Written Memorial in Taoist Ceremonies,' Art. in *Religion and Ritual in Chinese Society*. Ed. A. P. Wolf, Stanford Univ. Press, Calif. 1974, p. 309.
- SCHMIDT, C. & TILL, W. K. (1). '*Pistis Sophia*, ein gnostisches Originalwerk des 3. Jahrhunderts aus dem Koptischen übersetzt. Leipzig, 1925.
- SCHOLER, D. M. (1) (ed.). *Nag Hammadi Bibliography, 1948-1969*. Brill, Leiden, 1971. (Nag Hammadi Studies, no. 1). Supplemented annually. Subsequently in *NT*, 1971, 13, 322; 1972, 14, 312; 1973, 15, 327; 1974, 16, 316; 1975, 17, 305; 1977, 19, 293.
- SCHULTES, R. E. & HOFMANN, A. (1). *The Botany and Chemistry of Hallucinogens*. Thomas, Springfield, Ill., 1973; repr. 1978.
- SEIDEL, A. & WELCH, HOLMES H. (1) (ed.). *Facets of Taoism*. Yale Univ. Press, New Haven, Conn., 1978.
- SELYE, H. (1). *The Physiology and Pathology of Exposure to Systemic Stress*. Acta Inc. Med. Pub., Montreal, 1950.
- SELYE, H. (2). 'The Adaptation Syndrome in Clinical Medicine.' *PRACT*, 1954, 172, 5.

- SELYE, H. (3). 'The General Adaptation Syndrome and Gastro-enterology.' *RGE*, 1953, 20 (no. 3), 185.
- SELYE, H. (4). *Stress without Distress*. Lippincott, Philadelphia and New York, 1974.
- SENGUPTA, ANIMA (1). *Classical Samkhya; a Critical Study*. Monoranjan Sen Gour Askram, Lucknow, 1969.
- SENGER, M. (1) (ed.). *Krishna; Myths, Rites and Attitudes*. East-west Centre, Honolulu, Hawaii, 1966.
- SIVIN, N. (13) (ed.). *Science and Technology in East Asia* (nineteen articles by sixteen writers reprinted from *ISIS*, 1914 to 1976). Science History Publications, New York, 1977.
- SIVIN, N. (15). 'On the Word "Taoist" as a Source of Perplexity; with special reference to the Relations of Science and Religion in Traditional China.' *HDR*, 1978, 17, 303.
- SIVIN, N. (16) (tr.). 'Thien Lao Shen Kuang Ching, the "Celestial Elder's Canon of the Spirit Lights," an ancient Chinese book of Interior Astrology.' *IO*, 1973, 4, 232.
- SMITH, I. D. & SHEARMAN, R. P. (1). 'Circadian Aspects of Prostaglandin F₂-induced Termination of Pregnancy; Intra-amniotic effectiveness for abortion greatest at 6 pm in a diurnal rhythm?' *JOGBC*, 1974, 81, 841. Cf. editorial in *BMJ*, 1975 pt. 2 (5 Apr.), 3.
- SOLOMON, D. (2) (ed.). *The Marijuana Papers*. New York, 1966, 2nd, ed., revised, Granada (Panther Books), 1969; repr. 1970, 1972.
- SORENSEN, S. (1). *The Quest for Wholeness*. Prentismidja Jons Helgasonar, Reykyavik, 1971.
- STAAL, F. (1). *Exploring Mysticism*. Penguin, London, 1975.
- STAUE, J. R. (1). 'Psyche and Society; Freud, Jung and Lévi-Strauss; a Comparative Historical Study.' Communication to the Int. Congr. Sociology, Toronto, 1974.
- STIEFVATER, E. W. & STIEFVATER, ILSE (1). *Chinesische Atemlehre und Gymnastik*. Haug, Ulm (Donau), 1962.
- STRICKMANN, M. (2). On the Alchemy of Tao Hung-Ching. Unpub. MS. Revised version contributed to the 2nd. International Conference of Taoist Studies, Tateshina, Japan, 1972. Art. in *Facets of Taoism*, ed. A. K. Seidel & H. H. Welch (1).
- STRICKMANN, M. (4). 'Taoist Literature,' Art. in *EB*, 15th ed. 1974, p. 1051.
- STRICKMANN, M. (5). 'A Taoist Confirmation of Liang Wu Ti's Proscription of Taoism' (MS of 1975). *JAOS*, 1978, 98 (no. 4), 467.
- STRICKMANN, M. (6). 'The Longest Taoist Scripture [*Tu Jan Ching*].' *HOR*, 1978, 17, 331.
- SUBBARAYAPPA, B. V. (2). *Some Trends in Indian Alchemy*. Proc. 15th Internat. Congr. History of Science. Edinburgh, 1977. Abstracts, p. 48.
- SUBBARAYAPPA, B. V. (3). 'Chemical Practices and Alchemy [in India].' Art. in *Concise History of Science in India*, ed. Bose, Sen & Subbarayappa (1), p. 274.
- SUGIMOTO MASAYOSHI & SWAIN, D. L. (1). *Science and Culture in Traditional Japan, A.D. 600-1854*. M.I.T. Press, Cambridge, Mass, 1978. (M.I.T. East Asian Science Series, no. 6).
- T'ENG SSU-YÜ & BIGGERSTAFF, K. (1). *An Annotated Bibliography of Selected Chinese Reference Works*. Harvard-Yenching Inst. Peiping, 1936. (Yenching Journ. Chin. Studies, monograph no. 12).
- TERIGI, A. T. (1). *Longevità e Vitalità*. Patron, Bologna, 1967.
- THORBECKE, G. J. (1) (ed.). *The Biology of Ageing and Development*. Plenum, New York, 1975. (FASEB Monographs, no. 3).
- TIMIRAS, P. S. (1). *Development Physiology and Ageing*. Macmillan, New York, 1972.
- TIMMONS, B. & KAMIYA, J. (1). "The Psychology and Physiology of Meditation and Related Phenomena; a Bibliography." *JTPP*, 1970, 2, 41.
- TURNER, V. W. (1). *The Ritual Process; Structure and Anti-Structure*. Routledge & Kegan Paul, London, 1969; Penguin (Pelican), London, 1974.
- VANSINA, J. (1). *Oral Tradition*, tr. H. M. Wright. Routledge & Kegan Paul, London, 1965; Penguin, London, 1973.
- WALEY, A. (6). *Three Ways of Thought in Ancient China*. Allen & Unwin, London, 1939.
- WATSON, BURTON (4) (tr.). *Chuang Tzu; Basic Writings*. Columbia Univ. Press, New York and London, 1964.
- WEIL, GOTTHOLD (1) (tr. & ed.). *Moses ben Maimon: Responsum on the Duration of Life (Über die Lebensdauer)—ein unediertes Responsum herausgegeben, übersetzt und erklärt von G. W.* Basel and New York, 1958.
- WOLF, A. P. (1) (ed.). *Religion and Ritual in Chinese Society*. Stanford Univ. Press, Palo Alto, Calif. 1974.
- VON ZACH, E. (5) (tr.). *Yang Hsiung's 'Fa Yen'* (Sinologische Beiträge, IV). Drukkerij Lux, Batavia, 1939.

GENERAL INDEX

by MURIEL MOYLE

NOTES

- (1) Articles (such as 'the', 'al-', etc.) occurring at the beginning of an entry, and prefixes (such as 'de', 'van', etc.) are ignored in the alphabetical sequence. Saints appear among all letters of the alphabet according to their proper names. Styles such as Mr, Dr, if occurring in book titles or phrases, are ignored; if with proper names, printed following them.
- (2) The various parts of hyphenated words are treated as separate words in the alphabetical sequence. It should be remembered that, in accordance with the conventions adopted, some Chinese proper names are written as separate syllables while others are written as one word.
- (3) In the arrangement of Chinese words, Chh- and Hs- follow normal alphabetical sequence, and *ü* is treated as equivalent to *u*.
- (4) References to footnotes are not given except for certain special subjects with which the text does not deal. They are indicated by brackets containing the superscript letter of the footnote.
- (5) Explanatory words in brackets indicating fields of work are added for Chinese scientific and technological persons (and occasionally for some of other cultures), but not for political or military figures (except kings and princes).

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TABLE OF CHINESE DYNASTIES

夏	Hsia kingdom (legendary?)		c. -2000 to c. -1520
商	SHANG (YIN) kingdom		c. -1520 to c. -1030
周	CHOU dynasty (Feudal Age)	{ Early Chou period Chhun Chhiu period 春秋 Warring States (Chan Kuo) period 戰國	c. -1030 to -722
			-722 to -480
			-480 to -221
First Unification	秦 CHHIN dynasty		-221 to -207
漢	HAN dynasty	{ Chhien Han (Earlier or Western) Hsin interregnum Hou Han (Later or Eastern)	-202 to +9
			+9 to +23
			+25 to +220
三國	SAN KUO (Three Kingdoms period)		+221 to +265
First Partition	蜀 SHU (HAN)		+221 to +264
	魏 WEI		+220 to +265
	吳 WU		+222 to +280
Second Unification	晉 CHIN dynasty: Western		+265 to +317
	Eastern		+317 to +420
	劉宋 (Liu) SUNG dynasty		+420 to +479
Second Partition	Northern and Southern Dynasties (Nan Pei chhao)		
	齊 CHHI dynasty		+479 to +502
	梁 LIANG dynasty		+502 to +557
	陳 CHHEN dynasty		+557 to +589
	魏	Northern (Thopa) WEI dynasty	+386 to +535
		Western (Thopa) WEI dynasty	+535 to +556
		Eastern (Thopa) WEI dynasty	+534 to +550
	北齊 Northern CHHI dynasty		+550 to +577
	北周 Northern CHOU (Hsienpi) dynasty		+557 to +581
Third Unification	隋 SUI dynasty		+581 to +618
	唐 THANG dynasty		+618 to +906
Third Partition	WU TAI (Five Dynasty period) (Later Liang, Later Thang (Turkic), Later Chin (Turkic), Later Han (Turkic) and Later Chou)		+907 to +960
	遼 LIAO (Chhitan Tartar) dynasty		+907 to +1124
	West LIAO dynasty (Qarā-Khiṭāi)		+1124 to +1211
	西夏 Hsi Hsia (Tangut Tibetan) state		+986 to +1227
Fourth Unification	宋 Northern SUNG dynasty		+960 to +1126
	宋 Southern SUNG dynasty		+1127 to +1279
	金 CHIN (Jurchen Tartar) dynasty		+1115 to +1234
	元 YUAN (Mongol) dynasty		+1260 to +1368
	明 MING dynasty		+1368 to +1644
	清 CHHING (Manchu) dynasty		+1644 to +1911
	民國 Republic		+1912

N.B. When no modifying term in brackets is given, the dynasty was purely Chinese. Where the overlapping of dynasties and independent states becomes particularly confused, the tables of Wiegner (1) will be found useful. For such periods, especially the Second and Third Partitions, the best guide is Eberhard (9). During the Eastern Chin period there were no less than eighteen independent States (Hunnish, Tibetan, Hsienpi, Turkic, etc.) in the north. The term 'Liu chhao' (Six Dynasties) is often used by historians of literature. It refers to the south and covers the period from the beginning of the +3rd to the end of the +6th centuries, including (San Kuo) Wu, Chin, (Liu) Sung, Chhi, Liang and Chhen. For all details of reigns and rulers see Moule & Yetts (1).

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Secondary sources

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Aurification and aurifaction in the West

The theory of *chrysopeia*

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Aurifaction in the *Pao Phu Tzu* book

The drug of deathlessness; macrobiotics and immortality-theory in East and West

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Nomenclature of chemical substances

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The origins of alchemy in Chou, Chhin and Early Han; its relation with Taoism

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The Imperial Laboratory of the Northern Wei and the Taoist Church at Mao Shan

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The Kiangnan Arsenal and the sinisation of modern chemistry

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- The stoves *lu* and *tsao*
- The reaction-vessels *ting* (tripod, container, cauldron) and *huei* (box, casing, container, aludel)
- The sealed reaction-vessels *shen shih* (aludel, lit. magical reaction-chamber) and *yao fu* (chemical pyx)
- Steaming apparatus, water-baths, cooling jackets, condenser tubes and temperature stabilisers
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 - The organic development of minerals and metals
 - Planetary correspondences, the First Law of Chinese physics, and inductive causation
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 - The subterranean evolution of the natural elixir
- The alchemist as accelerator of cosmic process
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 - Correspondences in duration
 - Fire phasing
- Cosmic correspondences embodied in apparatus
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 - Spatially oriented systems
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 - China and the Hellenistic world
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 - Conclusions; *nei tan* as proto-biochemistry
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 - The empirical background
 - The main isto-chemical preparations
 - Comments and variant processes
 - The history of the technique

ROMANISATION CONVERSION TABLES

BY ROBIN BRILLIANT

PINYIN/MODIFIED WADE-GILES

Pinyin	Modified Wade-Giles	Pinyin	Modified Wade-Giles
a	a	chou	chhou
ai	ai	chu	chhu
an	an	chuai	chhuai
ang	ang	chuan	chhuan
ao	ao	chuang	chhuang
ba	pa	chui	chhui
bai	pai	chun	chhun
ban	pan	chuo	chho
bang	pang	ci	tzhu
bao	pao	cong	tshung
bei	pei	cou	tshou
ben	pên	cu	tshu
beng	pêng	cuan	tshuan
bi	pi	cui	tshui
bian	pien	cun	tshun
biao	piao	cuo	tsho
bie	pieh	da	ta
bin	pin	dai	tai
bing	ping	dan	tan
bo	po	dang	tang
bu	pu	dao	tao
ca	tsha	de	tê
cai	tshai	dei	tei
can	tshan	den	tên
cang	tshang	deng	têng
cao	tshao	dí	ti
ce	tshê	dian	tien
cen	tshên	diao	tiao
ceng	tshêng	die	dieh
cha	chha	ding	ting
chai	chhai	diu	tiu
chan	chhan	dong	tung
chang	chhang	dou	tou
chao	chhao	du	tu
che	chhê	duan	tuan
chen	chhên	dui	tui
cheng	chhêng	dun	tun
chi	chhih	duo	to
chong	chhung	e	ê, o

Pinyin	Modified Wade-Giles	Pinyin	Modified Wade-Giles
en	ên	jia	chia
eng	êng	jian	chien
er	êrh	jiang	chiang
fa	fa	jiao	chiao
fan	fan	jie	chieh
fang	fang	jin	chin
fei	fei	jing	ching
fen	fên	jiong	chiung
feng	fêng	jiu	chiu
fo	fo	ju	chü
fou	fou	juan	chüan
fu	fu	jue	chüeh, chio
ga	ka	jun	chün
gai	kai	ka	kha
gan	kan	kai	khai
gang	kang	kan	khan
gao	kao	kang	khang
ge	ko	kao	khao
gei	kei	ke	kho
gen	kên	kei	khei
geng	kêng	ken	khên
gong	kung	keng	khêng
gou	kou	kong	khung
gu	ku	kou	khou
gua	kua	ku	khu
guai	kuai	kua	khua
guan	kuan	kuai	khuai
guang	kuang	kuan	khuan
gui	kuei	kuang	khuang
gun	kun	kui	khuei
guo	kuo	kun	khun
ha	ha	kuo	khuo
hai	hai	la	la
han	han	lai	lai
hang	hang	lan	lan
hao	hao	lang	lang
he	ho	lao	lao
hei	hei	le	lé
hen	hên	lei	lei
heng	hêng	leng	lêng
hong	hung	li	li
hou	hou	lia	lia
hu	hu	lian	lien
hua	hua	liang	liang
huai	huai	liao	liao
huan	huan	lie	lieh
huang	huang	lin	lin
hui	hui	ling	ling
hun	hun	liu	liu
huo	huo	lo	lo
ji	chi	long	lung

Pinyin	Modified Wade-Giles	Pinyin	Modified Wade-Giles
lou	lou	pa	pha
lu	lu	pai	phai
lǔ	lǔ	pan	phan
luan	luan	pang	phang
lǘe	lǘeh	pao	phao
lun	lun	pei	phei
luo	lo	pen	phên
ma	ma	peng	phêng
mai	mai	pi	phi
man	man	pian	phien
mang	mang	piao	phiao
mao	mao	pie	phieh
mei	mei	pin	phin
men	mên	ping	phing
meng	mêng	po	pho
mi	mi	pou	phou
mian	mien	pu	phu
miao	miao	qi	chhi
mie	mieh	qia	chhia
min	min	qian	chhien
ming	míng	qiang	chhiang
miu	miu	qiao	chhiao
mo	mo	qie	chhieh
mou	mou	qin	chhin
mu	mu	qing	chhing
na	na	qiong	chhiung
nai	nai	qiu	chhiu
nan	nan	qu	chhü
nang	nang	quan	chhüan
nao	nao	que	chhüeh, chhio
nei	nei	qun	chhün
nen	nên	ran	jan
neng	nêng	rang	jang
ng	ng	rao	jao
ni	ní	re	jê
nian	nien	ren	jên
niang	niang	reng	jêng
niao	niao	ri	jih
nie	nieh	rong	jung
nin	nín	rou	jou
ning	níng	ru	ju
niu	niú	rua	jua
nong	nung	ruan	juan
nou	nou	rui	jui
nu	nu	run	jun
nǔ	nǔ	ruo	jo
nuan	nuan	sa	sa
nǘe	nio	sai	sai
nuo	no	san	san
o	o, ê	sang	sang
ou	ou	sao	sao

Pinyin	Modified Wade-Giles	Pinyin	Modified Wade-Giles
se	sê	wan	wan
sen	sên	wang	wang
seng	sêng	wei	wei
sha	sha	wen	wên
shai	shai	weng	ong
shan	shan	wo	wo
shang	shang	wu	wu
shao	shao	xi	hsi
she	shê	xia	hsia
shei	shei	xian	hsien
shen	shen	xiang	hsiang
sheng	shêng, sêng	xiao	hsiao
shi	shih	xie	hsieh
shou	shou	xin	hsin
shu	shu	xing	hsing
shua	shua	xiong	hsiang
shuai	shuai	xiu	hsiu
shuan	shuan	xu	hsü
shuang	shuang	xuan	hsüan
shui	shui	xue	hsüeh, hsio
shun	shun	xün	hsün
shuo	shuo	ya	ya
si	ssu	yan	yen
song	sung	yang	yang
sou	sou	yao	yao
su	su	ye	yeh
suan	suan	yi	i
sui	sui	yin	yin
sun	sun	ying	ying
suo	so	yo	yo
ta	tha	yong	yung
tai	thai	you	yu
tan	than	yu	yü
tang	thang	yuan	yüan
tao	thao	yue	yüeh, yo
te	thê	yun	yün
teng	thêng	za	tsa
ti	thi	zai	tsai
tian	thien	zan	tsan
tiao	thiao	zang	tsang
tie	thieh	zao	tsao
ting	thing	ze	tsê
tong	thung	zei	tsei
tou	thou	zen	tsên
tu	thu	zeng	tsêng
tuan	thuan	zha	cha
tui	thui	zhai	chai
tun	thun	zhan	chan
tuo	tho	zhang	chang
wa	wa	zhao	chao
wai	wai	zhe	chê

Pinyin	Modified Wade-Giles	Pinyin	Modified Wade-Giles
zhei	chei	zhui	chui
zhen	chên	zhun	chun
zheng	chêng	zhuo	cho
zhi	chih	zi	tzu
zhong	chung	zong	tsung
zhou	chou	zou	tsou
zhu	chu	zu	tsu
zhua	chua	zuan	tsuan
zhuai	chuai	zui	tsui
zhuan	chuan	zun	tsun
zhuang	chuang	zuo	tso

MODIFIED WADE-GILES/PINYIN

Modified Wade-Giles	Pinyin	Modified Wade-Giles	Pinyin
a	a	chhio	que
ai	ai	chhiu	qiu
an	an	chhiung	qiong
ang	ang	chho	chuo
ao	ao	chhou	chou
cha	zha	chhu	chu
chai	chai	chhuai	chuai
chan	zhan	chhuan	chuan
chang	zhang	chhuang	chuang
chao	zhao	chhui	chui
chê	zhe	chhun	chun
chei	zhei	chhung	chong
chên	zhen	chhŭ	qu
chêng	zheng	chhŭan	quan
chha	cha	chhŭeh	que
chhai	chai	chhŭn	qun
chhan	chan	chi	ji
chhang	chang	chia	jia
chhao	chao	chiang	jiang
chhê	che	chiao	jiao
chhên	chen	chieh	jie
chhêng	cheng	chien	jian
chhi	qi	chih	zhi
chhia	qia	chín	jín
chhiang	qiang	ching	jing
chhiao	qiao	chio	jue
chhieh	qie	chiu	jiu
chhien	qian	chiung	jiong
chhih	chi	cho	zhou
chhin	qin	chou	zhou
chhing	qing	chu	zhu

Modified Wade-Giles	Pinyin	Modified Wade-Giles	Pinyin
chua	zhua	huan	huan
chuai	zhuai	huang	huang
chuan	zhuang	hui	hui
chuang	zhuang	hun	hun
chui	zhui	hung	hong
chun	zhun	huo	huo
chung	zhong	i	yi
chŭ	ju	jan	ran
chŭan	juan	jang	rang
chŭeh	jue	jao	rao
chŭn	jun	jê	re
ê	e, o	jên	ren
ên	en	jêng	reng
êng	eng	jih	ri
êrh	er	jo	ruo
fa	fa	jou	rou
fan	fan	ju	ru
fang	fang	jua	rua
fei	fei	juan	ruan
fên	fen	jui	rui
fêng	feng	jun	run
fo	fo	jung	rong
fou	fou	ka	ga
fu	fu	kai	gai
ha	ha	kan	gan
hai	hai	kang	gang
han	han	kao	gao
hang	hang	kei	gei
hao	hao	kên	gen
hên	hen	kêng	geng
hêng	heng	kha	ka
ho	he	khai	kai
hou	hou	khan	kan
hsi	xi	khang	kang
hsia	xia	khao	kao
hsiang	xiang	khei	kei
hsiao	xiao	khên	ken
hsieh	xie	khêng	keng
hsien	xian	kho	ke
hsin	xin	khou	kou
hsing	xing	khu	ku
hsio	xue	khua	kua
hsiu	xiu	khuai	kuai
hsiung	xiong	khuan	kuan
hsŭ	xu	khuang	kuang
hsŭan	xuan	khuei	kui
hsŭeh	xue	khun	kun
hsŭn	xun	khung	kong
hu	hu	khuo	kuo
hua	hua	ko	ge
huai	huai	kou	gou

Modified Wade-Giles	Pinyin	Modified Wade-Giles	Pinyin
ku	gu	mu	mu
kua	gua	na	na
kuai	guai	nai	nai
kuan	guan	nan	nan
kuang	guang	nang	nang
kuei	gui	nao	nao
kun	gun	nei	nei
kung	gong	nên	nen
kuo	guo	nêng	neng
la	la	ni	ni
lai	lai	niang	niang
lan	lan	niao	niao
lang	lang	nieh	nie
lao	lao	nien	nian
lê	le	nin	nin
lei	lei	ning	ning
lêng	leng	niu	nũe
li	li	niu	niu
lia	lia	no	nuo
liang	liang	nou	nou
liao	liao	nu	nu
lieh	lie	nuan	nuan
lien	lian	nung	nong
lin	lin	nũ	nũ
ling	ling	o	e, o
liu	liu	ong	weng
lo	luo, lo	ou	ou
lou	lou	pa	ba
lu	lu	pai	bai
luan	luan	pan	ban
lun	lun	pang	bang
lung	long	pao	bao
lũ	lũ	pei	bei
lũeh	lũe	pên	ben
ma	ma	pêng	beng
mai	mai	pha	pa
man	man	phai	pai
mang	mang	phan	pan
mao	mao	phang	pang
mei	mei	phao	pao
mên	men	phei	pei
mêng	meng	phên	pen
mi	mi	phêng	peng
miao	miao	phi	pi
mieh	mie	phiao	piao
mien	mian	phieh	pie
min	min	phien	pian
ming	ming	phin	pin
miu	miu	phing	ping
mo	mo	pho	po
mou	mou	phou	pou

Modified Wade-Giles	Pinyin	Modified Wade-Giles	Pinyin
phu	pu	tên	den
pi	bi	têng	deng
piao	biao	tha	ta
pieh	bie	thai	tai
pien	bian	than	tan
pin	bin	thang	tang
ping	bing	thao	tao
po	bo	thê	te
pu	bu	thêng	teng
sa	sa	thi	ti
sai	sai	thiao	tiao
san	san	thieh	tie
sang	sang	thien	tian
sao	sao	thing	ting
sê	se	tho	tuo
sên	sen	thou	tou
sêng	seng, sheng	thu	tu
sha	sha	thuan	tuan
shai	shai	thui	tui
shan	shan	thun	tun
shang	shang	thung	tong
shao	shao	ti	di
shê	she	tiao	diao
shei	shei	tieh	die
shên	shen	tien	dian
shêng	sheng	ting	ding
shih	shi	tiu	diu
shou	shou	to	duo
shu	shu	tou	dou
shua	shua	tsa	za
shuai	shuai	tsai	zai
shuan	shuan	tsan	zan
shuang	shuang	tsang	zang
shui	shui	tsao	zao
shun	shun	tsê	ze
shuo	shuo	tsei	zei
so	suo	tsên	zen
sou	sou	tsêng	zeng
ssu	si	tsha	ca
su	su	tshai	cai
suan	suan	tshan	can
sui	sui	tshang	cang
sun	sun	tshao	cao
sung	song	tshê	ce
ta	da	tshên	cen
tai	dai	tshêng	ceng
tan	dan	tsho	cuo
tang	dang	tshou	cou
tao	dao	tshu	cu
tê	de	tshuan	cuan
tei	dei	tshui	cui

Modified Wade-Giles	Pinyin	Modified Wade-Giles	Pinyin
tshun	cun	wang	wang
tshung	cong	wei	wei
tso	zuo	wên	wen
tsou	zou	wo	wo
tsu	zu	wu	wu
tsuan	zuan	ya	ya
tsui	zui	yang	yang
tsun	zun	yao	yao
tsung	zong	yeh	ye
tu	du	yen	yan
tuan	duan	yin	yin
tui	dui	ying	ying
tun	dun	yo	yue, yo
tung	dong	yu	you
tzhu	ci	yung	yong
tzu	zi	yü	yu
wa	wa	yüan	yuan
wai	wai	yüeh	yue
wan	wan	yün	yun