

A Translation of a Zosimos' Text in an Arabic Alchemy Book

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ABSTRACT

In a recent paper (El Khadem 1995), it was reported that an Arabic translation of a Greek text by Zosimos was found in a copy of a book entitled "Keys of Mercy and Secrets of Wisdom," written by the twelfth century alchemist Al-Tughra'i. Reported here is a description of this rare book, which has recently been added to the Library of Congress' Near East Section collection.

Tughra'i, Author and Translator

The copy of "Keys of Mercy and Secrets of Wisdom" under consideration was written in two parts designated, "Part One, Introduction" by Al-Tughra'i', and Part Two, "From Keys of Wisdom by Zosimos" translated to Arabic by Al-Tughra'i. The author and translator's full name is Mu'ayed-ul-Din Abu Ismail Ibn Al-Hassan Ibn Ali Al-Tughra'i. He was born in 1062 A.D. in the city of Asbahan in Persia and was later appointed "Katib" (secretary) in the court of the Seljuq Sultan Malik-Shah and that of his successor, Sultan Muhammad. Because of his skills in calligraphy, he was assigned the duty of affixing the royal signature "Tughra" to the sultan's writs (hence his name, which means the writer of Tughras). After several years, Tughra'i moved to Mosul in Iraq where he was appointed Vizir to Emir Ghiyat-ul-Din Mas'ud. When the Emir died, uncertainty regarding his successor led to a palace revolt. Tughra'i sided with the oldest son, Mas'ud, who subsequently lost the power struggle to a younger brother, Mahmud. The latter, angered by his support of his brother,

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arranged to have him accused of heresy and then had him beheaded in the year 1121 A.D. Tughra'i's execution caused dismay among the learned community in the region and prompted many publishers to delete all what they considered controversial from his books.

Tughra'i was a statesman, an alchemist and a poet, considered by many as one of the key literary figures of his time (see Nicholson 1941). The present text, which according to an annotation on its title page, was also known as: "Key of Mercy and Lantern of Wisdom" and "Key of the Treasures and Lantern of the Symbol", has been cited by authors, such as Ullmann (1972), who lists it as "Keys of Mercy and Lanterns of Wisdom", and Sezgin (1971) and Kraus (1943) who list it as "Keys of Mercy". None of these authors, however, mentions that this, or any other book by Tughra'i, contains a translation of a text by Zosimos. A possible explanation of this absence is that the translation of Zosimos' text was deemed sufficiently controversial to delete it from many copies of "Keys of Mercy."

Zosimos:

Zosimos, the author of Part Two of the present text, was the most famous alchemist of his time. He was a gnostic philosopher, born in the city of Panopolis (present day Akhmim) in Southern Egypt around the year 300 A.D. He lived in Alexandria, and traveled to many parts of the Hellenic world (see Read 1937, and Hopkins 1967). Although Zosimos was a prolific writer, all his books have been lost and what remains of them today are mere passages and quotes written in the original Greek language, or translated to Syriac or Arabic. The Greek and Syriac texts have been translated to French by Berthelot (1885, 1888, 1893) and discussed in detail by Halleux (1979) and Mertens (1990).

Arabic translations of Zosimos' work are listed by Sezgin (1971, p. 73) and by Ullmann (1972, p. 160). They are also listed in the Arabic encyclopedia, "Kitab al-Fihrist", published in Baghdad in 987 A.D., by Ibn Al-Nadim (1872). In Section Ten of this book, Nadim gives the titles of four books authored by Zosimos (see Flugel 1872); they are: "Keys of the Craft," by "Rimos," (its title was translated by Berthelot 1888, p. 28) as "Keys of the Work"); "Keys of Magic," by "Thosimos"; "The Book of Elements," by "Dosimos" and "Book to All the Wise of the Craft" also by Dosimos. The inconsistency in spelling Zosimos' name can be traced to two reasons: (a) Arabic vowels may be deleted, altered, or transposed, according to certain rules, to render foreign names easier to pronounce; (b) the pairs of Arabic letters "Ra" and "Za" that produce the sounds "R" and "Z," and "Dal" and "Thal," that produce the sounds

“D,” and “Th” (as in “the”) are identical in shape, except for a dot on top of the second letter of each pair. A dot on the letter “Ra” changes it to “Za” and a dot on “Dal,” forms the letter “Thal,” In the writings of Geber, Avicenna and Tughra’i, Zosimos is referred to as Rismos or Zismos, depending on whether the copier of the manuscript remembered to put the dot. For example on p. 2 of the Introduction of the present text, Zosimos’ name is spelled with a dot, whereas on the title page of Part Two it is spelled without the dot. Nadim, probably did not realize that the authors he lists as Rimos, Thosimos and Dosimos were one and the same person. Furthermore, because “The Craft,” “The Work,” and “Magic,” were synonyms used to describe “Alchemy,” it is quite possible that Zosimos’ books listed as, “Keys of the Craft,” and “Keys of Magic,” were one and the same book which Tughra’i later referred to as “Keys of Wisdom,” because he did not wish to use of the word “craft” or “magic” lest he be accused of heresy. Nadim describes “Keys of the Craft” as a collection of letters, numbered one through seventy, and states that the book was also called the “Seventy Letters.” Another book having the word “Keys,” in its title namely, “The Book of Keys,” also known as “The Little Key of Zosimos,” is more difficult to relate to the present text, because it was not listed by Nadim; it was cited instead by the Byzantine monk, Michael Psellus (see Berthelot 1885).

The Text

The present book contains extremely valuable historical information about the chemical knowledge available in Tughra’i’s time. Unfortunately, Part Two is not a verbatim translation of Zosimos’ book “Keys of the Craft,” since it offers comments without specifying whether they belong to Tughra’i, or to Zosimos. It does however, give a detailed summary of Zosimos’s text, and contains innumerable direct quotes of Zosimos and many philosophers of antiquity.

The Preface of “Keys of Mercy and Secrets of Wisdom” lists the chapters of both parts of the book. Part One or “Introduction” is divided into five chapters: I. The science, and its Materials; II. Mixing and its Ways; III. Fire and its Nature; IV. Balances (of properties); V. Metals and Plants and how to Recognize them. Part Two, entitled “From Keys of Wisdom,” is divided into seven sections: I. Definitions and Symbols; II. Promotion, and what can be Promoted; III. Distillation, what can and cannot be Distilled; IV. Conversions and Synthesis; V. Degradation and Decomposition; VI. How Chemists Deduced these Facts; VII. The stages of the Work. Even though the chapters of the two parts of the book have different titles, they are similar in content and present the subjects in roughly the same order. Two sections of Part Two, namely Section Five and Section Six

were missing from the copy studied. However, because their subject matter had been previously discussed in Chapters Four and five of the Introduction, it was possible to comprehend the text without much difficulty.

“Keys of Mercy and Secrets of Wisdom” is written in the format of lectures. The narrator in both parts of the book seems to be Tughra’i since he refers to Zosimos in the third person. Furthermore, Part Two often contains references to things that had not occurred, or did not exist in Zosimos’ time. Example of these are statements like: “the Moslem philosophers said . . .” (Islam came three centuries after Zosimos’ death), and “gun powder” (a product that was not known in Zosimos time). Similarly, in a dream depicting “Cinnabar,” as a giant sitting on a throne reached by nine steps (the number of steps needed to prepare the elixir), the person relating the dream praises the prophet Mohammed, and invokes the archangel “Israfil” (the angel who blows the horn on judgment day, according to certain Islamic writings). In both parts of the text, the narrator ends each paragraph with the typically Islamic cliché: “God is more knowledgeable,” which Zosimos, a Christian, would not normally say. However, it is also quite possible that these pious words were intentionally added by Tughra’i to abate criticism by the religious leaders of his time.

Although some might suspected that Zosimos’ name was added to the book in order to enhance its value, this possibility is remote for two reasons: (a) Tughra’i was a successful author and an influential statesman, who did not need such a practice to promote one of his book, and (b) Zosimos’ name is not displayed prominently, but seems instead to be intentionally hidden; it does not appear on the book’s title page, but is relegated to the title page of Part Two, which comes after hundreds of pages belonging to Part One.

The Quotes

Among the many quotes attributed to Zosimos, some are in the form of letters addressed to women. One is addressed to a certain Maria (probably Mary the Copt), and stresses the importance of rigorously following procedures in any chemical work. Zosimos says: “You may think, Maria, that all the balances and the ten laws that pertain to the Substance (the elixir) need not be rigorously followed, and that some may be altered a little, while others may be totally ignored. It is not so; never disobey any of the rules, otherwise you will not succeed in your preparation and all your efforts will be wasted.” In turn Mary asks: “Can you produce gold but from gold, or can you form a metal from a non-metal? Can you produce a man save from a man; a plant except from a plant and an animal but from its own kind?”

In another section of the book Zosimos is quoted as saying: “Knowledge is treated with great honor, because only a philosopher, who has acquired Wisdom, scientifically and practically, is able to use it. An experimentalist may obey his master when he tells him: Take this and do such and such a thing, evaporate it, dissolve it, distill it, and so on till the end of the work. That aide does not understand anything beyond how to do things; whereas the person who comprehends the science and the practice, knows how and why something is evaporated, i.e. the purpose of the evaporation. This is why, to become a philosopher, one must know the aim of Wisdom in each step of the work.”

The book also contains several quotes made by famous Greek philosophers, such as Aristotle, whose discussions with Plato are reproduced in some detail, and Democritus, who is quoted as saying: “The stone is not formed until it has gathered all the colors that exist in the universe, and until it has been colored with all the simple and complex colors.”

Galen is quoted as saying: “To determine the amount of a drug to be used as an antidote, select three doses; one in great excess, let it be forty eight (48) units of weigh; drams, iotas, or any other unit; the second in the middle, which is twenty four (24), and the second (third), which is the least, six (6) parts. To determine which of these to use, consider all the variables, the powers, and the reasons, as well as the benefits gained by increasing the dose to forty eight units or decreasing it to six. If one condition requires an increase and one condition a decrease, then you use twenty four.”

The book also contains quotes from lesser known personalities such as Andromachus (a contemporary of Galen), Heracles, Tamagus and “Balinas” (Apollonios of Tyana). Also quoted, are mythical characters, such as Hermes Trismegistus, his son Tata, and his daughter Queen Cleopatra. For example, Hermes is quoted as saying: “A body will not accept a soul that is not its own, and a soul will not reside in a body that is not its own. Thus a human body will not accept the soul of a bird, and the soul of a bird will not reside in a human body.” Unfortunately, some Greek philosophers quoted could not be identified because of lack of records, or because transliteration had altered their names beyond recognition.

Among the Greek literature cited in Part Two of the text are: “The Book of Revelation” (Istigla’) by Aristotle; “The Basics” by Apollonios of Tyana (Balinas), from which a passage is quoted, describing how to dye elixirs with yellow colors extracted from a sun flower like plant called in Greek “Lumenia”, and “Letters from Ostanos to Cleopatra”, which are discussed in some detail.

Content of the Book

Both parts of the book start with a discussion of the “four elements” (fire, air, water, and earth) and the “four natures” (hot, cold, moist, and dry), and

continue with their quantitative estimation. This is followed by a determination of their ratios and how to amend these to form the elixirs. The book ends with the use of the white elixir in the transmutation of copper to silver and the red elixir in the conversion of silver to gold.

Both parts of the book contain detailed accounts of dreams that reveal the secrets of Alchemy and long sections dealing with astrology and the role of the seven "planets" (the sun, the moon, Mercury, Venus, Mars, Jupiter, and Saturn) in each stage of the work. They abound with diagrams depicting benefic and malefic configurations of "planets" and their effect on the work.

Nomenclature is quite confusing because the chemical names bear no relation to composition. For example, lead sulfide is referred to as the "Tree that Grows in the Black Soil of India" because of its color and the heat used in its preparation from sulfur.

Most of the conclusions reached by the authors of the text are today invalid because of two major flaw in reasoning: The first is the belief that there are only four elements, and the second, that metals are not elements, but compounds. In spite of these shortcomings, Alchemists have succeeded in producing yellow colored alloys made of silver and gold, and white ones made of copper and silver. Avicenna (Ibn Sina) correctly warned his contemporaries that it was not possible to produce real gold chemically, saying: "Only imitations of gold can be formed, because the essential nature of a pure metal can never be altered" (see Holmyard 1928). His ideas were unfortunately disputed by Tughra'i in the book "Facts about Martyrdom." Zosimos believed in transmutation, but he correctly states that to prepare gold (alloys) out of silver one must start with gold, and to make silver out of copper one needs silver. He is quoted as saying: "He who sows silver reaps silver, and he who sows gold reaps gold." His mistake was to think that the amount of silver or gold added increases like that of yeast during fermentation.

Some of the important contributions of alchemists, discussed in the present text are the distinction between distillation, and pyrolysis (which they called smoking). Their success in making stills and constant temperature reactors, can be seen in the illustrations depicted: Thus Fig. 1 shows a sublimation apparatus; Fig. 2 the precursor of the modern Kugelrohr; Fig. 3. shows a reactor warmed with what is described as "moist heat", and Fig. 4. an incubator warmed by fermenting garbage and burning coal. In a remarkable statement, Zosimos explains why vapor rises against gravity during distillation; he says: "Motion is due to heat for without heat there would be no motion".

Most alchemists rejected the idea of "spontaneous creation". Thus Tughra'i says: "Try as they may the wise were never able to form something from something other than what it is normally generated from; humans from human semen;

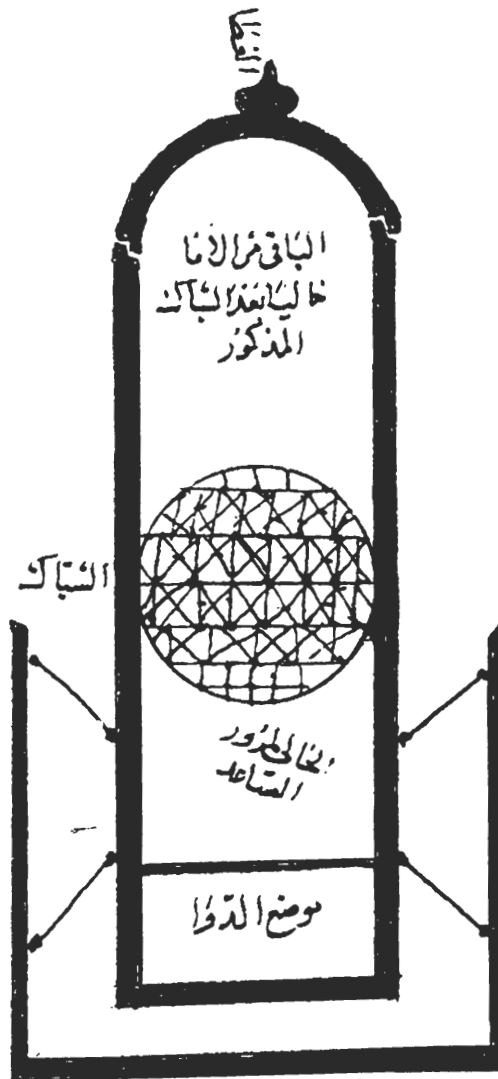


Fig. 1. Sublimation apparatus.

wheat from its grains, etc. They tried to produce snakes and asps by fermenting human hair; bees and wasps from putrefied horse meat; humans from human flesh as well as from innumerable other things, but they all failed.’’

Format of the Book

The manuscript “Keys of Mercy and Secrets of Wisdom” is written in black and red inks; black ink for text, red ink for punctuation and both inks for art

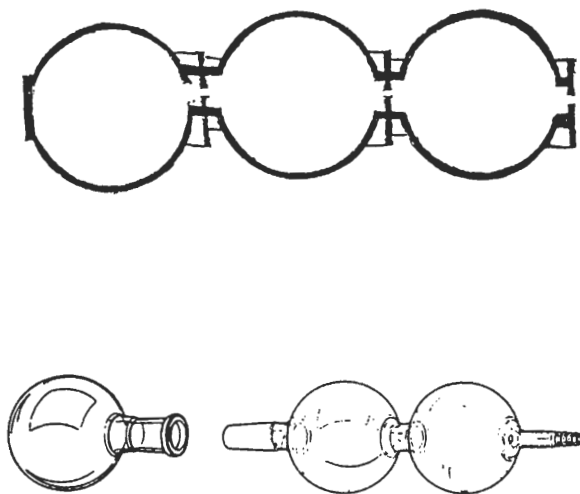


Fig. 2. Upper figure: A fractional distillation apparatus, made up of three glass flasks connected by metal and sealed with clay. Lower figure: a modern *Kugelrohr*.

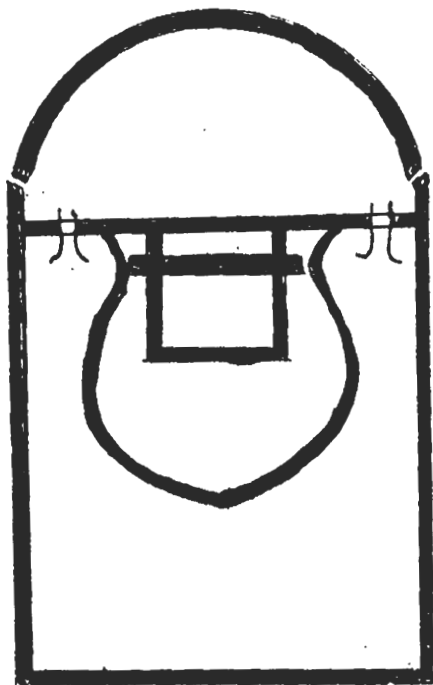


Fig. 3. Coal heated water bath to produce "moist heat" for a reactor.

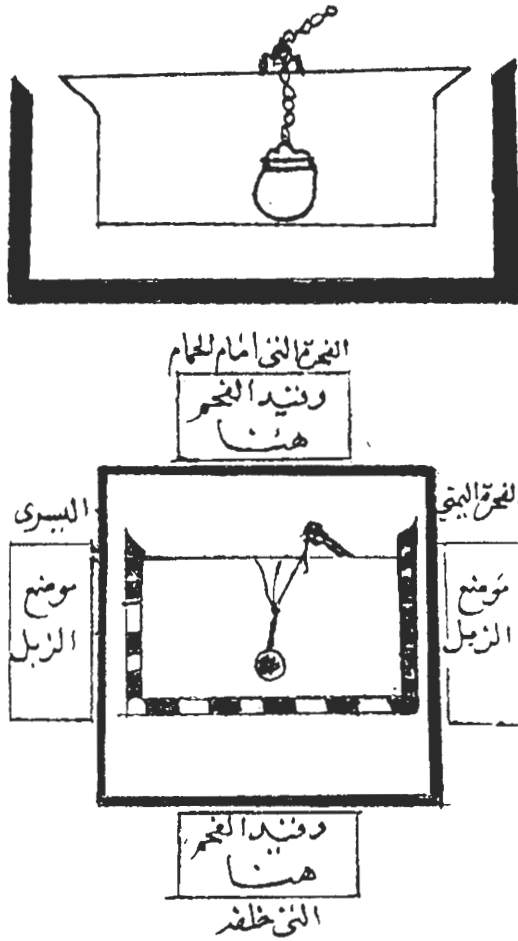


Fig. 4. Upper Figure: An incubation bath; Lower Figure: The bath placed in a pit warmed from two sides with fermenting garbage and from the other sides with coal.

work. The text was originally made up of 157 folios (314 sheets or 628 pages); of these 24 folios (48 sheets or 96 pages) of Part Two are missing. The Introduction, or Part One, is in 60 folios (120 sheets or 240 pages) grouped in 13 signatures (booklets), that contain 28 Tables and 23 Figures. Part Two is presently composed of 73 folios (146 sheets or 292 pages), arranged in 15 signatures, that contain 10 Tables and 42 Figures. Although the pages of the book are not numbered, it was possible to determine the existence of a gap, because the first word in each *verso* is entered at the bottom of the preceding *recto*. This made it possible to ascertain that there are missing pages between Sections Four and Seven. The size of the gap was determined from two annotations found at the end of each Part. These give the number of sheets that were present in the Part in question.

On the last page of Part Two, a recent owner of the book wrote: "Owned by legal purchase by so and so, son of so and so, in the holy month of Zul-Que'da 1148 H. (1735 A.D.); 194 sheets in 19 booklets." A count of the actual number of sheets present in Part Two, revealed that 48 sheets (24 folios) in 4 booklets were missing. A similar annotation found at the end of Part One, revealed that this part contained 120 sheets in 13 booklets, which is the actual number of sheets presently found.

The pages of the book (204 × 147 mm) contain about twenty five lines of text (less if a page contains an art work). Tables and Figures are often surrounded by frames made of double red lines. The margins are generous; top margins are 24 mm, and bottom ones, slightly larger (26 mm). Side margins vary in width; the right margins in *rectos* and the left margins in *versos* are wider (60 mm) than the margins opposing them (18 mm). It seems that the two parts of the books were not kept separately because the last signature of Part One and the first of Part Two have identical worm holes and water stain marks.

Many of the side margins of the book bear annotations, written in ink by successive owners of the manuscript. An annotation on the title page states that the present text was also known by the two other names mentioned earlier, and lists the title of three other books by Tughra'i. They are: (a) "Collection of Secrets and Compositions of Lights"; (b) "Introduction to the Book of Healing," and (c) "Facts about Martyrdom." There are also two biographical notes; one located on the title page, dealing with the biography of the author, and the other, on the last page of the book, which promotes the work of the fifteenth century alchemist, Al-Jildaqi, and names six of his books. In addition, there are several short notes in the margins, dealing with errors in the text and their corrections, and longer ones dealing with explanations and interpretations.

The present text must have been copied after Tughra'i's death, since his name is followed by the words "May God have mercy on him." It is in a reasonably good condition, thanks to some restorative treatment administered in France after world war II. At that time the copy was dated, circa fifteenth century, which is consistent with the fact that the book was first published in the twelfth century, and has since then been periodically recopied. The restoration was made at the request of Dr. Puy-Haubert the war time Director of the French Hospital in Alexandria (Egypt). It involved cleaning the pages and spraying them with insecticides to kill the worms that had damaged the margins; then spraying the damaged pages with a varnish.

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