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(editor)

ISSUES
on Greek Alchemy

Institute of Historical Research
National Hellenic Research Foundation

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Introduction

The Dacalbo Project

Efthymios Nicolaidis

Institute of Historical Research/
National Hellenic Research Foundation

DACALBO (Digital archive concerning alchemy in Byzantium and in Greek-speaking communities of the Ottoman Empire) project addresses a significant gap in the current historiography of sciences, by exploring and carefully mapping the Byzantine and post-Byzantine alchemy through the creation of a comprehensive, open access, digitized, and searchable database and metadata material. Specifically the project aims to:

- a) Identify, collect, digitize and classify all surviving manuscript and printed primary sources relevant to alchemy in Greek language during the periods of Byzantium and of the Ottoman Empire.
- b) Collect and classify the secondary bibliography.
- c) Create prosopographical entries for every identifiable author.
- d) Evaluate the modifications or transformations which Byzantine alchemical tradition has undergone, and to ascertain its relations with Hellenistic, Arabic, or Latin alchemy.
- e) Determine what twists in the development of alchemy have taken place after its introduction in the cultural context of Greek-speaking communities of the Ottoman Empire, from the 15th to the 18th century and the passage to “Chymistry”.

Additional objectives:

- a) The enrichment of the history of Byzantium, drawing lines of connection between the historiography of Byzantine alchemy and that of the natural sciences in South-Eastern Europe.
- b) The production of a historical material that is both profitable in terms of educational applications and suitable for activities tending to promote public awareness of the different temporalities that having been merged in the history of science and render the written monuments of this history tokens of a common cultural legacy.

The interdisciplinary team is constituted by historians, historians of science, philologists, palaeographers, chemists and didacticians.

The project is supported by the International Academy of History of Science and funded by the 7th European Community Framework Program.

The Alchemical Manuscript Tradition.

An Overview

Alain Touwaide

Institute for the Preservation of Medical Traditions

Over the past century and a half, Greek manuscripts with alchemical contents have been extensively researched. Study mainly dealt with the inventory of such codices, the identification of their contents, the determination of the linkages between manuscripts (stemma codicum), the edition and translation of their texts, possibly together with a commentary, and, on this basis, tentative reconstructions of the history of alchemy through time and space. In spite of this intensive activity, no general overview of the whole textual tradition has been attempted. In this paper, I will lay down the basis for such an approach.

This first attempt is based on currently available literature, the material newly brought to light by the DACALBO programme and my own research on medical manuscripts. Although it still is exploratory, it has detected a significant similarity with the transmission of Greek medical texts, and suggests that scientific traditions might have common characteristics. Further study will be needed, to verify whether these preliminary conclusions might be extended to other scientific disciplines.

Defining the field of alchemy

Based on the analysis of the manuscripts containing texts that can be identified as alchemical by either their title or their author, alchemy can be defined from a formal viewpoint as an operative technique combined with some sort of natural philosophy and mystic speculation that brings together a vast set of disciplines (principally in the natural and medical sciences) together with specialized techniques. To this end, it requires specific technical apparatus, selected ingredients, precise tables of weights and measures, and prescriptive descriptions of operations.

All these elements are represented in the **figures 1-9**. One after the other (in an order that aims to follow in a certain sense the alchemical process, although it might be partially arbitrary), they decompose the very notion of alchemy in a visual way that maps the territory of alchemy. Starting with the basic disciplines that contribute to the

making of the alchemical scientific environment and the elementary ingredients necessary for the alchemical operation,

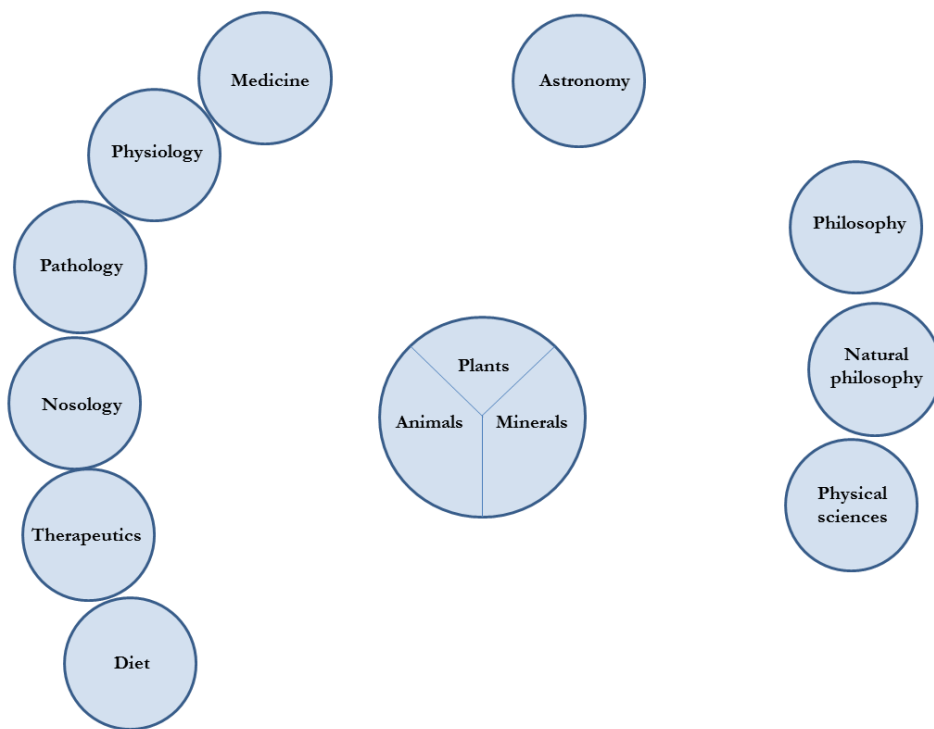


Figure 1

they introduce the disciplines using these substances

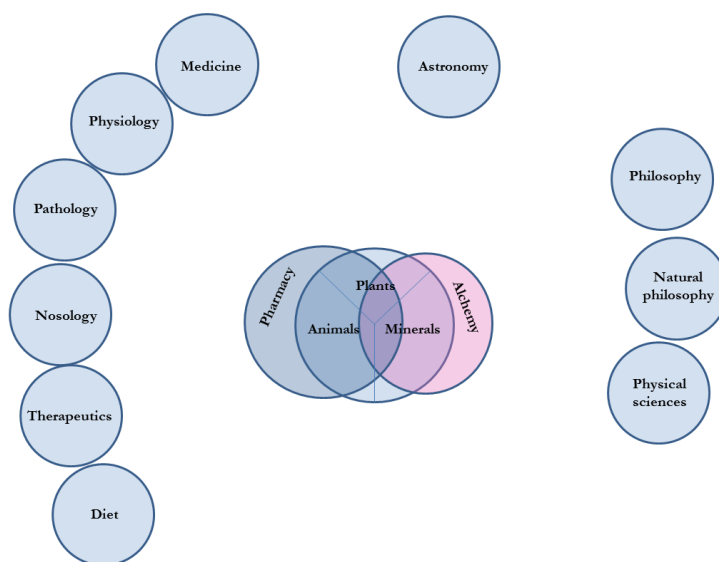


Figure 2

with the requested manipulations

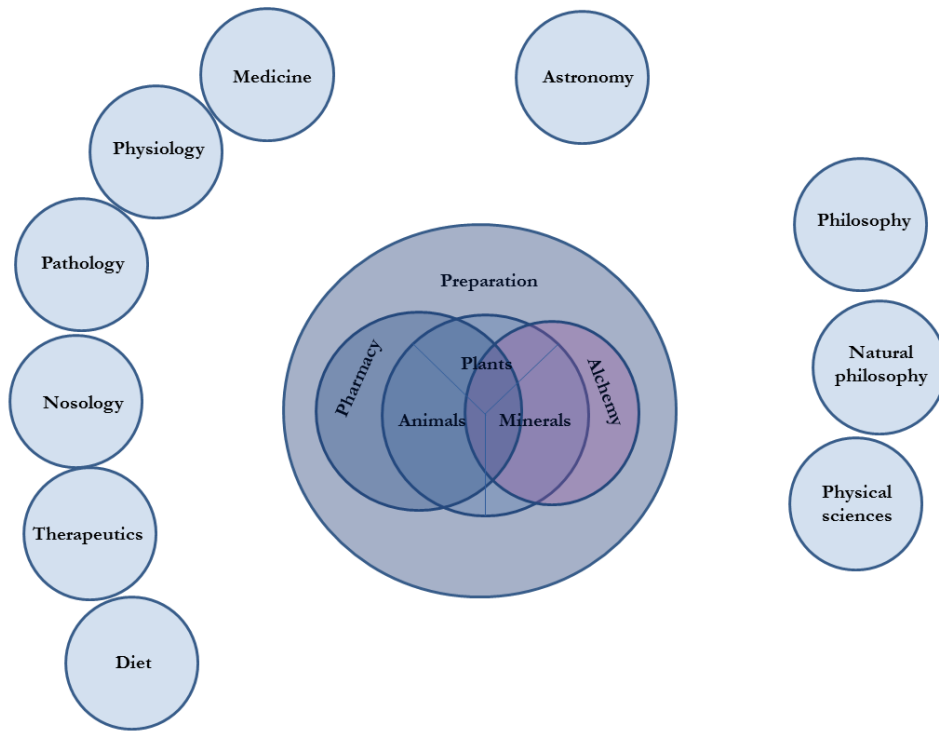


Figure 3

and the weights and measures.

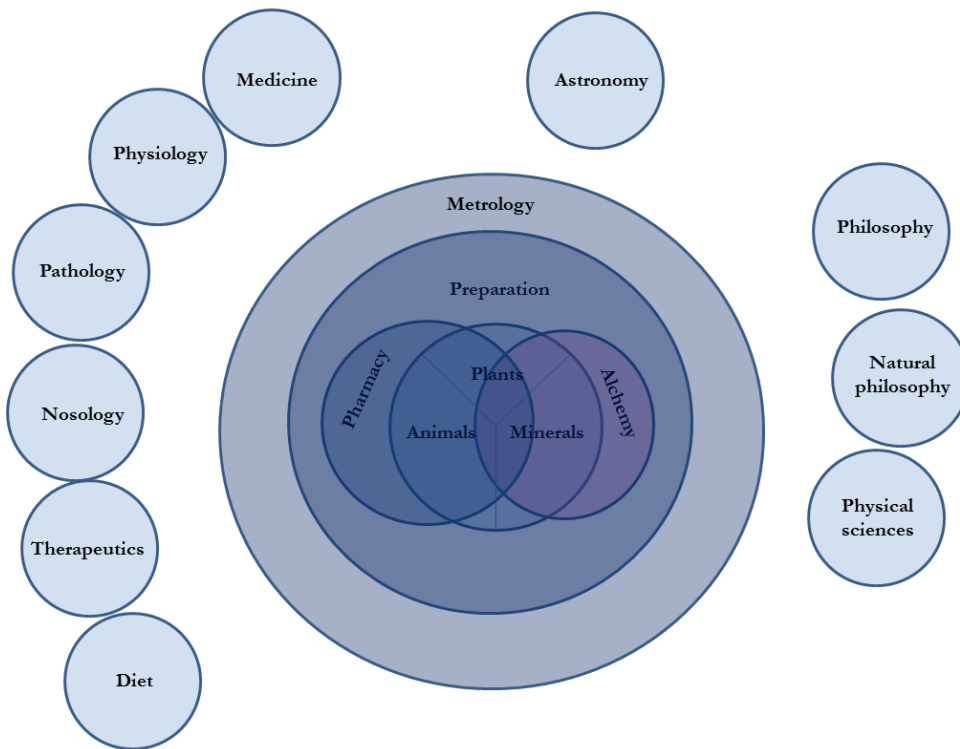


Figure 4

Then they move from the sublunar to the celestial world, with the influence exercised by the astral system on the living creatures in the sublunar world

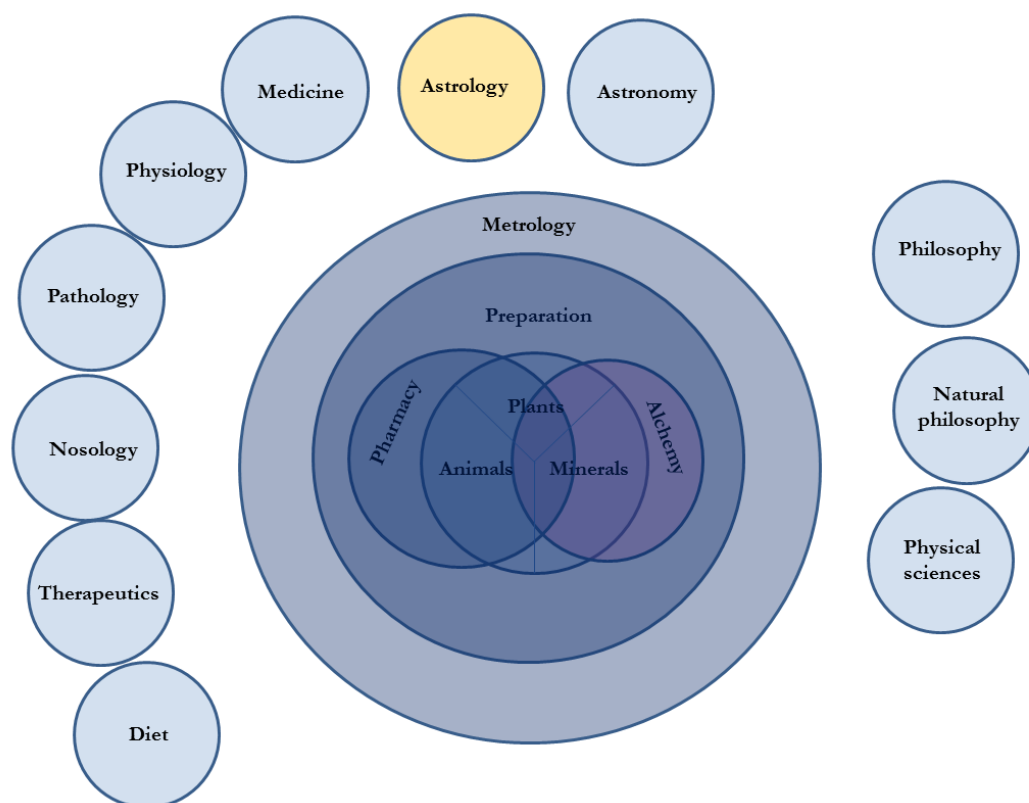


Figure 5

and the related discipline, that is, iatromathematics.

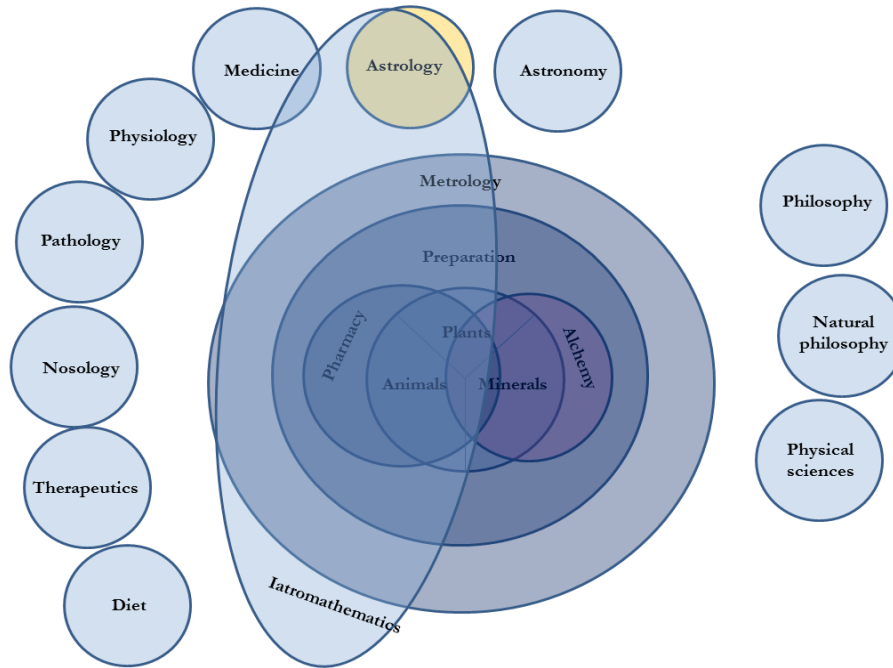


Figure 6

Similarly, the concepts of the kosmos and its genesis

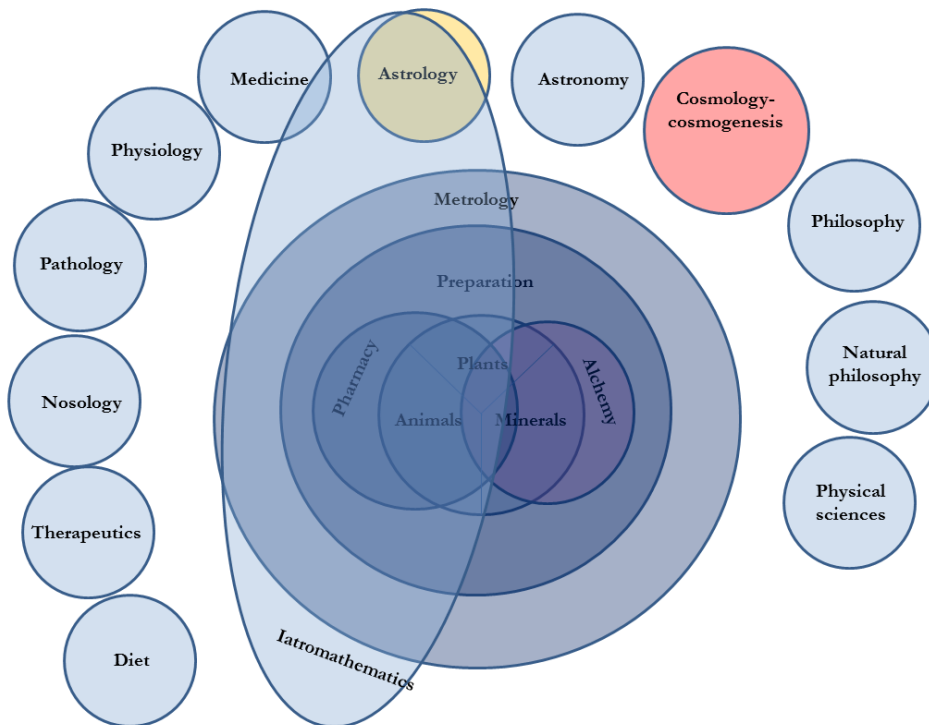


Figure 7

open the door to philosophical speculation.

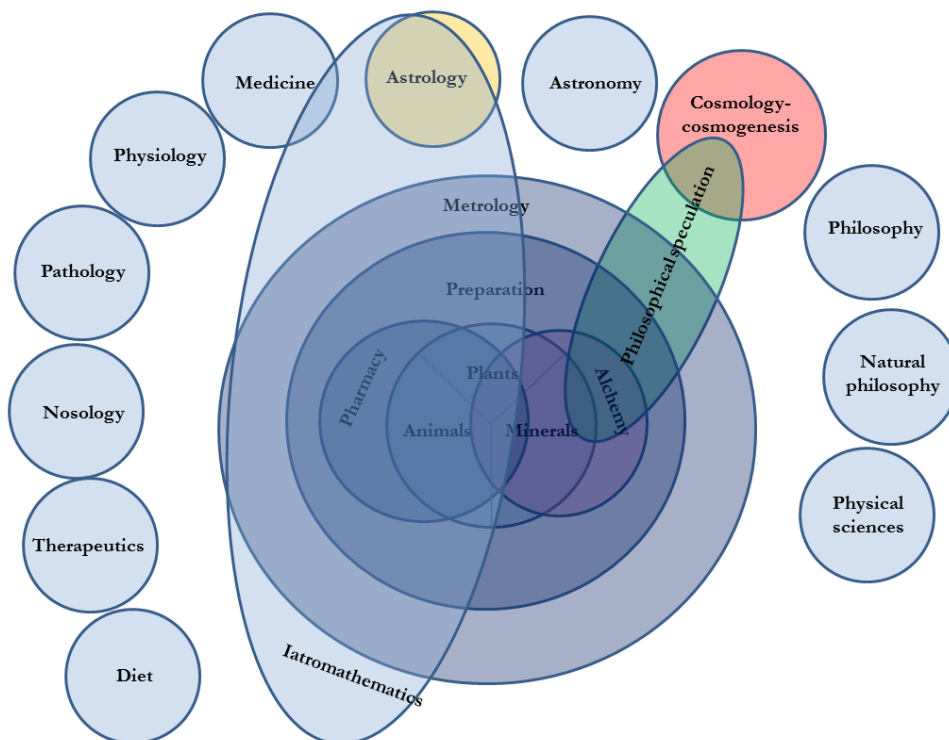
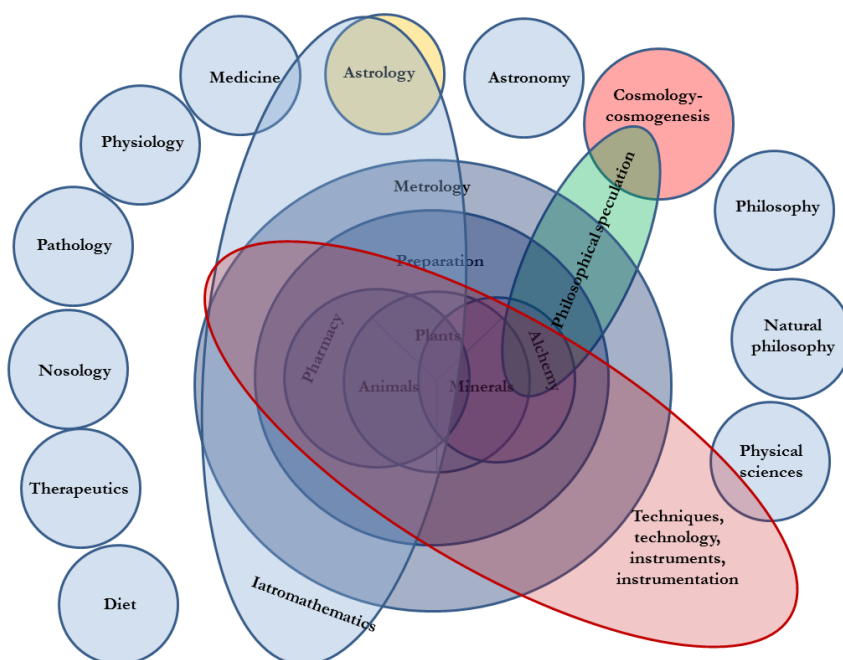


Figure 8

All these components, whatever the order in which they are considered, are brought and hold together by the practical manipulations to be performed by the alchemists, which require ad-hoc instrumentation together with operative techniques and know-how.

Figure 9



Assembling a corpus

Many of the manuscripts that contain the treatises on the basis of which the definition above has been made, have been inventoried and described with great detail, together with the edition of several of their texts from 1924 to 1932 in the renown *Catalogue des manuscrits alchimiques grecs (CMAG)*. However useful this catalogue might have been, it is now partially obsolete, to the very least with regard to the census of codices. Over the last quarter of the 20th century, codicology greatly developed, including the cataloguing of manuscripts worldwide.

The renewed inventory of alchemical manuscripts on which the present study is based has proceeded in three different, yet complementary phases performed in coordination with the collaborators of the DACALBO programme:

- all the manuscripts mentioned in the *CMAG*, whatever the degree of detail of their description, have been databased in an ACCESS table;
- the manuscripts preserved in libraries in Greece have been systematically searched for, first through published catalogues (ancient and recent) and then by a personal inspection of the collections and the direct examination of identified items in loco as a component of the DACALBO programme;
- a systematic search has been done at the same time a *Corpus of Greek Medical Manuscripts* was compiled on the basis of available catalogues (be they printed or, in some cases, still handwritten), systematic browsing of entire collections, and direct autoptic analysis of items of interest.

All the manuscripts newly identified during the second and third phases briefly described above have been added to the ACCESS database created on the basis of the *CMAG*.

Results were significant: whereas *CMAG* listed only 5 items from the libraries in Greece, the DACALBO programme brought to light 39 new ones (that is, an increase by almost 800% for Greece and almost 40% for the whole corpus of alchemical manuscripts), whereas the *Corpus of Greek Medical Manuscripts* has made it possible to identify multiple previously unknown items that complete the scientific context of alchemy.

For interpretative purposes, I have recorded in the database relevant historical data as the year or time period and place of production of the manuscripts. To that, I have

added any data that might help understand the production of manuscripts, their itinerary, readers and users, and the intermediaries through whom they arrived at their present location, together with the scholars who consulted and used them in their publications.

Reconstructing manuscript production

On the basis of this material – particularly the alchemical manuscripts *stricto sensu*, it is possible to give a first visual representation of the profile of the alchemical tradition.

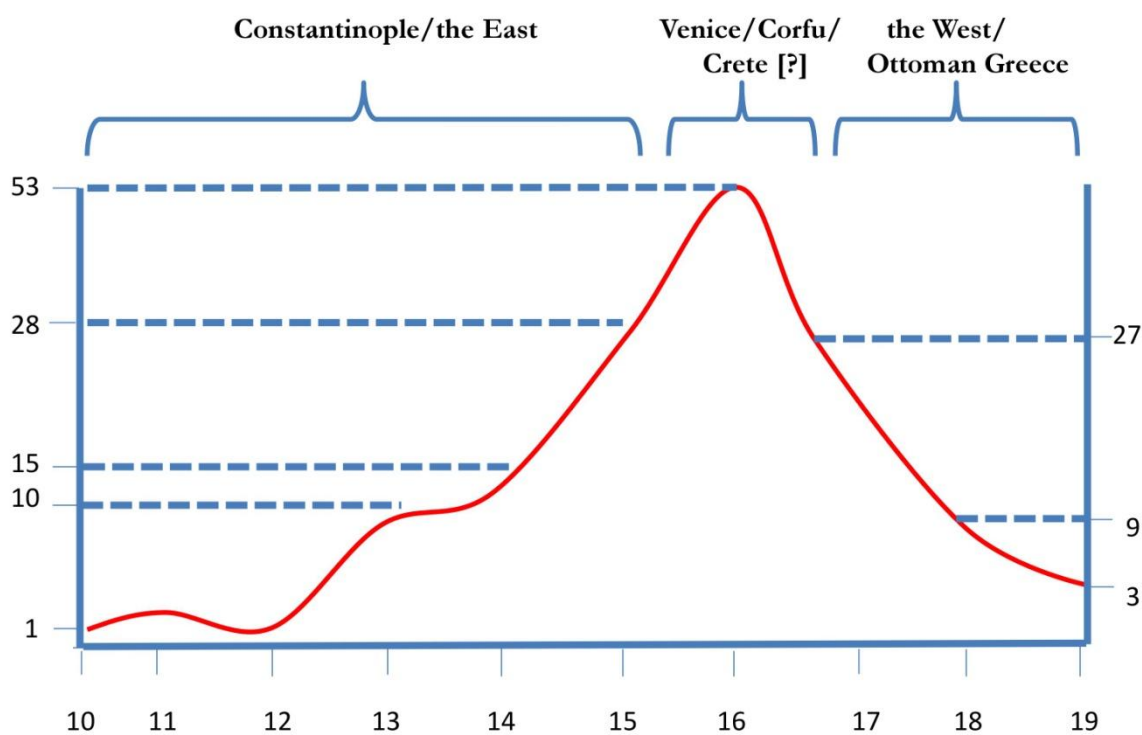


Figure 10

Preserved manuscripts do not predate the 10th century. After an increase during the 10th century, production declines during the 11th to sharply increase during the 12th. The 13th century, instead, is characterized by a plateau, immediately followed by a new and continued increase during the full 14th and 15th centuries. The beginning of the 16th century corresponds to the peak of production. Further on, manuscripts continued to be copied, even though they were significantly less numerous. Production witnesses a regular, yet slow decline, but not a disappearance, until the

end of the 19th century.

The geography of production underwent a significant transformation from the Byzantine Empire to the Mediterranean after the Fall of Constantinople in 1453, followed by a double diffusion, in the Europe among Western scholars and in the East among the Greek-speaking populations in the Ottoman Empire.

None of these data is surprising. They follow the general history of the Byzantine world, particularly the reduction of book production during the 13th century, dominated by the 4th Crusade and the Latin occupation of Constantinople (1204-1261). This decline is followed by the redevelopment of scientific activity after the reconquest of the capital of the Empire. In spite of this general correspondence to the political and, consequently, cultural activity in Byzantium, the degree of increase after 1261 is notable, as is also its continuity after 1453 and the final conquest of Constantinople by the Ottomans. Similarly, the decline during the 16th century, through sharp, is not as dramatic as in other sectors. At any rate, production was pursued until the independence of Greece in 1830 and beyond.

The structure of the manuscript tradition

The database is not limited to the inventory of the manuscripts, but also records the texts contained in each of them. Identification has greatly benefitted from available literature, mainly the ground-breaking (though obsolete) work by Marcelin Berthelot and Charles-Emile Ruelle and the *CMAG* followed more recently by the critical editions (with substantial introduction and commentary) by Robert Halleux and Jacques Schamp (1985), Michèle Mertens (2002), Andrée Colinet (2002 and 2010) and, ultimately, Matteo Martelli (2011). This material has been significantly complemented by the data resulting from the ongoing work of DACALBO. The database also records information on the linkages between manuscripts as far as they can be established with some degree of plausibility.

The figure 11 summarizes in a visual way the macro-structure of the mainstream tradition of alchemical treatises as it can be determined on the basis of past and ongoing research. The parentheses framing the name of manuscripts *Marcianus Venetus graecus* 299 and *Parisinus graecus* 2325 aim to translate the uncertainty that still exists on the question of the relationship between these manuscripts and their supposed descendants. Similarly, the majuscule letters X, Y and Z refer to

hypothetical ancestors of the whole tradition (archetypes), and dotted arrows represent hypothetical relationships.

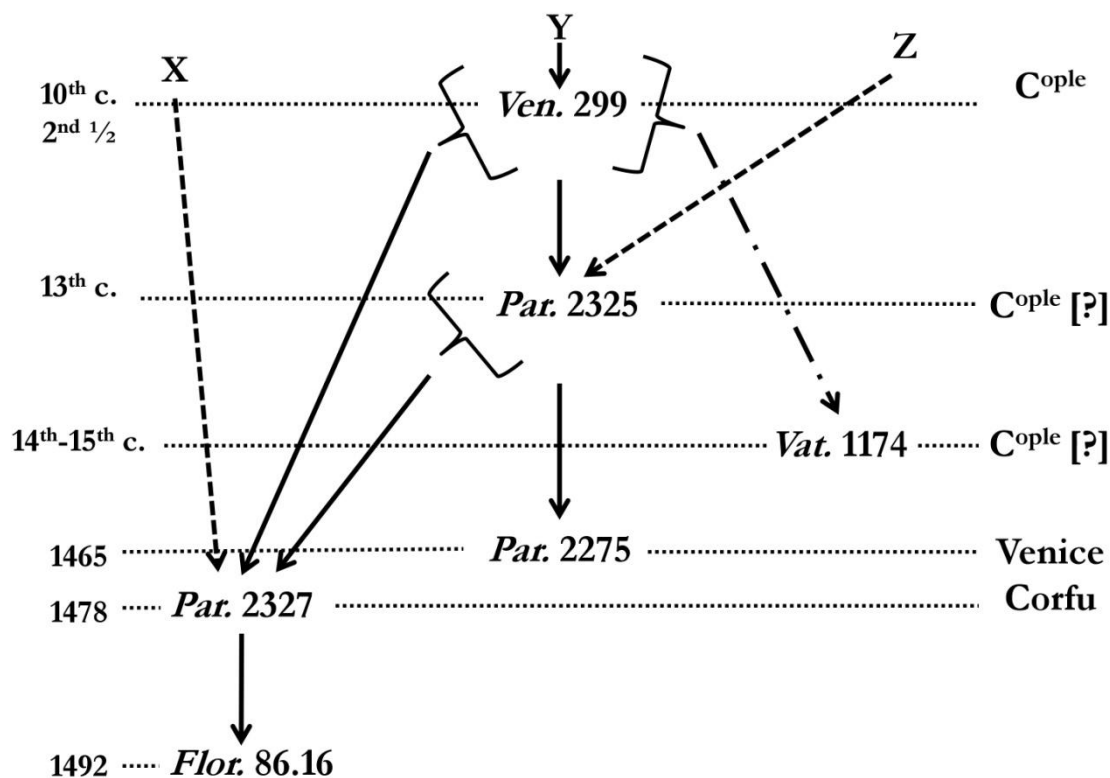


Figure 11

Manuscript evidence

In the current state of research it is not yet possible to reconstruct a detailed history of the full textual tradition of the alchemical manuscripts. Nevertheless, some significant phases can be identified as follows.

a) Middle-Byzantine encyclopedism (so-called Macedonian Renaissance)

The manuscript *Venetus Marcianus graecus 299* on parchment traditionally dated to the 10th century contains a corpus of alchemical texts mainly formed by the following treatises:

- Stephanus Alexandrinus
- Democritus
- Synesius
- Zosimus

- Christianus

It is generally assumed that this corpus was assembled sometimes during the 7th and the 10th century and that the *Marcianus* might have some relation with the imperial library collection in Constantinople.

The formation of this collection parallels the transformations in a part of the tradition of the Greek text of the major encyclopedia of pharmacopoeisis produced in Antiquity, *De materia medica* by Dioscorides (1st century AD). The part of the tradition referred to here is what is traditionally called the *alphabetical recension*, a central piece of which is the manuscript of Vienna, *medicus graecus* 1 dated 512 ca. and richly illustrated with polychrome representations of medicinal plants. According to current textual reconstruction, these transformations can be summarized in a rather simple, linear way summarized in the figure 12a.

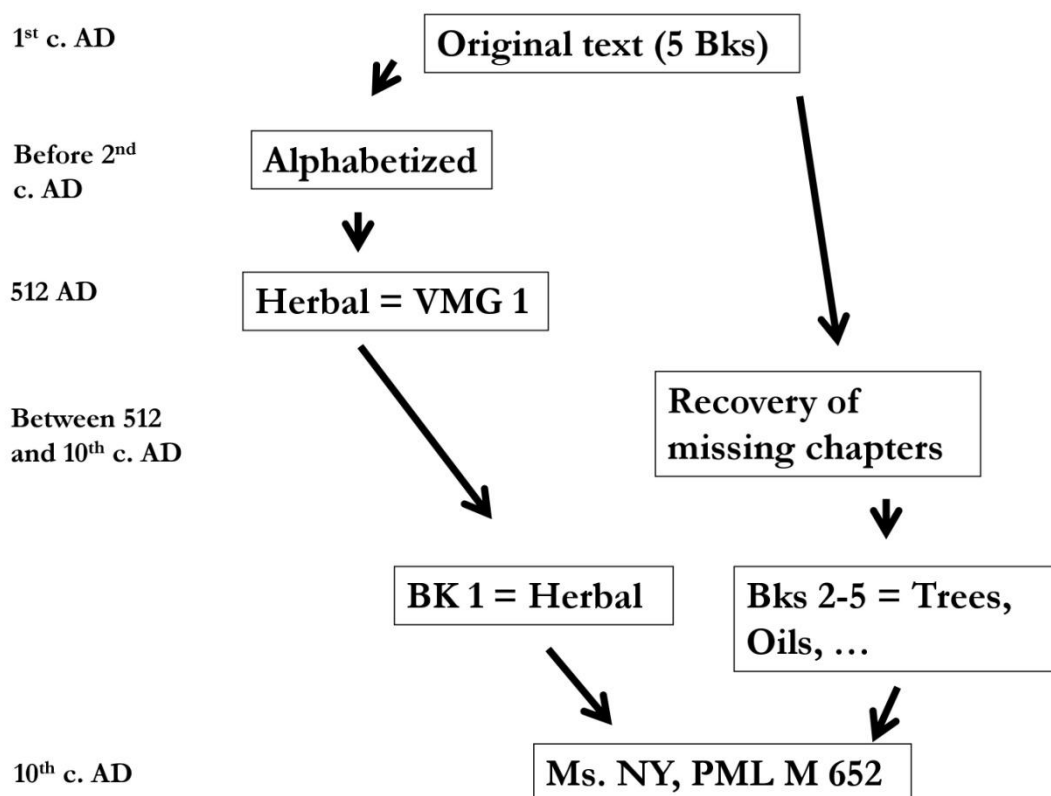


Figure 12a

Although it has been received for more than one century, this reconstruction can no longer be accepted as it does not account for the rationale of these transformations and for the fact that the plant illustrations clearly evidence two groups with very different characteristics. An interpretation based on the analysis of the therapeutic uses of the

plants listed in each of the two groups of illustrations allows for a substantial modification of the most ancient part of transmission of the text as the figure 12b makes apparent.

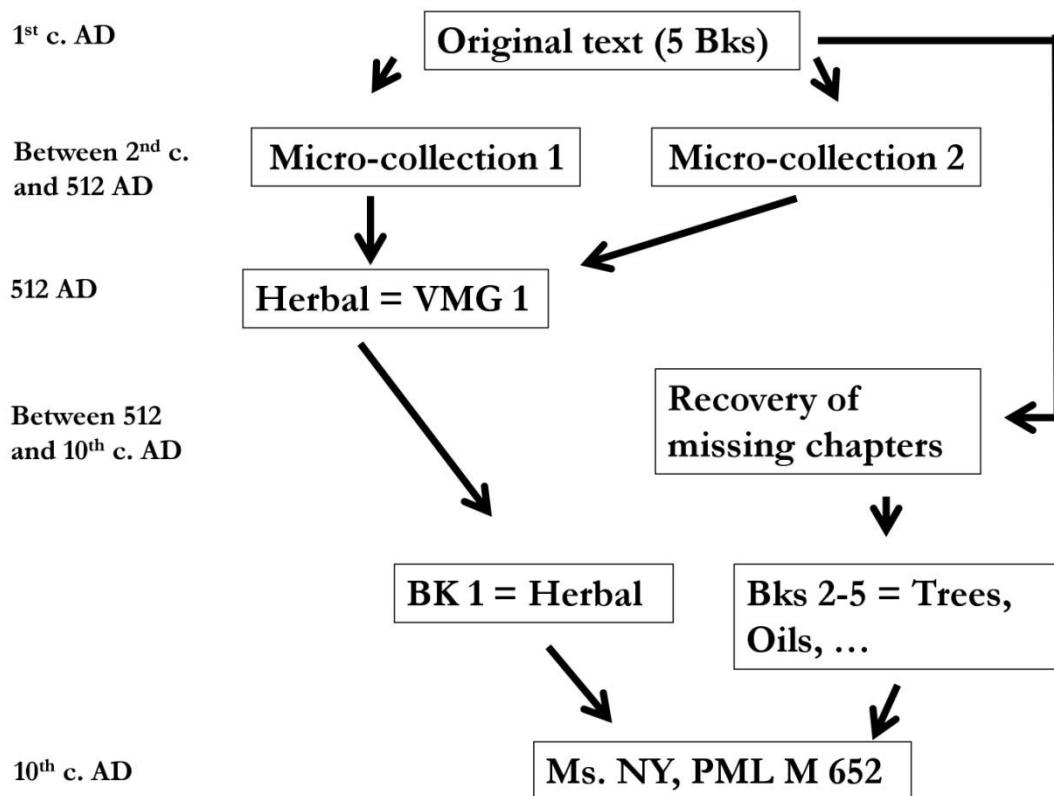


Figure 12b

The important point in such a reconstruction is that it brings to light micro-collections of texts that have been further agglutinated in order to create larger macro-collections. If this is correct, this process of gradual accumulation of material might offer some similarity with the corpus attested by the *Marcianus* manuscript and account in a dynamic way for the development of alchemical textual collections.

Although this has been the general assumption over the past decades (not always with solid manuscript evidence, however), there is no need to postulate that these and similar textual collections of classical and later scientific works have been made *sub aegidis* of the imperial library in Constantinople in the 10th century, even though such collections might have been present at certain point in time in such library.

b) the Latin Occupation of Constantinople

As already mentioned, during the period 1204-161 Constantinople was occupied by the troops of the 4th Crusade and became the capital of the Latin Kingdom of

Constantinople. Scientific activity was not interrupted, but it migrated as did also the imperial court, which moved to Nicaea.

A manuscript witnesses to this diaspora: the codex *Mediolanensis Ambrosianus A 95* sup made of paper. This manuscript on paper is made of three contemporary parts, the first of which (ff. 1-49 and 94-163) contains the following alchemical texts:

- [Orpheus], *Lithica*;
- [Socrates], *De lapidibus*;
- Dionysius, *De lapidibus*.

The manuscript can be dated to the first quarter of the 14th century by its watermarks, and contains on folio 179 verso a date (1345/6) which provides a *terminus ante quem*.

The most significant point is that this codex is a manual of medicine with the following texts, which offer a summary of practical medicine from anthropology (in its Christian form) to prevention of health through nutrition and lifestyle:

- Gregorius Nyssenus, *De hominis opificio*;
- [Hippocrates], *De vita et morte*;
- Dioscorides, *De materia medica*;
- [Dioscorides], *De ponderibus et mensuris*;
- [Hippocrates], *Epistula ad Ptolemaeum de sanitate tuenda*;
- *Remedia varia anonyma*.

Interestingly enough, the codex contains a note with a map of Cyprus on folio 180 recto. This suggests that scientists left Constantinople, moved to Mediterranean islands and pursued their activity in decentralized locations. It might be worth mentioning that at least another scientist was in the island during the period of the Latin Kingdom: the astronomer and astrologer Iohannes Abramios.

The most striking characteristic of this manuscript is the connection of alchemy and medicine that it indicates. The *Marcianus* codex is a library piece, whereas the *Mediolanensis* is a notebook of a practitioner. With it we enter the laboratory of an alchemist who was also a druggist, if not a physician.

c) Early Palaeologan Renaissance

Several alchemical manuscripts on paper that can be dated to the 14th century (from early to mid) by their watermarks contain alchemical texts. They are the following in a plausible chronological order:

- *Bononiensis Universitatis* 1808 (AD 1303-1316)
- *Vaticanus graecus* 297
- *Florentinus Laurentianus* 75.19
- *Florentinus Laurentianus* 28.14
- *Romanus Angelicus* 29
- *Parisinus graecus* 2510
- *Venetus Marcianus, appendix graeca*, .13
- *Parisinus graecus* 2286 (AD 1360 ca.)
- *Vaticanus graecus* 299 (AD 1360 ca.)

Two of these manuscripts which also contain medical texts, can be precisely located and one of them can be attributed to an individual known by name. These codices are the *Vaticanus graecus* 299 and the *Parisinus graecus* 2286. Both can be located at the so-called *Xenodocheion tou Krali* (or: Hospital of the [Serbian] King [Stefan Uros Milutin II]), that is, a major hospital in Constantinople which had also within its walls a library, a scriptorium, and a higher education institution.

Among the multiple texts present in the *Vaticanus* the following are relevant here:

- Democritus, *De sympathicis et antipathicis*;
- Dioscorides, *De materia medica (partim)*;
- Hospital manuals;
- *Formulae medicinarum*;
- Arabic and Persian material (medicine, materia medica, pharmacy) translated into Greek.

As for the *Parisinus*, it is the notebook of a member of the *Krali* that contains the medical works authored by this individual (including a bilingual lexicon of Arabic and Persian plant names and medical terms with their Greek equivalent), as well as the *Coeranides* and *De materia medica* by Dioscorides.

As both the place of origin of these manuscripts and their contents make clear, alchemy and medical practice were intimately associated. The personality and activity of the author, writer and owner of the *Parisinus* as far as they are known, make this even clearer: Neophytos Prodromenos is indeed a polymath interested in natural sciences, medicine, logic and philosophy, and also alchemy.

Significantly enough both manuscripts contain material translated from Arabic and

Persian into Greek, witnessing to a milieu the interests of which went beyond Greek science and tradition.

These points of contact between the alchemical and medical traditions, topical in nature, are even more interesting as the writers of the *Vaticanus* and *Parisinus* participated in a dense activity of collecting previous scientific literature, rearranging it and integrating it with contemporary science in a trans-cultural, international way.

d) Late Palaeologan Renaissance

The late-14th –or early-15th –century manuscript on paper *Vaticanus graecus* 1174 reproduced some texts of the *Venetus Marcianus graecus* 299. In *CMAG*, the authors considered that its texts offer «... une forme plus pure, peut-être, et vierge de toute retouche ...» (“... a purer form, perhaps, and without any intervention ...”).

The philological quality of the text suggests that this manuscript is a direct descendant of the *Venetus Marcianus graecus* 299 or even of its source. In this view, this Vatican codex, though *recentior*, is certainly not *deterior*, and thus contradicts the traditional editorial rule and practice. However, philology should not overshadow the data of the manuscript tradition.

Returning to the *Parisinus graecus* 2286 and the *Vaticanus graecus* 299, these two manuscripts were produced in a milieu where editing of ancient texts was common practice. The case of Dioscorides’ *De materia medica* at the *Krali* in Constantinople is illuminating from this viewpoint: the text of an old manuscript in majuscule was reproduced in minuscule. Other manuscripts of earlier periods were collected, restored if necessary, and their texts were collated in order to produce a new edition. After a first version was revised, the resulting second version was reproduced in a manuscript that became its archetype and was reproduced with great exactness in another copy. Whereas the new archetype was not used further—it was probably preserved separately, in some sort of special collection—, its first direct copy was used to generate several new apographs.

This new *recensio* was preferred to all others, most probably because of its philological correctness, it was diffused all across the Mediterranean world, and reached the West. It was eventually printed in Venice in an *editio princeps* by Aldo Manuzio in 1499. Until the early 20th century this was the form of Dioscorides’ text that Western scholars knew and used.

Knowing this it can be doubted that the version of the alchemical corpus in the manuscript *Vaticanus graecus* 1174 is exempt of any remaking and offers a “purer version” of the texts under study here.

e) The West and the Ottoman Empire

The gradual, yet irreversible decline of the Byzantine Empire and the increasingly rare resources it had did not interrupt the tradition of alchemical texts as the codex *Bononiensis Universitatis* 3602 on paper indicates (it is dated to 1430 ca. thanks to its watermarks). As was the case in the past, alchemical material goes together with medical and pharmacopoeitic texts, and activity took place at the *Xenodocheion tou Krali* which was acting as Constantinople’s university among others with such a figure as Ioannes Argyropoulos (1415-1487).

With the Fall of Constantinople and the end of the Empire in 1453, Byzantine scientists and alchemists abandoned the capital and migrated to Crete, Kerkyra (Corfu), Venice, Messina and further West as can be seen from the manuscripts they copied at that time.

Further on, alchemical texts continued to be copied all over the Mediterranean and in the West, though with differentiated profiles in Europe and the Ottoman Empire.

In the West, indeed, no less than 27 manuscripts were produced with the following texts:

- 14 contain Stephanus of Alexandria (that is, half of the Western production in that time), including one that contains only this text;
- the major interest was in Democritus together with Stephanus of Alexandria;
- 2 manuscripts contain Democritus and Zosimus;
- 3 codices are copies of Nicephorus Blemmydes’ alchemical treatise, one of which contains only this text.

In the Ottoman Empire, the number of newly produced codices was much lower than in the West, with only 10 items. The contents of these codices are significant:

- 5 manuscripts contain Stephanus of Alexandria (that is, half of the production, just as in the West);
- 1 is a copy of a collection similar to that of *Venetus graecus* 299;
- 1 manuscript introduces into the tradition a Neo-Hellenic treatise.

Conclusions

The alchemical corpus, made of texts by (or attributed to) Democritus, Cleopatra, Zosimus and Stephanus of Athens (or Alexandria), brought together philosophical speculation on natural history and operative techniques. It might have been gradually assembled, possibly starting with micro-collections that have been further assembled in the form of the corpus attested from the 10th century onward. Such a process can be detected in the field of medicine, particularly Dioscorides' *De materia medica*, in which two micro-collections dating back to Late Antiquity were assembled before 512 and were further agglutinated with complementary material so as to form a vast corpus on pharmacopoeisis

Once it was formed, the canonical alchemical corpus was continuously transmitted, being also complemented by original works by such polymaths as Michael Psellus (1018-1070) and Nicephorus Blemmydes (1197-1272). The political turmoil of the Byzantine Empire from the 13th century on (particularly the 4th Crusade and the Latin Occupation of Constantinople) did not interrupt the transmission of this textual body, but led to a decentralisation of activity, which nevertheless might have been reduced.

The reconquest of the Capital of the Empire went together with a recrudescence of scientific activity in which alchemy was included. Significantly enough, manuscripts from that time period on witness to a close proximity of alchemy and medicine, which is attested from the 13th century onward, when Byzantine science was decentralized. Both alchemy and medicine were present in the capital of the Byzantine Empire in its last institution of higher education, the so-called *Xenodocheion tou Krali*. Activity was not limited to recovering the ancient textual body, but also included—to the very least for the medical texts and probably also for the alchemical ones—editorial work aimed to correct language and to compensate for the unavoidable transformations (and deteriorations) resulting from centuries of repeated copies. Alchemical texts might have been subject to a strong process of transformation because they are practical in nature.

After the Fall of Constantinople, Byzantine scientists and manuscripts dispersed across the Mediterranean World and Europe. Although both worlds shared an interest in Stephanus of Athens, they diverged on their approach to alchemy. Whereas the West seems to have investigated more specifically the ancient roots of alchemy (Democritus) and Zosimus' corpus, the Greeks perpetuated the tradition of the corpus

attested by the *Marcianus graecus* 299, also including a newly produced treatise. Furthermore, the tradition within the Ottoman Empire extended until the 19th century. In the West, instead, the libraries of such major Renaissance esotericist and scientist as Giovanni Pico della Mirandola (1463-1494) and Nicolao Leoniceo (1428-1524), respectively, did not seem to have contained Greek alchemical manuscripts. Interest in alchemy was shifting from science to antiquarianism and history of science through book collecting, on the one hand, and critical edition, translation, study of, and commenting on, the texts on the other hand. Seventeenth-century scholarly activity was followed by a long hiatus, until the work of the chemist Marcelin Berthelot and the classicist Charles-Emile Ruelle brought the alchemical matter back to the attention of the scientific and scholarly communities of Europe.

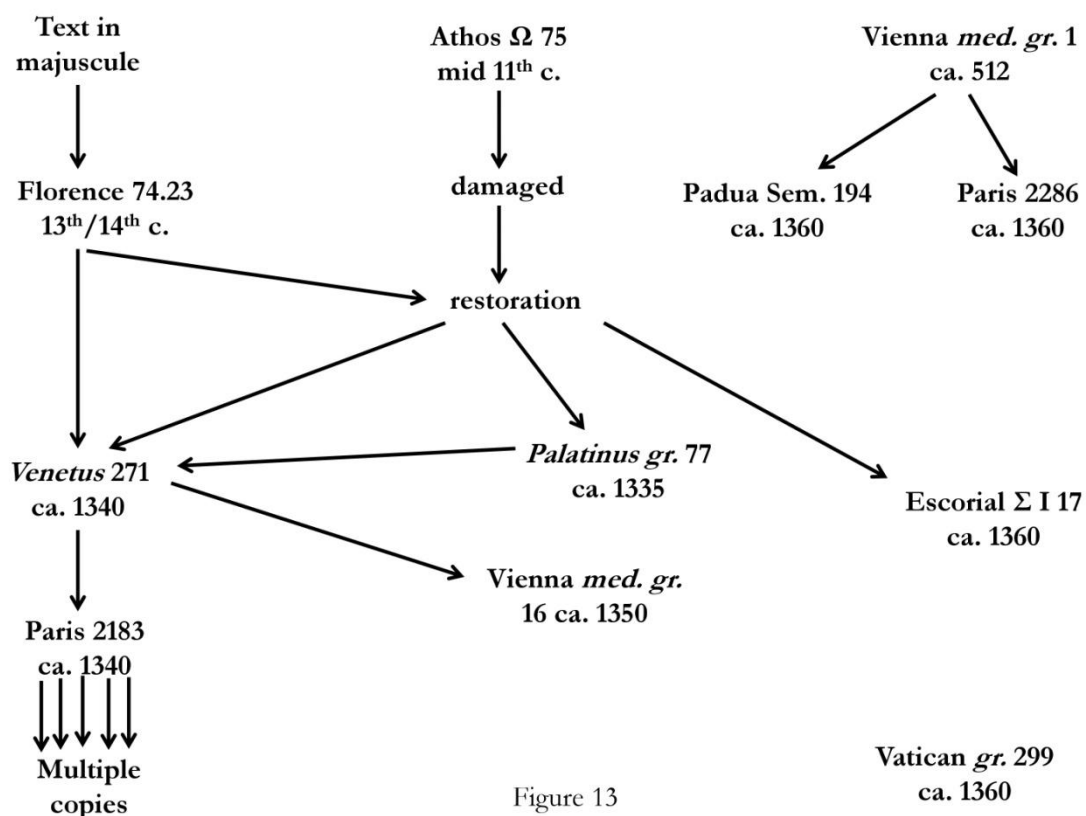


Figure 13

**The mutations of alchemy and the development of
“chymistry” during the post-Byzantine era
in the Greek-speaking communities**
(Looking into some first interesting indications)

Vangelis Koutalis

Institute of Historical Research/
National Hellenic Research Foundation

Introductory remarks: between national science and non-science

The Greek historiography of the Enlightenment in SE Europe has highlighted the emergence, during the second half of 18th century, of ideological orientations among the strata of Greek-speaking Ottoman Christian scholars, clerics, merchants and officials, which were both new in the descriptive sense of being radically different from the hitherto dominant practices and prone to justify, or even exalt, novelties as such. New aspirations grew and were loudly voiced, deviant ways of thinking were espoused, oppositional collective identities were gradually formed, the very feeling of belonging to a community was restructured, the sense of identifying oneself as a Greek started being redefined. Within this cluster of dislocations and shifts, one of the most conspicuous elements is the proliferation of writings and educational courses ‘on nature’, employable for the dissemination of theories drawn from the rich repertoire of the modern, Cartesian or Newtonian philosophia naturalis as markers of a major cultural change already well underway in the societies of Western Europe¹.

¹ The English-speaking reader may consult the following general studies: G. P. Henderson, *The Revival of Greek Thought 1620-1830*, Albany: State University of New York Press, 1970; P. Kitromilides, *Tradition, enlightenment and revolution: Ideological change in eighteenth and nineteenth century Greece*, Cambridge, MA: Harvard University, 1978; *idem*, *Enlightenment and revolution: The making of modern Greece*, Cambridge, MA & London: Harvard University Press, 2013. There is also in French the study of C. T. Dimaras, *La Grèce au temps des lumières*, Genève: Droz, 1969. For the specific term “Neo-Hellenic Enlightenment” routinely used in Greek historiography, and some of its ideological connotations, see: M. Patiniotis, “Neo-Hellenic Enlightenment: In search of a European identity”, in: T. Arabatzis, J. Renn & A. Simões (eds.), *Relocating the history of science: essays in honor of Kostas Gavroglu*, Boston Studies in the Philosophy and History of Science 312, Cham et al.: Springer, 2015, pp. 117-130. For the construction of a modern Greek identity resulting from the developments initiated

During the last decades, historians working on this area of research have admittedly made one great step forward, conceding that this dissemination must be interpreted more as an “appropriation” of means of knowledge production by active agents than as a “transfer” of knowledge products to passive recipients. One principal question, though, remains pending: what was really the upshot of the articulation of various theories, conveyed from Western Europe –as well as theories, in not a few cases, sanctioned by existing, prior to Enlightenment, traditions– into new fields of knowledge? Historians find themselves in a quandary about what answer should they pick out. At the one end of the balance, the answer proposed is that the process of appropriation brought about a peculiarly “Greek” scientific discourse. A new, specifically “Greek” kind, therefore, of science have seen the light of day: “Greek”, in so far as the Greek-speaking scholars, despite the lack of original scientific production, did not confine themselves to the role of translators, but incorporated, instead, the new knowledge into “a pre-existing edifice”, without breaking the cultural continuity, and offering thus “new syntheses which shaped, by and large, a different view regarding education, a new scientifico-philosophical insight into the phenomena, a new, different spiritual consciousness”² (we shall call this, Thesis I). At the other end of the balance, we are induced to resolve that the appropriation led merely to a “sound philosophy”, a discourse on nature suited howsoever to serve moral edification, all the more so, in a period where the ideals of individual prudence, self-reflectivity, and self-governmentality had gained considerable ground, but, for all that, bereft of those requirements of rationality and objectivity that are meant to demarcate science proper from philosophy³ (Thesis II).

In the first case, the difference in the national context of appropriation differentiates what is appropriated. It results in a different species of science, with dissimilar criteria of evaluation to those that have prevailed in the other, West European species, most commonly known to our days as science proper. In the second case, the difference in

during the second half of the 18th century see S. Myrogiannis, *The emergence of a Greek identity (1700-1821)*, Newcastle upon Tyne: Cambridge Scholars Publishing, 2012, especially: pp. 83-129.

² I. Karas [Γ. Καράς], *Η Ελληνική επιστήμη και ο Βαλκανικός χώρος*, Αθήνα: «Δαίδαλος»-Ι. Ζαχαρόπουλος, 2001, pp. 40-41.

³ This is the approach of D. Dialetis, K. Gavroglu & M. Patiniotis, “The sciences in the Greek speaking regions during the 17th and 18th Centuries – The process of appropriation and the dynamics of reception and resistance”, in: K. Gavroglu (ed.), *The sciences of the European periphery during the Enlightenment*, Archimedes; New Studies in the History and Philosophy of Science and Technology 2, Dordrecht, Boston & London: Kluwer Academic Publishers, 1999, pp. 41-72.

the dynamics of appropriation inhibits appropriation itself. The “absence of any discussion concerning the character of the rules of new ways to study nature, the processes of legitimizing the new viewpoint and the initiation of consensual activities to consolidate the new attitude about the ways of dealing with natural phenomena”, an absence readily ascertainable within the various Ottoman Christian scholarly milieus, is interpreted here as an indication, not of a different kind of science, but of the absence of science itself. “In introducing the new sciences, the Greek scholars did not attempt to introduce natural philosophy per se, but, rather, they sought a new way of philosophizing”: the type of discourse they developed “lacked the constitutive features of the discourse of natural philosophy as it was being articulated and legitimized in Western Europe and it was primarily a philosophical discourse”⁴. What is scientific in the West, and remains scientific after being disseminated to the Western periphery (e.g. to the Iberian Peninsula), is transformed into something strictly, or essentially, philosophical, when it is appropriated in the Eastern periphery. In either case, Ottoman Christian scholars are confessedly presented as active agents, since they appropriate, indeed, scientific knowledge. But their agency ends up distorting this knowledge. Either by altering arbitrarily, just for the reason that another cultural community is posited as the context of its appropriation, the standards of its evaluation, namely, the yardsticks that permit a rational decision to the question whether this knowledge qualifies to pass as scientific or not. Or by altering its nature: diluting scientific knowledge to such a degree that it is not scientific any more.

The distortion carried out is so extensive that we can hardly compare the input of the appropriation process with its output, or even critically relate the one with the other. In Thesis I, the only element that remains common, after the appropriation has been through, is one signifier, “science”, devoid of any meaningful content. In Thesis II, the historian of science can only confirm that some modern theories on natural phenomena eventually passed the borders of this peripheral territory. After getting this done, she has no jurisdiction of going further than noting that what was produced in this territory through appropriation falls short of the mark: it can no longer bear the credentials of being science. Other specialties, philosophers, historians of ideas,

⁴ D. Dialetis & K. Gavroglu, “Appropriating new scientific ideas in Greek-speaking regions during the 17th and 18th centuries”, in: H. Heppner & O. Katsiardi-Hering (eds.), *Die Griechen und Europa: Außen-und Innensichten im Wandel der Zeit*, Zur Kunde Südosteuropas II/25, Wien, Köln & Weimar: Böhlau Verlag, 1998, pp. 69-101 – the reference on pp. 72-73.

historians of culture, or historians generally, must now come into play, if this odd singularity, which lies outside the province of science, is to be apprehended at all. Choosing the first option, science is dissolved in its particular national manifestations, ends up being subsumed under the rubric of one population's cultural distinctiveness. Should we refuse to "adopt different principles for every country in accordance with the saying 'different countries, different customs'", or to believe that "in one country $3 \times 1 = 1$, in another that women have no souls, in a third that beer is drunk in heaven"⁵, and, on the contrary, keep considering science as something that can be evaluated in terms of objective testing and rational criticism, which means something that can be evaluated in similar, or at least converging, terms universally, often against the conditions set by a particular cultural context (how else could we deny, for example, the merits of a Nazi science?), then, we have to switch to the second option. There, science retains without fail its universality, at the price, however, of lapsing into a sheer absence when it gravitates from its productive Western center to the appropriating Eastern periphery. Science is disseminated only to be negated, either in the form of a national species, or in that of a new philosophy.

This seemingly tight knot tends to be a sort of historiographical vicious circle: in the very terms in which this problem is formulated, as a problem necessitating historical reconstructions in order to be tackled as such, non-historical significations are tacitly presupposed, or rather significations that invest historical determinations with the status of ontological ones. "Science", this common denomination for a number of distinct, self-sustained specialized sciences, as we know them, today, from the specific social historical standpoint that delimits and shapes our view, appears to be the reference standard used to evaluate every knowledge-acquiring undertaking of the past intended, then, and not now, to meet the requirements of objectively assessed experimentation and openness to rational criticism. "Natural philosophy" is but the name of one precursory form of modern physics: if nothing else, it is characterized by the same "processes of legitimizing" the viewpoint proper to it and the same "consensual activities" to consolidate the attitude proper to it. By the same token, the fact that only during the last half of the 19th century philosophy assumed the narrow

⁵ K. Marx, "The leading article in No. 179 of the *Kölnische Zeitung*: Religion, free press, and philosophy", in *idem, Writings of the young Marx on philosophy and society*, edited and translated by L. D. Easton & K. H. Guddat, reprint, with correction, of 1967 edition, Indianapolis: Hackett Publishing, 1997, pp. 109-130 – the reference on p. 118.

sense of a discipline concerned mostly with the manipulation of certain notions abstracted from the specialized sciences, and only very recently it has remitted itself to the precarious condition of being nothing but an appellation for certain university departments doomed to be financial viable or else to get closed, passes entirely unnoticed. A “new way of philosophizing” is but the name of another way of reasoning, since philosophy is tacitly assumed to have been always co-extensive with, or at any rate reducible to, that kind of intellectual activity which has reasoning schemas as its object, and which we have no hesitations, today, in describing as “philosophy”.

There is something, then, that both these interpretative strategies, beneath their procedural differences, share: the non-historical signification of the terms “science” and “philosophy” respectively. Yet another common denominator can be shown to exist. The significantly different formulations notwithstanding, underneath we can detect the same assumption that scientific knowledge migrating from the West bears, essentially and unavoidably, some hallmarks pertaining to a particularly West European mindset, certain inerasable signatures of its cultural origin. Whether it is about “different views regarding education” and “new scientifico-philosophical insights”, according to the more epistemologically oriented Thesis I, or about “processes of legitimizing” and “consensual activities”, according to Thesis II, leaning, as it confessedly does, towards explanations involving cultural history and contextual determinations, what departs from the West as science, and is bound to be transformed, when passing through the Eastern parts of Europe, into a new, Greek species of science or a new way of philosophizing, is regarded as possessing some inherent formal properties, a normative structure above all, that cannot thrive in soil impregnated with different, South-East European cultural values, precisely because these properties are postulated to be inextricably tied to a cultural environment typical for Western Europe.

This stance threatens to create a novel source of stagnation for historical theorizing, additional to the old drawbacks it has seemingly helped us to surmount. The reason is that it prominently involves the elevation of the “network of constraining localities” to a normative structure incumbent on any discourse immersing itself across any given cultural space. The process of appropriation is identified with the “ways devised to overcome cultural resistance and make the new ideas compatible with local

intellectual traditions”, and “hence, understanding the character of resistance to the new scientific ideas becomes of paramount importance”⁶. But, following this track, “local intellectual traditions” are presumed to be far more solid than they actually, under close examination, could be always proved to be. Substituting the notion of appropriation for that of transfer, time-worn accounts of “what is filtered out” are, thankfully, at last cast aside. In their place, accounts of what is filtered in are to be introduced. Yet, both this “in” and that “out” are presumed to remain more or less unaffected by the processes respectively of going out and coming in. That which weighs most is the character of resistance which the spread of scientific knowledge has encountered, just as the character of the eligible for dissemination scientific knowledge has been previously considered to be the alpha that remains, more or less, alpha regardless of the fact that we often must pass through many of the other letters. Since science, philosophy, cultural context, are equally pushed aside as objects themselves of historical research, let alone being brought in, more generally speaking, as objects themselves of scientific research, historians of science have no new, untrodden terrains to discover and explore, no interesting questions to ask, no tentative answers to test, no science to exercise. Some years ago, Dialetis and Nicolaidis pointed out that “an anti-history of science position” has been entrenched in the Greek intellectual milieu, due to “the fact that history of science was either part of the history of philosophy, or sociology, or history of education”⁷ (1994, 124). Strangely enough, recent constructivist accounts, aspiring to remedy this situation by erecting a self-sustaining history of science, tend sometimes to converge with the most profoundly barren historiographical traditions in instituting a cultural chasm between East and West, as a point of departure so ruthlessly fixed as to discourage closer scrutiny by supplying tacitly in advance the general conclusion, and the fixed framework, of any possible historical narrative.

An untrodden territory

A way out from the vicious circle is not likely to be found unless we try to reinstate science and philosophy in their temporal rhythm, in their becoming, and accordingly

⁶ D. Dialetis & K. Gavroglu, op. cit. (n. 4), p. 74.

⁷ D. Dialetis & E. Nicolaidis, “Issues in the historiography of post-Byzantine science”, in K. Gavroglu, J. Christianidis & E. Nicolaidis (eds.), *Trends in the historiography of science*, Boston Studies in the Philosophy of Science 151, Dordrecht: Kluwer Academic Publishers, pp. 121-127 – the reference on p. 124.

to problematize our current notions of what science is, what philosophy should be in regard with what science presently is, and how the South-Eastern and the North-Western parts of Europe are related to each other as cultural spaces. Such a way of proceeding entails the laborious task of reactivating the available, or yet to be located, primary sources, and putting them into interplay with the secondary sources through which the posterior significations of the historical events or entities under study are crystallized and conveyed. The history of alchemy, designating a set of trajectories cutting across multiple fields of experience and a variety of disciplines, opens up one of the most promising avenues for this kind of work.

How and whether alchemy have been practiced, studied or diffused, and under what form or mutations, in Greek-speaking communities, during the post-Byzantine era, is something that up to the present is almost totally unexplored. There are two assumptions, which despite to some evidence to the contrary already available, are still dominant in the Greek historiography of science:

- a) Modern sciences emerged in the Greek-speaking communities through the dissemination or appropriation of Newtonianism.
- b) Chemistry arrived here only later, when Lavoisier had established his “new chemistry”, through some printed translations.

Alchemy did not play any role, not even that of an obstacle. Although, its origins date back to the encounter between the Greek and Egyptian cultures during the first centuries CE; although it was part of the Greek literary heritage of the Late Antiquity; although the corpus of the surviving Greek alchemical texts was constituted in Byzantine times, between the 7th and the early 11th century⁸, alchemy seems to have been ruled out as an object of intellectual interest, or even just of curiosity, by the Greek-speaking literati in the first two centuries of the early modernity, even more so by those who were principal actors in the Enlightenment. But is it really so?

We know, at least, one instance of a scholar of Greek origin who studied alchemy and wrote about it. Angelo Forte, born at the end of the 15th century in Corfu, which at that time was under Venetian rule, at a young age moved to the capital of the Serenissima Repubblica. It is unclear whether he was given formally there the title of the doctor of the art of medicine, but he eventually used it. He dealt also with

⁸ See M. Mertens, “Graeco-Egyptian alchemy in Byzantium”, in P. Magdalino & M. Mavroudi (eds.), *The occult sciences in Byzantium*, Geneva: éditions de la Pomme d'Or, 2007, pp. 205-230 – the reference on pp. 220-224.

astrology. From 1520 to 1556 he published a series of treatises of his own in Italian and Latin, the second of which (printed in 1525) was dedicated to the “sacred art” of alchemy (*Verità della alchimia*), where he defines the alchemical opus as a “medication” of metals. In his later works, especially after his *Opera nuova* of 1532 he renounced chrysopoeia and turned his attention to iatrochemistry. It is difficult to determine precisely what relations he had formed with the other Greek scholars residing in Venice, but, anyway, it seems that Forte shared certain deep preoccupations with many of his contemporary thinkers aspiring to find a place in the greyer zones of the front line of the Renaissance: Neoplatonism, Hermetism, theories on natural magic, corpuscular matter theories, projects of reformation⁹.

Strictly speaking, Forte was not a scholar actively contributing to the intellectual edification of young Greek-speaking students or scholars, since he did not write any of his works in Greek. This is not the case with Nikolaos Mavrocordatos (1670-1730)¹⁰, Grand Dragoman to the Divan (1697), and consequently the first Phanariote

⁹ For the life and work of Forte see: F. Lotti, *Angelo Forte da Corfù a Venezia: Pratica medica, divulgazione cultural e identità greca nel primo Cinquecento; Opera omnia*, PhD Dissertation, Pisa: Università degli Studi di Pisa, 2014.

¹⁰ For Mavrocordatos' life and work see: T. Sotirescu, “Apostilele domnitorului Nicolae Mavrocordat la o ediție a operelor lui Nicolò Machiavelli”, in: *Prima sesiune științifică de bibliografie și documentare – București, 15-16 decembrie 1955 – Comunicări și discuții*, București: Editura Academiei Republicii Populare Romîne, 1957, pp. 238-285; A. Angelou [A. Αγγέλου], *Πλάτωνος τύχαι: Η λόγια παράδοση στην Τουρκοκρατία*, Αθήνα: Ερμής, 1963, pp. 63-81; G. P. Henderson, op. cit. (n. 1), pp. 20-27; J. Bouchard, “Les relations épistolaires de Nicolas Mavrocordatos avec Jean le Clerc et William Wake”, *Ο Εραμιστής*, 11 (1974), pp. 67-92; *idem*, “Les lettres fictives de Nicolas Mavrocordatos à la manière de Phalaris: une apologie de l’absolutisme”, *Revue des Études Sud-Est Européennes*, 13 (1975), pp. 197-207; *idem*, “Nicolas Mavrocordatos et l’ « époque des tulipes »”, *Ο Εραμιστής*, 17 (1981), pp. 120-129; *idem*, “Nicolas Mavrocordatos et l’aube des Lumières”, *Revue des Études Sud-Est Européennes*, 20 (1982), pp. 237-246; *idem*, “L’intolérance religieuse dans *Les Loisirs de Philothée*”, *Eighteenth-Century Fiction*, 15 (2003), pp. 729-735; *idem*, “L’aube des Lumières dans les pays roumains”, *The Historical Review / La Revue Historique*, 2 (2005), pp. 31-51; *idem*, *Une encyclopédie dans la bibliothèque des Mavrocordatos (1720)*, Montréal: Centre d’Études néo-helléniques de l’Université de Montréal, 2010; E. Abazoglou-Argyropoulou [E. Αμπαζόγλου-Αργυροπούλου], «Προσπάθεια πρώτης προσεγγίσεως εις τὰς πηγὰς τοῦ ἔργου τοῦ Νικόλαου Μαυροκορδάτου», *Φιλοσοφία*, 7 (1977), pp. 404-415; A. Pippidi, “Mysticisme et rationalism au Phanar: Les cas de Daniel de Fonseca”, *Ο Εραμιστής*, 11 (1980), pp. 175-196; *idem*, “Manuscritos bizantinos de la biblioteca de los Mavrocordatos”, in: P. Bádenas, A. Bravo & I. Pérez Martín (eds.), *Ἐπίγειος οὐρανός: El cielo en la tierra. Estudios sobre el monasterio bizantino*, Nueva Roma 3, Madrid: Consejo Superior de Investigaciones Científicas, 1997, pp. 329-340; D. Apostolopoulos, [Δ. Αποστολόπουλος], *Η εμφάνιση της σχολής του φυσικού δικαίου στην ‘τουρκοκρατούμενη’ ελληνική κοινωνία*, 2 vols., I: *Η ανάγκη μιας νέας ιδεολογίας*, II: *Η πρώτη μετακένωση*, Αθήνα, 1980-1983; *idem*, *Για τους Φαναριώτες: Δοκίμες ερμηνείας και μικρά αναλυτικά*, Αθήνα: Κέντρο Νεοελληνικών Ερευνών –E.I.E., 2003; P. Kondylis [Π. Κονδύλης], «Η παρουσία του Πλάτωνα στον νεοελληνικό Διαφωτισμό», *Τα Ιστορικά*, 1 (1983), pp. 85-100. [republished in: *idem*, *Νεοελληνικός Διαφωτισμός: Οι φιλοσοφικές ιδέες*, Αθήνα: Θεμέλιο, 1988, pp. 225-244]; *idem*, «Το ηθικοφιλοσοφικό πρόβλημα και ο νεοελληνικός Διαφωτισμός», *Τα Ιστορικά*, 4 (1987), pp. 27-45. [republished in: *idem*, *Νεοελληνικός Διαφωτισμός*, op. cit., pp. 151-174]; D. Barbu, “Loisir et pouvoir: Le temps de la lecture dans les pays roumains au XVIII^e siècle”, *Revue des Études Sud-Est Européennes*, 28 (1990), pp. 17-27; A. Kaberides [A.

Hospodar of the Danubian Principalities. Nikolaos was one of the most eminent Greek-speaking scholars and officials of the late 17th and the early 18th centuries. In his treatise on the duties of a prince (*Περὶ τῶν καθηκόντων βίβλος*, first published in 1719¹¹), in the chapter “On the justice towards God, and towards oneself, and towards one’s neighbor” (“Περὶ τῆς εἰς θεὸν, καὶ εἰς ἑαυτὸν, καὶ εἰς τὸν πλησίον δικαιοσύνης”), chemistry is compared to astrology and is reproached as a trickery. Two equally vain, and morally harmful, arts: instigated by the passion for gold and silver, the chemist distorts nature, transcends impermissibly the limitations posed by God to each of his creations, and deceives both himself and those around him¹². In his *Φιλοθέου πάρεργα* (written in the period 1716-1719), however, a distinction is drawn between the deceiving and the non-deceiving chemistry. On the one side, we find the Arab swindlers (“ἐν τοῖς περὶ τὴν χημείαν φενακισμοῖς τῶν ἀπατεῶνων καὶ ἀγυρτῶν

Καμπερίδης], «Η σοφιολογική παράδοση και το *Περὶ καθηκόντων* του Νικόλαου Μαυροκορδάτου», *Παλίμψηστον*, 14/15 (1994-1995), pp. 37-52; G. Kechagioglou [Γ. Κεχαγιόγλου], «Η πρώτη, και ουσιαστικότερη, συνοπτική παρουσίαση των *Φιλοθέου παρέργων* του Ν. Μαυροκορδάτου (2.8.1719)», *Ελληνικά*, 49 (1999), pp. 305-316; M. Pechlivanos [Μ. Πεχλιβάνος], *Εκδοχές νεοτερικότητας στην κοινωνία του γένους: Νικόλαος Μαυροκορδάτος – Ιώσηπος Μοισιόδαξ – Αδαμάντιος Κοραΐς*, PhD Dissertation, Thessaloniki: Aristotle University of Thessaloniki, 1999 pp. 21-76; D. Livanios, “Pride, prudence, and the fear of God: The loyalties of Alexander and Nicholas Mavrocordato”, *Dialogos: Hellenic Studies Review*, 7 (2001), pp. 1-22; S. Athini, “Lecture et traduction dans le milieu phanariote. Le cas de « The Pleasures of the Imagination » de Joseph Addison, in: P. M. Kitromilides & A. Tabaki (ed.), *Relations Gréco-Roumaines: Interculturalité et identité nationale*, Athènes: Institut de Recherches Néohelléniques – Fondation Nationale de la Recherche Scientifique, 2004, pp. 113-124; N. Mavrelou [Ν. Μαυρέλος], «Νικόλαου Μαυροκορδάτου, *Φιλοθέου Πάρεργα*: Η μυθολογική εγκυκλοπαίδεια ανάμεσα στην Ανατολή και τη Δύση», in: K. Demades [Κ. Δημάδης] (ed.), *Ο ελληνικός κόσμος ανάμεσα στην εποχή του Διαφωτισμού και στον εικοστό αιώνα: Πρακτικά του Γ' Ευρωπαϊκού Συνεδρίου Νεοελληνικών Σπουδών της Ευρωπαϊκής Εταιρείας Νεοελληνικών Σπουδών (EENS)*, Βουκουρέστι, 2-4 Ιουνίου 2006, 3 vols., Αθήνα: Ελληνικά Γράμματα, 2007 I, pp. 99-113; *idem*, “*Les Loisirs de Philothée* de Nicolas Mavrocordatos: Le dialogue des genres dans une « espèce de roman » et le jeu entre la fonction ludique et sérieuse”, *Revue des Études Néo-helléniques*, nouvelle série, 7 (2011), pp. 59-79; M. Trudelle, “Sur l’étude des Lettres et la lecture des livres: Traité de Nicolas Mavrocordatos”, in: K. Demades (ed.), *op. cit.*, I, pp. 89-97.

¹¹ The full title is: Nikolaos Mavrocordatos, *Περὶ τῶν καθηκόντων βίβλος, Ξυγγραφεῖσα παρὰ τοῦ Εὐσεβεστάτου, Ὑψηλοτάτου, καὶ Σοφωτάτου Αὐθέντου καὶ Ἡγεμόνος Πάσης Οὐγγροβλαχίας κυρίου κυρίου Ἰωάννου Νικολάου Ἀλεξάνδρου Μαυροκορδάτου Βοεβόδα. Νῦν πρῶτον Τύποις ἐκδοθεῖσα ἐπὶ τῆς Ἡγεμονείας τῆς αὐτῆς Ὑψηλότητος, Ἀρχιερατεύοντος τοῦ Πανιερωτάτου καὶ Θεοπροβλήτου Μητροπολίτου Κυρίου Δανιὴλ, Ἐπιμελεία κ(αὶ) διορθώσει τοῦ λογιωτάτου κὺρ Γεωργίου Τραπεζουντίου, διδασκάλου τῆς ἐν Βουκουρεστίῳ ἀθηντικῆς σχολῆς. Ἐν τῇ σεβασμίᾳ Μονῇ τῶν Ἁγίων Πάντων τῇ ἐν Βουκουρεστίῳ. Ἔτει ἀπὸ Θεογονίας ἀριθ' [=1719]. Κατὰ Μῆνα Δεκέμβριον. The book was republished in 1722 and in 1724.*

¹² “παραπαίουσι δῆτα οἱ ἐποτημένοι ταῖς τῶν ἀστρολόγων ψευδολογίαις, τὰ γὰρ ἐπὶ μέρους προνοία διοικεῖται. οὐδ' ἔχουσιν ὄψω κινήσωσιν οἱ ἀστέρες τὴν ἡμετέραν προαίρεσιν, τὴν μῆτε παρὰ τοῦ πλάσαντος ἡμᾶς βιαζομένην. «ἰδοὺ δέδωκα πρὸ προσώπου σου σήμερον τὴν ζωὴν, καὶ τὸν θάνατον, τὸ ἀγαθὸν καὶ τὸ κακὸν». ἄδικος ὁ ἔρωτι χρυσοῦ καὶ ἀργύρου τοῖς περὶ χημείας πόνοις στρεβλῶν τὴν φύσιν, ἑαυτὸν τε, καὶ τοὺς ἄλλους φενακίζων, καὶ ἐθελοντὶ κακουργῶν, ὅμοια τῶ ἐν θαλάσῃ θηρῶντι λαγωῦς, καὶ ἐν ὄρεσιν ἰχθῦς διώκοντι. ἀφόρισε γὰρ ὁ δημιουργὸς τῇ ἐκάστου γενέσει τόπον κατάλληλον, καὶ ὄριον ἔθετο τοῖς οὖσιν, ὃ οὐ παρελεύσονται”. Nikolaos Mavrocordatos, *op. cit.* (n. 11), pp. πη'-πθ'.

Ἀράβων”) and on the other, we come up against the depths of the non-deceiving chemistry, which may offer unfathomable and real, though not material, riches (“τὰ ἄδυτα τῆς μὴ φενακιζούσης, μυρίοις δ’ ἀγαθοῖς πλουτιζούσης τὸν βίον χημείας”)¹³. But this contradiction has much wider implications: the deceiving chemistry occupies the same rank with the vain scholasticism, the epicurean ethics, the Platonic mysticism, and generally any theory or stance that is content with the testimony of the senses, with reality as something given. On the other side, we find theories and intellectual stances that are genuinely philosophical, that tend to question what is given and seek what is hidden beneath. Modern chemistry is not anymore a vain art, just as modern Platonism (that of Marsilio Ficino and Giovanni Pico della Mirandola, who are explicitly mentioned, in this regard, by Mavrocordatos¹⁴) is not anymore a barren way of philosophical conduct.

In 1719, the same year that Mavrocordatos published his book on the duties of a prince, Anastasios Popas of Ioannina, a scholar “well acquainted with philosophy, theology and the grammatical art”¹⁵, who was then employed as a teacher in the school of Serres, a post he retained until 1740 (or perhaps until 1742¹⁶), composed a book of general knowledge, dialogic in form, called *Φώσφορος*. He dedicated it to the physician Michael Perdikares (or Predikares) of Monemvasia¹⁷, a key figure himself

¹³ Nicolas Mavrocordatos, *Les loisirs de Philothée*, texte établi, traduit et commenté par Jacques Bouchard, avant-propos de C. Th. Dimaras, Athènes: Association pour l’Étude des Lumières en Grèce, Montréal: Les Presses de l’Université de Montréal, 1989, p. 86 (l. 6-23).

¹⁴ Mavrocordatos, *Les loisirs*, op. cit. (n. 13), 178 (l. 7-10).

¹⁵ G. Vendotes [Γ. Βενδότης], *Προσθήκη τῆς Ἐκκλησιαστικῆς Ἱστορίας Μελετίου Μητροπολίτου Ἀθηνῶν πρὸς ἐξακολούθησιν τῶν ἄλλων τριῶν τόμων· ἐρανισθεῖσα μετὰ μεγάλης προσοχῆς καὶ ἐπιμελείας ἐκ διαφόρων ἀξιολόγων συγγραφέων εὑρισκομένων ἐν τῇ περιφῆμῳ Κ. Β. Βιβλιοθήκῃ τῆς Βιέννης εἰς τὴν ἀπλὴν ἡμῶν Διάλεκτον [...], Τόμος Δ’. Περιέχων τὰ ἐν τῇ Ἐκκλησίᾳ Συμβάντα ἀπὸ τοῦς χιλίους ἑπτακοσίους χρόνους τῆς τοῦ Χριστοῦ Γεννήσεως ἄχρι τῆς Σήμερον· δηλ. ὅλου τοῦ παρόντος αἰῶνος, ἐν Βιέννῃ τῆς Ἀουστρίας: ἐν τῇ Ἑλληνικῇ Τυπογραφίᾳ Γεωργίου Βενδότη, 1795, p. 146. For Popas and the scant existing literature on his life and works see: I. Chatzes [I. Χατζής], *Αναστάσιος Παπαβασιλόπουλος (c. 1670-c. 1750): Βιογραφία-εργογραφία*, Ph.D. Dissertation, Ioannina: University of Ioannina, 2002, pp. 30-31.*

¹⁶ M. K. Paraniakas [Μ. Κ. Παρανίκας], *Σχεδιάσμα περὶ τῆς ἐν τῷ ἑλληνικῷ ἔθνει καταστάσεως τῶν γραμμάτων ἀπὸ ἀλώσεως Κωνσταντινουπόλεως (1453 μ. Χ.) μέχρι τῶν ἀρχῶν τῆς ἐνεστώσης (10’.) ἑκατονταετηρίδος (Ἀναγνωσθὲν ἐν τῷ ἐν Κ/Πόλει Ἑλληνικῷ Φιλολογικῷ Συλλόγῳ κατὰ Ἰούνιον τοῦ 1866), ἐν Κωνσταντινουπόλει: ἐκ τοῦ τυπογραφείου Α. Κορομηλά, 1867, p. 52-53; T. Evangelides [T. Εὐαγγελίδης], *Ἡ παιδεία ἐπὶ Τουρκοκρατίας (ἑλληνικὰ σχολεῖα ἀπὸ τῆς Ἀλώσεως μέχρι Καποδιστρίου)*, 2 vols., ἐν Ἀθήναις: τύποις Α. Π. Χαλκιοπούλου, 1936 [reimpr. Ἀθήνα: Βιβλιοπωλεῖο Διονυσίου Νότη Καραβία, 1992], I, p. 138.*

¹⁷ For Perdikares of Monemvasia see: K. N. Sathas [Κ. Ν. Σάθας], *Νεοελληνικὴ φιλολογία: Βιογραφία τῶν ἐν τοῖς γράμμασι διαλαμψάντων Ἑλλήνων, ἀπὸ τῆς καταλύσεως τῆς Βυζαντινῆς Αυτοκρατορίας μέχρι τῆς ἑλληνικῆς ἐθνεγερσίας (1453-1821)*, ἐν Ἀθήναις: ἐκ τῆς Τυπογραφίας τῶν τέκνων Ἀνδρέου Κορομηλά, 1868, pp. 444-445; G. I. Zaviras [Γ. Ἰ. Ζαβίρας], *Νέα Ἑλλάς ἢ Ἑλληνικὸν Θέατρον*, ἐκδοθὲν ὑπὸ Γεωργίου Π. Κρέμου, Γεωργίου Ἰωάννου Ζαβίρα Ἀνέκδοτα Συγγράμματα, Ἀθήνησι: Τύποις

in Anastasios' wide-embracing multi-thematic literary undertaking: as a matter of fact, the dialogue which takes place in the book is explicitly staged as an encounter between Michael, whose voice is that of the enquirer, and Anastasios, who assumes the role of the respondent.

Having roamed, already from the very outset, over an impressive variety of topics, ranging from the highly abstract preoccupation with the nature of God (“μὰ ὄρισε μοι τὶ εἶναι ὁ θεός;”), or that with the definition of hell (“Τὶ εἶναι ἡ κόλασις;”), to more particular problems, such as that of the peculiarities in character exhibited by women (“Παρακαλῶ την, νὰ μὲ εἰπῆς μερικαῖς γνώμαις διὰ τὰς γυναῖκας;”) or that of the analogical relation between the cosmos as a whole, the macrocosm, and the human being as a “recapitulation” of the cosmos on a smaller scale, the microcosm (“Διατὶ ὁ ἄνθρωπος λέγεται μικρὸς κόσμος;”)¹⁸, Popas at one point is invited to answer yet another root philosophical question: what is the primary principle in the created universe (“Ποῖα εἶναι ἡ ἀρχὴ τοῦ κόσμου;”)? He sums up the conclusions reached by the early Greek philosophers, tacitly restricting himself to those that we customarily classify as ‘pre-Socratics’, who all shared the belief “that God created the world out of matter and form”, and then right away he makes his interlocutor aware of the relevant views held by “the chymists” (“οἱ χυμικοὶ”) and Hermes Trismegistus. The first have opined that the primary principles of things are the acid (“ἄκιδον”) and the alkali (“ἄλκαλι”); the second, that this merit belongs to salt, sulfur, and mercury (“ἄλας, θεῖον, καὶ ἔμμεῖν [sic]”). Of course, the true story is to be found beyond the philosophical controversies, in what the Holy Scripture narrates. God created all things “out of non-beings”, as indicated in the book of Judith: “You conceived of everything and everything was produced in you” (“ἐννόησας καὶ πάντα παρήχθησάν σοι”). “And still, chymists”, Popas adds, “decompose everything into water”¹⁹.

¹⁸ Ἐφημερίδος τῶν Συζητήσεων, 1872 [reprint: T. A. Γριτσόπουλος (ed.), Ἐπιστημονικαὶ Πραγματεῖαι, Σειρὰ Φιλολογικὴ καὶ Θεολογικὴ, 11, Ἀθῆναι: Ἐταιρεία Μακεδονικῶν Σπουδῶν, 1972], pp. 456-457.

¹⁹ A. Popas, *Βιβλίον ἄριστον καλούμενον Φώσφορος. Συντεθὲν ἀπλῆ φράσει παρὰ τοῦ λογιωτάτου κυρίου Αναστασίου Πώπα τοῦ ἐξ Ἰωαννίνων, καὶ ἀφιερωθὲν τῷ ἀξιωτάτῳ καὶ λογιωτάτῳ ἐν ἰατροῖς κυρίῳ Μηχαλάκῃ τῷ πρεδικάρῃ τῷ ἐκ Μονεμβασίας, ἐν ᾧ ἐρωτᾷ ὁ Μιχαὴλ καὶ ἀποκρίνεται ὁ Αναστάσιος φιλαλήθως καὶ ὀρθοδόξως. Ἀδεία τοῦ πανιερωτάτου καὶ λογιωτάτου μητροπολίτου ἁγίου Σεβρῶν κυρίου κυρίου Στεφάνου. Ἐν ἔτει ἀπὸ Χριστοῦ αἰμιθ' [=1719]. Σεβρῆσι τῆς Μακεδονίας ἡ ἐμὴ ἐλπὶς ἐν τῷ ἀρνίῳ. Νῦν πρῶτον τύπῳ ἐκδοθὲν παρὰ τινῶν εὐρισκομένων ὀρθοδόξων χριστιανῶν ἐν τῇ πόλει Βιέννῃ ἐν ἔτει 1756.* Βιέννα: Τυπωθὲν παρὰ τοῦ Ἰωάννου Θωμᾶ Τράττνερ, Καισαρικοῦ Βασιλικοῦ Βιβλιοπώλου, pp. 5, 18-19, 21.

¹⁹ Popas, *op. cit.* (n. 18), p. 27.

Although the passage from Judith is inaccurately quoted, the meaning conveyed here is similar to that assigned to the particular verse of the original text, to which Popas refers, by some of the most rigorous Christian thinkers of the past. For John Philoponus, e.g., when Judith addresses God, saying “You had the thought and they came to be; you minded it and they were present”, the clearly discernible idea illustrated by this divinely inspired, poetical wording is that God’s creative power is infinite²⁰. And, what’s more, any attempt to acquire knowledge on the nature of material things should be tuned in to the implications of this conception. Natural philosophy should intersect and interact with theology. The knowledge of nature, of what is created, cannot be dissociated from the knowledge of God, of the creating agent. Popas likewise, in another of his answers, stresses the paramount position occupied by the knowledge of God in the ascending scale of erudition: the sensible soul is subject to the rational soul; the latter is subject to theory; and theory is subject to truth, that is, to God²¹. By invoking the theory of creation *ex nihilo*, perhaps he wants to remind his reader of how utterly futile and vain the quest for material primary principles is.

Even more noteworthy, though, at least from the point of view adopted in this paper, is the fact that Popas places the theories on the elementary constituents of reality proposed by this distinct class of philosophers called “the chymists” side by side with those of the early Greek naturalists. As it seems, he is only very roughly familiar with what he is talking about. Nevertheless, his knowledge is in some degree up-to-date. The acid-alkali theory which he succinctly brings up was first formulated by Otto Tachenius (1610-1680)²², in a work entitled *Hippocrates chimicus* which was

²⁰ John Philoponus, *Against Proclus on the eternity of the world 1-5*, translated by M. Share, Ancient Commentators on Aristotle, London: Duckworth; Ithaca, NY: Cornell University Press, 2004, p. 22. Cf. the original Greek text: H. Rabe (ed.), *Ioannes Philoponus De aeternitate mundi*, Bibliotheca Scriptorum Graecorum et Romanorum Teubneriana (BSGRT) 1591, Lipsiae: in aedibus B. G. Teubneri, 1899, p. 6 (l. 7-8). Philoponus’ quotation is also a paraphrasis: “διενοήθησιν καὶ ἐγενήθησαν, ἐνενοήθησιν καὶ παρέστησαν”. The original passage in the Septuagint text of Judith (9:5-6) is the following: “καὶ τὰ ἐπερχόμενα διενοήθησιν, καὶ ἐγενήθησαν ἃ ἐνενοήθησιν, καὶ παρέστησαν ἃ ἐβουλεύσω”. In his commentary on the biblical *Hexaemeron*, however, Philoponus uses the correct formulation, G. Reinhardt (ed.), *Ioannes Philoponus De opificio mundi libri VII*, BSGRT 1782, Lipsiae: in aedibus B. G. Teubneri, 1897, p. 6 (l. 12-13).

²¹ “ἡ αἰσθητικὴ ψυχὴ ὑπόκειται εἰς τὴν λογικὴν, διότι εὐγενέστερον εἶναι ὁ ἄνθρωπος, ἀπὸ τὸ ζῶον· πάλιν ἡ λογικὴ ψυχὴ ὑπόκειται εἰς τὴν θεωρίαν· ὥστε καλλίτερος εἶναι ὁ θεωρητικὸς [sic] ἄνθρωπος, ἀπὸ τὸν πρακτικὸν· πάλιν ἡ θεωρία ὑπόκειται εἰς τὴν ἀλήθειαν, ἢ ὅποια εἶναι ὁ θεὸς”. Popas, *op. cit.* (n. 18), p. 4.

²² Tachenius received the degree of doctor of medicine from the University of Padua, in 1647, and then he moved to Venice, where he remained till his death. For his life see: G. F. Dann, “Beitrag zur Biographie von Otto Tachenius”, in: *Atti del II congresso internazionale di storia della farmacia*:

published in 1666, on the basis of the suggestion put forward, less than a decade earlier, by the professor of medicine at the University of Leiden, François de la Boë (or Franciscus Sylvius, 1614-1672), that all physiological processes could be explained in terms of chemical interactions, wherein the polarity between the acidic and the alkaline components was of key importance²³. It was developed further, popularized, and defended as well against the objections that Robert Boyle had raised, in the meantime, with his *Experiments, Notes, etc. About the Mechanical Origine or Production of divers Qualities* (1675), by the French physician François de Saint-André²⁴, whose *Entretiens sur l'acide et sur l'alkali* (first published in 1677²⁵) went

Padova-Venezia, 7, 8, 9 ottobre 1958, Pisa: Tip. Pacini-Mariotti, 1958, pp. 118-131; H.-H. Take, *Otto Tachenius (1610-1680): Ein Wegbereiter der Chemie zwischen Herford und Venedig*, Herforder Forschungen 16, Bielefeld: Verlag für Regionalgeschichte, 2002. For his work see: J. Ferguson, *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., Glasgow: J. Maclehoose and Sons, 1906 [reprint: London: Derek Verschoyle, 1954], II, pp. 424-425; L. Thorndike, *History of magic and experimental science*, 8 vols., New York & London: Columbia University Press, 1923-1958, VIII, pp. 357-361; J. R. Partington, *A history of chemistry*, 4 vols., London: MacMillan and Co Ltd, 1961-1972, II, pp. 291-297; I. W. Müller, "Untersuchungen zum Hippokratesverständnis von Otto Tachenius und Michael Etmüller", *Medizinische Journal*, 22 (1987), pp. 327-341; Martin Mulsow, *Prekäres Wissen: Eine andere Ideengeschichte der Frühen Neuzeit*, Berlin: Suhrkamp Verlag, 2012, pp. 265-275.

²³ Sylvius' theory gained currency through his university courses, from 1658 onwards, through ten disputations held under his presidency, published in 1663, and finally through the three books of his *Praxeos medica idea nova* (the first published in 1671; the other two, together with an appendix of 10 tracts, in three separate volumes edited by his former student Justus Schrader in 1674) and several other treatises of his own included in his *Opera medica* which were issued posthumously in 1679. For his life and work see: A. Rey, *De Sylvius à Régnier de Graaf: Quelques considérations sur les idées médicales au XVIIe siècle*, PhD Dissertation, Bordeaux: Université Bordeaux, 1930; E. D. Baumann, *François dele Boe Sylvius (1614-1672)*, Leiden: E. J. Brill, 1949; Partington, op. cit. (n. 22), II, pp. 281-290; G. E. Dann, "Beitrag zur Biographie und Familiengeschichte des Leidener Professors François de la Boë Sylvius", *Veröffentlichungen der Internationalen Gesellschaft für Geschichte der Pharmazie*, 26 (1965), pp. 29-46; L. S. King, *The road to medical enlightenment 1650-1695*, London: MacDonald; New York: American Elsevier Inc., 1970, pp. 93-112; E. Ashworth Underwood, "Franciscus Sylvius and his iatrochemical school", *Endeavour*, 31 (1972), pp. 73-76; H. Beukers, "Het laboratorium van Sylvius", *Tijdschrift voor Geschiedenis der Geneeskunde, Natuurwetenschappen, Wiskunde, en Techniek*, 3 (1980), pp. 28-36; *idem*, "Mechanische principes bij Franciscus dele Boë, Sylvius", *Tijdschrift voor Geschiedenis der Geneeskunde, Natuurwetenschappen, Wiskunde, en Techniek*, 5 (1982), pp. 6-15; *idem*, "Acid spirits and alkaline salts: The iatrochemistry of Franciscus dele Boë, Sylvius", *Sartoniana*, 12 (1999), pp. 39-56; A. G. Debus, *Chemistry and medical debate: Van Helmont to Boerhaave*, Canton, MA: Science History Publications/USA, 2001, pp. 59-64.

²⁴ The details of François de Saint-André's life are almost completely unknown. He was born in Coutances, sometime around the middle of the 17th century, and then he became doctor of medicine in the University of Caen, where he probably worked as a professor. See: A. Pluquet, *Bibliographie du Département de la Manche*, Caen: A. Massif, Libraire-Éditeur, 1873, p. 328; P. Carel, *Les médecins et les chirurgiens de Caen avant la révolution*, Caen: A. Massif, Librairie, 1888, pp. 30-31; J. Paget, "André, François, or Monsieur de St. André", in: *The biographical dictionary of the Society for the Diffusion of Useful Knowledge*, 4 vols. in 7 tomes, London: Longman, Brown, Green, and Longmans, 1842-1844, II.2, p. 609.

²⁵ For the correct date of this edition, which frequently is referred to as printed in 1672, see: L. M. Principe, "Liens et influences chimiques entre Boyle et la France", in: M. Dennehy & C. Ramond (eds.), *La philosophie naturelle de Robert Boyle*, collection: Analyse et Philosophie, Paris: Librairie Philosophique J. Vrin, 2009, pp. 71-89 – the reference on p. 83; E. R. Ragland, "Between certain

through a second enlarged edition in 1687²⁶. As for the theory of Hermes, which Popas lists together with that of “the chymists”, it is the well-known Paracelsian theory of the *tria prima*, which was presented, both by Paracelsus (1493-1541) himself and by his follower, Gerhard Dorn (1530/1535 - † after 1584), as the outcome of a faithful interpretation of the legendary Egyptian wise man’s rediscovered authoritative sayings. It was disseminated broadly during the first half of the 17th century, when Dorn’s *Liber de naturae luce physica, ex Genesi desumpta* (1583) was included in the first volume of the monumental anthology *Theatrum chemicum* edited by Lazarus Zetzner (1602)²⁷.

metaphysics and the senses: Cataloging and evaluating Cartesian empiricisms. [Review article of:] Mihnea Dobre & Tanny Nyden (eds.), *Cartesian Empiricisms*, Studies in the History and Philosophy of Science 33, Dordrecht: Springer, 2013, 326 pp.”, *Journal of Early Modern Studies*, 3 (2014), pp. 119-139 – the reference on p. 136 (n. 64).

²⁶ For the acid-alkali theory, and the controversy with Boyle, see: M. Boas Hall, “Acid and alkali in seventeenth century chemistry”, *Archives Internationales d’Histoire des Sciences*, 9 (1956), pp. 13-28; H. Metzger, *Les doctrines chimiques en France du début du XVIIe à la fin du XVIIIe siècle*, Nouveau tirage, Paris: Librairie Scientifique et Technique Albert Blanchard, 1969, pp. 200-218; Debus, *Chemistry and medical debate*, op. cit. (n. 23), pp. 103-136.

²⁷ The existing literature on Philippus Theophrastus Aureolus Bombastus von Hohenheim or Paracelsus, and his followers, is abundant. Indicatively, see: G. Eis, *Vor und nach Paracelsus: Untersuchungen über Hohenheims Traditionsverbundenheit und Nachrichten über seine Anhänger*, Medizin in Geschichte und Kultur 8, Stuttgart: Gustav Fischer Verlag, 1965; C. Webster, *From Paracelsus to Newton: Magic and the making of modern science (The Eddington Memorial Lectures delivered at Cambridge University, November 1980)*, Cambridge: Cambridge University Press, 1982; W. Pagel, *Paracelsus: An introduction to philosophical medicine in the era of the Renaissance*, 2nd revised edition, Basel et al.: Karger, 1982; *idem*, *The smiling spleen: Paracelsianism in storm and stress*, Basel et al.: Karger, 1984; H. Trevor-Roper, “The Paracelsian movement”, in: *idem*, *Renaissance essays*, Chicago: Chicago University Press, 1985, pp. 149-199; A. G. Debus, *The chemical philosophy: Paracelsian science and medicine in the sixteenth and seventeenth centuries*, 2 vols., New York: Science History Publications, 1977; *idem*, *The French Paracelsians: The chemical challenge to medical and scientific tradition in Early Modern France*, Cambridge: Cambridge University Press, 1991; U. Fellmeth & A. Kotheder (eds.), *Paracelsus, Theophrast von Hohenheim: Naturforscher, Arzt, Theologe*, Stuttgart: Wissenschaftliche Verlagsgemeinschaft, 1993; U. Benzenhöfer (ed.), *Paracelsus*, Darmstadt: Wissenschaftliche Buchgesellschaft, 1993; *idem*, *Paracelsus*, Rowohlt’s Monographien 1290, Reinbeck bei Hamburg: Rowohlt, 1997; *idem*, *Studien zum Frühwerk des Paracelsus im Bereich Medizin und Naturkunde*, Münster: Klemm & Oelschläger, 2005; J. Telle (ed.), *Analecta Paracelsica: Studien zum Nachleben Theophrast von Hohenheims im deutschen Kulturgebiet der frühen Neuzeit*, Heidelberger Studien zur Naturkunde der frühen Neuzeit 4, Stuttgart: Franz Steiner, 1994; A. Weeks, *Paracelsus: Speculative theory and the crisis of the Early Reformation*, SUNY series in Western Esoteric Traditions, Albany, NY: State University of New York Press, 1997; H. Schott & I. Zinguer (eds.), *Paracelsus und seine internationale Rezeption in der Frühen Neuzeit*, Leiden: E. J. Brill, 1998; O. P. Grell (ed.), *Paracelsus: The man and his reputation, his ideas and their transformation*, Leiden, Boston & Köln: Brill, 1998; G. Scholz Williams & C. D. Gunnoe, Jr. (eds.), *Paracelsian moments: Science, medicine, and astrology in Early Modern Europe*, Sixteenth Century Essays & Studies 64, Kirksville, MO: Truman State University Press, 2002; A. Classen (ed.), *Paracelsus im Kontext der Wissenschaften seiner Zeit: Kultur- und Mentalitätsgeschichtliche Annäherungen*, Theophrastus Paracelsus Studien 2, Berlin & New York: Walter de Gruyter, 2010; *idem* (ed.), *Religion und Gesundheit: Der heilkundliche Diskurs im 16. Jahrhundert*, Theophrastus Paracelsus Studien 3, Berlin & New York: Walter de Gruyter, 2011. For the life and work of Gerhard Dorn see: Thorndike, op. cit. (n. 22), V, pp. 630-635; J.-F. Marquet, “Philosophie et alchimie chez Gerhard Dorn”, in: J.-C. Margolin

In all probability, it would be erroneous to assume that Popas had read any of the primary sources that we just specified. It is, rather, obvious, that we have to do with information received at second, if not third, hand: perhaps, from one of his own teachers, when he was younger, or from Perdikares himself. This is not to say that Popas' short encyclopaedic and dialogic guide, which seems to rely much upon the tradition of medieval florilegia, is nothing but an assemblage of unrelated commonplace aphorisms. Even supposing that this was all, we would still have to dwell on the question how theories propounded by Paracelsus or Tachenius found somehow their way into an arsenal of serviceable maxims at the disposal of an average local educator. But there are some indications that this is not all. We will pick out one that is particularly interesting. Popas appended to his *Φόσφορον* a relatively lengthy "enchiridion called institutes of moral philosophy" (*Ἐγχειρίδιον ἄριστον καλούμενον Κανόνες τῆς ἠθικῆς φιλοσοφίας*), consisting of 767 propositions²⁸. In the chapter on God, besides the numerous predictable apophatic pronouncements we may also fall upon some enunciations which link notably more strongly God to the palpable reality of life in this world. Such is the 384th proposition, where we learn that "the world is but a visible image of the invisible deity, because this and other things as well were becoming images of the saints"²⁹; the 390th proposition, according to which "God is life-surpassing and life-giving, the overflowing, containing in itself the principle of life, and simplest life"³⁰; and the 416th proposition, which goes as follows: "God is the alpha, and the omega, the beginning and the end; in which we live, and move, and exist"³¹. Popas uses commonly known, among literate Orthodox Christians, materials, but, in some instances at least, he shades them in tones reminiscent of certain naturalistic or vitalistic Renaissance philosophical proclivities.

& S. Matton (eds.), *Alchimie et philosophie à la Renaissance: Actes du colloque international de Tours (4-7 décembre 1991)*, De Pétrarque à Descartes 57, Paris : Librairie Philosophique J. Vrin, 1993, pp. 215-221; D. Kahn, "Dorn, Gerhard", in: C. Priesner & K. Figala (eds.), *Alchemie: Lexicon eines hermetischen Wissenschaft*, München: C. H. Beck, 1998, pp. 112-114; *idem*, *Alchimie et Paracelsisme en France à la fin de la Renaissance (1567-1625)*, Genève: Librairie Droz S.A., 2007, pp. 114-115, 143-149, 162-163, 196-199, 207-213; A. Ribí, "Gerhard Dorn: Ein verkannter Fortsetzer paracelsischer Alchemie und paracelsischer Philosophie: das Problem von Drei und Vier", *Nova Acta Paracelsica*, Neue Folge, 16 (2002), pp. 61-92.

²⁸ Popas, op. cit. (n. 18), pp. 51-204.

²⁹ "Ο κόσμος δὲν εἶναι ἄλλο, παρὰ μία εἰκὼν φανερά τῆς κεκρυμένης θεότητος, διατὶ τοῦτο καὶ ἕτερα ἐγίνοντο εἰκόνες τῶν ἁγίων". Popas, op. cit. (n. 18), p. 134.

³⁰ "Ο Θεὸς εἶναι ὑπέρζωος, καὶ ζωοποιὸς, ὑπερεκβλίζουσα, ζωαρχικὴ, καὶ ἀπλουστάτη ζωὴ". Popas, op. cit. (n. 18), p. 135.

³¹ "Ο Θεὸς εἶναι τὸ ἄλφα, καὶ τὸ ὠμέγα ἢ ἀρχὴ καὶ τὸ τέλος· ἐν ᾧ ζῶμεν, καὶ κινούμεθα καὶ ἐσμὲν". Popas, op. cit. (n. 18), p. 139.

What we have seen till now are no more than singular cases pointing to a dimension, hitherto unnoticed by the historians of the Enlightenment in SE Europe. A renowned scholar and statesman, such as Mavrocordatos, and an average, perhaps well-educated, teacher, saying a few words about an idiosyncratic field of knowledge, this is what we have seen for the moment. “Chemistry” in the first case and “the chymists” in the second suddenly, though only passingly, appear as something familiar or as something that can be actually embraced or taken into account: both a moral risk of beguilement and a promise of intellectual wealth for Mavrocordatos; an alternative theory on the elementary structure of the universe, comparable to those of the early Greek naturalists, for Popas. But we have only gone across a small segment in the territory that we decided to traverse. The continuation of this paper will examine further, and much richer, evidence provided by some of the surviving manuscripts of the period.

Olympiodore l'alchimiste et la *taricheia*.

La transformation du minerai d'or : *technê*, nature, histoire et archéologie

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Le commentaire d'Olympiodore *Sur le Kat'energeian* de Zosime, débute par la citation d'une phrase de Zosime concernant la « macération » (*taricheia*), opération paradigmatique du traitement du minerai d'or, comportant plusieurs étapes et interprétée comme une allégorie de l'opération alchimique.

Or, la confrontation des procédés décrits par Olympiodore avec le témoignage historique d'Agatharchide sur les mines d'or d'Erythrée ainsi que les résultats de récentes fouilles conduites en Égypte dans les sites miniers aurifères de l'époque ptolémaïque¹, permet de faire lumière sur les enjeux théoriques et pratiques des étapes de la transformation du minerai d'or et notamment sur le rapport entre nature et *technê* tel que le concevaient les alchimistes grecs. Il s'agit d'un très bel exemple de la fécondité d'une approche multidisciplinaire des textes de l'alchimie grecque.

Prémises: la structure du commentaire sur le *Kat'energeian* de Zosime par Olympiodore

Avant d'aborder le passage qui nous intéresse, et afin de définir sa place dans le commentaire du *Kat'energeian* de Zosime par Olympiodore, je voudrais résumer brièvement les résultats de mes dernières recherches sur la structure, la nature et la composition de ce traité.

Comme la plupart des textes du *corpus* des alchimistes grecs, qui sont fabriqués à partir du démembrement de textes perdus, le commentaire d'Olympiodore présente une nature composite. Le titre même, tel qu'on le trouve dans le manuscrit principal, le *Marcianus Graecus* 299 (M) illustre bien cela: «Olympiodore, philosophe d'Alexandrie, sur le livre *Selon l'action* de Zosime tout ce qui a été dit par Hermès et

¹ Je remercie chaleureusement les collègues archéologues de la Mission Française du Désert Oriental: Jean-Pierre Brun (Collège de France), Thomas Faucher (CNRS, IRAMAT) et Bérangère Redon (CNRS, HiSoMa), pour les précieuses informations et la documentation qu'ils m'ont généreusement transmises au sujet de cette découverte.

les philosophes» (ΔΟΛΥΜΠΙΟΔΩΡΟΥ ΦΙΛΟΣΟΦΟΥ ΑΛΕΞΑΝΔΡΕΩΣ ΕΙΣ ΤΟ ΚΑΤ' ΕΝΕΡΓΕΙΑΝ ΖΩΣΙΜΟΥ ΟΣΑ ΑΠΟ ΕΡΜΟΥ ΚΑΙ ΤΩΝ ΦΙΛΟΣΟΦΩΝ ΗΣΑΝ ΕΙΡΗΜΕΝΑ).

Dans sa description de M, Lagercranz² divise le texte d'Olympiodore en deux sections dont seulement la première présente une structure cohérente.

En effet, la première section (M, f. 163r - 166r; BeRu II, 69, 12- 77, 14; § 1-14) est structurée en cinq parties séparées et distinctes : l'opération de l'extraction des paillettes d'or du minerai, à travers la «macération» (*taricheia*) et le «lessivage» (*plusis*) (§1-7. Ensuite est introduite la «soudure» (*chrysocolle*) de l'or (§8-11), qui consiste à rassembler les particules d'or obtenues en un corps homogène. Ces deux opérations spécifiques, de séparation et de réunion, sont ici interprétées comme des allégories de la transmutation des métaux. Viennent ensuite les trois types de teinture des anciens alchimistes (§ 11-14).

La deuxième section — la partie la plus étendue du texte (f. 166r, 26-179r, 4 = II, 77, 15-104, 7; §15-55) — est constituée par une suite de *excerpta* et de digressions accompagnés de notes sur les principales opérations alchimiques.

Or dans une étude récente³, j'ai montré qu'au-delà de cette apparence de désordre et de confusion, on peut saisir dans le déroulement de notre traité un dessin rationnel et cohérent, révélé par deux traces. La première consiste dans le fil rouge de la logique qui relie les opérations alchimiques, les principes et les substances fondamentales. On peut en effet constater une progression dans la présentation des composantes de l'alchimie, qui va des opérations fondamentales (lévigation, fusion, teinture) à ses principes causaux et matériels, pour terminer avec des considérations épistémologiques sur cette discipline en tant que *technê*.

Le deuxième fil rouge consiste en des formules que l'on pourrait définir comme «de raccord et d'accompagnement», où l'auteur parle à la première personne et signale la transition entre les différentes parties ainsi que le but, la méthode et l'organisation interne de son travail. Notre texte se révèle ainsi être une *epitomê*, un résumé au but

² O. Lagercranz, «Codex Marcianus 299», Catalogues des manuscrits alchimiques grecs, II, Bruxelles, 1927, p. 16-17; cf. E. Mioni, *Bibliothecae divi Marci Venetiarum Codices Graeci Manuscripti*, v. I, Roma, 1981, p. 432.

³ C. Viano, «Le commentaire d'Olympiodore l'alchimiste: un puzzle cohérent?», dans C. Viano, M. Martelli, *Les alchimistes grecs: textes, doctrines, comparaisons* (colloque de Venise, 5-7 décembre 2007) (à paraître).

protreptique⁴, offrant un choix de témoignages, accompagnés de commentaires, découpés à partir des écrits des anciens alchimistes, mais aussi des philosophes proprement dits, sur les fondements de l'art (les opérations, les ingrédients, et aussi l'histoire). Il est adressé à quelqu'un, probablement quelqu'un de jeune et de rang élevé dans le but de lui offrir «une vue d'ensemble de l'art complet» (*tês enkukliou technês hê sunopsis*, §38).

Selon mon hypothèse, un ouvrage perdu d'Olympiodore, rédigé dans une forme plus structurée, était à l'origine du texte que nous possédons. Celui-ci serait constitué au moins de deux couches: le commentaire d'Olympiodore au *Kat'energeian* de Zosime et l'arrangement d'un compilateur. Celui-ci a pu copier Olympiodore jusqu'à un certain point et ajouter ensuite une série de notes sur les principales opérations alchimiques, accompagnées d'*excerpta* de Zosime et d'autres auteurs alchimiques, en cousant le tout avec ce double fil rouge: d'une part, celui de la progression logique dans l'apprentissage des opérations et des principes de l'alchimie, et de l'autre, l'introduction de formules signalant la transition entre les parties ainsi que la méthode de composition et le but de ce précis.

Je pense que le morceau initial (§1-7) provient directement du commentaire au *Kat'energeian* d'Olympiodore le néoplatonicien ainsi qu'une bonne partie de la doxographie sur les Présocratiques que l'on trouve au milieu du traité (§18-27). Puisque dans l'ensemble du traité, les citations de Zosime sont plus fréquentes et plus nombreuses (son nom est cités explicitement vingt fois) que celles des autres alchimistes et, qu'en plus du titre du commentaire, deux *excerpta* sont explicitement déclarés par la suite comme provenant du *Kat'energeian*⁵, il est aussi fort probable que cette compilation se superpose à la trace du commentaire. C'est-à dire que le compilateur a inséré d'autres *excerpta* et digressions mais il a pu revenir au commentaire d'Olympiodore sur le *Kat'energeian* et en copier et/ou paraphraser d'autres parties, comme justement la partie doxographique qui à mon avis est d'Olympiodore du moins en ce qui concerne les Présocratiques. Il est aussi tout à fait plausible que le *Kat'energeian* de Zosime soit déjà un ouvrage doxographique en ce

⁴ Cf. 71, 18: « L'expression "réaliser l'acte de la macération" exhorte au travail pratique» (Τῷ δὲ «ποιῆσαι τῆς ταριχείας ἐνέργειαν» πρὸς τὴν ἔμπρακτον ἐργασίαν προτρέπεται).

⁵ Cf. II, 89, 8 (§32): «Et Zosime dans son livre Selon l'action (*Kai; Zwvsimo" ejn th' Katæ ejnergeian bivblw*)...» et 100, 9 (§50): «Et vois que Zosime, dans le livre Selon l'action, dans la seconde section (*ejn th' Katæ ejnevrgeian bivblw, tw' deutevrw/ lovgw*)...».

qui concerne les opinions des alchimistes et qu'Olympiodore dans son commentaire y ait rajouté une doxographie sur les Présocratiques, structurée selon le schéma typique des doxographies néoplatoniciennes⁶. Les parties que je suppose avoir été copiées directement du commentaire d'Olympiodore sont justement caractérisées par des ressemblances formelles (le schéma typique du commentaire selon *lexis, théôria, exegetis kata lexis*; l'agencement de la doxographie), terminologiques et conceptuelles frappantes avec le commentaire des *Meteorologica* et d'autres ouvrages d'Olympiodore⁷.

Or, si cette hypothèse est vraie, nous pouvons expliquer que, par la suite, ce texte a été attribué dans son entier à Olympiodore d'Alexandrie, par une sorte d'«attraction» de la partie initiale. J'exclus qu'il était dans les intentions du compilateur du *patchwork* de s'attribuer le nom d'Olympiodore. Le titre ne fait que refléter précisément ce qu'est cet ouvrage: le commentaire d'Olympiodore à Zosime *et* une collection d'*excerpta*. Il faut donc distinguer les deux parties du titre par un *kai* ou une virgule. Quant au compilateur, on pourrait vraisemblablement songer à ce Théodore, qui aurait rassemblé la collection entière des textes alchimiques à l'époque d'Héraclius et composé la préface en vers qui se trouve au début de M (f. 5v).

La «macération» (*taricheia*)

Venons maintenant au passage qui nous intéresse. Le *lemma* cité concerne l'opération de l'extraction des paillettes d'or du minerai, à travers la «macération» (*taricheia*) et le «lessivage» (*plusis*) (§1-7). Comme nous l'avons déjà mentionné, il est suivi par la description de la «soudure» (*chrysocolle*) de l'or (§8-11), qui consiste à rassembler les particules d'or obtenues en un corps homogène. Ces deux opérations spécifiques, de séparation et de réunion, sont ici interprétées comme des allégories de la transmutation des métaux. Viennent ensuite les trois types de teinture des anciens alchimistes (§ 11-14). Le § 15 énonce le but fondamental de la teinture : donner à un corps «dissipable» une nature indélébile. Cela signifie, en termes opératifs, fixer la

⁶ Voir C. Viano, «Olympiodore l' alchimistes et les Présocratiques: une doxographie de l'unité» (De arte sacra, §18-27)", dans D. Kahn et S. Matton (éd.), *Alchimie: Art, Histoire et Mythes*, Paris-Milan, 1995 (Textes et travaux de Chrysopoeia, 1), p. 95-150.

⁷ Voir C. Viano, *La matière des choses. Le livre IV des Météorologiques d'Aristote, et son interprétation par Olympiodore, avec le texte grec révisé et une traduction inédite de son Commentaire au Livre IV*, Paris, Vrin, Collection "Tradition de la pensée classique", 2006, p. 199 suiv.

coloration d'un métal de manière à lui donner une nature persistante

BeRu, CAAG, II, 69, 15 -70, 3:

1. Γίνεται δὲ ἡ ταριχεΐα ἀπὸ μηνὸς μεχίρ κε' [καὶ] ἕως μεσωρί (15) (70.) κε' ὅσα ἂν δύνῃ ταριχεῦσαι καὶ πλῦναι ἕως ἀφῆς τὰ αὐτὰ ἐν ἀγγείοις ἀποκεείμενα. Καὶ ἐὰν δύνῃ ποιῆσαι, ποιήσον τῆς ταριχεΐας τὴν ἐνέργειαν, κάλλιστε τῶν σοφῶν.

«La macération se fait à partir du 25 du mois de méchir jusqu'au 25 du mois de mésori (70). Toutes les choses que tu peux faire macérer et lessiver, mets-les de côté dans des récipients. Et, si tu peux le faire, réalise en acte la macération, toi, le plus noble des sages».

La citation, vraisemblablement de Zosime, est commentée selon le schéma «classique» des commentateurs néoplatoniciens, typique d'Olympiodore le néoplatonicien: d'abord le morceau à commenter, une explication générale, qui correspond à la *theoria*, et ensuite l'exégèse détaillée des phrase et des termes (*lexis*), que nous trouvons aux paragraphes 2, 3, 4, 5, 6, 7.

La considération générale porte sur la coutume des anciens de cacher la vérité aux non-initiés au moyen d'allégories et d'un langage ésotérique; l'auteur évoque, de manière obscure (comme il se doit), comme exemple les formulations de Platon et d'Aristote concernant la substance et les accidents. Ensuite Olympiodore annonce l'exégèse du procédé de la *taricheia* dans la perspective de «pousser les chercheurs des objets physiques vers les objets non physiques».

Même si l'analyse de cette citation se conclut avec la distinction entre le «lavage mystique» (*plusis mustikê*), le «lavage proprement dit» (*plusis apolelumenê*) et l'identification de celui-ci au «grand traitement» (*megalê therapeia*), ce qui semblerait se situer sur le plan allégorique de la transmutation, de fait, l'exégèse détaillée d'Olympiodore, au-delà d'un certain nombre d'obscurités, apparaît essentiellement technique et se référant à des procédés bien réels.

En effet, il y a l'intention d'expliquer, en termes concrets, les étapes, les temps, les outils et les phases de l'opération de la lévigation du minerai d'or, décrite dans la citation de Zosime.

Ainsi, apprend-on que le point de départ de la «macération» est la «terre boueuse (ou limoneuse)» (§2)⁸, qui doit être lessivée jusqu'à ce que la boue ait disparu, et qu'il ne reste que le minerai (*psammos*), c'est-à-dire les paillettes d'or, argentées ou plombées. La phase successive consistera à soumettre les paillettes à l'action du feu. De plus, Olympiodore interprète l'expression «réaliser l'acte de la macération» comme une exhortation au travail pratique. Le terme «acte» (*energeia*, qui donne le titre à l'ouvrage de Zosime ici commenté, le *Kat'energeian*: («selon l'action») est interprété ici comme «action pratique», «opération» (5. Τῷ δὲ «ποιῆσαι τῆς ταριχείας ἐνέργειαν» πρὸς τὴν ἔμπρακτον ἐργασίαν προτρέπεται. Καὶ ἡ ἐνέργεια γὰρ ἐνταῦθα εἰς τὴν πρᾶξιν ἐκλαμβάνεται). Il s'agit donc de mettre en pratique une prescription.

Mais peut-on dire quelque chose de plus concernant la *taricheia*?

La *taricheia* dans le CAAG

Le terme *taricheia* en grec signifie trois choses⁹. En premier lieu : a) « dessiccation, salaison, conservation sous sel » (Aristote, *Meteor.*, II, 3, 359 a16 suiv.). Chez Aristote, dans *Meteor.* II, 3, 359 b 12, nous trouvons un rapport entre la «boue» et la «macération». Aristote présente comme preuve (*tekmérion*) du fait que la mer est un mélange d'eau et de sel, la densité de la masse de la mer. En effet, si l'on fait un mélange d'eau, en y mêlant une grande quantité de sel, le résultat est une sorte de «boue» (w{ sper phlov"). La même opération est faite pour les «conserves à la saumure» (tau{jto; de; tou'to drw'si kai; peri; ta;" tariceiva") trad. P. Louis; «dans les salaisons des poissons», J. Tricot, cf. *Hist anim.*, VIII, 30, 607 b 28, où il est question des salaisons des thons). Ici la *taricheia* est décrite comme un procédé de conservation sous sel au moyen d'un mélange de sel et d'eau. C'est le sens le plus

⁸ Le morceau de Zosime est attribué à Olympiodore, dans une version plus étendue, dans un recueil de fragments, relativement récent selon Berthelot, intitulé Sur la pierre philosophale, CAAG II, 200, 7 (transcrit sur A) : « La macération a lieu depuis le 25 du mois de méchir jusqu'au 25 du dernier mois de l'automne (6)... Toutes les choses que tu peux faire macérer et lessiver, laisse-les déposer dans des vases (convenables). La macération s'exécute sur la terre limoneuse, jusqu'à ce que la partie limoneuse s'en aille et que le minerai soit isolé. Cet art ne se pratique pas au moyen du feu. » (Γίνεται ἡ ταριχεία ἀπὸ μηνὸς μεχίρ κε' ἕως μετοπωρινῶν κε'· ὅσα ἂν δύνῃ ταριχεῦσαι καὶ πλύναι ἕως ἀφῆς αὐτὰ ἐν ἄγγεσιν ἀποκεῖμενα. Γίνεται δὲ ἡ ταριχεία περὶ τῆς πηλώδους γῆς, μέχρις ἂν τὸ πηλώδες ἐξέλθῃ, καὶ εἰς ψάμμον καταλήξῃ. Ὅτι ἡ τέχνη αὕτη διὰ πυρὸς οὐ γίνεται). S'agit-il de la version plus complète d'un fragment du *Kat'energeian* de Zosime? En effet ces deux dernières phrases, absentes dans le morceau présenté au début de notre texte, sont ensuite commentées aux paragraphes 2 et 16.

⁹ Cf. LSJ: τᾱρῖχ-εία, Ion. τᾱρῖχ-ῆῖη, ἡ, (1) preserving, pickling, in pl., εἰς ταριχείας φαῦλοι Arist.HA607b28, cf. Mete.359a16: sg., γογγυλίδας εἰς τ. POxy. 736.5 (i A.D.), cf. Gal.6.745. (2) mummification, PEleph.8.8 (iii B.C.), POxy.40.9 (ii A.D.). (3). maceration, Olymp.Alch.p.69B., al. II. Ταριχεῖαι prob. factories for salting fish, Hdt.2.15,113, Str.3.1.8

commun du mot. b) Dans la *taricheia* d'Olympiodore, il n'est pas question de sel mais il reste la notion d'un mélange humide et dense d'où il faut séparer la partie solide. Pour la signification de *macération*, LS renvoie justement à ce passage d'Olympiodore. c) La *taricheia* peut signifier aussi «momification», il s'agit au fond là aussi d'un traitement de conservation où le sel (*natron*) joue un rôle important.

Dans le *corpus* des alchimistes grecs, on trouve de nombreuses occurrences du terme *taricheia* surtout chez Zosime, ce qui fait penser qu'il s'agit d'une terme central dans le *Kat'energeian*. Il semble désigner tantôt l'ensemble des opérations de lévigation du minerai d'or, tantôt la phase préalable qui consiste à réaliser un mélange du minerai broyé et réduit en poudre avec de l'eau et à le faire décanter dans des récipients. (cf. CAAG, 121, 18; 136, 8; 155, 19; 199, 1)

Dans l'une des *Visions*, représentée comme un autel en forme de coupe contenant de l'eau bouillonnante où s'opère la transformation (*metabolê*) des hommes qui abandonnent les corps et deviennent esprits, elle est le symbole de la purification du minerai d'or de la terre (cf. *Mém. auth.* X, 37, 50-57 Mertens). Dans d'autres passages, par rapport aux quatre phases principales de la transformation (noir, blanc, jaune et *iôsis*), elle prend sa place entre le noircissement et le blanchiment (cf. Zosime, 220, 3-14; Comarius, 290, xxx).

Agatharchide

Parmi les témoignages non alchimiques, les étapes techniques de l'extraction du minerai et de son traitement jusqu'à sa transformation en or sont décrites en détail par le géographe Agatharchide (qui a vécu en Égypte à la fin du II^e s. av. J.-C. et a été précepteur de Ptolémée X), qui a laissé un récit très vivant de l'activité des mines d'or du désert Oriental¹⁰.

En réalité, ce témoignage n'est pas du tout extérieur au corpus alchimique puisque dans M (f. 138-141) on en trouve un abrégé :

Sur la pierre métallique; en quels lieux elle est préparée CAAG, 26, 9-27, 3; trad. p. 27-28:

¹⁰ Son récit est transcrit dans Diodore de Sicile, III, 12, 1-14, 5; Strabon XVI, 4, 5-20 et Photius, Bibliothèque, chap. 250. Cf. Agatharchides of Cnidus, *On the Erythrean Sea*, transl. and ed. by M. Burstein, The Hakluyt Society, London, 1989, p. 57-68.

Χρῆ γὰρ γινώσκειν ὅτι ἐν τῇ Θηβαΐδι γῆ ἐν ᾧ τόπῳ εἰσί, (9) ἐν ᾧ τὸ ψῆγμα σκευάζεται Κλειόπολις, Ἀλυκόπριος Ἀφροδίτη, (10) Ἀπόλενος καὶ Ἐλεφάντινα.

Ἔστι δὲ ὁ μεταλλικὸς λίθος μαρμαροειδῆς, σκληρὸς, καὶ οἱ ἄνθρωποι ἐκεῖσε μεγάλῳ μόχθῳ ὀρύσσαντες σκευάζουσιν ἕνδον ἐσμικθὸς λύχνους κατέχοντες, τὴν φλέβα κατέχουσιν εὕρισκόμενοι. αἱ δὲ γυναῖκες αὐτῶν τρίβουσιν, καὶ ἀλήθουσι. (15) Ὅταν δὲ σποδὸν ποιήσαντες τὸ ὕδωρ χυμαῖον ἐμβάλλουσιν ὑποκάτω σανίδας, καὶ κοίλας ἀντιστασίμους ἔχοντες· καὶ τὸ μὲν ἀχυρῶδες καὶ κοῦφον καὶ ἄχρηστον περὶ τοῦ ὕδατος ἔγεται· τὸ δὲ χρήσιμον εἰς τόπους τῶν σανίδων διὰ τὸ βάρος ὑπολέληπται. Καὶ τότε τῇ ἐνήσει περιδῶσι τὸ συναχθὲν εἰς ἄγγος κεράμου (20) ἐμβαλόντες καὶ μίξαντες τὸ κατὰ λόγον, τότε περιχρίουσιν τὸ ἄγγος, ἐνοῦσιν ἐν καμίνῳ ἡμερόνυκτα πέντε, ἔχον τὸ ἄγγος πόρονδιὰ τὴν ἔξοδον.

Il faut connaître en quel lieu de la terre de Thébaïde se prépare la paillette métallique: Cléopolis (Héracléopolis), Alycoprios (Lycopolis); Aphrodite; Apolenos (Apollinopolis); Eléphantine.

La pierre métallique ressemble au marbre; elle est dure, et les hommes qui, dans les lieux précités en font l'extraction avec beaucoup de peine, la préparent à l'intérieur (de la terre); ils portent des lampes..., et lorsqu'ils trouvent un filon, ils l'occupent. Leurs femmes broient (la pierre) et en font mouture.

Lorsque, après avoir réduit le minerai en poudre, ils l'ont étalé sur des tables garnies de rainures contrariées et disposées en pente douce, ils y font couler de l'eau; la partie pulvérisée, légère et inutile, est entraînée par l'eau, tandis que la partie utile, retenue par son poids, est recueillie dans les rainures des planchettes. Alors, pour la cuisson, ils resserrent le dépôt, le placent dans un vase de terre cuite et, faisant un mélange selon la formule¹¹, ils lutent le vase et le font chauffer sur un fourneau, pendant cinq jours et cinq nuits; le vase a une issue pour l'extraction (des produits).

¹¹ Chez Photios et Diodore sont indiquées des recettes de cémentation et coupellation. Pour la définition de ces opérations, cf. R. Halleux, «Méthode d'essai et d'affinage des alliages aurifères dans l'Antiquité et au Moyen-âge», dans N. Morisson et alii (éd.), *L'or monnayé I*, Cahiers Ernest Babelon, Paris, CNRS, 1985, p. 39-77: la cémentation consiste «à chauffer un métal ou un alliage en présence d'une préparation qui modifie ses propriétés plus ou moins profondément à partir de la surface» (p. 45); la

L'opération décrite consiste à « laver » le minerai réduit en poudre en faisant couler de l'eau qui entraîne la partie légère et inutile. Le minerai utile qui reste est placé ensuite dans un vase de terre cuite, qui est luté et chauffé¹². Les descriptions précises d'Agatharchide, dont cet abrégé est un échantillon, sur les quatre opérations techniques fondamentales de transformation du minerai: le concassage, le broyage, le lavage (ou lévigation) et l'affinage¹³ permettent de confirmer que le passage d'Olympiodore se réfère à des procédures bien réelles, mises en place depuis longtemps et qui devaient constituer la base technique fondamentale par rapport à laquelle la réflexion théorique des alchimistes s'est développée aussi bien dans la théorisation des principes méthodologiques que dans les allégories de la transmutation.

Les mines ptolémaïques

Venons-en maintenant à un témoignage très récent et très concret sur la procédure d'extraction et de lavage du minerai d'or, qui constitue pour nous une autre pièce d'importance capitale pour la reconstruction du *puzzle* des opérations des alchimistes grecs. Il s'agit des résultats de fouilles conduites en 2013 en Égypte dans les sites miniers aurifères de l'époque ptolémaïque (fin du IV^e s.-milieu du III^e s. av. J.-C.) de Samut par la mission française du désert Oriental. Dans le compte-rendu nous lisons:

« Désireuse de se pencher sur l'âge d'or de l'exploitation des mines du désert Oriental, la mission française du désert Oriental a débuté ses travaux par l'exploration de la région de Samut, dont les vestiges semblent dater, pour les plus imposants, du début de l'époque ptolémaïque (fin du IV^e s.-milieu du III^e s. av. J.-C.) [...] La région de Samut, dont le nom égyptien ancien signifie «la tour», a de plus l'avantage de comporter des

coupellation «est une technique de séparation des métaux par oxydation qui possède son origine et sa principale application en métallurgie du plomb argentifère» (p. 49).

¹² De fait, le mot « macération » est bien choisi pour traduire *taricheia* parce qu'il signifie à la fois « laver » (séparer par le liquide) et « conserver ». Cf. «La macération est un procédé qui consiste à laisser séjourner un solide dans un liquide froid pour en extraire les composés solubles, *Dictionnaire de la langue française : lexis*, Paris, Larousse, 1989 (1^{re} éd. 1979) (ISBN 2-03-320211-9), p. 2.

¹³ Cf. aussi : «Lévigation = séparation, par entraînement dans un courant d'eau, des constituants d'un mélange préalablement réduit en poudre»; «affinage = purification d'un métal par élimination des impuretés, par cémentation ou coupellation» (Ibid.).

vestiges nombreux, complexes et bien conservés, organisés en un véritable district minier. Il s'organise autour de deux implantations, l'une, au sud, appelée Bi'r Samut (24°48' N, 33°55' E), l'autre au nord, qui n'a pas de nom sur les cartes topographiques modernes, et que nous appellerons désormais Samut nord (24°51' N, 33°55' E). Les deux sites sont distants de 4,3 km à vol d'oiseau ; le site sud, localisé dans un vaste ouadi, comporte un fortin qui abrite un puits (d'où son appellation de Bi'r, « le puits ») ; le site nord, dans les montagnes, est organisé autour d'un filon aurifère¹⁴.

Or, les premiers résultats de la fouille du site de Samut nord ont produit des informations d'importance fondamentale car elles permettent de reconstruire certaines des étapes de la chaîne de l'extraction du minerai et de son traitement jusqu'à la transformation en or. La grande clarté des vestiges en surface ont révélé des installations témoignant des différentes phases du travail: d'abord la phase mécanique du tri, concassage des blocs de quartz aurifère



Figure 1 : Une zone de concassage du minerai en contrebas de la cabane 404 du site de Samut nord (cliché J.-P. Brun, MAFDO)

¹⁴ Cf. Jean-Pierre Brun, Jean-Paul Deroin, Thomas Faucher, Bérandère Redon, Florian Téreygeol, «Les mines d'or ptolémaïques. Résultats des prospections dans le district minier de Samut (désert Oriental)», Bulletin de l'Institut Français d'Archéologie Orientale (BIFAO), 2013, p. 111-142, ici p. 112, et Th. Faucher et B. Redon, «Goldmining in Early Ptolemaic Egypt», Egyptian Archaeology 46 (2015), p. 17-19.

puis la phase de transformation du minerai en farine (poudre de minerai) qui se pratiquait notamment grâce à deux grands moulins



Figure 2 : Le moulin d'époque ptolémaïque à Compasi (Daghabag IV)(cliché J.-P. Brun)



Figure 3 : Vue des deux moulins de Samut nord (cliché A. Bülow-Jacobsen, 2014, MAFDO)

En revanche, contrairement aux premières hypothèses de l'équipe, les deux dernières étapes décrites par Agatharchide (le lavage et la fonte) n'ont pas été localisées sur le site de Samut nord, soit qu'elles aient été effectuées dans la Vallée, soit, mais c'est moins probable, qu'elles n'aient pas été repérées par les archéologues¹⁵.

Nature et *technê*

Dans le compte-rendu des fouilles nous lisons: «Il existe deux types de gisements aurifères dans le désert Oriental. Le premier est un gisement de type filonien qui se caractérise par l'apparition en surface, souvent sur les crêtes des collines, de longs filons de quartz aurifère. Le second, le gisement alluvionnaire, est une conséquence du premier, puisqu'à une époque géologique, l'érosion du minerai de quartz a éparpillé ce dernier dans des placers¹⁶, au bas des collines, qui se retrouvent maintenant dans les ouadis. L'or se trouve alors sous forme de paillettes ou encore dans une gangue de quartz». (Brun, 2013, p. 114, n. 17)

Il est évident que cette technique d'extraction de l'or naît de l'observation de la nature: le broyage du minéral de quartz aurifère et son lavage reproduit la situation naturelle des sables aurifères dans les fleuves.

Ce fait illustre bien la conception des rapports entre *technê* et nature qui émerge dans les textes alchimiques grecs. Conception qui est conforme à la vision aristotélicienne, selon laquelle le *technitês*, tel le médecin, ne remplace pas la nature, mais crée les conditions pour que la nature agisse, pour que les processus naturels puissent se produire.

En effet, dans *Metaph. Z*, 7, 1032b 1 suiv., où Aristote analyse les productions (*poieseis*) de l'art, dont la forme est présente dans la pensée du praticien, il donne l'exemple de la médecine. Il décrit le raisonnement du médecin qui cherche à produire la guérison en reliant le cas particulier à la forme de la santé qui est présente dans son esprit en tant que science: puisque la santé consiste en cela, si l'on veut obtenir la guérison, il faut que cette chose se réalise, par exemple, un certain équilibre des fonctions du corps, ultérieurement, si l'on veut obtenir cet équilibre, il faut une certaine chaleur.

¹⁵ Cf. Th. Faucher et B. Redon, «The “heavy mineral processing plants” of Samut North are mills!», *Egyptian Archaeology* 48, Printemps 2016, à paraître.

¹⁶ Par placer on désigne un gisement secondaire de roches sédimentaires, le plus souvent d'origine alluvionnaire, produisant des métaux et des minéraux lourds, notamment de l'or et des pierres précieuses.

Dans le commentaire même d'Olympiodore, on retrouve cette idée répétée à plusieurs endroits, partagée avec Zosime. La méthode correcte consiste à procéder selon nature, et non en lui faisant violence ou opposition, car en fin de comptes c'est la nature qui agit.

Par exemple, en, 75, 15, à propos du «lavage», nous lisons:

Le lavage, disent-ils, est le lavage coagulant les substances fugaces qui s'écoulent ensemble grâce à des paroles de bonne augure *et à la nature seule*, ou c'est la corporification des esprits non-corporels, c'est-à-dire de leurs âmes, *choses accomplies par la seule nature* et non par la main de l'homme, comme certains <le croient> (αὐτῶν διὰ μόνης τῆς φύσεως τελούμενα καὶ οὐ διὰ χειρῶν ὡς τινες νομίζουσιν)

Mais particulièrement significatif est un autre passage au sujet de l' «économie» de la chrysocholla:

73, 20: Tu pourrais apprendre, ô ami des Muses, ce que veut dire le mot de «économie». Ne va pas croire, comme le font certains, qu'il désigne *une action manuelle* (74), mais (comprends) que c'est celle qui se fait par la nature, car c'est une action qui dépasse l'homme (τὴν διὰ χειρῶν ἐνέργειαν μόνον ἀρκοῦσαν εἶναι, ἀλλὰ καὶ τὴν διὰ τῆς φύσεως γινομένην, ὑπὲρ ἄνθρωπον οὔσαν). Si tu as pris de l'or, tu dois le travailler, et si tu le travailles avec attention, tu auras l'or. Et ne va pas croire, dit-il (Zosime), qu'une teinture soit faite à partir d'autres règles (ἀπὸ ἄλλων τινῶν ἐννοιῶν) et d'autres ingrédients végétaux (plantes), mais consacre ton temps à l'usage même de *la nature* (ἀλλὰ αὐτῇ τῇ φυσικῇ χρήσει), et tu auras l'objet cherché.

La méthode à suivre décrite ici de même que dans plusieurs passages du corpus alchimiques, est celle qui laisse agir la nature, car l'homme ne peut pas se mettre à sa place. Cette méthode demande, par conséquent, une connaissance approfondie des propriétés spécifiques des corps, de manière à les faire réagir naturellement.

On remarquera que la liste des couples contraires des propriétés passives de *Meteor.* IV, 8-9 d'Aristote, qui permettent de classer tous les corps homéomères, organiques et non organiques, sont toutes des propriétés révélées par la *technê*. Et on peut constater aussi qu'il s'agit, dans la presque totalité, de termes liés au travail minéralier ou

métallurgique: solidifiable, fusible, flexible, friable, modelable, broyable, combustible etc.

La *technê* permet donc de connaître les propriétés naturelles des corps dont elle s'occupe. En effet, comme le dit très bien R. Halleux¹⁷, les anciennes techniques d'affinage constituent l'origine de la chimie analytique.

Il est par ailleurs intéressant que parmi les buts de la Mission du désert Oriental, sont mentionnées : (a) la connaissance des techniques d'extraction, de traitement et de fonte du minerai et (b) la caractérisation chimique de la composition de l'or égyptien¹⁸.

La reconstruction du *puzzle*

En mettant ensemble les pièces du *puzzle*, on peut avancer une hypothèse de reconstruction de ce que nous dit Olympiodore dans son commentaire. Il me semble que le résultat le plus important de cette enquête porte sur le fait qu'Olympiodore, ou Zosime, se réfèrent à des opérations bien concrètes et réelles.

Le cas de la *taricheia* illustre très bien la fécondité et l'exigence de l'application d'une méthode multidisciplinaire aux textes alchimiques grecs.

En effet, d'une part, l'appel à d'autres disciplines et témoignages, littéraires, archéologiques ou encore à la chimie, nous permet d'interpréter les textes alchimiques. De l'autre, les textes alchimiques jettent de la lumière sur les enquêtes historiques et archéologiques.

Un autre cas emblématique est la recette pour la fabrication du «bronze noir» que l'on trouve dans des fragments de Zosime en syriaque (manuscrit de Cambridge Mm.6.29)¹⁹.

Il s'agit de la seule recette antique que l'on possède sur ce célèbre et mystérieux bronze noir de Corinthe, très prisé par les Romains et dont parle Pline l'ancien (*Hist. Nat.* XXXIV 8) et qui constitue un véritable casse tête pour les archéologues et les chimistes. En effet, ils s'interrogent depuis longtemps sur le lien entre les allusions des

¹⁷ R. Halleux, «Méthode d'essai», art. cit., p. 39,

¹⁸ Cf. <http://desorient.hypotheses.org/>

¹⁹ Sur les bronzes noirs voir A. Giumlia-Mair, «Zosimos the Alchemist - Manuscript 6.29, Cambridge, Metallurgical interpretation» et E.C.D. Hunter, «Beautiful black bronzes : Zosimo's treatises in Cam. Mm. 6.29» dans A. Giumlia-Mair (éd.), *I bronzi antichi: produzione e tecnologia* (Atti del XV Congresso internazionale sui bronzi antichi, Grado-Aquileia 2001), Montagnac, Ed. Monique Mergoil ('Monographies Instrumentum', 21) 2002, p. 317-23 et p. 665-50, ainsi que les contributions de M. Martelli et de M. Mertens dans Viano et Martelli (à paraître).

auteurs classiques et certains objets conservés dans les musées qui présentent justement une étonnante patine noire. Des analyses menées en laboratoire ont permis de reconstituer l'histoire de cette technique qui consistait à enrichir un alliage cuivreux d'une petite quantité d'or et/ou d'argent, ce qui permettait ensuite, grâce à un traitement de surface par réaction chimique, d'obtenir la formation d'une patine artificielle noire particulièrement brillante et apte à faire ressortir la beauté des décorations. Or les recettes de Zosime syriaque sont très techniques et n'ont rien de mystique et les chercheurs cherchent à reproduire en laboratoire. Evidemment l'opération n'est pas facile, à cause de l'identification des ingrédients, mais celle-ci est une autre histoire.



Figure 4 : Encrier de Vaison la Romaine, troisième quart du Ier siècle (cliché C2RMF Dominique Bagault). Cf. S. Descamps, avec la participation de M. Aucouturier, "L'encrier de Vaison la Romaine et la patine volontaire des bronzes antiques," *Monuments Piot*, 24, 2005, 5-30

Stéphanos d’Alexandrie:

La tradition patristique dans son œuvre alchimique

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Résumé

La plupart des Discours de l’œuvre alchimique de Stéphanos d’Alexandrie commencent et finissent par des prières. Stéphanos s’y réfère surtout à Logos, qui est la lumière, et à la sagesse de Dieu. Selon notre recherche, les sources de Stéphanos sont l’Évangile de saint Jean, les épîtres des Apôtres, le Credo, et les œuvres des Pères de l’Église (ex: Clément d’Alexandrie, Basile de Césarée, Grégoire de Nazianze, Grégoire de Nysse, Jean Chrysostome). On constate que ces prières ne contiennent pas de trace de doctrines hérétiques, soit des monophysites d’Alexandrie soit de Serge, patriarche de Constantinople (610-638). Stéphanos rédigea son œuvre alchimique en 617 à Constantinople. Entre 616 et 618 le patriarche Serge proposa son “monoenergisme” et cherchait des textes en son appui; il continua ses efforts en 622/623 et aux années suivantes. Il paraît que Stéphanos, qui mourut peu de temps après 621, une fois converti du monophysisme en l’Orthodoxie par Eulogios, patriarche d’Alexandrie, il n’a pas suivi l’hérésie de Serge. Il est donc bien probable que la personnalité de Stéphanos est tombée dans l’oubli après sa mort, pendant le patriarcat de Serge et après lui, à cause de son insistance sur la foi orthodoxe.

Introduction

Stéphanos d’Alexandrie est un érudit byzantin actif à la fin du VIe et au début du VIIe siècle. Il est surtout connu comme commentateur de Platon et d’Aristote mais il a aussi commenté sur les *Tables manuelles de Théon* d’Alexandrie, qui n’étaient que celles de Ptolémée commentées par Théon. Sous son nom, on possède aussi un *Traité apotélesmatique adressé à son élève Timothéos*, concernant l’horoscope de l’Islam, et ses discours *Sur l’art divin et sacré, sur la Chrysopée*, c’est-à-dire “Sur la fabrication de l’or.” (Ideler 1842:199-253; Papathanassiou 1990, 1992, 1996, 1997, 2005, 2006, 2008) Il faut aussi inclure dans ses œuvres des commentaires sur Hippocrate, puisque

les recherches les plus récentes renforcent l'hypothèse que Stéphane d'Alexandrie, Stéphane d'Athènes et Stéphane le philosophe, tous actifs à Alexandrie pendant la même période, ne sont qu'une et même personne (Papathanassiou 1992, 2006:201-203; Wolska-Conus 1989, 1992, 1997).

Selon la tradition, Stéphane d'Alexandrie fut invité par l'empereur Héraclius (610-641) à Constantinople pour enseigner le quadrivium (c'est-à-dire, l'arithmétique, la géométrie, l'astronomie et l'harmonique). C'est pendant les premières années du règne de Héraclius, plus précisément pendant les années 617-619, que Stéphane écrivit son *Commentaire sur les Tables manuelles de Théon*, comme on peut conclure des dates pour lesquelles il a calculé les positions des planètes (Neugebauer 1975:1040). D'après mes dernières recherches, c'est aussi en 617 que Stéphane rédigea ses discours sur la Chrysopée (Papathanassiou 1996; 2006). Selon la tradition manuscrite et son édition par Ideler,¹ cette œuvre se compose d'une série de neuf discours écrits en style rhétorique où Stéphane commente sur quelques passages empruntés aux œuvres alchimiques antérieures. Mais comme nous avons démontré (Papathanassiou 1996), cette opinion est erronée et la partie finale du dernier discours de Stéphane est définitivement perdue, et que deux discours originaux ont été plus loin divisés chacun en deux autres discours. Notre nouvelle division de l'œuvre de Stéphane en discours, qui est peut-être plus proche à l'originale inconnue qui précède le Codex Marcianus et les autres MSS sauvés, est la suivante:²

<i>Nouvelle division</i>	<i>MSS et Ideler</i>
Discours 1	Praxis I et Praxis II
Lettre à Théodore	Lettre à Théodore et Praxis III
Discours 2	Praxis IV
Discours 3	Praxis V
Discours 4	Praxis VI

¹ Stephani Alexandrini, "De magna et sacra arte" (Στεφάνου Ἀλεξανδρέως οἰκουμηνικοῦ φιλοσόφου καὶ διδασκάλου τῆς μεγάλης καὶ ἱερᾶς τέχνης. Περὶ χρυσοποιίας), dans Ideler, J. L. [1841-42] 1963, *Physici et medici graeci minores*, I-II, Leipzig: Teubner [réimpr. Amsterdam], II:199-253. Le texte de Stéphane finit à la p. 213,6; une faute de reliure du MS Marc. gr. 299 avait comme résultat la perte de la partie finale de l'œuvre. Saffrey, H. D. 1995, "Historique et description du manuscrit alchimique de Venise Marcianus Graecus 299", dans Kahn, D., et Matton, S. (eds.), *Alchimie: art, histoire et mythes*, Paris and Milan.

² Dans notre exposé nous nous référons tant aux page(s) et line(s) de l'édition d'Ideler, autant qu'au numéro du Discours et son paragraphe de notre division. E.g. Id(eler). page,line(s); D(iscours) x.(§)y ou (§§)y-z.

Discours 5	Praxis VII
Discours 6	Praxis VIII
Discours 7	Praxis IX

Les Prières au début et à la fin des Discours ne prouvent pas seulement la piété de Stéphane; elles reflètent aussi ses idées concernant la personnalité et les qualités d'un philosophe pratique qui veut découvrir les secrets du monde matériel. Selon lui, "*la philosophie n'est qu'une ressemblance à Dieu autant qu'il est possible à l'homme.*"³ C'est ainsi que le philosophe, en tant qu'amoureux de la sagesse, tâche continuellement de ressembler à Dieu. Dans un tel contexte on doit examiner le contenu de ses Prières.

Notre exposé comprend trois parties: a) Une présentation générale du contenu des prières et leurs sources patristiques suivie des remarques concernant la foi orthodoxe de Stéphane. b) La traduction en français des prières avec des références aux œuvres des Pères de l'Église.⁴ c) Le texte grec des prières avec les mêmes références aux œuvres patristiques accompagnées de leurs passages relatifs.

Le contenu des Prières

Pendant les longues années de ma recherche sur la "*Chrysopée*" de Stéphane j'avais mis au second rang l'étude des "*Prières*" qui se trouvent en général au début et à la fin de ses Discours. Il est évident que mon objectif était l'étude et l'appréciation des principes philosophiques et des pratiques de la chrysopée, tels qu'ils se présentent dans son œuvre. D'ailleurs, j'avais pourtant en tête de m'en occuper dans la perspective de l'édition critique de l'œuvre. Aujourd'hui, je suis sûre que les "*Prières*" constituent un argument précieux pour l'éclaircissement de la personnalité de Stéphane ainsi que pour la compréhension de son œuvre.

Selon W. Wolska-Conus, Stéphane d'Alexandrie (ou d'Athènes ou philosophe) était un chrétien orthodoxe d'Athènes, qui s'est rendu à Alexandrie pour étudier les sciences. À cause de ses études faites dans le milieu monophysite de Jean Philoponos et de Damianos, patriarche monophysite d'Alexandrie, lui aussi il s'est converti au

³ Id. 224,27-28; L 4.5: Τί γάρ ἐστι φιλοσοφία, ἀλλ' ἢ ὁμοίωσις Θεῷ κατὰ τὸ δυνατόν ἀνθρώπων;

⁴ Il y a très longtemps que le Père H. Saffrey a eu la bonté de me confier ses improvisations écrites sur les Discours de Stéphane pour en faire usage selon mon avis. Parmi ses notes j'ai trouvé la traduction de quelques prières et j'en cite ici celles que je considère qu'elles sont en forme définitive. Elles sont signalées par un astérisque précédant le numéro du passage de la prière.

monophysisme. Plus tard, s'appuyant sur une méditation tout à fait théorique, il découvrit les contradictions de la Christologie monophysite. Il se mit donc à se faire des syllogismes qui détruisaient petit à petit les croyances auxquelles, lui-même, s'était autrefois converti. Désapprouvé par le patriarche Damianos, Stéphane fut exclu de l'Église monophysite. Alors, reconsidérant ses nouvelles thèses, il aboutit à des conclusions définitives et il rejoint les Chalcédoniens; il trouve refuge auprès d'Euloge, patriarche orthodoxe d'Alexandrie, et il retourne aux seins de l'Orthodoxie. Enfin, quand il fut invité par l'empereur Héraclius à Constantinople, il s'est converti de nouveau au monothélisme par le patriarche Serge. Selon W. Wolska-Conus, ces conversions, notamment la dernière, sont selon toute probabilité, la raison pour laquelle le nom de Stéphane est tombé à l'oubli. En outre, elle prétend que nous sommes dans l'ignorance par rapport aux conceptions de Stéphane concernant la religion. W. Wolska-Conus soutient que cette ignorance est due au manque d'information et des textes théologiques de cet écrivain. (Wolska-Conus 1989, 66-68) Mais ces textes existent jusqu' à nos jours; ils ne sont pas autres que les "*Prières*," qui n'ont été l'objet d'aucune étude jusqu'à nos jours.

Pour comprendre le sens profond des "*Prières*" qui nous aideront à mieux connaître la personnalité de Stéphane, nous devons essayer de faire revivre l'atmosphère de son époque et celle de la composition de son œuvre.

Après avoir fait une étude approfondie sur un phénomène astronomique décrit dans un Discours, j'abouti à la conclusion que Stéphane l'a écrit entre le 26 mai et le 3 juin de l'an 617 (Papathanassiou 1996, 258-264; 2006, 180-188). Par conséquent, l'an 617 est la date de la composition de ses Discours sur la Chrysopée. À cette époque-là il écrivait parallèlement son "*Commentaire sur les tables faciles de Ptolémée*," où il donnait des exemples des calculs astronomiques pour les années 617-619.

De plus, son "*Traité apotélésmatique adressé à Timothéos*," c'est à dire l'Horoscope de l'Islam, calculé pour le 1er Septembre de 621, et le témoignage d'Ananias de Sirak, qui, lorsqu'il se rendit à Constantinople pour ses études, le fameux maître des sciences du quadrivium n'y existait plus, il en résulte que Stéphane mourut peu après la composition de l'horoscope de l'Islam (Papathanassiou 1997, 117).

Depuis l'an 610 sur le trône de Constantinople était l'empereur Héraclius (610-641) tandis que Serge Ier (610-638) était le patriarche œcuménique. Serge faisait tous ses efforts pour restaurer l'unité religieuse de l'empire byzantin, unité brisée par le

schisme entre les chrétiens orthodoxes qui suivaient la confession de la foi du concile de Chalcédoine de 451 et les monophysites qui appartenaient surtout à l'Église jacobite de Syrie et l'Église copte. Le but de ces efforts, encouragés par Héraclius, était le renforcement de l'empire en vue des expéditions de l'empereur contre les Perses et ensuite contre les Arabes. Pour atteindre son but, entre 616 et 618 Serge s'adressa à un moine copte d'Alexandrie (George Arvas) en lui écrivant une lettre où il a exposé sa proposition pour le "monoenergisme."⁵ En plus, Serge demandait au moine de lui procurer des textes en appui de sa théorie du monoenergisme. Cela entraîna les protestations de Jean V le Miséricordieux (610-621), patriarche orthodoxe d'Alexandrie.

Par conséquent, la première question qui se pose est la suivante: Est-ce que les "Prières" des Discours de Stéphane contiennent des éléments hérétiques soit du monophysisme soit du monoenergisme, nouvellement introduit par Serge? La réponse est Non!

Je vais me référer brièvement au contenu de ces "Prières" en utilisant quelques exemples caractéristiques.

Au début de son œuvre, Stéphane chante Dieu et le supplie de l'illuminer par la lumière de son omniscience, à fin qu'il puisse arriver à sélectionner les meilleurs éléments du Traité qu'il avait en mains et le rendre digne de révéler la vérité.

Il s'adresse à Dieu triadique en nommant les trois personnes de la Sainte Trinité; par son mot introductif Stéphane fait allusion au Père: "*Après avoir chanté un hymne en l'honneur de l'Auteur de tous les biens, du Roi de l'univers et de son Fils unique, qui a procédé (rayonné) de Lui avant tous les siècles, avec le Saint Esprit.*"⁶ Il faut noter

⁵ La doctrine du monothélisme, une des deux variations du monophysisme, admettait les deux natures de Jésus-Christ, mais ne lui reconnaissait qu'une seule volonté. La volonté humaine est engloutie par la volonté divine. La doctrine du monoenergisme, l'autre variation du monophysisme, qui présuppose celle du monothélisme, admettait que Jésus-Christ est une personne à deux natures, mais que l'opération des deux natures est unique, c'est-à-dire que l'énergie qui manifeste les deux natures est unique. Par conséquent, il n'y a pas de distinction entre la nature humaine et la nature divine; il s'agit d'une confusion des deux natures, où celle de l'humanité reste passive devant l'action de la divinité. L'Église orthodoxe conçoit Jésus-Christ comme une personne à deux natures parfaites, et lui reconnaît deux opérations distinctes, même s'il y a un seul but à ces deux opérations, un seul acte, un seul résultat. Chaque nature coopère à l'acte unique, selon sa propre manière. <http://christologieecclesiology.blogspot.gr/2014/03/monoenergisme-et-monothelisme.html>

⁶ Id. 199,6-8 (D 1.1) Θεὸν τὸν πάντων ἀγαθῶν αἴτιον καὶ βασιλέα τῶν ὅλων, καὶ τὸν ἐξ αὐτοῦ πρὸ τῶν αἰώνων ἐκλάμψαντα μονογενῆ υἱὸν σὺν τῷ Ἁγίῳ Πνεύματι.

ici que sa référence à la seconde personne de la Sainte Trinité n'est pas loin de celle du *Symbole de la foi*: “le Fils unique de Dieu, né du Père avant tous les siècles.”⁷ Stéphane utilise le verbe “rayonner” (ἐκλάμπω) à l'imitation des Pères de l'Église. Par exemple Clément d'Alexandrie fait souvent allusion à “la lumière qui vient d'en haut” (ἄνωθεν φωτοδοσία) et qui émane du Père. Stéphane se réfère surtout au “Fils-lumière” ou à la “lumière paternelle” (πατρικὸν φῶς) ou “rayonnement” (ἀπαύγασμα); par exemple, il écrit: “qui habite une lumière inaccessible, lumière qui éclaire tout homme venant dans le monde.”⁸ Ici il combine quelques mots d'un passage de la première *Épître* de Paul adressée à *Timothé* (Tm 6,16: le seul qui possède l'immortalité, qui habite une lumière inaccessible)⁹ avec un passage du premier chapitre de l'évangile selon Jean (Jn 1,9: Le Verbe était la lumière véritable, qui éclaire tout homme venant dans le monde.)¹⁰ Ces passages ont été l'objet des commentaires extensifs écrits par les grands Pères de l'Église (Dionysios d'Areopage, Athénagore, Origène, Clément d'Alexandrie, St Basile, Grégoire de Nysse, Grégoire de Nazianze, St Jean Chrysostome et d'autres.

Stéphane écrit aussi que Jésus est “le Verbe divin de Dieu, ... le Verbe vivant du Père; le Verbe était Dieu et le Verbe était toujours avec Dieu; tout fut par lui,”¹¹ renvoyant ainsi au début de l'évangile selon Jean (Jn 1,1-4: Au commencement le Verbe était et le Verbe était avec Dieu et le Verbe était Dieu. Il était au commencement avec Dieu. Tout fut par lui et sans lui rien ne fut. De tout être il était la vie.)¹² Il s'agit d'ailleurs, d'un passage commenté plusieurs fois par les Pères de l'Église.

Dans une autre prière à la fin d'un Discours, Stéphane se réfère au “Seigneur de Tout ... né du Père avant tous les siècles, Créateur de toute création, lumière vraie, née de la lumière, Dieu né de Dieu et étant toujours avec Dieu, et aux derniers jours le même engendré pour notre salut de Marie, la glorieuse Mère de Dieu et toujours vierge,

⁷ *Symbole de la foi*: τὸν Υἱὸν τοῦ Θεοῦ τὸν μονογενῆ, τὸν ἐκ τοῦ Πατρὸς γεννηθέντα πρὸ πάντων τῶν αἰώνων.

⁸ Id. 202,4-5 (D 1.10) φῶς οἰκῶν ἀπρόσιτον· φῶς, ὃ φωτίζει πάντα ἄνθρωπον ἐρχόμενον εἰς τὸν κόσμον.

⁹ Tm 6,16: ὁ μόνος ἔχων ἀθανασίαν, φῶς οἰκῶν ἀπρόσιτον.

¹⁰ Jn 1,9: Ἦν τὸ φῶς τὸ ἀληθινόν, ὃ φωτίζει πάντα ἄνθρωπον, ἐρχόμενον εἰς τὸν κόσμον.

¹¹ Id. 213,14-17 (D 2.1) ὁ θεαρχικὸς τοῦ Θεοῦ Λόγος, ... ὁ ζῶν Λόγος τοῦ Πατρὸς, θεὸς ὢν καὶ πρὸς τὸν Θεὸν αἰεὶ ὢν, ὁ δι' οὗ τὰ πάντα ἐγένετο.

¹² Jn 1,1-4: Ἐν ἀρχῇ ἦν ὁ λόγος, καὶ ὁ λόγος ἦν πρὸς τὸν θεόν, καὶ θεὸς ἦν ὁ λόγος. Οὗτος ἦν ἐν ἀρχῇ πρὸς τὸν θεόν. πάντα δι' αὐτοῦ ἐγένετο, καὶ χωρὶς αὐτοῦ ἐγένετο οὐδὲ ἓν ὃ γέγονεν. ἐν αὐτῷ ζωὴ ἦν.

notre Seigneur Jésus Christ.”¹³ Ici Stéphane répète des passages du *Symbole de la foi*: “Je crois en un seul Seigneur, Jésus-Christ, le Fils unique de Dieu, né du Père avant tous les siècles; Il est Dieu, né de Dieu, lumière, née de la lumière, vrai Dieu, né du vrai Dieu, Engendré [...] et par lui tout a été fait,”¹⁴ mais aussi un passage de la *Profession de foi* du quatrième concile œcuménique de Chalcédoine (5^e session, 22 Octobre 451): “et aux derniers jours le même (engendré) pour nous et notre salut de la Vierge Marie, Mère de Dieu selon l’humanité, Un seul et même Christ, Fils, Seigneur.”¹⁵

On doit remarquer ici qu’après le mot “engendré” (γεννηθέντα) dans son passage du *Symbole de la foi* Stéphane ne cite pas la suite de la phrase: “non pas créé, de même nature que le Père.”¹⁶

Les références de Stéphane à “la grande philanthropie de Dieu”¹⁷ et “la bonté sublime de Dieu”¹⁸ renvoient aussi aux œuvres des Pères de l’Église. Par exemple, la confession de Stéphane, “Tout don excellent, toute donation parfaite vient d’en haut et descend du Père des lumières,”¹⁹ est un passage de l’*Épître de St Jacques* (1,17). Ce passage n’a pas été commenté seulement par les Pères, mais on le prononce aussi à la Liturgie de St Jean Chrysostome.

D’autres allusions de Stéphane à “l’abîme” (ἄβυσσος) ou à “l’abîme de la sagesse du Créateur de tout”²⁰ et à ses “indicibles” (ἀνεκφραστα) ou “insondables” (ἀνεξερεύνητα) mystères renvoient aux passages de l’*Épître* de Paul aux Romains (11:33): “Ô abîme de la richesse, de la sagesse et de la science de Dieu! Que ses décrets sont insondables et ses voies incompréhensibles!”²¹ et à sa première *Épître aux Corinthiens* (A, 2:8, “Ce dont nous parlons au contraire, c’est d’une sagesse de

¹³ Id. 237,16-22 (D 5.22) πάντων Δεσπότην ... τὸν πρὸ αἰώνων ἐκ Πατρὸς γεννηθέντα, τὸν Δημιουργὸν πάσης κτίσεως, τὸ ἐκ τοῦ φωτὸς ἀληθινὸν φῶς, τὸν ἐκ Θεοῦ Θεὸν καὶ πρὸς τὸν Θεὸν αἰεὶ ὄντα, ἐπ’ ἐσχάτων δὲ τῶν ἡμερῶν διὰ τῆς ἐνδόξου Θεοτόκου καὶ ἀειπαρθένου Μαρίας ἐνανθρωπήσαντα διὰ τὴν ἡμετέραν σωτηρίαν, τὸν Κύριον ἡμῶν Ἰησοῦν Χριστόν.

¹⁴ *Symbole de la foi*: Καὶ εἰς ἓνα Κύριον Ἰησοῦν Χριστόν, τὸν Υἱὸν τοῦ Θεοῦ τὸν Μονογενῆ, τὸν ἐκ τοῦ Πατρὸς γεννηθέντα πρὸ πάντων τῶν αἰώνων· Φῶς ἐκ φωτός, Θεὸν ἀληθινόν, ἐκ Θεοῦ ἀληθινοῦ γεννηθέντα ... δι’ οὗ τὰ πάντα ἐγένετο.

¹⁵ *Profession de foi*: ἐπ’ ἐσχάτων δὲ τῶν ἡμερῶν τὸν αὐτὸν δι’ ἡμᾶς καὶ διὰ τὴν ἡμετέραν σωτηρίαν ἐκ Μαρίας τῆς παρθένου κατὰ τὴν ἀνθρωπότητα, ἓνα καὶ τὸν αὐτὸν Χριστόν, υἱόν, Κύριον.

¹⁶ *Symbole de la foi*: οὐ ποιηθέντα, ὁμοούσιον τῷ Πατρὶ.

¹⁷ Id. 202,15-16 (D 1.11) τὴν εἰς ἡμᾶς μεγάλην φιλανθρωπίαν τοῦ Θεοῦ.

¹⁸ Id. 202,19 (D 1.11); 219,22-23 (D 3.1); 244,6-7 (D 7.3) τὴν ὑπεράγαθον τοῦ Θεοῦ ἀγαθότητα.

¹⁹ Id. 213,9-10 (D 2.1) Πᾶσα δόσις ἀγαθῆ καὶ πᾶν δώρημα τέλειον, ἄνωθέν ἐστι καταβαῖνον ἀπὸ τοῦ πατρὸς τῶν φώτων.

²⁰ Id. 219,20 (D 3.1) τὴν ὑπεράβυσσον σοφίαν τοῦ Δημιουργοῦ τῶν ὄλων.

²¹ *Épître aux Rom.* 11:33 Ὁ βάθος πλοῦτου καὶ σοφίας καὶ γνώσεως Θεοῦ· ὡς ἀνεξερεύνητα τὰ κρίματα αὐτοῦ καὶ ἀνεξιχνίαστοι αἱ ὁδοὶ αὐτοῦ.

Dieu, mystérieuse, demeurée cachée.”; 2:9: “*mais, comme il est écrit, [nous annonçons] ce que l’œil n’a pas vu, ce que l’oreille n’a pas entendu, ce qui n’est pas monté au cœur de l’homme, tout ce que Dieu a préparé pour ceux qui l’aiment.*”²²

Ces passages furent commentés par les Pères de l’Église.

Quant à la phrase, “*Que tes œuvres sont en grand nombre, ô Éternel! Tu les as toutes faites avec sagesse,*”²³ c’est un passage du *Psaume* 103.

Stéphanos souhaite “*que nous soyons rendus capables de faire jaillir des fleuves d’eau vive par la grâce de notre Seigneur Jésus Christ,*”²⁴ pour que ses auditeurs puissent comprendre ses discours. Ceci renvoie aussi au passage de *l’évangile selon Jean* (Jn 7,38: *celui qui croit en moi; selon le mot de l’Écriture: De son sein couleront des fleuves d’eau vive.*)²⁵ Encore un passage commenté plusieurs fois par les Pères de l’Église.

On remarque, donc, que Stéphanos ne cite pas n’importe quels passages du *Nouveau Testament*, mais il en choisit ceux qui furent l’objet de commentaires extensifs par la plupart de Pères de l’Église qui précédèrent son époque; il en résulte que Stéphanos connaissait leurs œuvres principaux.

Le motif terminal des “*Prières,*” surtout à la fin de chaque Discours, est une phrase glorifiant les personnes de la Sainte Trinité, comme par exemple, “*Afin qu’eux aussi glorifient avec nous ton Nom digne de tout honneur et de toute gloire, Père, Fils et Saint-Esprit, maintenant et toujours et dans les siècles des siècles.*”²⁶ Il s’agit d’une phrase prononcée à la Liturgie de St Jean Chrysostome.

Dans un de ses Discours Stéphanos s’adresse à son auditoire en le traitant “*ouailles sacrées*” (ἱερὰ ποιῖμη). Avec ses paroles Stéphanos exhorte ces “*amoureux de la sagesse*” (σοφίας ἐρασταί), de lutter contre eux-mêmes et de se parer avec les parures des vertus, de s’arroser par le flux abondant des larmes s’appuyant sur “*la foi,*

²² *A Corinth.* 2:8 λαλοῦμεν θεοῦ σοφίαν ἐν μυστηρίῳ, τὴν ἀποκεκρυμμένην. 2:9 ἀλλὰ καθὼς γέγραπται· Ἄ ὀφθαλμὸς οὐκ οἶδεν καὶ οὐδὲ οὐκ ἤκουσεν καὶ ἐπὶ καρδίαν ἀνθρώπου οὐκ ἀνέβη, ὅσα ἠτοίμασεν ὁ Θεὸς τοῖς ἀγαπῶσιν αὐτόν.

²³ *Psaume* 103 §24: Ὡς ἐμεγαλύνθη τὰ ἔργα σου, Κύριε· πάντα ἐν σοφίᾳ ἐποίησας.

²⁴ *Id.* 202,12-14 (D 1.11) διὰ τῆς χάριτος τοῦ κυρίου ἡμῶν Ἰησοῦ Χριστοῦ ποταμοὺς ἀναβλῦσαι ὕδατος ζῶντος.

²⁵ *Jn* 7,38: ὁ πιστεύων εἰς ἐμέ, καθὼς εἶπεν ἡ γραφή, ποταμοὶ ἐκ τῆς κοιλίας αὐτοῦ ρεύσουσιν ὕδατος ζῶντος.

²⁶ *Chrys., Liturgie:* ὅπως δοξάζεται τὸ πάντιμον καὶ μεγαλοπρεπὲς ἅγιον ὄνομα τοῦ Πατρὸς καὶ τοῦ Υἱοῦ καὶ τοῦ Ἁγίου Πνεύματος, νῦν καὶ ἀεὶ καὶ εἰς τοὺς αἰῶνας τῶν αἰώνων. Ἀμήν.

l'humilité et l'amour de Dieu."²⁷ Tout cela indique un encouragement pour atteindre une perfection morale et s'est basé sur des passages relatifs des textes patristiques qui se réfèrent à ceux "*qui luttent dans la vie*" pour arriver à la perfection par l'acquisition de toutes les vertus, afin d'obtenir la sagesse parfaite. Les Pères considèrent comme de très grandes vertus l'humilité et les larmes, qui –comme ils disent– peuvent effacer de grands péchés.

Stéphanos s'adresse à ses auditeurs en les encourageant à contempler de leurs "*yeux intellectuels ... la lumière-là au dessus de chaque lumière*" et aussi à s'écarter de "*toutes les œuvres du monde;*" de plus, il les exhorte à rechercher "*la mort volontaire*" par mortification de tout leur corps.²⁸ Comment peut-on mortifier le corps? Comme St Grégoire de Nysse dit, "*la mort du corps est l'extinction des organes de sensation et la dissolution aux éléments affines.*"²⁹ C'est-à-dire, Stéphanos appelle ses auditeurs à mener leur vie sans s'intéresser aux stimulations de leur organes de sensation. C'est ainsi qu'ils pourront s'échapper au niveau matériel de la destruction et remonter jusqu'au niveau spirituel de l'incorruptibilité, c'est-à-dire de l'immortalité; et s'y intégrer. Parce que, selon les Pères, il n'y a pas d'autre moyen pour que notre corps devienne immortel que par sa communion avec l'immortel.

Dans un autre passage Stéphanos souhaite "*de s'unir et de s'approprier par la foi et l'amour à Dieu Verbe,*" pour "*que nous soyons remplis de la grâce divine et devenir ainsi la résidence de Dieu, que nous jouissions de la lumière douce de Dieu.*"³⁰ Dans son *Épître* St Barnabas dit que "*la résidence de notre cœur est une église sainte de Dieu*" et que "*dans notre résidence Dieu réside vraiment en nous.*"³¹

Ici Stéphanos recommande encore: "*et aimer le Seigneur notre Dieu de toute notre âme, de tout notre esprit et de tout notre cœur.*"³² Il s'agit d'un passage de l'évangile

²⁷ Id. 214,8-15 (D 2.4) ὃ ἱερὰ ποιμνὴ καὶ σοφίας ἐρασταί ... διὰ τῆς τῶν ἀρετῶν ἐπικοσμήσεως ἐν ἑαυτοῖς ἀγωνιζέσθωσαν, καὶ τῇ πολλῇ ῥοῇ τῶν δακρύων ἑαυτοὺς ἀρδευέτωσαν, ἐν πίστει καὶ ταπεινοφροσύνῃ καὶ ἀγάπῃ Θεοῦ.

²⁸ Id. 241,33f. (D 6.13) Ἄν νοεροῖς ὄμμασι τὰ ἀναρίθμητα καὶ ἀμήχανα τούτων κάλλη καὶ πρὸς τὸ φῶς ἐκεῖνο τὸ ὑπὲρ πᾶν φῶς ἀτενίσας καὶ θαυμάσας τὰ ἔργα τε πάντα τὰ ἐν κόσμῳ ἀποθέμενος καὶ τὸν προαιρετικὸν μελετήσας θάνατον, καὶ ὅλον τὸ ἑαυτοῦ σῶμα κατανεκρώσας, ἔτι δὲ καὶ τὴν ἑαυτοῦ ψυχὴν ἀρνησάμενος.

²⁹ Gr. Nyss., *Contra Eun.* 2, M 45.545B: σώματος ... ἐστὶ θάνατος ἢ τῶν αἰσθητηρίων σβέσις καὶ ἡ πρὸς τὰ συγγενῆ τῶν στοιχείων διάλυσις.

³⁰ Id. 242,10-11 (D 6.14) διὰ πίστεως καὶ ἀγάπης ἐνωθῆναι καὶ οικειωθῆναι τῷ Θεῷ Λόγῳ ... τῆς χάριτος ἐμπλησθῶμεν κατοικητήριον Θεοῦ γενόμενοι, τὸ ἡδὺ φῶς τοῦ Θεοῦ ἐναπολαύσωμεν.

³¹ Barn. 6.15 ναὸς ἅγιος ... τῷ κυρίῳ τὸ κατοικητήριον ἡμῶν τῆς καρδίας 16.8 ἐν τῷ κατοικητηρίῳ ἡμῶν ἀληθῶς ὁ θεὸς κατοικεῖ ἐν ἡμῖν.

³² Id. 242,12-13 (D 6.14) καὶ αὐτὸν τὸν Κύριον καὶ Θεὸν ἀγαπήσαι ἐξ ὅλης ψυχῆς καὶ ἐξ ὅλης τῆς διανοίας καὶ ἐξ ὅλης τῆς καρδίας.

*selon Matthieu qui renvoie à ceci du Deuteronome (Mt 22,37; Dt 6,5): “Jésus lui dit: Tu aimeras le Seigneur ton Dieu de tout ton cœur, de toute ton âme et de tout ton esprit.”*³³

On se demande donc à quel titre Stéphane adresse de tels conseils à son auditoire.

D’après le récit de Jean Moschos dans son *Pratum spirituale*, lui-même et son ami, le Seigneur Sophronios, plus tard devenu patriarche orthodoxe de Jérusalem, pendant leur premier séjour à Alexandrie, ils sont allés “chez le philosophe Stéphane, qui habitait à l’église de la Sainte Mère de Dieu, édifiée par le bienheureux Pape Euloge, surnommée de Dorothee.”³⁴ On peut donc se demander, à quel titre Stéphane habitait dans un édifice appartenant à une église. Il est bien probable, qu’à cette époque-là Stéphane était sous la protection du patriarche Euloge et c’est ainsi qu’on lui permit d’habiter là.

On doit mentionner ici, que la phrase initiale du texte final d’un Discours de Stéphane “Trinité transcendant tous les êtres par ton excellence et ta suprême divinité” renvoie au commencement de la *Prière de Sophrone* à la cérémonie de la Grande bénédiction des eaux à la Théophanie.³⁵

Il en est de même pour un autre passage où Stéphane dit: “tu glorifieras en trinité et unité le Fils Verbe Dieu, qui a accompli tout à fait sagement et convenablement le monde tout entier à partir des quatre éléments, et qui a paré le cycle de l’année avec les quatre conversions,”³⁶ en le comparant à ceci de Sophrone: “Des quatre éléments tu composas la création, des quatre saisons tu couronnas le cycle de l’année.”³⁷

En outre, le passage de Stéphane “Qui donc pourra chanter tes merveilles, Seigneur?”³⁸ renvoie aussi à la *Prière de Sophrone*: “Tu es grand, Seigneur, tes œuvres sont admirables, et nulle parole ne suffira pour chanter tes merveilles.”³⁹

³³ Mt 22,37; Dt 6,5: ὁ δὲ (Ἰησοῦς) ἔφη αὐτῷ· ἀγαπήσεις κύριον τὸν θεόν σου ἐν ὅλῃ τῇ καρδίᾳ σου καὶ ἐν ὅλῃ τῇ ψυχῇ σου καὶ ἐν ὅλῃ τῇ διανοίᾳ σου.

³⁴ Jean Moschos, *Pratum spirituale*, ch. 77, M 87, 2929D: Ἀπήλθομεν ἐν μιᾷ εἰς τὸν οἶκον Στεφάνου τοῦ σοφιστοῦ ... ἔμενον δὲ εἰς τὴν ἁγίαν Θεοτόκον, ἣν ᾠκοδόμησεν ὁ μακάριος πάπας Εὐλόγιος, τὴν ἐπονομαζομένην τῆς Δωροθέας.

³⁵ Id. 207,37-208,1 (D 1.35) Τριάς ὑπερούσιε καὶ ὑπεράγαθε καὶ ὑπέρθεε. *Grande bénédiction des eaux à la Théophanie, Prière de Sophrone, patriarche de Jérusalem*: Τριάς ὑπερούσιε, ὑπεράγαθε, ὑπέρθεε.

³⁶ Id. 223,11-15 (D 3.15) δοξάσεις τὸν ἐν τριάδι καὶ μονάδι Υἱὸν Λόγον Θεόν, τὸν ἐκ τεσσάρων στοιχείων τὸν ἅπαντα κόσμον τελεσιουργήσαντα πανσόφως καὶ εὐπρεπῶς, καὶ τετράσι τροπαῖς κοσμήσαντα τὸν κύκλον τοῦ ἐνιαυτοῦ.

³⁷ *Bénédiction des eaux à la Théoph., Prière de Sophrone*: Σὺ ἐκ τεσσάρων στοιχείων τὴν κτίσιν συναρμόσας, τέτταρσι καιροῖς τὸν κύκλον τοῦ ἐνιαυτοῦ ἐστεφάνωσας.

³⁸ Id. 237,8-9 (D 5.21) Τίς οὖν εἰπεῖν δυνήσεται πρὸς ὕμνον τῶν θαυμασίων σου, Δέσποτα;

³⁹ *Bénédiction des eaux à la Théoph., Prière de Sophrone*: Μέγας εἶ, Κύριε, καὶ θαυμαστὰ τὰ ἔργα σου, καὶ οὐδεὶς λόγος ἐξαρκέσει πρὸς ὕμνον τῶν θαυμασίων σου.

Le fait que Stéphane s'inspira et emprunta le poème de Sophrone, pourrait signifier certaines choses:

Premièrement, Stéphane d'Alexandrie est la même personne que Stéphane le sophiste ou philosophe à Alexandrie.

Deuxièmement, il est bien probable que Sophrone écrivit son poème bien avant l'an 617, juste la date de la composition de l'œuvre de Stéphane; et c'est ainsi que le poème de Sophrone lui fut connu. L'an 617 est donc un *terminus ante quem* pour le poème de Sophrone. Si Sophrone avait composé son poème pendant son premier séjour à Alexandrie avec Moschos et même plus tard, il aurait sûrement pu être connu à Stéphane, qui alla à Constantinople vers l'an 612. Je suppose que tous les trois se trouvaient dans le milieu des patriarches orthodoxes d'Alexandrie, Euloge (581-608), Théodore Ier Scribon (608-610) et Jean V le Miséricordieux (610-621).

Troisièmement, Sophrone était très connu comme partisan ardent de l'Orthodoxie beaucoup d'années avant son élection comme patriarche de Jérusalem à la fin de sa vie (634-638): Par conséquent, Stéphane, empruntant des passages du poème de Sophrone, il témoigne d'avantage de son attachement à l'Orthodoxie.

Quatrièmement, Stéphane avait une forte inclination au mysticisme chrétien; c'est exactement cette qualité qui l'apparente encore plus à Sophrone.

On attribue plusieurs titres à Stéphane qui est connu surtout comme "Maître œcuménique et philosophe" (Papathanassiou 1992, Teil I. 1; 1996, 164 n. 3). On doit noter que la plupart des intellectuels de Byzance qui avaient bien approfondi aux lettres et à la théologie et qui se distinguaient également aux sciences du quadrivium ils étaient des moines ou membres du clergé de l'Église Orthodoxe. Comme ils étaient des enseignants, ils possédaient le titre du Maître auquel ils doivent leur réputation et qui figure, d'ailleurs, sur leurs œuvres. Par exemple, Nicéphore Blemmydes, Maximos Holobolos, Georges de Chypre, Ioannes Pediasimos, Georges Pachymère, Maximos Planoudes, Ioannes Glycys, Grégoire Chioniades etc. Mais il y avait d'autres intellectuels de Byzance, qui sans être moines ou membres du clergé orthodoxe avaient des relations étroites avec l'Église. Les intellectuels grecs aux siècles de l'occupation turque continuaient la même pratique.

Maintenant on peut se poser une autre question: Est-ce que le patriarche de Jérusalem Sophrone s'identifie avec le personnage de Sophrone dont parla Stéphane dans son *Traité apotélésmatique*?

Il faut se rappeler que Jean Moschos et Sophrone voyageaient ensemble pendant presque trente ans. Leur dernier lieu de résidence était Rome, où ils se réfugièrent après l'invasion des Perses en Egypte au mois de Septembre de l'an 616 et la résistance d'Alexandrie, qui avait comme résultat son siège pendant des mois et enfin sa chute par trahison.

Moschos mourut en Septembre de 619 à Rome. Son dernier souhait était que son corps soit transporté dans un cercueil en bois et qu'il soit enterré au Sinaï. En effet, Sophrone transporta le corps embaumé de Moschos de Rome à Ascalon, port de Palestine. Un tel voyage à travers la mer, au milieu de l'hiver, aurait pu durer au moins 20 jours. Sophrone, quand il arriva à Ascalon, constata qu'il était impossible de continuer son voyage jusqu'au Sinaï qui était déjà occupé par des barbares (l'Islam). Il continua donc son voyage aux Lieux saints occupés par les Perses, jusqu'au Monastère de St Théodose le Grand à Jérusalem, où il enterra le corps de Moschos en janvier de 620 et il resta là.

Questions importantes: Sophrone fit-il un voyage à Constantinople, où il se rencontra après bien des années (30 ans) avec Stéphane, dont il fut l'un de ses disciples à Alexandrie en 581-584? Cette vieille relation entre maître et disciple, pourrait-elle expliquer l'intimité dont Stéphane s'exprime en disant "*j'ai mandé mon Sophrone*" (τῷ ἐμῷ Σωφρονίῳ ἐνετειλάμην) dans son "*Traité apotélésmatique*," quand Epiphanius, commerçant d'Arabie, demande à Stéphane d'ordonner à un de ses disciples de "*suspendre l'astrolabe*" (τὸν ἀστρολάβον διαπτᾶν) et de noter les résultats de l'observation pour le calcul de l'horoscope de l'Islam? (Usener 1914, 272; Papathanassiou 1997; 2006, 189f.)

Je voudrais souligner ici que l'astrolabe était le meilleur instrument pour la détermination du temps avec grande précision aux observations astronomiques (Ptolémée, *Tetrabiblos*, III. 2); de plus, son usage était bien connu. En outre Sophrone suivit des leçons de médecine données par Stéphane (le philosophe), commentateur des œuvres d'Hippocrate. Dans son œuvre "*Des airs, des eaux et des lieux*" Hippocrate explique l'influence des phénomènes astronomiques annuels à la santé et aux maladies des hommes et dit que la contribution de l'astronomie à la médecine est grande. On constate donc que l'utilisation de l'astrolabe n'était pas inconnue aux médecins et ce n'était pas du tout surprenant qu'un étudiant de la médecine s'en sert.

En tout cas, s'il s'agit vraiment de Sophrone, le futur patriarche de Jérusalem, est-ce que la connaissance de l'horoscope de l'Islam lui servirait-il, 16 ans après, en 637, à ses négociations avec le khaliph Omar pour la reddition de Jérusalem?

Après avoir étudié les "*Prières*" et prenant en considération les nouveaux éléments qui en résultent, je crois que l'opinion de W. Wolska-Conus, que j'avais, d'ailleurs, moi-même adoptée autrefois, selon laquelle Stéphane renonça à l'Orthodoxie et se converti au monothélisme du patriarche Serge, est erronée.

Ce qui s'est passé est exactement le contraire. Stéphane a réussi à rester orthodoxe dans le milieu de Serge, quand celui-ci commençait ses activités pour introduire d'abord son "monoénergisme". Il est évident que Stéphane n'offrit pas son aide au patriarche Serge avec ses connaissances philosophiques, et c'est pour cela que Serge s'adressa à un moine d'Egypte. D'ailleurs, comment Stéphane pourrait-il secourir Serge avec ses connaissances philosophiques et se convertir de nouveau, après avoir abandonné le monophysisme à cause des contradictions logiques qu'il a découvertes quand il était à Alexandrie?

On pourrait supposer que l'activité intense de Stéphane, en tant qu'écrivain, pendant ces années (*Sur la chrysopée, Commentaire sur les tables faciles de Ptolémée* éditées par Théon, et plus tard le *Traité apotélésmatique*) était assez dure pour son âge et il est bien probable que cela justifie la neutralité de son comportement. Donc, comme il évita de se convertir au monoénergisme d'une part et d'autre part il se rencontra probablement avec Sophrone, qui était toujours un adversaire ardent de Serge, tout cela aurait pu contribuer à l'omission de son nom après sa mort, étant donné que Serge resta au trône patriarcal encore seize ans.

PRIÈRES (Traduction)

Stéphanos d'Alexandrie, professeur œcuménique de philosophie et maître en ce grand et saint art “*Sur la fabrication de l'or.*” Avec l'aide de Dieu, premier discours.

1.1. [Id. 199,6-12] Après avoir chanté un hymne en l'honneur de l'Auteur de tous les biens, du Roi de l'univers et de son Fils unique, qui a procédé (rayonné¹) de Lui avant tous les siècles, avec le Saint Esprit, et après avoir supplié Dieu de nous illuminer avec la lumière de sa connaissance, nous commençons à cueillir les plus beaux fruits du traité de cette œuvre que nous avons entre les mains. Appliquons-nous à poursuivre les traces de la vérité. Pour l'instant, il faut construire le sujet en question à partir de la vraie science de la nature.

*1.6. [Id. 200,30-34] Je proclame² la grâce³ du don de la lumière qui vient d'en-haut⁴, qui nous est donnée de la part du Père des lumières. Écoutez, en tant qu'*intellects égaux aux anges*,⁵ rejetez la considération des choses matérielles, afin que vous soyez jugés dignes de voir avec *les yeux de votre intelligence*⁶ le mystère caché.

*1.10. [Id. 202,1-10] Écoutez, les amoureux de la sagesse, et vous connaîtrez les magnificences de Dieu Pantokratôr (tout-puissant), car il est le pourvoyeur de toute sagesse, *qui habite une lumière inaccessible*;⁷ *lumière, qui éclaire tout homme venant dans le monde*.⁸ Car nous ne sommes rien sans sa *puissance divine*⁹. Ce don que nous cherchons n'est absolument rien en comparaison de sa béatitude. Approchez-vous, ô amis de la vertu, de cet objet incorporel de votre désir. Apprenez comme elle est

¹ Clem. Alex., *Strom.* 7.9, M 9.480A. Gr. Nyss., *Epist. xxvi ad Evagr. mon.*, M 46.1104.

² Orig., *Jo.* 32.18, M 14.821C.

³ Clem. Rom., *Epist. ad Corinth. I* 23.1, M 1.199.

⁴ Dion. Areop., *De div. nom.* 1.4, M 3.464A.

⁵ Max., *Schol. in Dion. Areop. Cæl. hier.* 1.2, M 4.32A,B.

⁶ Euseb., *Vita Const.* 4.19, M 20.1168A.

⁷ *I Tm.* 6,16: le seul qui possède l'immortalité, qui habite une lumière inaccessible, que nul d'entre les hommes n'a vu ni ne peut voir. Athénagore, *Apologie des Chrétiens*, trad. M. de Genoude: Car il (Dieu) est lui-même toutes choses, lumière inaccessible, monde parfait, esprit, puissance et raison. Gr. Naz., *De filio orat.* 30, 13.6, M 36.120; id. *orat.* 44.3, M 36.609B. Chrys., *in Epist. I ad Timoth. orat.* 18, M 62.595 et 62.597.

⁸ *Jn* 1,9: Le Verbe était la lumière véritable, qui éclaire tout homme venant dans le monde. Orig. *Contra Celsum* 6,5,6, M 11.1296B. Basil., *De spiritu sancto*, 18,47,14, M 32.153B. Gr. Naz., *De spiritu sancto orat.* 31, 3,9-15, M 36.136. Chrys., *Homil. 7 in Jo.*, M 59.61. Athanas., *Epist. I ad Serap.* 19, M 26,573D.

⁹ Gr. Nyss., *Hom. 1.3 in Jo.*, ed. Godhead p. 99.14. Dion. Areop., *De cæl. hier.* 2.1, M 3.137A.

douce la lumière de Dieu. Les choses que l'on admire aujourd'hui ne sont rien à côté de cette merveilleuse bienheureuse destinée.

*1.11. [Id. 202,10-19] Apparentons-nous à Lui par l'amour, et de Lui nous recevrons notre part de la sagesse insondable qui jaillit de l'abîme, afin que par la grâce de notre Seigneur Jésus-Christ nous soyons rendus capables de faire *jaillir des fleuves d'eau vive*,¹⁰ si bien que, par admiration pour la si grande sagesse du Créateur, tu puisses chanter un hymne à sa grande *philanthropie*¹¹. Pourquoi faut-il admirer la forme du corail d'or? Il faut admirer davantage la beauté incircriscriptible de Dieu. Cependant je remplirai votre désir, afin que vous soyez rendus dignes de L'aimer au point de prêcher avec des hymnes la *bonté sublime*¹² de Dieu.

*1.34. [Id. 207,30-37] Ô mystères inexprimables de la sagesse de Dieu! Ô dons pleins de richesse pour ceux qui aiment le Seigneur! Ô *abîme de la richesse, de la sagesse et de la science* des mystères!¹³ Si ces choses du temps présent sont merveilleuses et extraordinaires, combien plus celles de l'éternité que nul intellect ne peut expliquer? Si cette opération matérielle est pour nous l'objet d'un discours en quelque sorte ineffable, combien plus les biens absolument purs et les beautés inscrutables et que nulle force ne peut contempler?

*1.35. [Id. 207,37-208,3] Je te loue, je t'adore, je te glorifie, *Trinité transcendant tout les êtres par ton excellence et ta suprême divinité*.¹⁴ Qui peut proclamer quelque chose qui approche de la louange de tes merveilles? *Que tes œuvres sont en grand nombre, ô Éternel! Tu les as toutes faites avec sagesse*.¹⁵

¹⁰ Jn 7,38: celui qui croit en moi; selon le mot de l'Écriture: De son sein couleront des fleuves d'eau vive. Gr. Nyss., *In Cant. canticorum*, hom. 9, M 44.977B.

¹¹ Chrys., *Hom. 78.4 in Mt.*, M 58.756A. Clem. Alex., *Protr.* 10, M 8.204B.

¹² Dion. Areop., *De div. nom.* 2.4, M 3.641A.

¹³ *Épître aux Romains* 11:33 Ô abîme de la richesse, de la sagesse et de la science de Dieu! Que ses décrets sont insondables et ses voies incompréhensibles! Clem. Alex., *Strom.*, 5,12,80,4, M 9.120A. *Corinth. I*, 2:6-8, Pourtant c'est bien de sagesse que nous parlons parmi les parfaits, mais non d'une sagesse de ce monde ... Ce dont nous parlons au contraire, c'est d'une sagesse de Dieu, mystérieuse, demeurée cachée. Theodoret., *De providentia*, or. 10, M 83.740.

¹⁴ *Bénédition des eaux à la Théoph.*, *Prière de Sophrone: Trinité transcendant tous les êtres par ton excellence et ta suprême divinité*, Tout-puissant qui vois tout, Invisible que nul ne peut saisir, Créateur des êtres spirituels et doués de raison, pure essence du Bien, Lumière inaccessible qui, venant dans le monde, illumines tout homme, éclaire-moi aussi, ton indigne serviteur; illumine les yeux de mon intelligence, afin que j'ose célébrer tes bienfaits et ta puissance infinis...

¹⁵ Ps. 104,24: Que tes œuvres sont en grand nombre, ô Éternel! Tu les as toutes faites avec sagesse.

Du même Stéphane sur l'œuvre intitulé "*En l'action;*" avec l'aide de Dieu, deuxième discours.

2.1. [Id. 213,9-27] *Tout don excellent, toute donation parfaite vient d'en haut et descend du Père des lumières.*¹⁶ Eh bien, nous avons invoqué Jésus, lumière paternelle, Être vrai, *lumière de lumière,*¹⁷ *qui éclaire tout homme venant dans le monde.*¹⁸ Car c'est Lui qui est la lumière, la vérité et la vie, le Verbe divin de Dieu, la sagesse et la force,¹⁹ *la sagesse*²⁰ capable de tout faire et indicible de Dieu, *le Verbe vivant du Père, le Verbe était Dieu et le Verbe était toujours avec Dieu,*²¹ *tout fut par lui.*²² C'est Lui qui confère la lumière aux croyants pour qu'ils aient la connaissance des êtres et qu'ils chantent les merveilles de Dieu pantokratôr; car c'est Lui le bienfaiteur et le Sauveur du monde. Qu'Il illumine notre esprit et notre cœur²³ et qu'Il fasse rallumer le flambeau en nous, resplendissant en nous les profondeurs inextricables de sa connaissance et de sa sagesse en vue de la vraie et droite connaissance qui consiste à Te connaître, Toi, notre seul Dieu vivant et vrai, la sainte et consubstantielle Trinité et *le Père vivifiant tout, le Fils et le Saint Esprit*²⁴, *maintenant et toujours et pour les siècles des siècles. Amen.*

2.4. [Id. 214,8-15] Mais, ô ouailles sacrées et vous amoureux de la sagesse, vous qui voulez découvrir ce mystère tâchant de concevoir Dieu, *luttez contre vous-mêmes*²⁵

¹⁶ *Épître de St Jacques*, 1,17: tout don excellent, toute donation parfaite vient d'en haut et descend du Père des lumières. Dion. Areop., *De cæl. hier.* 1.1, M 3.120B. Athanas., *Epist. II ad Castorem* 8D, M 28.905. Basil., *Liturgie*. Chrys., *orat. In Ps. 118*, M 55.683. Chrys., *Liturgie*, CJOChr, VII/2 (2012) p. 152: [Le Prêtre]: Car toute grâce et tout don parfait viennent d'en haut et procèdent de Toi, Père des lumières.

¹⁷ Orig., *Hom. 9.4 in Jer.*, M 13.337A. Gr. Nyss., *Contra Eun.* 8, M 45.775B.

¹⁸ Dion. Areop., *De cæl. hier.*, 1.2, M 3.121A.

¹⁹ Clem. Alex., *Strom.* 5.13, M 9.125A; ib. 1.4, M 8.717A. Gr. Nyss., *Contra Eun.* 3, M 45.612D.

²⁰ Orig., *Exp. in Pr.* 9:1, M 17.185B; id. *adnot. in Dt.* 16:19f., M 17.28B. Clem. Alex., *Strom.* 7.2, M 9.412A.

²¹ *Jn* 1,1-4: Au commencement le Verbe était et le Verbe était avec Dieu et le Verbe était Dieu. Il était au commencement avec Dieu. Tout fut par lui et sans lui rien ne fut. De tout être il était la vie. Gr. Nyss., *Contra Eun.* 8, M 45.896C,D. Gr. Naz., *De se ipso or.* 36, M 36.265.

²² *Symbole de la foi*: et par lui tout a été fait.

²³ Orig., *Comm. In Evang. Ioannis*, M 11.68B,C; id. *Exhort. ad martyr.* 47, M 11.629A et 632A.

²⁴ Basil., *De spiritu sancto*, 18,47,1-7,17-19, M 32.153A,B.

²⁵ Orig., *orat.* 11.2, M 11.449A.

par la parure des *vertus*,²⁶ et arrosez-vous par *le flux abondant des larmes*,²⁷ s'appuyant sur la foi, *l'humilité*²⁸ et l'amour de Dieu, pour que rien des choses matérielles ne vous étonne ni n'attire votre admiration, sauf Dieu qui vous a aimés.

2.20. [Id. 219,1-14] Il y a un grand mystère en cela et on voit se produire des choses extraordinaires. Pleins d'admiration on chantera Dieu Père pantokratôr, ainsi que sa sagesse toute puissante, et son Esprit vivifiant. Car le Verbe de Dieu tout parfait et dominant porte en soi tout par la force de sa parole. Que ce Verbe illumine notre intelligence et notre cœur, afin de nous approprier à la lumière vraie de sa connaissance et nous apparenter à elle par son amour. Illuminés ainsi par la vraie lumière nous puissions connaître les êtres, et contempler les œuvres de Dieu de l'univers, *afin qu'il soit glorifié ton Nom digne de tout honneur et de toute gloire, Père, Fils et Saint-Esprit, maintenant et toujours et dans les siècles des siècles. Amen.*²⁹

Du même Stéphane philosophe sur l'œuvre intitulé "*En l'action de l'art sacré*;" avec l'aide de Dieu, troisième discours.

3.1. [Id. 219,18-220,6] Qui est le bienheureux qui puisse agréer les *jugements*³⁰ de Dieu pantokratôr? Qui est si savant et sage pour raconter la sagesse insondable du Créateur de tout? Qui est si heureux pour comprendre les puissances de Dieu universel qui surveille tout et le glorifier pour sa *bonté sublime*³¹? D'une part, il m'est bien évident de parler facilement, infailliblement et aisément; j'examine clairement les idées énigmatiques des prédécesseurs à l'aide de Dieu pantokratôr. D'autre part, il semblerait bon pour vous, en tant que prudents, de reconsidérer vos idées pour adhérer à ce qui a été admis par nombre de savants, pour pouvoir agréer leurs idées. Vous pourrez ainsi passer à mon petit œuvre très bref, demandant à notre unique vrai Dieu

²⁶ Orig., *Jo.* 32.15, M 14.780D.

²⁷ Athan., *De virgin.* 17, M 28.272B. Just. *dial.* 90,5, M 6.692A. Chrys., *Anna* 3.1, M 54.721E; id. *hom. in Mt*, M 57.68.

²⁸ Athan., *Exp. Ps.* 85:1, M 27.373C.

²⁹ Chrys., *Liturgie*, CJOChr, VII/2 (2012) p. 118: [évêque] Afin qu'eux aussi glorifient avec nous ton Nom digne de tout honneur et de toute gloire, Père, Fils et Saint-Esprit, maintenant et toujours et dans les siècles des siècles.

³⁰ Pss. Sal. 18.3. Gr. Nyss., *Contra Eun.* 3, M 45.601D.

³¹ Dion. Areop., *De div. nom.* 4.1, M 3.693B. Gr. Nyss., *Vita Mos.* 7, M 44.301A. Chrys., *Hom.* 13.6 *in Mt*, M 57.215; id. *hom.* 78.4 *in Mt*, M 58.715.

d'illuminer *l'œil de votre intelligence*³² et faire briller vos cœurs par sa lumière immatérielle dans le but de connaître la domination de Dieu pantokratôr et sa gloire, souhaiter de Le rencontrer dans votre cœur purifié et de chanter les magnificences de Dieu de tout et *glorifier le Nom très saint et digne de toute gloire, du Père, du Fils et du Saint-Esprit, maintenant et toujours et dans les immenses siècles des siècles. Amen.*

3.15. [Id. 223,5-19] Car, si tu transformes les corps incorporels en corporels et les corporels en incorporels, tu travailleras efficacement, facilement et admirablement; c'est-à-dire, tu dois atteindre le but de ton désir au prix de ta peine: étudier le corps qui *se compose de quatre éléments*,³³ le traitement ternaire et le mouvement des conversions aux douze signes du zodiaque. Ils existent sept astres appelés planètes dans une unique union extrême des corps, des formes et des contemplations. Tu glorifieras pour cela le Fils Verbe Dieu en trinité et unité, *qui a accompli tout à fait sagement et convenablement le monde tout entier à partir des quatre éléments, et qui a paré le cycle de l'année avec les quatre conversions*,³⁴ et qui après les sept aïons il fera entrer ceux qui ont vécu de manière digne, à son repos³⁵ au royaume infini du ciel, faisant l'hymne de la lumière unique et inconcevable de la Trinité, dans *le Père, le Fils et le Saint-Esprit, maintenant et toujours et dans les siècles des siècles. Amen.*

Du même Stéphane philosophe; avec l'aide de Dieu, quatrième discours.

4.29. [Id. 231,1-5] Ayant acquis cette vertu nous viendrons à la lumière douce de Dieu et apprendrons la si grande sagesse de la grâce à partir de Lui, qui étonne et brille en ceux qui ont cru à Lui, Jésus notre Dieu.

Du même Stéphane philosophe; avec l'aide de Dieu, cinquième discours.

³² Chrys., *Or. 54 in Mt.*, M 58.536. *Bénédictio des eaux à la Théoph.*, *Prière de Sophrone*: illumine les yeux de mon intelligence.

³³ Gr. Nyss., *Imag.*, M 44.1328B.

³⁴ *Grande bénédiction des eaux à la Théophanie, Prière de Sophrone*: Des quatre éléments tu composas la création, des quatre saisons tu couronnas le cycle de l'année

³⁵ Bas. *h. myst.* 60.

*5.1. [Id. 231,8-14] Je chante, je glorifie et je rends grâces à Dieu l'indicible, le Père de la sagesse et de la vérité, le dispensateur de la vie et de la lumière, *la cause de tout et au delà de tout*,³⁶ et à son Fils unique (monogène³⁷) qui est issu de Lui, ainsi qu'à l'Esprit divin de la vérité qui procède de Lui, pour terminer sous sa guidance ce sixième ouvrage qui est entre nos mains.

5.2. [Id. 231,8-14] Que cela soit le préambule selon notre coûtume. Les leçons qui nous conduisent des choses matérielles aux choses immatérielles, et des choses composées aux choses simples et non composées parées par l'inspiration divine, sont des exercices de l'âme; car ce sont des pensées et des sujets de philosophie. Telle est la méthode, telles sont les leçons. Tel est le but, tel est la proposition qui maintenant met fin aux idées théoriques. Tel est le discours qui accomplit la pratique.³⁸ Telle est la méthode, telles sont les leçons. Que la richesse de la grâce est grande! Que les trésors de la sagesse indicible sont nombreux! Que les dons sont inénarrables! Que les eaux de cette pratique sont des *fleuves d'eau vive*! Que l'abîme est source de la sagesse de Dieu! Que la venue du Saint Esprit est une lumière très pure!

5.3. [Id. 231,26-232,3] Rien n'est supérieur à la sagesse; car c'est par elle que le Verbe dominant de Dieu a tout créé; c'est par elle qu'Il a paré les illuminations nobles des intelligences célestes; c'est par elle que le paradis spirituel a été préparé pour la jouissance des êtres qui vivent éternellement; c'est par elle qu'Il a préparé pour nous le Royaume des Cieux. Comment donc pourrons-nous nous élever vers la sagesse? Comment pourrons-nous nous apparenter à elle? Comment revêtirons-nous sa tunique incorruptible? Seule l'amour de Dieu nous attire vers la passion de la sagesse.

*5.21. [Id. 237,5-16] Ô grâce de la sagesse! Ô œuvre d'intelligence! Ô accomplissement des idées! Ô perfection de la parole! Ô dons du Demiurge de tout! Ô cadeaux riches reçus du Père des lumières! *Qui donc pourra chanter tes merveilles, Seigneur?*³⁹ Quelle bouche est en mesure de te célébrer, Seigneur, Maître de tout? Quel intellect ne tremblera pas d'effroi à contempler le bon ordre de l'arrangement

³⁶ Clem. Alex., *Strom.*, 1.28.177, M 8.924A,B.

³⁷ Clem. Alex., *Strom.* 7.3, M 9.424D. Euseb., *Laud. Const.* 12, M 20.1388C.

³⁸ Dion. Areop., *De cæl. hier.* 10.1, M 3.273A.

³⁹ *Bénédiction des eaux à la Théoph.*, *Prière de Sophrone*: Tu es grand, Seigneur, tes œuvres sont admirables, et nulle parole ne suffira pour chanter tes merveilles.

universel? *Qui ne chantera pas les magnificences de Dieu tout-puissant? Que tes magnificences sont grandes, Sauveur! Que ta philanthropie est grande, Seigneur! Que la pitié de ta bonté est riche! Que tes dons sont source de toute sagesse!*

5.22. [Id. 237,16-31] *Je te chante et te glorifie Seigneur de tout, né du Père avant tous les siècles, Créateur de toute création, lumière vraie, née de la lumière, Dieu né de Dieu et étant toujours avec Dieu, et aux derniers jours le même engendré pour notre salut de Marie, la glorieuse Mère de Dieu et toujours vierge, notre Seigneur Jésus Christ, notre vrai Dieu.*⁴⁰ Car il n'y a plus rien à ajouter à Toi, qui es complet et qui veux toujours faire du bien à tous. Ni vie, ni mort, ni ange, ni les choses présentes dont il est question, ni principes, ni puissances, ni encore les choses présentes et celles à venir ne nous sépareront pas de ton amour, Jésus Christ, notre Dieu. C'est par celui-ci que nous adressons au Père gloire, honneur, louange, et majesté, avec son très saint et adorable et vivifiant Esprit, *dans tous les immenses siècles des siècles. Amen.*

Du même Stéphane philosophe œcuménique; sixième discours sur l'œuvre intitulé "*Sur la division de l'art sacré.*"

*6.1. [Id. 238,1-13] *Je te confesse, Père Saint, Seigneur, Dieu du ciel et de la terre, Dieu universel et Pantokratôr, auteur et dispensateur de tous les biens; Toi, Dieu pantokratôr, que les cieux confessent et racontent tes merveilles et celles de ta gloire. Puissions-nous d'un cœur pur louer, célébrer, glorifier et adorer les magnificences de Dieu de l'univers, de l'Auteur des tous ces biens. Puissions-nous nous prosterner devant le nom majestueux, plein de sainteté et vivifiant, du Père et du Fils et du Saint-Esprit, maintenant et toujours et pour les siècles des siècles. Amen.*

6.12. [Id. 241,24-33] *Des contemplations sensibles passe maintenant aux contemplations intellectuelles et vois le bon ordre immatériel des êtres célestes. Toi, ayant contemplé leurs nobles apparences et ayant levé la pensée au dessus de la matière, ayant compris la grande et très brillante gloire et félicité des anges, ne*

⁴⁰ *Symbole de la foi: ... créateur du ciel et de la terre, de l'univers visible et invisible. Je crois en un seul Seigneur, Jésus-Christ, le Fils unique de Dieu, né du Père avant tous les siècles; Il est Dieu, né de Dieu, lumière, née de la lumière, vrai Dieu, né du vrai Dieu, Engendré, non pas créé, de même nature que le Père, et par lui tout a été fait. Pour nous les hommes, et pour notre salut, il descendit du ciel; Par l'Esprit Saint, il a pris chair de la Vierge Marie, et s'est fait homme.*

retourne plus à la formation matérielle d'une vulgaire fabrication d'or, mais attache ce travail aux principes de la philosophie et découvre cette technique dans le traité que tu as devant les yeux. Pourtant élève tout ton intellect en haut et fais-le s'envoler lumineux, ressemblable aux substances les plus élevées.

6.13. [Id. 241,33-242,9] Si toi, après avoir contemplé et admiré par des yeux intellectuels leur beautés innombrables et extraordinaires et vers cette lumière-là au dessus de chaque lumière, et après avoir écarté de toi toutes les œuvres du monde et avoir recherché *la mort*⁴¹ volontaire, après avoir fait mourir tout ton corps, et en plus avoir nié tout ton *âme*⁴², avoir chanté et glorifié avec des hymnes incessants le Roi de tout et Seigneur de la gloire, après avoir frissonné de peur extrême devant la force toute-puissante, tu comprendras sa bonté sublime. La langue est saisie de vertige et l'intelligence ne peut pas expliquer du tout, comment tout est produit par sa sagesse indicible; et tu ne pourras pas assumer ni explorer du tout ni exprimer les magnificences de Pantokratôr.

6.14. [Id. 242,9-21] Ayant conçu tout cela en nous-mêmes, hâtons-nous, mes frères, de s'unir et de s'approprier par la foi et *l'amour*⁴³ à Dieu Verbe, qui nous a aimés; *et aimer le Seigneur notre Dieu de toute notre âme, de tout notre esprit et de tout notre cœur*.⁴⁴ Ayant admiré ce trésor de la vie que nous glorifions toujours sous n'importe quelle condition ou lieu, nous pourrons ainsi nous réjouir de la théologie et nous serons dignes de la relation avec Dieu. Nous serons remplis de la grâce et constituerons la *résidence de Dieu*⁴⁵; par conséquent nous jouirons de sa douce lumière. Précipitons-nous vers cette lumière qui illumine toute créature rationnelle, qui brille et éclaire⁴⁶ les sens, les cœurs et les intelligences de tous ceux qui aiment le Seigneur.

⁴¹ Gr. Nyss., *Contra Eun.* 2, M 45.545B.

⁴² Gr. Nyss., *De hom. opif.* 29.3, M 44.236B; id. *Orat. catech.* 37, M 45.93C; id. *De anim. et res.*, M 46.29B.

⁴³ Basil., *Hom. in Ps.* 44, M 29.392A. Gr. Nyss., *Hom. 5 in Cant.*, M 44.857D.

⁴⁴ *Mt 22,37 (Dt 6,5)*: Jésus lui dit: Tu aimeras le Seigneur ton Dieu de tout ton cœur, de toute ton âme et de tout ton esprit.

⁴⁵ Barn. 6.15; ib. 16.7; ib. 16.8.

⁴⁶ Clem. Alex., *Protr.* 9, M 8.197A. Euseb., *Dem. evang.* 4.6, M 22.214C. Lit. Marc. (Brightman p. 135.19).

6.15. [Id. 242,22-32] Plaise à Dieu que nous aboutissions au port⁴⁷ de sa volonté par la foi et l'amour de Dieu, afin de jouir de biens éternels, *par la grâce et la philanthropie du Fils unique de Dieu*, avec Lui, l'incorruptible, qui est la cause de tout, Dieu Roi et Père de tout, *ainsi que l'Esprit très saint, adorable et vivifiant*, inspirant de sa grandeur, respect, domination, adoration, honneur, gloire, magnificence, hymne éternel avant le début de tous les siècles et après toute l'éternité, *et maintenant et toujours et dans tous les siècles éternels des siècles. Amen.*⁴⁸

Du même philosophe Stéphane, *Enseignement en présence de l'Empereur Héraclius*; avec l'aide de Dieu, septième discours.

7.1. [Id. 243,4-23] Dieu sans commencement et Tout-dominant, bon par nature au dessus de la bonté, au caractère bienveillant, inconcevable et incompréhensible, Dieu universel et Pantokratôr, *le Dèmiurge de toute la création*,⁴⁹ après avoir fait passer tout de l'inexistence à l'existence et avoir construit tout par sa gloire, sa volonté, sa puissance et sa sagesse, Il a créé l'homme *à son image*⁵⁰ et à sa ressemblance, raisonnable, intellectuel et libre⁵¹, et Il l'a établi comme roi de toute la création. Dieu Pantokratôr et Souverain des souverains, t'a établi empereur œcuménique sur la terre entière pour détenir le pouvoir sur toutes les autres créatures bienveillance et scrupuleusement. Ce Dieu pantokratôr t'a accordé sa faveur faisant un signe de sa main droite compréhensive et créatrice. De sa source inépuisable ont germé à toi toutes les joies et tous les dons benevoles. Il t'a inspiré des idées multiformes de bienfaisance et t'a révélé ainsi la sérénité bénie et la piété exprimée par des activités variées, te rendant son serviteur digne et confesseur de foi en Dieu vrai et unique et en Jésus Christ, le Fils de Dieu vivant, qu'Il a envoyé sur terre.

7.2. [Id. 243,23-244,3] Il est donc vraiment équitable, ô roi couronné par Dieu, d'accourir avec bienveillance, amour sincère et crainte de Dieu, pour pouvoir par la

⁴⁷ Clem. Alex. fr. 44. Jo. D., *Hom.* 2.7, M 96.588B.

⁴⁸ Chrys., *Liturgie*, CJOChr. VII/2 (2012) p. 142 [Evêque]: par la grâce, les miséricordes et l'amour pour les hommes de ton Fils unique avec lequel Tu es béni, ainsi que ton Esprit très saint, bon et vivifiant, maintenant et toujours et dans les siècles des siècles. Amen.

⁴⁹ Gen. 1,1: Au commencement, Dieu créa le ciel et la terre. Chrys., *In cap. I Genes. Homil. II*, M 53,28.

⁵⁰ Basil., *De struct. hom.* 1.16, M. 30.24D.

⁵¹ Gr. Nyss., *Orat. catech.* 21, M. 45.57C.

grâce de notre Seigneur Jésus Christ faire *jaillir des fleuves d'eau vive* et hériter ce grand désir de s'installer à droite de Dieu. Aucune créature qui est à present vue et admirée n'est digne dans tel aboutissement serein. Pourvue qu'on s'apparente à Lui par l'amour et recevoir de la source insondable qui sort de l'abîme d'où jaillit la pitié de nous. *Ce que l'œil n'a pas vu, ce que l'oreille n'a pas entendu, ce qui n'est pas monté au cœur de l'homme, tout ce que Dieu a préparé pour toi et tes ressemblants, ainsi que pour ceux qui l'aiment*⁵² *dépuis la création du monde.* Dieu qui est digne de glorification, d'honneur et de magnificence, *Père, Fils et Saint-Esprit, dans les siècles des siècles et au-delà de l'éternité. Amen.*

7.3. [Id. 244,3-9] Je reviendrai de nouveau à ce sujet et je m'efforcerais d'accomplir ton désir, ô roi excellent en tout. Je manifesterai mon discours, pour que tu sois jugé digne d'aimer, de dissertar de la divinité et de chanter la bonté sublime de Dieu, après avoir rejeté la multitude des choses matérielles pour t'orienter compatissant vers la passion pour Dieu.

⁵² 1 *Épître aux Corinthiens* I, 2:9: mais, comme il est écrit, [nous annonçons] ce que l'œil n'a pas vu, ce que l'oreille n'a pas entendu, ce qui n'est pas monté au cœur de l'homme, tout ce que Dieu a préparé pour ceux qui l'aiment. Basil., *De paradiso* orat. 3, 7B, M 30.68C.

PRIÈRES (Texte grec)

Στεφάνου Ἀλεξανδρέως οἰκουμενικοῦ φιλοσόφου καὶ διδασκάλου τῆς μεγάλης καὶ ἱερᾶς ταύτης τέχνης *Περὶ χρυσοποιΐας*· πρῶξις σὺν Θεῷ πρώτη.

1.1. [Id. 199,6-12] Θεὸν τὸν πάντων ἀγαθῶν αἴτιον καὶ βασιλέα τῶν ὅλων, καὶ τὸν ἐξ αὐτοῦ πρὸ τῶν αἰώνων ἐκλάμπαντα¹ μονογενῆ υἱὸν σὺν τῷ Ἁγίῳ Πνεύματι ὑμνήσαντες, καὶ τὸ τῆς αὐτοῦ γνώσεως φῶς ἐλλαμφθῆναι ἡμῖν καθικετεύσαντες, τῆς ἐν χερσὶ πραγματείας τοῦδε τοῦ συγγράμματος ἀπαρξώμεθα τὰ κάλλιστα δρέπεσθαι καὶ τὰ ἀληθῆ ἀνιχνεύειν ἐπιστωσάμεθα. Νυνὶ δὲ ἐκ τῆς ἀληθοῦς φυσικῆς θεωρίας κατασκευαστέον τὸ πρόβλημα.

1.6. [Id. 200,30-34] Ὁμολογῶ² τῆς ἄνωθεν φωτοδοσίας³ τὴν χάριν,⁴ ἢ παρὰ τοῦ πατρὸς τῶν φώτων ἡμῖν δεδωρηται. Ἀκούσατε ὡς ἰσαγγελοὶ⁵ νόες. Ἀπόθεσθε τὴν ὑλώδη θεωρίαν, ὅπως τοῖς νοεροῖς⁶ ὑμῶν ὀφθαλμοῖς ἰδεῖν ἀξιωθῆτε τὸ ἀποκεκρυμμένον μυστήριον.

1.10. [Id. 202,1-10] Ἀκούσατε οἱ τῆς σοφίας ἐρασταί, καὶ εἴσεσθε τὰ μεγαλεῖα τοῦ παντοκράτορος Θεοῦ· αὐτὸς γὰρ ἐστὶν ὁ πάσης σοφίας χορηγός· φῶς οἰκῶν ἀπρόσιτον·⁷ φῶς, ὃ φωτίζει πάντα ἄνθρωπον ἐρχόμενον εἰς τὸν κόσμον·⁸ οὐδὲν γὰρ

¹ Clem. Alex., *Strom.*, 7,9, M 9.480A: τὸ τῆς ἀγάπης ἀξίωμα ἐκλάμπει ἐκ φωτὸς εἰς φῶς. Gr. Nyss., *Epist. xxvi ad Evagr. mon.*, M 46.1104: οὕτω δὴ καὶ οἰονεῖ τινες τοῦ Πατρὸς ἀκτίνες ἀπεστάλησαν ἐφ' ἡμᾶς, ὃ τε φεγγώδης Ἰησοῦς, καὶ τὸ Πνεῦμα τὸ ἅγιον. Ὡσπερ γὰρ αἱ τοῦ φωτὸς ἀκτίνες ἀμέριστον ἔχουσαι κατὰ φύσιν τὴν πρὸς ἀλλήλας σχέσιν, οὔτε τοῦ φωτὸς χωρίζονται, οὔτε ἀλλήλων ἀποτέμνονται, καὶ μέχρις ἡμῶν τὴν χάριν τοῦ φωτὸς ἀποστέλλουσι· τὸν αὐτὸν τρόπον καὶ ὁ Σωτὴρ ὁ ἡμέτερος, καὶ τὸ Πνεῦμα τὸ ἅγιον, ἢ δίδυμος τοῦ Πατρὸς ἀκτὶς, καὶ μέχρις ἡμῶν διακονεῖται τῆς ἀληθείας τὸ φῶς, καὶ τῷ Πατρὶ συνήνωται.

² Orig., *Jo.* 32.18, M 14.821C: χάριτας ὁμολογοῦμεν τῷ θεῷ οὔσι πολλῶ μείζοσι τῆς ἡμετέρας ἀξίας.

³ Dion. Areop., *De div. nom.* 1.4, M 3.464A: τῆς ... νοητῆς αὐτοῦ φωτοδοσίας ἐν ἀπαθεί καὶ ἀύλω τῷ νῷ μετέχοντες.

⁴ Clem. Rom. *Epist. ad Corinth. I* 23,1, M 1.199: Ὁ οἰκτίρμων κατὰ πάντα καὶ εὐεργετικὸς πατὴρ ἔχει σπλάχνα ἐπὶ φοβουμένους αὐτόν, ἠπίως τε καὶ προσηνῶς τὰς χάριτας αὐτοῦ ἀποδοῖ τοῖς προσερχομένοις αὐτῷ ἀπλή διανοίᾳ.

⁵ Max., *Schol. In Dion. Areop. Cael. hier.* 1.2, M 4.32A,B: νόες καλοῦσι καὶ οἱ παρ' Ἑλλησι φιλόσοφοι τὰς νοεράς, ἧτοι ἀγγελικὰς δυνάμεις· ἐπειδὴ τὸ πᾶν νοῦς ἐστὶν ἕκαστος αὐτῶν, καὶ τὴν οὐσίαν ἅπασαν νοῦν ζῶντα εἰς τὸ εἶδος τὸ ἑαυτῶν οὐσιωμένον ἔχει.

⁶ Euseb., *Vita Const.* 4.19, M 20.1168A: ἐπὶ τὸν οὐράνιον βασιλέα τοὺς τῆς διανοίας παραπέμποντας ὀφθαλμούς.

⁷ *I Tm* 6,16: ὁ μόνος ἔχων ἀθανασίαν, φῶς οἰκῶν ἀπρόσιτον, ὃν εἶδεν οὐδεὶς ἀνθρώπων οὐδὲ ἰδεῖν δύναται. *Athenagoras. Legatio and De resurrectione*, éd. W. R. Schoedel, Oxford, Clarendon Press, 1972, p. 10: πάντα γὰρ ὁ θεός ἐστὶν αὐτὸς αὐτῷ, φῶς ἀπρόσιτον, κόσμος τέλειος, πνεῦμα, δύναμις, λόγος. Gr. Naz., *De filio orat.* 30, 13.6, M 36.120: τῷ μόνῳ ἔχοντι ἀθανασίαν, φῶς οἰκοῦντι ἀπρόσιτον. id., *orat.* 44.3, M 36.609B: φῶς ἦν ἀπρόσιτον καὶ ἀδιάδοχον, ὁ θεός, οὔτε ἀρξάμενον, οὔτε παυσόμενον, οὔτε μετρούμενον, ἀεὶλαμπές, τριλαμπές, ὀλίγοις ὅσον ἐστὶ θεωρούμενον. Chrys., *in*

ἐσμὲν ἄτερ τῆς αὐτοῦ θεαρχίας⁹. Οὐδὲν ὄλως ἐστὶ τὸ ζητούμενον τοῦτο δῶρον πρὸς τὴν αὐτοῦ μακαριότητα. Προσεγγίσατε, ὦ φίλοι ἀρετῆς, πρὸς τὴν αὐτὴν ἐκείνην ἔφεσιν. Μάθετε ὡς γλυκὴ Θεοῦ φῶς. Οὐκ ἄξια τὰ νῦν θαυμαζόμενα πρὸς τὴν μακαρίαν ἐκείνην λῆξιν.

1.11. [Id. 202,10-19] Μόνον οικειωθῶμεν αὐτῷ δι' ἀγάπης καὶ ληψόμεθα παρ' αὐτοῦ τὴν ἐξ ἀβύσσου ἄβυσσον πηγάζουσαν σοφίαν, ἵνα δυνηθῶμεν διὰ τῆς χάριτος τοῦ κυρίου ἡμῶν Ἰησοῦ Χριστοῦ ποταμοὺς ἀναβλῦσαι ὕδατος ζῶντος.¹⁰ Ὅπως θαυμάσας τοῦ Δημιουργοῦ τὴν τοσαύτην σοφίαν ὑμνήσης αὐτοῦ τὴν εἰς ἡμᾶς μεγάλην φιλανθρωπίαν.¹¹ Τί θαυμάζειν δεῖ χρυσοκόραλλον εἶδος; Θαυμάζειν δὲ δεῖ πλέον τὸ ἀπερίγραπτον κάλλος. Ὅμως καὶ τὸν πόθον ὑμῶν πληρώσω, ἵνα τοσοῦτον ἐρᾶν ἀξιωθῆτε μεθ' ὑμνωδίας θεολογεῖν τὴν ὑπεράγαθον τοῦ Θεοῦ ἀγαθότητα.¹²

1.34. [Id. 207,30-37] ὦ σοφίας Θεοῦ ἀνέκφραστα μυστήρια! ὦ πλούσια δωρεαὶ τοῖς ἡγαπηκόσι τὸν Κύριον! ὦ βάθος πλούτου καὶ σοφίας καὶ γνώσεως μυστηρίων!¹³ Εἰ τὰ

Epist. I ad Timoth. or. 18, M 62.595: ἐνώπιον τοῦ Θεοῦ τοῦ ζωοποιούντος τὰ πάντα, καὶ Κυρίου Ἰησοῦ Χριστοῦ ... ὁ μακάριος καὶ μόνος δυνάστης, ὁ βασιλεὺς τῶν βασιλευόντων, καὶ Κύριος τῶν κυριευόντων, ὁ μόνος ἔχων ἀθανασίαν, φῶς οἰκῶν ἀπρόσιτον, ὃν εἶδεν οὐδεὶς ἀνθρώπων, οὐδὲ ἰδεῖν δύναται, ὃ τιμὴ καὶ κράτος αἰώνιον, Ἀμήν. id. orat. 18.1, M 62.597: ἵνα τὸ ἀκατάληπτον τῆς θείας φύσεως παραστήση, φῶς οἰκεῖν αὐτὸν εἶπεν ἀπρόσιτον.

⁸ *Jn* 1,9: Ἦν τὸ φῶς τὸ ἀληθινόν, ὃ φωτίζει πάντα ἄνθρωπον, ἐρχόμενον εἰς τὸν κόσμον. Orig., *Contra Celsum* 6,5,6, M 11.1296B. Basil., *De spiritu sancto*, 18,47,14, M 32.153B: Ἐν τῷ φωτί σου ὁμώμεθα φῶς· τουτέστιν, ἐν τῷ φωτισμῷ τοῦ Πνεύματος, φῶς τὸ ἀληθινόν, ὃ φωτίζει πάντα ἄνθρωπον ἐρχόμενον εἰς τὸν κόσμον. Gr. Naz., *De spiritu sancto* orat. 31,3,9-15, M 36.136: Ἦν τὸ φῶς τὸ ἀληθινόν, ὃ φωτίζει πάντα ἄνθρωπον ἐρχόμενον εἰς τὸν κόσμον, ὁ πατήρ. Ἦν τὸ φῶς τὸ ἀληθινόν, ὃ φωτίζει πάντα ἄνθρωπον ἐρχόμενον εἰς τὸν κόσμον, ὁ υἱός. Ἦν τὸ φῶς τὸ ἀληθινόν, ὃ φωτίζει πάντα ἄνθρωπον ἐρχόμενον εἰς τὸν κόσμον, ὁ ἄλλος παράκλητος. Ἦν, καὶ ἦν, καὶ ἦν· ἀλλ' ἐν ἦν. φῶς, καὶ φῶς, καὶ φῶς· ἀλλ' ἐν φῶς, εἷς θεός. Chrys., *Homil. 7 in Jo.*, M 59,61. Athanas., *Epist. I ad Serap.* 19, M 26,573D.

⁹ Gr. Nyss., *in Jo hom. 1.3*, Godhead p. 99.14: τὸν λόγον ... ὡς ἓνα δηλονότι τῆς τρισυποστάτου καὶ μιᾶς θεαρχίας. Dion. Areop., *De cæl. hier.* 2.1, M 3.137A.

¹⁰ *Jn* 7,38: ὁ πιστεύων εἰς ἐμέ, καθὼς εἶπεν ἡ γραφή, ποταμοὶ ἐκ τῆς κοιλίας αὐτοῦ ρέουσιν ὕδατος ζῶντος. Gr. Nyss., *In Cant. canticorum*, hom. 9, M 44.977B: νῦν μὲν τῆς προφητείας λεγούσης ἐκ προσώπου τοῦ θεοῦ ὅτι Ἐμὲ ἐγκατέλιπον πηγὴν ὕδατος ζῶντος, πάλιν δὲ τοῦ Κυρίου πρὸς τὴν Σαμαρεῖτιν εἰπόντος *Εἰ ἤδεις τὴν δωρεὰν τοῦ θεοῦ καὶ τίς ἐστὶν ὁ λέγων σοι· Δός μοι πιεῖν, σὺ ἂν ἤτησας αὐτὸν καὶ ἔδωκεν ἂν σοι ὕδωρ ζῶν· καὶ Εἰ τις διψᾷ, ἐρχέσθω πρὸς με καὶ πινέτω· ὁ γὰρ πιστεύων εἰς ἐμέ, καθὼς εἶπεν ἡ Γραφή, ποταμοὶ ἐκ τῆς κοιλίας αὐτοῦ ρέουσιν ὕδατος ζῶντος.* Τοῦτο δὲ ἔλεγε περὶ τοῦ Πνεύματος οὗ ἡμελλόν λαμβάνειν οἱ πιστεύοντες εἰς αὐτόν.

¹¹ Chrys., *Hom. 78.4 in Mt.*, M 58.756A: φιλόανθρωπος γὰρ ἐστὶν ὁ δεσπότης, καὶ τῆς ἀγαθότητος αὐτοῦ τὸ δῶρον γίνεται. Clem. Alex., *Protr.* 10, M 8.204B: Ὁ γὰρ θεὸς ἐκ πολλῆς τῆς φιλανθρωπίας ἀντέχεται τοῦ ἀνθρώπου.

¹² Dion. Areop., *De div. nom.* 2.4, M 3.641A: οἷον ἐπὶ τῆς ἐνώσεως τῆς θείας ἦτοι τῆς ὑπερουσιότητος, ἠνωμένον μὲν ἔστι τῇ ἐναρχικῇ Τριάδι, καὶ κοινὸν ἢ ὑπερούσιος ὑπαρξίς, ἢ ὑπέρθεος θεότης, ἢ ὑπεράγαθος ἀγαθότης.

¹³ *Épître aux Romains* 11:33: ὦ βάθος πλούτου καὶ σοφίας καὶ γνώσεως Θεοῦ· ὡς ἀνεξερεύνητα τὰ κρίματα αὐτοῦ καὶ ἀνεξιχνίαστοι αἱ ὁδοὶ αὐτοῦ. Clem. Alex., *Strom.*, 5,12,80,4, M 9.120A: βεβαῶν

παρόντα τοιαῦτα θαυμαστά καὶ ἐξαίσια, ποταπὰ τὰ αἰώνια, ἃ οὐδεὶς νοῦς ἐξηγήσασθαι δύναται; Εἰ τὸ ἔνυλον ἔργον ἀρρήτῳ τινὶ λόγῳ τοιοῦτον ἡμῖν φαίνεται, ποταπὰ τὰ ἀκήρατα ἀγαθὰ καὶ ἀνεξιχνίαστα κάλλη, ἃ οὐδεὶς ἰσχύει θεάσασθαι;

1.35. [Id. 207,37-208,3] Ὑμῶν καὶ προσκυνῶ καὶ δοξολογῶ σε *Τριάς ὑπερούσιε καὶ ὑπεράγαθε καὶ ὑπέρθεε*.¹⁴ Τίς ἐξειπεῖν δύναται πρὸς ὕμνον τῶν θαυμασίων σου; Ὡς ἐμεγαλύνθη τὰ ἔργα σου, *Κύριε· πάντα ἐν σοφίᾳ ἐποίησας*.¹⁵

Τοῦ αὐτοῦ Στεφάνου εἰς τὸ *Κατ' ἐνέργειαν·* πρᾶξις σὺν Θεῷ δευτέρα.

2.1. [Id. 213,9-27] *Πᾶσα δόσις ἀγαθὴ καὶ πᾶν δῶρημα τέλειον, ἄνωθὲν ἐστὶ καταβαῖνον ἀπὸ τοῦ πατρὸς τῶν φώτων*.¹⁶ *Οὐκοῦν Ἰησοῦν ἐπικαλεσάμενοι, τὸ πατρικὸν φῶς, τὸ ὄν τὸ ἀληθινόν, φωτὸς ἀπαύγασμα*¹⁷ φωτίζον πάντα ἄνθρωπον ἐρχόμενον εἰς τὸν κόσμον.¹⁸ *Αὐτὸς γὰρ ἐστὶ τὸ φῶς καὶ ἡ ἀλήθεια καὶ ἡ ζωὴ, ὁ θεαρχικὸς τοῦ Θεοῦ Λόγος, ἡ σοφία καὶ δύναμις,*¹⁹ *ἡ παντοποιὸς καὶ ἄρρητος τοῦ Θεοῦ σοφία,*²⁰ *ὁ ζῶν*

ταῦτα ἐν τῇ πρὸς Κορινθίους ἐπιστολῇ ὁ Ἀπόστολος ἀναφανδὸν εἶρηκεν· *Σοφίαν δὲ λαλοῦμεν ἐν τοῖς τελείοις, σοφίαν δὲ οὐ τοῦ αἰῶνος τούτου τῶν καταργουμένων· ἀλλὰ λαλοῦμεν θεοῦ σοφίαν ἐν μυστηρίῳ, τὴν ἀποκεκρυμμένην*. Théodoret. *De providentia*, or. 10, M 83.740.

¹⁴ *Bénédiction des eaux à la Théoph., Prière de Sophrone*: Τριάς ὑπερούσιε, ὑπεράγαθε, ὑπέρθεε, παντοδύναμε, παντεπίσκοπε, ἄορατε, ἀκατάληπτε. Δημιουργε τῶν νοερῶν οὐσιῶν καὶ τῶν λογικῶν φύσεων, ἡ ἔμφυτος ἀγαθότης, τὸ Φῶς τὸ ἀπρόσιτον, τὸ φωτίζον πάντα ἄνθρωπον ἐρχόμενον εἰς τὸν κόσμον, λάμψον κάμοι τῷ ἀναξίῳ δούλῳ σου, φωτίσον μου τῆς διανοίας τὰ ὄμματα, ὅπως ἀνυμνήσω τολμήσω τὴν ἄμετρον εὐεργεσίαν καὶ δύναμιν...

¹⁵ *Ps. 104,24*: Ὡς ἐμεγαλύνθη τὰ ἔργα σου, Κύριε· πάντα ἐν σοφίᾳ ἐποίησας.

¹⁶ *Épître de St Jacques*, 1,17: Πᾶσα δόσις ἀγαθὴ καὶ πᾶν δῶρημα τέλειον ἄνωθὲν ἐστίν, καταβαῖνον ἀπὸ τοῦ πατρὸς τῶν φώτων. Dion. Areop., *De cæl. hier.* 1.1, M 3.120B. Athanas., *Epist. II ad Castorem*, 8D, M 28.905. Basil., *Liturgie*. Chrys., *Orat. in Ps. 118*, M 55.683. Chrys., *Liturgie*: [ὁ Ἱερεὺς] ὅτι πᾶσα δόσις ἀγαθὴ καὶ πᾶν δῶρημα τέλειον, ἄνωθὲν ἐστὶ καταβαῖνον ἐκ σοῦ τοῦ Πατρὸς τῶν φώτων.

¹⁷ Orig., *Hom. 9.4 in Jer.*, M 13.337A: τὸ ἀπαύγασμα τῆς δόξης οὐχὶ ἅπαξ γεγέννηται καὶ οὐχὶ γεννᾶται· ἀλλὰ ὅσον ἐστὶν τὸ φῶς ποιητικὸν τοῦ ἀπαυγάσματος ἐπὶ τοσοῦτον γεννᾶται τὸ ἀπαύγασμα τῆς δόξης τοῦ θεοῦ. Gr. Nyss., *Contra Eun.* 8, M 45.775B: οὕτως ὅλη ἡ δόξα ἣτις ἐστίν, ὁ Πατήρ, τῷ ἐξ ἑαυτῆς ἀπαυγάσματος, τοῦτ' ἐστὶ τῷ ἀληθινῷ φωτὶ πανταχόθεν περιαιγάζεται ... οὕτω τὸ συναφές τε καὶ ἄδιον τῆς ἐκ τοῦ Πατρὸς ὑπάρξεως τοῦ Μονογενοῦς παραδιδούς ὁ Ἀπόστολος, ἀπαύγασμα δόξης τὸν Υἱὸν κατωνόμασε.

¹⁸ Dion. Areop., *De cæl. hier.*, 1.2, M 3.121A: Οὐκοῦν Ἰησοῦν ἐπικαλεσάμενοι, τὸ πατρικὸν φῶς, τὸ ὄν τὸ ἀληθινόν, ὃ φωτίζει πάντα ἄνθρωπον ἐρχόμενον εἰς τὸν κόσμον ... δι' οὗ τὴν πρὸς τὸν ἀρχίφωτον πατέρα προσαγωγὴν ἐσχήκαμεν.

¹⁹ Clem. Alex., *Strom.* 5.13, M 9.125A: θεόδοτος ... ἡ σοφία, δύναμις οὕσα τοῦ πατρὸς. ib. 1.4, M 8.717A: τὴν σοφίαν τοῦ θεοῦ 'πολυμερῶς καὶ πολυτρόπως' διὰ τέχνης, διὰ ἐπιστήμης, διὰ πίστεως, διὰ προφητείας, τὴν ἑαυτῆς ἐνδεικνυμένην δύναμιν εἰς τὴν ἡμετέραν εὐεργεσίαν. Gr. Nyss., *Contra Eun.* 3, M 45.612D: Υἱὸς δὲ καὶ Δεξιὰ, καὶ Μονογενής, καὶ Λόγος, καὶ Σοφία, καὶ Δύναμις, καὶ τὰ τοιαῦτα πάντα ὅσα πρὸς τι λέγεται, καθάπερ ἐν συζυγίᾳ τινὶ σχετικῇ τῷ Πατρὶ πάντων συννομαζόμενος λέγεται.

²⁰ Orig., *Exp. in Pr.* 9:1, M 17.185B: τὴν σοφίαν ... διςσῶς ἐπιλαβεῖν, τὴν ἐκ πνεύματος ἀγίου ... δι' ἧς ... ἡ ἐπίγνωσις τοῦ θεοῦ τῷ κόσμῳ ἐγνωρίσθη· ὡσαύτως δὲ καὶ τὸν ἐνυπόστατον υἱὸν τοῦ θεοῦ. id.

*Λόγος τοῦ Πατρὸς, θεὸς ὢν καὶ πρὸς τὸν Θεὸν αἰεὶ ὢν,*²¹ ὁ δι' οὗ τὰ πάντα ἐγένετο,²² ὁ φῶς τοῖς πιστοῖς παρέχων πρὸς τὸ εἰδέναι τὴν τῶν ὄντων γνῶσιν καὶ ὑμνήσαι τὰ μεγαλεῖα τοῦ παντοκράτορος Θεοῦ. Αὐτὸς γάρ ἐστι δοτὴρ καὶ σωτὴρ τοῦ κόσμου. Αὐτὸς φωτίσειεν ἡμῶν τὸν νοῦν καὶ τὰς καρδίας²³ καὶ ἀναλάμψαι ἡμῖν λαμπάδα, καταλάμπουσιν ἡμῖν τὰ ἀνεξερεύνητα βάθη τῆς αὐτοῦ γνώσεως καὶ σοφίας πρὸς τὴν ἀληθῆ καὶ ἀπλανῆ γνῶσιν τοῦ γινώσκειν σε τὸν μόνον ζῶντα ἀληθινὸν Θεὸν ἡμῶν, τὴν ἀγίαν καὶ ὁμοούσιον Τριάδα καὶ πᾶν ζωοπάροχον *Πατέρα καὶ Υἱὸν καὶ Ἅγιον Πνεῦμα,*²⁴ νῦν καὶ αἰεὶ καὶ εἰς τοὺς αἰῶνας τῶν αἰώνων, ἀμήν.

2.4. [Id. 214,8-15] Ἄλλ', ὃ ἱερὰ ποιμνὴ καὶ σοφίας ἐρασταί, οἱ τοῦτο εὐρεῖν βουλόμενοι τῇ πρὸς τὸν Θεὸν ἐννοήσει διὰ τῆς τῶν ἀρετῶν²⁵ ἐπικοσμήσεως ἐν ἑαυτοῖς ἀγωνιζέσθωσαν²⁶, καὶ τῇ πολλῇ ροῇ τῶν δακρῶν²⁷ ἑαυτοὺς ἀρδευέτωσαν, ἐν

adnot. in Dt. 16:19f., M 17.28B: Χριστός ... ἐστίν ... τοῦ θεοῦ πατρὸς ἡμῶν ἢ ἀνωτάτω καὶ ἐνυπόστατος σοφία καὶ λόγος. Clem. Alex., *Strom.* 7.2, M 9.412A: αὕτη ... ἦν ἡ σοφία 'ἢ προσέχαιρεν' ὁ παντοκράτωρ θεὸς ... λόγος τοῦ πατρὸς, καὶ σοφία αὐτοῦ. Cf. Θεὸν τὸν ἄρρητον, Ideler, 231,8; πηλικός ἐστίν ἡ τῆς σοφίας ἄβυσσος, 232,5; διὰ τῆς ἀρρήτου αὐτοῦ σοφίας πάντα παρήχηθη, 242,6.

²¹ *Jn* 1,1-4: Ἐν ἀρχῇ ἦν ὁ λόγος, καὶ ὁ λόγος ἦν πρὸς τὸν θεόν, καὶ θεὸς ἦν ὁ λόγος. Οὗτος ἦν ἐν ἀρχῇ πρὸς τὸν θεόν. πάντα δι' αὐτοῦ ἐγένετο, καὶ χωρὶς αὐτοῦ ἐγένετο οὐδὲ ἓν ὃ γέγονεν. ἐν αὐτῷ ζωὴ ἦν. Gr. Nyss., *Contra Eun.* 8, M 45.896C,D: ὁ μακάριος, φησίν, Ἰωάννης ἐν ἀρχῇ εἶναι τὸν λόγον φήσας καὶ τοῦτον ζῶν προσειπών, εἶτα τὴν ζῶν φῶς ὀνομάσας, μικρὸν ὑποβάς Καὶ ὁ λόγος σὰρξ ἐγένετο, φησίν. Εἰ τοίνυν τὸ μὲν φῶς ἐστίν ἡ ζωὴ, ἡ δὲ ζωὴ ὁ λόγος, ὁ δὲ λόγος σὰρξ ἐγένετο, αὐτόθεν γίνεται φανερόν ὅτι τὸ φῶς ἐν σαρκὶ γέγονεν. Gr. Naz., *De seipso orat.* 36, M 36.265: Ἐμοῦ τε γὰρ κρέμασθε, καὶ ἀλλήλων εἰς τοῦ ἐνός ἐχόμενοι, καὶ Θεοῦ πάντες, ἐξ οὗ τὰ πάντα, καὶ εἰς ὃν τὰ πάντα. Ὡς τῆς θαυμασίας ἀλύσεως, ἦν πλήκει τὸ Πνεῦμα τὸ ἅγιον δεσμοῖς ἀλύτοις συνηρητισμένην!

²² *Symbolae de la foi*: δι' οὗ τὰ πάντα ἐγένετο.

²³ Orig., *Comm. In Evang. Ioannis*, M 11.68B: ὁ δὲ Σωτὴρ, ἐλλάμπων τοῖς λογικοῖς καὶ ἡγεμονικοῖς, ἵνα αὐτῶν ὁ νοῦς τὰ ἴδια ὀρατὰ βλέπῃ, τοῦ νοητοῦ κόσμου ἐστὶ φῶς. 68C: ὁ δὲ Σωτὴρ φῶς ὢν τοῦ κόσμου φωτίζει οὐ σώματα, ἀλλὰ ἀσώματῳ δυνάμει τὸν ἀσώματον νοῦν, ἵνα ὡς ὑπὸ ἡλίου ἕκαστος ἡμῶν φωτιζόμενος καὶ τὰ ἄλλα δυναθῆ βλέπειν νοητά. id., *Exhort. ad martyr.* 47, M 11.629A: Τί τοίνυν ὀκνοῦμεν καὶ διστάζομεν ἀποθέμενοι τὸ ἐμποδίζον φθαρτὸν σῶμα, βαρῦνον ψυχὴν, βριθὸν νοῦν πολυφρόντιδα, γεῶδες σκῆνος, ἀπολυθῆναι τῶν δεσμῶν, καὶ ἀναλῦσαι ἀπὸ τῶν μετὰ σαρκὸς καὶ αἵματος κυμάτων, ἵνα σὺν Χριστῷ Ἰησοῦ, τὴν οἰκείαν τῇ μακαριότητι ἀνάπαυσιν ἀναπαυσόμεθα: τὸν αὐτὸν ὅλως δι' ὅλων ἔμψυχον Λόγον θεωροῦντες, καὶ ἀπ' αὐτοῦ τρεφόμενοι, καὶ τὴν αὐτῷ ποικιλοτάτην σοφίαν καταλαμβάνοντες, καὶ λυπούμενοι ὑπὸ τῆς αὐτοαληθείας, καὶ (632A) ἐν φωτὶ τῷ ἀληθεῖ καὶ ἀλήκτῳ τῆς γνώσεως τὸν νοῦν καταλαμπόμενοι, πρὸς τὴν θεάν τῶν δι' ἐκείνου τοῦ φωτὸς θεωρεῖσθαι πεφυκότων, ὑπὸ ὀφθαλμῶν φωτιζομένων ὑπὸ τῆς τοῦ Κυρίου ἐντολῆς.

²⁴ Basil., *De spiritu sancto*, 18,47,1-7,17-19, M 32.153A,B: Ἐπειδὴ δὲ διὰ δυνάμεως φωτιστικῆς τῷ κάλλει τῆς τοῦ Θεοῦ τοῦ ἀοράτου εἰκόνος ἐνατενίζομεν, καὶ δι' αὐτῆς ἀναγόμεθα ἐπὶ τὸ ὑπέρκalon τοῦ ἀρχετύπου θέαμα, αὐτοῦ που πάρεστιν ἀχωρίστως τὸ τῆς γνώσεως Πνεῦμα, τὴν ἐποπτικὴν τῆς εἰκόνος δυνάμιν ἐν ἑαυτῷ παρεχόμενον τοῖς τῆς ἀληθείας φιλοθεάμοισιν, οὐκ ἔξωθεν τὴν δεῖξιν ποιούμενον, ἀλλ' ἐν ἑαυτῷ εἰσάγον πρὸς τὴν ἐπίγνωσιν ... (17-19) Ἡ τοίνυν ὁδὸς τῆς θεογνωσίας ἐστίν ἀπὸ ἐνός Πνεύματος, διὰ τοῦ ἐνός Υἱοῦ, ἐπὶ τὸν ἕνα Πατέρα.

²⁵ Orig., *Jo.* 32.15, M 14.780D: ὁ τέλειος καὶ πάσας ἔχων τὰς ἀρετὰς τελείαν ἔχει τὴν σοφίαν καὶ ... τὴν σωφροσύνην ... καὶ τὴν εὐσέβειαν καὶ τὰς λοιπὰς.

²⁶ Orig., *Orat.* 11.2, M 11.449A: οἱ ἐν βίῳ ἀγωνιζόμενοι.

²⁷ Athan., *De virgin.* 17, M 28.272B: μεγάλη γὰρ ἀρετὴ ἐστὶ τὸ δάκρυ, μέγα κατόρθωμα, μεγάλα ἁμαρτία ... διὰ δακρῶν ἀπαλείφονται. Just. *dial.* 90,5, M 6.692A: τίς γὰρ οὐκ ἐπίσταται ὑμῶν, ὅτι μάλιστα μὲν ἢ μετὰ οἴκτου καὶ δακρῶν εὐχὴ μειλίσσεται τὸν θεόν; Chrys., *Anna* 3.1, M 54.721E: τὸ

πίστει καὶ ταπεινοφροσύνη²⁸ καὶ ἀγάπη Θεοῦ στηριζόμενοι, ἵνα μηδὲν τῶν ἐνύλων ὑμᾶς ξενίσῃ ἢ θαυμάσῃ, πλὴν τοῦ ἀγαπήσαντος ἡμᾶς Θεοῦ.

2.20. [Id. 219,1-14] Μέγα ἐν τούτοις μυστήριον εἴληφεν καὶ παράδοξα θεωρῶν γινόμενα. Θαυμάσας ὑμνήσει Θεὸν παντοκράτορα πατέρα, ἅμα τῆς παντοδυνάμου αὐτοῦ σοφίας, σὺν τῷ ζωοποιῷ πνεύματι. Αὐτὸς γὰρ ὁ παντέλειος καὶ ὑπεράρχιος τοῦ Θεοῦ Λόγος, ἐνὶ φέρων τὰ πάντα τῷ ῥήματι τῆς δυνάμεως αὐτοῦ, φωτίσειεν ἡμῶν τὸν νοῦν καὶ τὰς καρδίας καὶ διὰ τῆς ἀγάπης αὐτοῦ οικειωθῆναι καὶ ἐνωθῆναι τῷ ἀληθινῷ φωτὶ τῆς αὐτοῦ θεογνωσίας, ἵνα διὰ τοῦ ἀληθινοῦ φωτὸς καταυγαζόμενοι δυνηθῆμεν τὴν τῶν ὄντων γνῶσιν καταλαβεῖν, καὶ θεάσασθαι τὰ ἔργα τοῦ Θεοῦ τῶν ὄλων, ὅπως *δοξάζεται τὸ πάντιμον καὶ μεγαλοπρεπὲς ἅγιον ὄνομα τοῦ Πατρὸς καὶ τοῦ Υἱοῦ καὶ τοῦ Ἁγίου Πνεύματος, νῦν καὶ αἰεὶ καὶ εἰς τοὺς αἰῶνας τῶν αἰώνων. Ἀμήν.*²⁹

Τοῦ αὐτοῦ Στεφάνου φιλοσόφου εἰς τὸ *Κατ' ἐνέργειαν τῆς θείας τέχνης*: πρᾶξις σὺν Θεῷ τρίτη.

3.1. [Id. 219,18-220,6] Τίς μακάριος καὶ συνήσει τὰ κρίματα³⁰ τοῦ παντοκράτορος Θεοῦ; Τίς σοφὸς καὶ συνετὸς καὶ διηγήσεται τὴν ὑπεράβυσσον σοφίαν τοῦ Δημιουργοῦ τῶν ὄλων; Τίς εὐμοῖρος καὶ κατανοήσει τὰς δυναστείας τοῦ παντεπόπτου καὶ καθολικοῦ Θεοῦ καὶ δοξάσειε τὴν ὑπεράγαθον αὐτοῦ ἀγαθότητα³¹; Ἐμοὶ μὲν ῥαδίως καὶ ἀπτῶτως καὶ εὐχερῶς ὁμιλεῖν εὐδελόν ἐστιν καὶ τὰς γρίφους ἐννοίας τῶν προγενεστέρων ἐμφανῶς τὰς πεύσεις ποιοῦμαι συνεργοῦντος τοῦ παντοκράτορος

φυτὸν τῆς εὐχῆς αἱ πηγαὶ τῶν δακρύων ποτίζουσαι. id. *hom. 6.5 in Mt*, M 57.68: καὶ πάντων τῶν ὀρωμένων ὑπερορῶν λοιπόν, ὁ τοιοῦτος ἐν κατανύξει μένει διηνεκεῖ, πηγὰς συνεχεῖς ἀφίεις δακρύων ... οὐδὲν γὰρ οὕτως συγκολλᾷ καὶ ἐνοῖ τῷ θεῷ, ὡς τὰ τοιαῦτα δάκρυα.

²⁸ Athan., *Exp. Ps.* 85:1, M 27.373C: μέγα ... ἐφόδιον πρὸς τὸ εὐχόμενον ἐπακούεσθαι ἢ ταπεινοφροσύνη.

²⁹ Chrys., *Liturgie*: [ὁ Ἱερεὺς] ἵνα καὶ αὐτοὶ σὺν ἡμῖν δοξάζωσι τὸ πάντιμον καὶ μεγαλοπρεπὲς ὄνομα Σου, τοῦ Πατρὸς καὶ τοῦ Υἱοῦ καὶ τοῦ Ἁγίου Πνεύματος, νῦν καὶ αἰεὶ καὶ εἰς τοὺς αἰῶνας τῶν αἰώνων. Ἀμήν.

³⁰ Pss. Sal. 18.3: τὰ κρίματά σου ἐπὶ πᾶσαν τὴν γῆν μετ' ἐλέου. Gr. Nyss., *Contra Eun.* 3, M 45.601D: τὸν ἰδιώτην τῷ λόγῳ Παῦλον διδάσκαλον τῶν ὑπὲρ γνῶσιν μυστηρίων ποιοῦμενοι· ὃς τοσοῦτον ἀπέχει τοῦ τῆν θείαν φύσιν ἐντὸς τῆς ἀνθρωπίνης περινοίας οἶεσθαι, ὡς καὶ τὰ κρίματα τοῦ Θεοῦ ἀνεξερευνήτα λέγειν, καὶ τὰς ὁδοὺς ἀνεξιχνιάστους, καὶ τὰ τοῖς ἀγαπῶσιν αὐτὸν ὑπὲρ τῶν ἐν τῷ βίῳ τῷδε κατορθωθέντων ἐπιγγελέμενα, ὑπὲρ κατάληψιν εἶναι διίσχυρίζεσθαι· ὡς μήτε ὀφθαλμῷ λαβεῖν, μήτε ἀκοῇ παραδέξασθαι, μήτε καρδίαν χωρῆσαι δυνατὸν εἶναι.

³¹ Dion. Areop., *De div. nom.* 4.1, M 3.693B: τὴν θεαρχικὴν ὑπαρξιν, ἀγαθότητα λέγοντες. Gr. Nyss., *Vita Mos.* 7, M 44.301A: τὸ πρῶτον καὶ κυρίως ἀγαθόν, οὗ ἡ φύσις ἀγαθότης ἐστίν, αὐτὸ τὸ θεῖον. Chrys., *Hom.* 13.6 *in Mt*, M 57.215: ἡ δὲ ἄπειρος ἀγαθότης, ὁ θεός, ἡ ἄφατος φιλανθρωπία. id. *hom.* 78.4 *in Mt*, M 58.715: φιλόανθρωπος γὰρ ἐστὶν ὁ δεσπότης, καὶ τῆς ἀγαθότητος αὐτοῦ τὸ δῶρον γίνεται.

Θεοῦ. Ὑμῖν δὲ ἔοικεν ὡς ἐχέφροσιν ἀναχαιτίσασθαι καὶ σφετερίζειν τὰ ὑπὸ πολλῶν σοφῶν ἰδρυμένα καὶ κατανησῆσαι τὰς ἐκείνων ἐννοίας, καὶ οὕτως πρὸς τὸ βραχύτατον μου πόνημα ἀπιέναι αἰτούμενοι τὸν μόνον ἀληθινὸν Θεὸν ἡμῶν, ἵνα ὑμῶν φωτίση τὸ τῆς διανοίας ὄμμα³² καὶ καταυγάσῃ τῷ ἄυλφ αὐτοῦ φωτὶ τὰς καρδίας ὑμῶν πρὸς τὸ εἰδέναι τὰς δυναστείας τοῦ παντοκράτορος Θεοῦ καὶ τῆς δόξης αὐτοῦ, ἧς γένοιτο ἡμᾶς ἐν καθαρᾷ ἐπιτυχεῖν καρδία καὶ ὑμνεῖν τὰ μεγαλεῖα τοῦ Θεοῦ τῶν ὄλων καὶ *δοξάζειν τὸ πανάγιον καὶ μεγαλοπρεπὲς ὄνομα τοῦ Πατρὸς καὶ τοῦ Υἱοῦ καὶ τοῦ Ἁγίου Πνεύματος, νῦν καὶ ἀεὶ καὶ εἰς τοὺς ἀπεράντους αἰῶνας τῶν αἰώνων, ἀμήν.*

3.15. [Id. 223,5-19] Εἰ γὰρ ποιήσεις τὰ σώματα ἀσώματα καὶ τὰ ἀσώματα σώματα, μεγάλως καὶ εὐπαραγώγως καὶ θαυμασίως ἐργάση. Ἐπιτευξόμενος δηλονότι τῆς ἐφέσεως δι' ὧν στενούμενος τετραστοίχῳ³³ σώματι τριαδικῆ οἰκονομίας δωδεκαζωδιακῆ τροπῶν κινήσει. Ἐπτὰ δῆτ' ἀστέρων λεγομένων πλανητῶν σώμασί τε καὶ εἶδεσι καὶ θεωρίαις μοναδικῆ τινὲς ἐνιαίᾳ ἄκρᾳ ἐνώσει δοξάσεις τὸν ἐν τριάδι καὶ μονάδι Υἱὸν Λόγον Θεόν, *τὸν ἐκ τεσσάρων στοιχείων τὸν ἅπαντα κόσμον τελεσιουργήσαντα* πανσόφως καὶ εὐπρεπῶς, *καὶ τετράσι τροπαῖς κοσμήσαντα τὸν κύκλον τοῦ ἐνιαυτοῦ,*³⁴ καὶ μετὰ τοὺς ἑπτὰ αἰῶνας εἰσάξοντα τοὺς ἀξίως πολιτευσαμένους εἰς τὴν αὐτοῦ κατάπαυσιν³⁵ ἐν τῇ τῶν οὐρανῶν ἀλήκτω βασιλείᾳ, ὑμνοῦντας τὸ τῆς Τριάδος ἐνιαῖον καὶ ἀκατάληπτον φῶς, ἐν Πατρὶ καὶ Υἱῷ καὶ Ἁγίῳ Πνεύματι, *νῦν καὶ ἀεὶ καὶ εἰς τοὺς αἰῶνας τῶν αἰώνων, ἀμήν.*

Τοῦ αὐτοῦ Στεφάνου φιλοσόφου· πρᾶξις σὺν Θεῷ τετάρτη.

4.29. [Id. 231,1-5] Καὶ διὰ ταύτης μᾶλλον τῆς ἀρετῆς διαπεράσαντες ἔλθωμεν ἐπὶ τὸ ἡδὺ τοῦ Θεοῦ φῶς καὶ μάθωμεν τὴν ἐξ αὐτοῦ τολαύτην τῆς χάριτος σοφίαν ἐκπλήττουσαν καὶ ἐκλάμπουσαν ἐπὶ τοὺς εἰς αὐτὸν πεποιθότας, τὸν Ἰησοῦν Θεὸν ἡμῶν.

³² Chrys., *Orat. 54 in Mt.*, M 58.536: Διὰ τοῦτο καὶ ἐνδιατρίβει (ὁ Ἰησοῦς) τοῖς δυσχερέσι, καὶ ἐμπλατύνει τὸν λόγον, ἵνα διανοίξῃ αὐτῶν (τῶν μαθητῶν) τὴν διάνοιαν, καὶ συνῶσι τί ποτέ ἐστι τὸ λεγόμενον. *Bénédiction des eaux à la Théoph., Prière de Sophrone*: φώτισόν μου τῆς διανοίας τὰ ὄμματα.

³³ Gr. Nyss., *Imag.*, M 44.1328B: Συντελέσας γὰρ ὁ Κτίστης τὸν ἀπλοῦν καὶ νοερότατον τῶν ἀοράτων δυνάμεων κόσμον, μεθ' ὃν καὶ τὸν ὑλικὸν τοῦτον καὶ ὀρώμενον, τὸν ἐκ τεσσάρων στοιχείων συγκείμενον.

³⁴ *Bénédiction des eaux à la Théoph., Prière de Sophrone*: Σὺ ἐκ τεσσάρων στοιχείων τὴν κτίσιν συναρμόσας, τέτταρσι καιροῖς τὸν κύκλον τοῦ ἐνιαυτοῦ ἐστεφάνωσας.

³⁵ Basil., *Hist. myst.* 60: μεταστάντας ἐνθάδε πρὸς τὰς ἐκεῖθεν μονὰς καὶ κατάπαυσιν.

Τοῦ αὐτοῦ Στεφάνου φιλοσόφου· πρᾶξις σὺν Θεῷ πέμπτη.

5.1. [Id. 231,8-14] Θεὸν τὸν ἄρρητον, τὸν σοφίας καὶ ἀληθείας πατέρα, τὸν ζωῆς καὶ φωτὸς δοτῆρα, τὸν τῶν ὅλων αἴτιον καὶ πάντων ἐπέκεινα,³⁶ καὶ τὸν ἐξ αὐτοῦ μονογενῆ³⁷ Υἱὸν σὺν τῷ θείῳ τῆς ἀληθείας Πνεύματι, τῷ παρ' αὐτοῦ ἐκπορευομένῳ, ὕμνῳ καὶ δοξολογῳ καὶ εὐχαριστῳ, ἵνα καὶ τὸ μετὰ χειρας τοῦτο ἔκτον σύγγραμμα συνοδηγία τῇ παρ' αὐτοῦ ἐκπεράνω.

5.2. [Id. 231,14-26] Κατὰ δὲ τὸ ἔθος ἡμῶν ἐχέτω τὸ προοίμιον. Γυμνάσια μὲν εἰσὶ τῆς ψυχῆς τὰ μαθήματα ἐκ τῶν ἐνύλων ἡμᾶς ἐπὶ τὰ αὔλα ἀνάγοντα, καὶ ἐκ τῶν συνθέτων ἐπὶ τὰ ἀπλᾶ καὶ ἀσύνθετα ἐνθεαστικῶς ἀγλαΐζοντα· σοφίας γὰρ εἰσὶ νοήματα καὶ φιλοσοφίας πράγματα. Ἄλλ' οὗτος ὁ τρόπος καὶ ταῦτα τὰ μαθήματα, οὗτος ὁ σκοπὸς καὶ αὕτη ἡ πρότασις, ἢ νῦν τὰς θεωρητικὰς ἀποκόπτει ἀκτῖνας καὶ ὁ λόγος τὰς πρακτικὰς ἀποπληροῖ περατώσεις³⁸. Οὗτος ὁ τρόπος, ταῦτα τὰ μαθήματα, μέγας ὁ πλοῦτος τῆς χάριτος, πολλοὶ τῆς ἀρρήτου σοφίας οἱ θησαυροὶ, ἀνεκδιήγητα τὰ χαρίσματα, ποταμοὶ ὕδατος ζῶντος τὰ τοιαῦτα ὕδατα, πηγὴ σοφίας τοῦ Θεοῦ ἢ ἄβυσσος, φῶς καθαρῶτατον τοῦ Ἁγίου Πνεύματος ἢ ἐπιφοίτησις.

5.3. [Id. 231,26-232,3] Οὐδὲν σοφίας ἀνώτερον· δι' αὐτῆς γὰρ ὁ ὑπεράρχιος τοῦ Θεοῦ Λόγος τὰ πάντα ἐδημιούργησε, δι' αὐτῆς τὰς τῶν οὐρανίων νόων εὐπρεπεῖς ἐλλάμψεις ἐκόσμησε, δι' αὐτῆς ὁ νοητὸς παράδεισος εἰς ἀπόλαυσιν τῶν ἀεὶ ζώντων εὐτρέπισται, δι' αὐτῆς τὴν τῶν οὐρανῶν βασιλείαν ἡμῖν προητοίμασε. Πόθεν οὖν ἡμῖν πρὸς τὴν σοφίαν ἢ ἄνοδος; Πῶς αὐτὴν οἰκειωσόμεθα; Πῶς αὐτῆς τὸν ἄφθαρτον χιτῶνα περιβαλλόμεθα; Μόνη τοῦ Θεοῦ ἢ ἀγάπη πρὸς τὸν πόθον αὐτῆς ἔλκει.

5.21. [Id. 237,5-16] Ὡ σοφίας χάρις, ὧ συνέσεως ἔργον, ὧ νοήματος πρᾶγμα, ὧ λόγων συμπλήρωσις, ὧ χαρίσματα παρὰ τοῦ Δημιουργοῦ τῶν ὅλων, ὧ πλούσιαι δωρεαὶ παρὰ τοῦ πατρὸς τῶν φώτων. Τίς οὖν εἰπεῖν δυνήσεται πρὸς ὕμνον τῶν

³⁶ Clem. Alex., *Strom.*, 1.28.177, M 8.924A,B: μικτὴ δὲ φιλοσοφία οὕσα τῇ ἀληθείᾳ ἢ ἀληθῆς διαλεκτικῆ, ἐπισκοποῦσα τὰ πράγματα, καὶ τὰς δυνάμεις καὶ τὰς ἐξουσίας δοκιμάζουσα, ὑπεξαναβαίνει ἐπὶ τὴν πάντων κρατίστην οὐσίαν, τολμᾷ τε ἐπέκεινα ἐπὶ τὸν τῶν ὅλων Θεόν, οὐκ ἐμπειρίαν τῶν θνητῶν, ἀλλ' ἐπιστήμημιν τῶν θείων καὶ οὐρανίων ἐπαγγελιομένην· ἢ συνέπεται καὶ ἢ [περὶ] τῶν ἀνθρωπείων, περὶ τε τοὺς λόγους καὶ τὰς πράξεις, οἰκεία χρῆσις.

³⁷ Clem. Alex., *Strom.* 7.3, M 9.424D: ὁ ... βραβευτής, ὁ μονογενῆς υἱὸς τοῦ θεοῦ. Euseb., *Laud. Const.* 12, M 20.1388C: ὁ τοῦ ... θεοῦ τέλειος λόγος, οἷα μονογενῆς πατρὸς υἱός.

³⁸ Dion. Areop., *De cael. hier.* 10.1, M 3.273A.

*θαυμασίων σου,*³⁹ Δέσποτα; Ποῖον στόμα ἱκανὸν πρὸς ἀξίαν ὑμνήσαι σε, τὸν πάντων δεσπότην καὶ κύριον; Ποῖος νοῦς μεθ' ὑμνωδίας οὐκ ἐκπλαγήσεται, τῶν ζητημάτων σου τὰς εὐκοσμίας θεωρῶν; Τίς μὴ ὑμνήσει τὰ μεγαλεῖα τοῦ Παντοκράτορος Θεοῦ; Μεγάλα τὰ θαυμάσια σου, Σωτήρ· πολλή ἡ φιλανθρωπία σου, Δέσποτα· πλούσιον τὸ ἔλεος τῆς σῆς ἀγαθότητος, πηγὴ πάσης σοφίας τὰ σὰ χαρίσματα.

5.22. [Id. 237,16-31] Σὲ ὑμνῶ, τὸν πάντων Δεσπότην, καὶ σὲ δοξολογῶ τὸν πρὸ αἰώνων ἐκ Πατρὸς γεννηθέντα, τὸν Δημιουργὸν πάσης κτίσεως, τὸ ἐκ τοῦ φωτὸς ἀληθινὸν φῶς, τὸν ἐκ Θεοῦ Θεὸν καὶ πρὸς τὸν Θεὸν ἀεὶ ὄντα, ἐπ' ἐσχάτων δὲ τῶν ἡμερῶν διὰ τῆς ἐνδόξου Θεοτόκου καὶ ἀειπαρθένου Μαρίας ἐνανθρωπήσαντα διὰ τὴν ἡμετέραν σωτηρίαν, τὸν Κύριον ἡμῶν Ἰησοῦν Χριστόν, τὸν ἀληθινὸν ἡμῶν Θεόν.⁴⁰ Οὐ γὰρ ἔτι προστεθήσεται σοι τῷ πλήρει καὶ τοῖς πᾶσι τῷ εὖ πράττειν ἐθέλοντι, οὐ ζῶή, οὐ θάνατος, οὐκ ἄγγελος, οὐ τὰ παρόντα περὶ ἧς ὁ λόγος, οὐκ ἀρχαί, οὐ δυνάμεις, οὐδ' ἔτι τῶν ὄντων ἢ ἐσομένων, οὐδὲ τὰ μέλλοντα χωρίσει ἡμᾶς τῆς σῆς ἀγάπης, Χριστέ, ὁ Θεὸς ἡμῶν. Δι' οὗ τῷ Πατρὶ δόξαν, τιμὴν, αἶνον, μεγαλοπρέπειαν ἀναπέμφωμεν, σὺν τῷ παναγίῳ καὶ ζωοποιῷ καὶ προσκυνητῷ αὐτοῦ Πνεύματι, εἰς πάντας τοὺς ἀπεράντους αἰῶνας τῶν αἰώνων. *Ἀμήν.*

Τοῦ αὐτοῦ Στεφάνου οἰκουμενικοῦ φιλοσόφου, πρᾶξις ἕκτη· *Περὶ τομῆς τῆς ἱερᾶς τέχνης.*

6.1. [Id. 238,1-13] Ἐξομολογοῦμαί σοι, Πάτερ ἅγιε, Κύριε ὁ Θεὸς τοῦ οὐρανοῦ καὶ τῆς γῆς· ὁ καθολικὸς Θεὸς καὶ Παντοκράτωρ, ὁ τῶν πάντων ἀγαθῶν αἴτιος καὶ δοτῆρ, ὃν οἱ οὐρανοὶ ἐξομολογοῦνται καὶ διηγοῦνται τὰ θαυμάσια σοῦ τοῦ Παντοκράτορος Θεοῦ καὶ τῆς δόξης σου, ἧς γένοιτο καὶ ἡμᾶς ἐν καθαρᾷ καρδίᾳ ὑμνεῖν, αἰνεῖν, δοξολογεῖν καὶ λατρεύειν τὰ μεγαλεῖα σοῦ τοῦ Θεοῦ τῶν ὄλων· τούτων ὄντων ὄντως ἀγαθῶν αἰτίου καὶ προσκυνεῖν τὸ μεγαλοπρεπὲς καὶ πανάγιον καὶ ζωαρχικόν σου

³⁹ *Bénédiction des eaux à la Théoph., Prière de Sophrone:* Μέγας εἶ, Κύριε, καὶ θαυμαστὰ τὰ ἔργα σου, καὶ οὐδεὶς λόγος ἐξαρκέσει πρὸς ὕμνον τῶν θαυμασίων σου.

⁴⁰ *Symbolle de la foi:* ... ποιητὴν οὐρανοῦ καὶ γῆς, ὁρατῶν τε πάντων καὶ ἀοράτων. Καὶ εἰς ἓνα Κύριον Ἰησοῦν Χριστόν, τὸν Υἱὸν τοῦ Θεοῦ τὸν Μονογενῆ, τὸν ἐκ τοῦ Πατρὸς γεννηθέντα πρὸ πάντων τῶν αἰώνων· Φῶς ἐκ φωτός, Θεὸν ἀληθινόν, ἐκ Θεοῦ ἀληθινοῦ γεννηθέντα, οὐ ποιηθέντα, ὁμοούσιον τῷ Πατρὶ, δι' οὗ τὰ πάντα ἐγένετο. Τὸν δι' ἡμᾶς τοὺς ἀνθρώπους καὶ διὰ τὴν ἡμετέραν σωτηρίαν κατελθόντα ἐκ τῶν οὐρανῶν, καὶ σαρκωθέντα ἐκ Πνεύματος Ἁγίου καὶ Μαρίας τῆς Παρθένου καὶ ἐνανθρωπήσαντα.

ὄνομα τοῦ Πατρὸς καὶ τοῦ Υἱοῦ καὶ τοῦ Ἁγίου Πνεύματος, νῦν καὶ αἰεὶ καὶ εἰς τοὺς ἀτελευτήτους αἰῶνας τῶν αἰώνων, ἀμήν.

6.12. [Id. 241,24-33] Ἐκ τῶν αἰσθητῶν μετάβηθι ἐπὶ τὰ νοητὰ θεάματα καὶ ἴδε τῶν οὐρανίων τὴν πολλὴν εὐκοσμίαν καὶ ἄυλον. Ὁ τὰς τούτων εὐπρεπείας θεασάμενος, ἐπέκεινα τὸν νοῦν ἀνυψώσας καὶ τὴν πολλὴν καὶ ὑπεραστράπτουσαν τῆς δόξης καὶ χαρᾶς τοσαύτης τῶν ἀγγέλων ἐννοῶν, μὴ παρατραπῆς τὸ λοιπὸν ἐπὶ τὴν ἔνυλον μόρφωσιν τῆς χαμαιζήλου ταύτης τοῦ μετὰ χεῖρα ζητουμένου καὶ ἀνακαλυπτομένου τῆς ἐμφιλοσόφου χρυσοποιΐας. Ἄλλ' ὅλον σεαυτοῦ τὸν νοῦν ἐπὶ τὰ ἄνω αἶρε καὶ φωτοειδῆ τῶν ὑπερτάτων οὐσιῶν ἀναπτερώσασθαι.

6.13. [Id. 241,33-242,9] Ἄν νοεροῖς ὄμμασι τὰ ἀναρίθμητα καὶ ἀμήχανα τούτων κάλλη καὶ πρὸς τὸ φῶς ἐκεῖνο τὸ ὑπὲρ πᾶν φῶς ἀτενίσας καὶ θαυμάσας τὰ ἔργα τε πάντα τὰ ἐν κόσμῳ ἀποθέμενος καὶ τὸν προαιρετικὸν μελετήσας θάνατον⁴¹, καὶ ὅλον τὸ ἑαυτοῦ σῶμα κατανεκρώσας, ἔτι δὲ καὶ τὴν ἑαυτοῦ ψυχὴν⁴² ἀρνησάμενος, ὕμνοις ἀσιγήτοις τὸν Παμβασιλέα τῶν ὄλων καὶ Κύριον τῆς δόξης δοξολογήσας καὶ ὑμνήσας, τρόμῳ δὲ καὶ φόβῳ φρίζας τὴν παντοδύναμον δύναμιν ἐννόησον αὐτοῦ τὴν ὑπεράγαθον ἀγαθότητα. Πῶς τὰ πάντα παρήχθη διὰ τῆς ἀρρήτου αὐτοῦ σοφίας ἰλιγγιᾶ δὲ γλῶττα καὶ νοῦς οὐκ ἰσχύει φέρειν ἢ ὅλως ἐξερευνηῆσαι καὶ εἰπεῖν τὰ μεγαλεῖα τοῦ Παντοκράτορος.

6.14. [Id. 242,9-21] Ταῦτα δὲ πάντα ἐν ἑαυτοῖς κατανοήσαντες, σπουδάσωμεν καὶ ἡμεῖς, ὧ ἀδελφοί, διὰ πίστεως καὶ ἀγάπης⁴³ ἐνωθῆναι καὶ οἰκειωθῆναι τῷ Θεῷ Λόγῳ, τῷ ἡμᾶς ἀγαπήσαντι· καὶ αὐτὸν τὸν Κύριον καὶ Θεὸν ἀγαπήσαι ἐξ ὅλης ψυχῆς καὶ ἐξ ὅλης τῆς διανοίας καὶ ἐξ ὅλης τῆς καρδίας.⁴⁴ καὶ αὐτὸν τὸν τῆς ζωῆς θησαυρὸν

⁴¹ Gr. Nyss., *Contra Eun.* 2, M 45.545B: σώματος ... ἐστὶ θάνατος ἢ τῶν αἰσθητηρίων σβέσις καὶ ἡ πρὸς τὰ συγγενῆ τῶν στοιχείων διάλυσις.

⁴² Gr. Nyss., *De hom. opif.* 29.3, M 44.236B: Ὡς μήτε (ψυχὴν) πρὸ τοῦ σώματος, μήτε χωρὶς ψυχῆς τὸ σῶμα εἶναι λέγειν, ἀλλὰ μίαν ἀμφοτέρων ἀρχὴν. id. *Orat. catech.* 37, M 45.93C: μὴ εἶναι δυνατόν ἐν ἀθανασία γενέσθαι τὸ ἡμέτερον σῶμα, εἰ μὴ διὰ τῆς πρὸς τὸ ἀθάνατον κοινωνίας ἐν μετουσίᾳ τῆς ἀφθαρσίας γενόμενον. id. *De anim. et res.*, M 46.29B: ψυχὴ ἐστὶν οὐσία γεννητὴ, οὐσία ζῶσα, νοερά, σωματι ὀργανικῶ καὶ αἰσθητικῶ, δύναμιν ζωτικὴν καὶ τῶν αἰσθητῶν ἀντιληπτικὴν δι' ἑαυτῆς ἐνείεσα, ἕως ἂν ἡ δεκτικὴ τούτων συνέστηκε φύσις.

⁴³ Basil., *Hom. in Ps.* 44, M 29.392A: οὐ τοῦ τυχόντος δὲ ἐστὶν εἰς τὸ τέλειον χωρῆσαι τῆς ἀγάπης, ἀλλὰ τοῦ ἐκδυσσαμένου ἤδη τὸν παλαιὸν ἄνθρωπον. Gr. Nyss., *Hom. 5 in Cant.*, M 44.857D: ὑψωθείσα δι' ἀγάπης πρὸς τὴν τοῦ ἀγαθοῦ μετουσίαν ἡ κεκαθαυμένη ψυχὴ.

⁴⁴ Mt 22.37 (*Dt* 6,5): ὁ δὲ (Ἰησοῦς) ἔφη αὐτῶ· ἀγαπήσεις κύριον τὸν θεόν σου ἐν ὅλῃ τῇ καρδίᾳ σου καὶ ἐν ὅλῃ τῇ ψυχῇ σου καὶ ἐν ὅλῃ τῇ διανοίᾳ σου.

θαυμάσαντες δοξάσωμεν ἀεὶ καὶ διὰ παντὸς ἐν παντὶ καιρῷ τε καὶ τόπῳ τῆ θεολογία ἐπευφραϊνόμενοι καὶ τῆς τοῦ Θεοῦ συνομιλίας ἀξιούμενοι, τῆς χάριτος ἐμπλησθῶμεν κατοικητήριον⁴⁵ Θεοῦ γενόμενοι τὸ ἡδὺ φῶς τοῦ Θεοῦ ἐναπολαύσωμεν. Πρὸς ἐκεῖνο τὸ φῶς σπεύδοντες τὸ φωτιστικὸν πάσης τῆς λογικῆς φύσεως, τὸ φωτίζον καὶ καταυγάζον⁴⁶ τὰς αἰσθήσεις καὶ καρδίας καὶ διανοίας πάντων τῶν ἀγαπώντων τὸν Κύριον.

6.15. [Id. 242,22-32] Ἦς γένοιτο ἡμᾶς διὰ πίστεως καὶ ἀγάπης Θεοῦ ἐπὶ τὸν λιμένα⁴⁷ καταντῆσαι τοῦ θελήματος αὐτοῦ καὶ τῶν αἰώνιων ἀπολαῦσαι ἀγαθῶν, *χάριτι καὶ φιλανθρωπία τοῦ μονογενοῦς Υἱοῦ τοῦ Θεοῦ, μεθ' οὗ τῶ πάντων αἰτίῳ καὶ Παμβασιλεῖ καὶ ἀφάρτῳ Θεῷ καὶ Πατρὶ τῶν ὄλων, σὺν τῷ θείῳ καὶ προσκυνητῷ καὶ ζωοποιῷ τῆς μεγαλοσύνης αὐτοῦ Πνεύματι, σέβας, κράτος, λατρεία, τιμὴ, δόξα, μεγαλοπρέπεια, ὕμνος αἰδῖος πρὸ πάντων τῶν αἰώνων καὶ μετὰ πάντας τοὺς αἰῶνας, καὶ νῦν καὶ ἀεὶ καὶ εἰς τοὺς σύμπαντας καὶ αἰδίως διαιωνίζοντας αἰῶνας τῶν αἰώνων. Ἀμήν.*⁴⁸

Τοῦ αὐτοῦ Στεφάνου φιλοσόφου. *Διδασκαλία πρὸς Ἡράκλειον τὸν βασιλέα*: πρᾶξις σὺν Θεῷ ἐβδόμη.

7.1. [Id. 243,4-23] Ὁ ἄναρχος καὶ ὑπεράρχιος Θεός, ὁ ἀγαθὸς καὶ ὑπεράγαθος τῆ φύσει, καὶ φιλάνθρωπος τῷ τρόπῳ, ὁ ἀπερίγραπτος καὶ ἀκατάληπτος, ὁ καθολικὸς Θεὸς καὶ Παντοκράτωρ, ὁ Δημιουργὸς πάσης τῆς κτίσεως, *ὁ ἐκ τοῦ μη ὄντος εἰς τὸ εἶναι παραγαγὼν τὰ πάντα*,⁴⁹ ὁ τῆ ἰδίᾳ δόξῃ καὶ βουλήσει καὶ δυνάμει καὶ σοφία

⁴⁵ Barn. 6.15: ναὸς ἅγιος ... τῷ κυρίῳ τὸ κατοικητήριον ἡμῶν τῆς καρδίας. ib. 16.7: πρὸ τοῦ ἡμᾶς πιστεῦσαι τῷ θεῷ ἦν ἡμῶν τὸ κατοικητήριον τῆς καρδιᾶς φθαρτὸν καὶ ἀσθενές. ib. 16.8: ἐν τῷ κατοικητηρίῳ ἡμῶν ἀληθῶς ὁ θεὸς κατοικεῖ ἐν ἡμῖν.

⁴⁶ Clem. Alex., *Protr.* 9, M 8.197A: φῶς ... ὁ λόγος ... δι' οὗ καταυγάζομεθα τὸν θεόν. Euseb., *Dem. evang.* 4.6, M 22.214C: τὰς ἀσωμάτους δυνάμεις ὁ τοῦ θεοῦ καταυγάζων τέλειος λόγος. Lit. Marc. (Brightman p. 135.19): διὰ τῆς ἐπιφοιτήσεως τοῦ ... πνεύματος καταύγασον τοὺς ὀφθαλμοὺς τῆς διανοίας ἡμῶν.

⁴⁷ Clem. Alex. fr. 44: ὡσπερ ἐν λιμένι ... τῷ θείῳ φωτὶ τοῦ σωτήρος. Jo. D., *Hom.* 2.7, M 96.588B: ὁδηγήσει σε ἐπὶ λιμένα θελήματος αὐτοῦ.

⁴⁸ *Chrys., Liturgie*: [ὁ Ἱερεὺς] Χάριτι καὶ οἰκτιρμοῖς καὶ φιλανθρωπία τοῦ Μονογενοῦς σου Υἱοῦ, μεθ' οὗ εὐλογητὸς εἶ, σὺν τῷ Παναγίῳ καὶ ἀγαθῷ καὶ ζωοποιῷ σου Πνεύματι, νῦν καὶ ἀεὶ καὶ εἰς τοὺς αἰῶνας τῶν αἰώνων. Ἀμήν.

⁴⁹ *Gen.* 1,1: Ἐν ἀρχῇ ἐποίησεν ὁ θεὸς τὸν οὐρανὸν καὶ τὴν γῆν. Chrys., *In cap. I Genes. Homil. II*, M 53,28.

κτίσας τὰ σύμπαντα, καὶ καθ' ὁμοίωσιν καὶ κατ' εἰκόνα⁵⁰ πλάσας τὸν ἄνθρωπον λογικόν τε καὶ νοερὸν καὶ αὐτεξούσιον⁵¹, καὶ ποιήσας αὐτὸν βασιλέα πάσης τῆς αὐτοῦ κτίσεως, αὐτός σε ὁ Παντοκράτωρ καὶ Βασιλεὺς τῶν βασιλευόντων οἰκουμενικὸν καὶ αὐτοκράτορα βασιλέα κατέστησεν ἐπὶ πάσης τῆς γῆς καὶ ἄρχειν πάσης τῆς αὐτοῦ κτίσεως μετ' εὐμενείας καὶ συνειδήσεως ἀνέδειξε· καὶ ὑπὸ τῆς αὐτοῦ συνεκτικῆς τε καὶ ποιητικῆς δεξιᾶς τὸ νεῦμα ἐχαρίσατο· καὶ ἐκ τῆς ἀενάου αὐτοῦ πηγῆς πᾶσα εὐφροσύνη καὶ δώρημα ἀγαθὸν ἐν σοὶ ἐβλάστησε, καὶ τὰς πολυμερεῖς ιδέας τῶν ἀγαθοεργιῶν τῆς θεοστέφου σου γαλήνης καὶ πολυτρόπου εὐσεβείας ὑπέδειξε καὶ λάτρην καὶ ὁμολογητὴν, τὸν μόνον ἀληθινὸν Θεὸν καὶ ὄν ἀπέστειλεν Ἰησοῦν Χριστὸν τὸν Υἱὸν τοῦ Θεοῦ τοῦ ζῶντος, ἀνέδειξε.

7.2. [Id. 243,23-244,3] Δίκαιον οὖν λοιπὸν σοὶ ἐστὶν ὡς ἀληθῶς, ὃ θεόστεπτε βασιλεῦ, προσδραμεῖν μετ' εὐμενείας καὶ φόβου Θεοῦ καὶ ἀνυποκρίτου ἀγάπης, ἵνα δυνηθῆς διὰ τῆς χάριτος τοῦ Κυρίου ἡμῶν Ἰησοῦ Χριστοῦ *ποταμοὺς ἀναβλῦσαι ὕδατος ζῶντος* καὶ κληρονομησαί τῆς μεγάλης ἐκείνης ἐφέσεως τῆς ἐκ δεξιῶν τοῦ Θεοῦ παραστάσεως, ὧν οὐκ ἄξια τὰ νῦν ὀρώμενα καὶ θαυμαζόμενα πρὸς τὴν μακαρίαν ἐκείνην λῆξιν. Μόνον οικειωθῶμεν αὐτῷ δι' ἀγάπης καὶ ληψόμεθα παρ' αὐτοῦ τὴν ἐξ ἀβύσσου ἄβυσσον πηγάζουσαν ἡμῖν ἔλεος· *ἃ ὀφθαλμὸς οὐκ εἶδε καὶ οὐς οὐκ ἤκουσε, καὶ ἐπὶ καρδίαν ἀνθρώπου οὐκ ἀνέβη, ἃ ἠτοίμασεν ὁ Θεὸς τοῖς κατὰ σὲ καὶ τοῖς ἀγαπῶσιν αὐτὸν*⁵² ἀπὸ καταβολῆς κόσμου. *Ἔ πρέπει δόξα τιμὴ τε καὶ μεγαλοπρέπεια, τῷ Πατρὶ καὶ τῷ Υἱῷ καὶ τῷ Ἁγίῳ Πνεύματι, εἰς τοὺς αἰῶνας τῶν αἰῶνων καὶ ἐπαιῶνων καὶ ἔτι, ἀμήν.*

7.3. [Id. 244,3-9] Πάλιν ἐπὶ τὸ προκείμενον ἐπανελεύσομαι καὶ τὸν πόθον σου, ὃ πανάριστε βασιλεῦ, ἀναπληρώσω· καὶ ἐπιφανῶς τὰς ῥήσεις ποιήσομαι, ἵνα τοσοῦτον ἐρᾶν ἀξιωθῆς μεθ' ὑμνωδίας θεολογεῖν τὴν ὑπεράγαθον τοῦ θεοῦ ἀγαθότητα, τὴν

⁵⁰ Basil., *De struct. hom.* 1.16, M. 30.24D: ἄνθρωπός ἐστιν ποίημα θεοῦ λογικόν, κατ' εἰκόνα γενόμενον τοῦ κτίσαντος αὐτόν.

⁵¹ Gr. Nyss., *Orat. catech.* 21, M. 45.57C: μίμημα τῆς θείας φύσεως κατεσκευάσθη ὁ ἄνθρωπος, τοῖς τε λοιποῖς τῶν ἀγαθῶν καὶ τῷ αὐτεξουσίῳ τῆς προαιρέσεως τὴν πρὸς τὸ θεῖον διασφύζων ὁμοίωσιν.

⁵² *I Épître aux Corinthiens*: ἀλλὰ καθὼς γέγραπται: Ἄ ὀφθαλμὸς οὐκ οἶδεν καὶ οὐς οὐ ἤκουσεν καὶ ἐπὶ καρδίαν ἀνθρώπου οὐκ ἀνέβη, ὅσα ἠτοίμασεν ὁ Θεὸς τοῖς ἀγαπῶσιν αὐτόν. Basil., *De paradiso*, orat. 3, 7B, M 30,68C: Πάντως γάρ σου ἡ διάνοια, ὑψηλὰ καὶ ὑπερκόσμια φρονοῦσα, οἷα δὴ τὸ πολίτευμα ἔχουσα ἐν οὐρανοῖς καὶ πρὸς τὴν ἄνω ἀξίαν ἀφορῶσα, τὰ τῆς ἐπαγγελίας ἐνενόει, καὶ περιεσκόπει ἀκούσασθαί τι τῶν ἐπηγγελμένων ἡμῖν ἀγαθῶν, Ἄ οὔτε ὀφθαλμὸς εἶδεν, οὔτε οὐς ἤκουσεν, οὔτε ἐπὶ καρδίαν ἀνθρώπου ἀνέβη.

πολυπληθείαν τῶν ἐνύλων ἀπωσάμενος καὶ ὑπὸ τῆς εὐσπλαχνίας τοῦ πάθους ἐπειγόμενος.

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Byzantine Alchemy
in two recently discovered manuscripts
(Saint Stephen's (Meteora) and Olympiotissa (Elassona)
Monasteries)

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The manuscript n. 97 in the library of Saint Stephen's monastery in Meteora (Meteora MS hereafter) and the manuscript n. 197 in the library of Olympiotissa monastery in Elassona (Elassona MS hereafter) rank among the earliest alchemical codices nowadays kept in Greece. These testimonies were not taken into account by M. Berthelot and C.É. Ruelle in their pioneering edition of the Greek alchemical collection, neither they were described or discussed in the more recent catalogue of the Greek alchemical manuscripts published between 1924 and 1932 under the aegis of the *Union Académique Internationale*.¹ In this chapter, I shall first present a short description of the two manuscripts; then I shall compare their contents and investigate more in depth specific sections, which, when necessary, will be illustrated by taking into account the other known testimonies of the *Corpus alchemicum* – in particular, the MSS *Marcianus* gr. 299 (10th century AD), *Parisini* gr. 2325 (13th c.) and 2327 (1478), and *Laurentianus* gr. 86.16 (1492).² Finally, special attention will be devoted to the last section of the Meteora MS, which preserves a long Byzantine book of recipes on the art of goldsmiths, which until now was only known in the *recensio* preserved in the MS *Parisinus* gr. 2327 (= CAAG II 321-337).

¹ In particular the fifth volume of the *Catalogue des manuscrits alchimiques grecs* is devoted to the manuscripts of Athens (see, in particular, pp. 143-173). In the introduction, the author A. Severyns (1928, 144) explained the difficulties he encountered in describing the alchemical codices kept in Greece outside Athens: “Devant le résultat de mes recherches à Athènes, j’avais d’abord formé le projet d’étendre mes investigations à tous les manuscrits conservés en territoire grec. Plusieurs raisons m’ont forcé à y renoncer. Étant donné le peu de temps dont je disposais, je ne pouvais songer à éplucher tous les catalogues imprimés ou manuscrits, non plus qu’à visiter les nombreuses bibliothèques de monastères [...]. D’un autre côté, l’expérience m’a appris qu’il est pratiquement impossible de faire venir à Athènes un manuscrit conservé en province”. This ambitious aim has been now achieved by the members of the DACALBO project, whom I warmly thank for the precious information they shared with me.

² For an introduction to these manuscripts, see Martelli 2012, 3-54; Mertens 1995, xx-lxxviii.

A Short Description of the Two Manuscripts

The Meteora MS -- bearing the n. 97 in the third volume of Sophianos' catalogue describing all the manuscripts kept in the Meteora monasteries ³ -- is a small size paper codex (160 x 105 mm) that counts 203 folia. Two colophons at fol. 203v mention the name of its scribe and the year when he finished copying the manuscript:

(fol. 203v1-5; red ink) ἐτελειώθη τῷ παρῶν βιβλίων [*lege* τὸ παρὸν βιβλίον] διὰ χειρὸς κάμοῦ Γεωργίου [*lege* Γεω-] ἐπὶ ἔτους ,ζιβ' (a second hand added: ἐν τοῦ Ἁγίου Στεφάνου)

ἀθλήως Γεώργιος [*lege* ἀθλίως Γεώργιος] ὁ ξήσας ἐρμηνεῖα<v> περὶ χρυσοποιίας⁴

“I Georgios finished handwriting myself this book in the year 7012, i.e. 1503/1504 AD [2nd hand: in Saint Stephen's (monastery)].

Georgios who humble wrote (lit. scratched out) the explanation of the making of gold”.

A few lines above, a similar, yet less detailed information is given in a *monokyndylon*:

(fol. 203v6-8) ἐγράφη τὸ παρ(ὸν) βιβλί(ον) [*lege* βι-] διὰ χειρὸς Γεωργίου [*lege* - γίου] περὶ ἀποιίας [*i.e.* χρυσοπ-] καὶ σποιίας [*i.e.* ἀργυροπ-].

“Georgios handwrote this book on the making of gold and on the making of silver”.

Regrettably, it is difficult to judge the reliability of the additional information provided by an anonymous reader, who integrated the first colophon with a reference to the place where the codex had been supposedly produced. If we rely on this information and infer that Georgios completed his work in Saint Stephen's monastery,

³ Sophianos 1986, 305-309. I was able to study the manuscript during a stay in Saint Stephen's monastery in 2010. I would like to warmly thank the sisters of the monastery, who provided me with all the necessary help and support to carry out my investigation.

⁴ The second part of the sentence is written with a cryptographic alphabet: εῤξβνθκεῤβ ακβλιθω, that is, ἐρμηνεῖα περὶ χρυσοποιίας. A second hand partly added the solution above the line: ἐρμηνεῖα περὶ [lacuna]. Another anonymous copyist (the same who added ‘In Saint Stephen's (monastery)’ in the colophon) copied again the cryptography after the colophon (fol. 203v8; black ink). The system used to encode the information is quite simple and widespread in Byzantine manuscripts. The Greek letters were divided into three groups of nine letters (stigma, koppa and sampi included) and in each group the first letter corresponded to the last one, the second letter to the second last one, and so on. For instance, the first group includes α, β, γ, δ, ε, ζ, η, and θ, where α = θ, β = η, γ = ζ, δ = ε, and ε = ε.

we might be tempted to identify the copyist with the homonymous Giorgios mentioned in one of the possession's notes scattered in the manuscript.⁵ Many marginal notes, indeed, make clear that the codex was property of Saint Stephen's monastery; among them the note at the margin of fol. 179v reads:

τὸ παρὸν βιβλίον [*lege* βιβλίον] τὸ ἀφιέρωσεν [*lege* -ωσεν]⁶ ὁ πα(πᾶς?) Γιώργιος ἤς [*lege* εἰς] τὸν ἅγιον Στέφανον, καὶ ὅπ(ο)ῖος το ἀποξινόσε [*lege* -ξένωσε] ἀπὸ τὴν μόνην ταύτην ἔστο ἀφορισμένος καὶ νὰ κόψη ὁ θε(ε)ὸς τὴν ζοὴν [*lege* ζωήν] του. Ἀνάθεμά τον, ἀμήν.

“Father Giorgios donated this book to Saint Stephen's (monastery); whoever takes it away from this monastery, may he be damned and may God cut his life short. Woe to him. Amen.”

On the other hand, we must note that an almost identical note (yet written by a different hand) occurs in the flysheet of the manuscript, where the patriarch of Constantinople (rather than the priest Giorgios) is mentioned as donor of the codex.⁷ Regrettably, the other possession's notes do not add further information about the exact time or the specific circumstances under which the manuscript entered the library of the monastery, so that it remains difficult to understand whether the book was originally produced in the monastery or was donated as a gift by a later possessor.

The Ellassona MS is a paper codex (145 x 100 mm) written by three different copyists. It currently counts 105 folia, yet some original pages or quires of the manuscript went probably missing. The 18th century monk Margarites transcribed the first section of the codex (fol. α-ζ), as clearly recorded in a short note at fol. 1r:

ὑπαρχὴ τοῦ Μαργαρίτη ἱερέως x 1741,

“The opening section is by the monk Margarites, (year) 1741”.

⁵ See Sophianos 1986, 308-309, where all the possession's notes are recorded.

⁶ The first segment of the sentence (τὸ παρὸν βιβλίον τὸ ἀφιέρωσεν) occurs twice in this folium; it was first written by Georgios, who copied down the rest of the page (containing a list of alchemical signs); then a second scribe wrote the sentence again and completed the note in the form reported above.

⁷ At the bottom of the flysheet the following note is transcribed: τὸ παρὸν βιβλίον ταφιέρωσεν (sic) ὁ μακάριος πατριάρχης ἀπὸ κοσταντινόπολη (sic) κτλ.

This first part includes short texts dealing with various topics related to alchemy, medicine, and natural philosophy, such as the seven planets and the zodiac (fol. α´)⁸, the association between seasons, human humours (blood, phlegm, black and yellow bile) and natural elements (identified with air, ether, water and fire; see fol. Β´)⁹, the correspondences between planets and metals (fol. στ´), and the seven ages of human beings (fol. γ´-δ´)¹⁰. The same copyist Margarites also compiled the last part of the codex, namely fol. 104r-110v.

These two parts somehow enclose the earlier section of the manuscript, which counts 66 folia progressively paginated from 1 to 103. It is evident that some folia went lost, probably after that the current foliation had been introduced (in each folium, the *recto* is marked by an Arabic number and the *verso* by the correspondent Greek number).

This earlier section was copied by two anonymous scribes in the 16th century. The first scribe finished copying the folia 1-98r in 1507, as a short notes at fol. 98r reports: after the *explicit* of a treatise entitled Περὶ λευκώσεως (*On Whitening*, fol. 98r4-14), someone recorded the date 1507 in Greek (i.e. ,αφζ´) and Arabic numbers. A second, more or less contemporary copyist wrote the fol. 98v-103v.

The contents of the two manuscripts: a comparison

The contents of the Meteora MS largely overlap with the contents of the earliest section of the Ellassona MS (*i.e.* the section written in 1507, that is, foll. 1-98r). In both manuscripts two anonymous short passages serve as introductory texts to the collection, which opens with a section devoted to the alchemical lectures (πρῶξιεις) by Stephanus of Alexandria (7th c. AD).¹¹ The Meteora MS hands down ten lectures: the first without title, the following five lectures progressively numbered from 2 to 6,¹² and the last four lectures numbered from 6 (again!) to 9. The loss of some quires (fol. 9-51) in the Ellassona MS does not allow us to see whether it followed the same order:

8 The MS, fol. α´r1-2 reads (a diplomatic transcription is provided): Περὶ των επτά πλανήτων και τή ζόδια ἔχουν.

9 The MS, fol. β´r1-2 reads (a diplomatic transcription is provided): Περὶ τῶν τεσσάρων· κερῶν τοῦ χρόνου· και τὰ στυχία· τοῦ ἀνθρώπου· πῶς εἶναι.

10 For instance, fol. γ´v9 reads (a diplomatic transcription is provided): ἑπτὰ ἡσῖν και η ηλυκίε· τοῦ σωματος τοῦ ἀνθρώπου· ἕως το γύρας.

11 An uncritical edition of Stephanus of Alexandria's alchemical lectures is available in Ideler 1842, 199-253. A few lectures has been reedited by Taylor 1937 (Lectures 1-2); idem 1938 (Letter to Theodoros + Lecture 3). On Stephanus, see Papathanassiou 2006.

12 The Meteora MS introduces here three different works -- one by Pelagius and two by Zosimus (see below).

in fact, it only preserves the first two lectures and the last one, which lacks of title and incipit. Despite this lacuna, we must note that the sequence attested in the Meteora MS differs from what we find in the other known testimonies of Stephanus' work, in particular in the MSS *Marcianus* gr. 299 (= **M**), *Parisinus* gr. 2325 (= **B**), *Parisinus* gr. 2327 (= **A**) and *Laurentianus* 86.16 (= **L**). All these manuscripts preserve nine lectures and a letter addressed to a certain Theodoros, whereas the Meteora MS hands down ten *praxeis*.¹³ Thus read their titles in the different testimonies:

First text = II 199-202 Ideler

Meteora MS (1v9-7r4) = Ellassona MS (1v1-4r14): *Sine titulo*

Other MSS: (**M**) Στεφάνου Ἀλεξανδρέως οἰκουμενικοῦ φιλοσόφου καὶ διδασκάλου τῆς μεγάλης καὶ ἱερᾶς ταύτης τέχνης περὶ χρυσοποιίας. πρᾶξις σὺν θεῷ πρώτη; (**BAL**) Στεφάνου Ἀλεξανδρέως οἰκουμενικοῦ φιλοσόφου περὶ τῆς ἱερᾶς καὶ θείας τέχνης τῆς τοῦ χρυσοῦ ποιήσεως: πρᾶξις πρώτη

Second text = II 203-208,3 Ideler

Meteora MS (7r5-15v15): Στεφάνου σὺν θεῷ πρᾶξις β' = Ellassona MS (4r14-8v) πρᾶξις β' (in mg. Στεφάνου)

Other MSS (**MBAL**): τοῦ αὐτοῦ Στεφάνου σὺν θεῷ πρᾶξις δευτέρα

Third Text = II 208,4-34 Ideler

Meteora MS (15r15-17r11): τοῦ αὐτ(οῦ) Στεφάνου, πρᾶξις ἐνύλου κόσμ(ου) σὺν θεῷ τρίτ(η)

Other MSS (**MBAL**): τοῦ αὐτοῦ Στεφάνου ἐπιστολὴ πρὸς Θεόδωρον

Fourth Text = II 209-213,6 Ideler

Meteora MS (17r11-24v1) τοῦ αὐτ(οῦ) Στεφάνου φιλοσόφου διὰ τὸ κατενέργειαν (sic) τῆς θείας καὶ ἱερᾶς τέχνης: πρᾶξις σὺν θεῷ δ'

Other MSS (**MBAL**): τοῦ αὐτοῦ Στεφάνου περὶ τοῦ ἐνύλου κόσμου πρᾶξις σὺν θεῷ τρίτη

¹³ On the structure of Stephanus' lectures in these manuscripts, see Papathanassiou 1996 (who maintains that Stephanus' writings were originally divided into 7 lectures).

Fifth text = II 213,7-219,14 Ideler

Meteora MS (24v2-34r4) τοῦ αὐτοῦ Στεφάνου σὺν θεῶ πρᾶξις ε΄

Other MSS (**MBAL**): τοῦ αὐτοῦ Στεφάνου εἰς τὸ κατ' ἐνέργειαν· πρᾶξις σὺν θεῶ τετάρτη

Sixth text = 219,15-223,19 Ideler

Meteora MS (34r4-40v7) τοῦ αὐτοῦ Στεφάνου εἰς τὸ κατενέργ(ε)ιαν (sic) τῆς θείας καὶ ἱερᾶς τέχνης· πρᾶξις σὺν θεῶ στ΄

Other MSS (**MBAL**): τοῦ αὐτοῦ Στεφάνου εἰς τὸ κατ' ἐνέργειαν τῆς θείας τέχνης· πρᾶξις σὺν θεῶ πέμπτη

Seventh text = II 223,20-231,5 Ideler

Meteora MS (57v9-70v11) τοῦ αὐτ(οῦ) στεφάνου πρᾶξις σὺν θεῶ στ΄¹⁴ ἔρμου· (sic) ἀγαθοδαίμονος

Other MSS (**MBAL**): τοῦ αὐτοῦ Στεφάνου φιλοσόφου πρᾶξις σὺν θεῶ ἕκτη

Eighth text = II 231,6-237 Ideler

Meteora MS (70v12-80v) τοῦ αὐτ(οῦ) Στεφάνου πρᾶξις σὺν θεῶ ζ΄

Other MSS (**MBAL**): τοῦ αὐτοῦ Στεφάνου φιλοσόφου πρᾶξις σὺν θεῶ ἑβδόμη (**M**; ζ^η· **A**)

Ninth text = II 238-242 Ideler

Meteora MS (81r1-88r) τοῦ αὐτοῦ Στεφάνου πρᾶξις σὺν θεῶ η΄· περὶ τομῆς τῆς ἱερᾶς τέχνης

Other MSS (**MBAL**): τοῦ αὐτοῦ Στεφάνου οἰκουμενικοῦ φιλοσόφου πρᾶξις ὀγδόη περὶ τομῆς τῆς ἱερᾶς τέχνης.

Tenth text = II 243-253 Ideler

Meteora MS (88v-107v) [= Elassona MS, fol. 52r-60v; *titulum et incipit deficiunt*] τοῦ αὐτοῦ Στεφάνου διδασκαλία πρὸς Ἡράκλειον τὸν βασιλέα· πρᾶξις σὺν θεῶ θ΄

Other MSS (**MBAL**): τοῦ αὐτοῦ Στεφάνου φιλοσόφου διδασκαλία πρὸς Ἡράκλειον τὸν βασιλέα· πρᾶξις σὺν θεῶ ἑνάτη.

¹⁴ This lecture bears the same title 'sixth lecture' than the precedent one.

After Stephanus' lectures both the *Meteora* and the *Elassona MSS* hand down Synesius's commentary on Ps.-Democritus alchemical books (4th century AD),¹⁵ two works by the so-called Philosopher Anonymous (8th-9th century AD),¹⁶ and a selection of excerpts attributed to the Graeco-Egyptian alchemist Zosimus of Panopolis (3rd-4th century AD). The overlapping between the two testimonies is shown in the following synoptic table:

	Meteora MS		Elassona MS
Fol. 1r	Short passage from Psellus (red ink)	Fol.	Short passage from Psellus
1v	Title of a recipe-book (red ink) = CAAG II 220,		Title of a recipe-book = CAAG II 220
2r-17r	Stephanus, <i>Lectures I-II</i> = II 199-208,3 Ideler	1r-8v	Stephanus, <i>Lectures I-II</i> = II 199-208,3 Ideler
17r-88r	Stephanus, <i>Lectures III-VI</i> = II 208,4-223,19 Ideler Pelagius, <i>On this Divine and Holy Art</i> = CAAG II 253-262 Zosimus, <i>On Virtue</i> = X 39-42 Mertens Zosimus, <i>On Lime</i> = XIII 48-49 Mertens Stephanus, <i>Lectures VI-VIII</i> = II 223,20-237 Ideler		Lacuna fol. 9-51 went missing
88v-107v	Stephanus, <i>Lecture IX</i> = II 238-242 Ideler	52r-60v	Stephanus, <i>Lecture IX</i> (Lacking of the title and the incipit) = II 238-242 Ideler

¹⁵ On Synesius, see Martelli 2014, 52-56.

¹⁶ According to Letrouit (1995,63-65), two different authors may be recognized behind the general 'title' of philosopher Anonymous, both active in the 8th/9th century. Letrouit distinguishes between 'le philosophe anépigraphe 1', who composed a long work (without title) that Berthelot-Ruelle published in different sections of their edition (i.e. CAAG II 433,11-436,18 + 219,13-220,10 + 436,20-441,25), and 'le phisophe anépigraphe 2', who composed the two works handed down in the *Meteora* and the *Elassona MSS*.

108r-114v	Synesius, <i>On Democritus' Book</i> (1 st part = CAAG II 56,20-63,21)	61v- 68v	Synesius, <i>On Democritus' Book</i> (Complete = CAAG II 56,20-69,11)
114v-117r	Anonymous, <i>On the Whitening of Sulphur Water</i> = CAAG II 421,6-424,2	68v- 69v	Anonymous, <i>On the Whitening of Sulphur Water</i> = CAAG II 421,6-424,2
117r-122v	Synesius, <i>On Democritus' Book</i> (2 nd part = CAAG II 63,21-69,11)		
122v-132r	Anonymous, <i>On the Making of Gold</i> = CAAG II 424,3-433,10 ¹⁷	70r- 75r	Anonymous, <i>On the Making of Gold</i> = CAAG II 424,3-433,10

The text of Synesius' commentary on Ps.-Democritus alchemical books deserves particular attention, since some discrepancies are detectable in the two collections. Whereas the Elassona MS accommodates the complete treatise by Synesius between Stephanus' last lecture and an alchemical work ascribed to the so-called philosopher Anonymous, the Meteora MS splits Synesius' treatise into two parts, which are divided by the insertion of philosopher Anonymous's work.

Synesius' treatise is a dialogue between the philosopher Synesius and Dioscorus, a priest of the Alexandrian temple of Serapis. The main topic of their conversation is the alchemical teaching of Democritus, which they effort to interpret by commenting on a selection of passages taken from the four books on dyeing, which the alchemical tradition ascribes to him. In both MSS the dialogue is introduced by the title:

(Meteora MS, fol.108r1-3 = Elassona MS, fol. 61r1-3) Συνεσίου φιλοσόφου πρὸς Διόσκορον εἰς τὴν βίβλον [βύβλον MetMS] Δημοκρίτου ὡς ἐν ἀχολίαις [*sic* MSS; *lege* σχολίαις]. Διοσκόρω ἱερεῖ τοῦ μεγάλου Σεραπίδος [*sic* MSS; *lege* σχολίαις] τοῦ ἐν Ἀλεξανδρείᾳ θεοῦ τε ἀεὶ εὐδοκοῦντος Συνέσιος ὁ φιλόσοφος χαίροι.

In the central part of the dialogue Synesius explains to Dioscorus the nature of quicksilver (ὕδραργυρος), its main properties, and the role it plays in the dyeing processes. Whereas the Elassona MS preserves this section without any gap, in the Meteora MS the discussion between the two characters suddenly breaks off, since we

¹⁷ On this treatise and its tradition, see Lagercrantz 1927, 18-19 and Letrouit 1995, 64

find philosopher Anonymous' work *On the Whitening of Sulphur* in the middle of the following passage (= Syn. § 11,174-182 Martelli = CAAG II 63,18-64,1; I marked the interruption we find in the Meteora MS with the sign †):

Διόσκορος. Μὴ ἄρα τοῦτο ἔλεγεν ὁ φιλόσοφος· ὧ φύσεις οὐράνιοι φύσεων δημιουργοί, ταῖς μεταβολαῖς νικῶσαι τὰς φύσεις;

Συνέσιος. Ναί, διὰ τοῦτω εἶπεν· εἰ μὴ ἐκστραφῆ, ἀδύνατον γενέσθαι τὸ προσδοκώμενον καὶ μάτην κάμνουσιν¹⁸ ἢ οἱ τὰς ὕλας ἐξευρῶντες καὶ μὴ φύσεις τῶν σωμάτων μαγνησίας ζητοῦντες. Ἐξεστι γὰρ τοῖς ποιηταῖς καὶ συγγραφεῦσιν τὰς αὐτὰς λέξεις ἄλλως τε καὶ ἄλλως σχηματίζειν. Σῶμα οὖν τῆς μαγνησίας εἰρηκεν, τουτέστιν τὴν μίξιν τῶν οὐσιῶν κτλ.

“Dioscorus. Did not the philosopher say these words: “O celestial natures, artificers of natures, which conquer natures with your transformations”?

Synesius. Yes, he did, and that is why he said: “if you do not turn (the natures) inside out, it will be impossible to reach what is expected; those who examine the natures and do not investigate the natures of the bodies of *magnēsia* wear themselves out in vain”. Indeed, poets and prose-writers are allowed to fashion the same speeches using different figurative expressions. Therefore he said: “the body of *magnēsia*”, that is, the mixing of the substances” (Martelli 2014,137).

In order to better illustrate the situations in the two manuscripts, in the following table I provide a diplomatic transcription of the passage quoted above as it stands in the two testimonies:

¹⁸ The Ellassona and Meteora MSS read καὶ μάτην ἐνοῦσιν.

Meteora MS, fol. 114v5-11	Elassona MS, fol. 63v22-64r10
<p>δ Διόσκορος· μὴ ἄρα τοῦτο ἔλεγεν ὁ φιλόσοφος· ὧ φύσες οὐρανίοι φύσεων δημιουργοί, ταῖς μεταβολαῖς νικῶσα τὰς φύσες;</p> <p>συνέσιος· καὶ διὰ τοῦτο εἶπεν· εἰ μὴ διαστραφῆναι δύναται γενέσθαι τὸ προσδοκούμενον καὶ μάτην ἐνοῦσιν ἐνοῦσιν ζῆται κατὰ ἁρμονίαν τοῦ λόγου· τὸ εἰς τὰς ὕλας ἐξερευνόντ⁰¹· ἔνθα καὶ τὸ τίμιον τόδε</p> <p>Ὶ Ἀνεπιγράφου φιλοσόφου περὶ ΧΖ τῆς λευκόκεοσι</p> <p><i>inc.</i> (fol. 114v14) καθόσον καὶ ἡ χρεία καλεῖ τοσοῦτον προδίδωται κτλ.</p> <p>....</p> <p><i>expl.</i> (fol. 117r9-10) νῦν καὶ εἰς τοὺς αἰῶνας τῶν αἰώνων ἀμήν·- οἱ τὰς ὕλας ἐξερευνῶντες καὶ μὴ φύσεις τῶν σωμάτων·- x _ ζητοῦντες· ἔξεστι γὰρ τοῖς ποιηταῖς συγγραφεῦσιν τὰς αὐτὰς λέξης ἄλλως τε καὶ ἄλλως σχηματίζειν· σῶμα οὖν μαγνησίας εἶρηκεν τὴν μίξιν τῶν οὐσιῶν</p>	<p>δ· Διόσκορος· μὴ ἄρα τοῦτο ἔλεγεν ὁ φιλόσοφος· ὧ φύσεις οὐρανίων [<i>s.l.</i> -ε] φύσεων δημιουργέ, ταῖς μεταβολαῖς νικῶσα τὰς φύσεις;</p> <p>συνέσιος· καὶ διὰ τοῦτω εἶπεν· εἰ μὴ διαστραφῆναι, οὐ δύναται γενέσθαι τὸ προσδοκούμενον καὶ μάτην ἐνοῦσιν·</p> <p>[here a marginal note is introduced: ἐδῶ ἔγραφεν τι ἀφιβόλη· καθόσον καὶ χρείας καλεῖ τοσοῦτον π(.) Ξ] οἱ τὰς ὕλας ἐξευρώντες καὶ μὴ φύσεις τῶν σωμάτων</p> <p>x _ [<i>s.l.</i> μαγνησίας] ζητοῦνται· ἔξεστι γὰρ τοῖς ποιηταῖς συγγραφεῦσιν τὰς αὐτὰς λέξεις ἄλλος τε καὶ ἄλλως σχηματίζην· σῶμα οὖν τῆς μαγνησίας εἶρηκεν τὴν μίξιν τῶν οὐσιῶν</p>

In the Meteora MS a note in red ink is introduced after the point in which the first part of Synesius' treatise suddenly stops (i.e. after καὶ μάτην ἐνοῦσιν). The note reads:

“According to the sequence of the argument, the term ‘ἐνοῦσιν’ seeks for (i.e. is connected with) the expression ‘εἰς [*lege oi*] τὰς ὕλας ἐξερευνόντες’. Here there is this

precious (treatise ?)¹⁹: the Philosopher Anonymous, *On the Whitening of Sulphur Water*.²⁰»

The copyist of the Meteora MS (or an anonymous reader who annotated its antigraph) was aware of the fact that Synesius' treatise continues with the words οἱ τὰς ὕλας ἐξευρενῶντες²¹, that are precisely the words by which the second part of Synesius' treatise is opened in the Meteora MS, fol. 117r11. On the other hand, the copyist of the Ellassona MS added a marginal note after the expression 'καὶ μάτην ἐνοῦσιν', in which he claims: "here something is written: ". These words correspond to the *incipit* of philosopher Anonymous' treatise, which the Meteora MS hands down between the first and the second part of Synesius' treatise. Moreover, after the marginal note the copyist of the Ellassona MS adds a sign (¥, i.e. a stroke with two dots above), which is used as reference to philosopher Anonymous' treatise *On the Whitening of Sulphur Water*. The same sign, in fact, occurs in the margin of fol. 68v3-4, where we find the *incipit* of Anonymous' treatise in the Ellassona MS:

[in the left margin: ¥] Ἀνεπιγράφου φιλοσόφου περὶ θείου ΧΖ τῆς λευκόσ(εω)ς.
(inc.) Καθόσον καὶ χρεία καλεῖ τοσοῦτων προδήδωτε (*sic*)

It seems quite clear that the scribe of the Ellassona MS copied from an antigraph, where the treatise *On the Whitening of Sulphur Water* occupied the same position than in the Meteora MS. We may wonder whether the Meteora MS itself may be identified with the source of the Ellassona MS. In that case, the above-mentioned note in the Meteora MS, which introduces the insertion of philosopher Anonymous' treatise, would have left no sign in the Ellassona MS. Probably only a complete collation of the two manuscripts will allow us to answer this question. For the moment, we can certainly draw the preliminary conclusion that the Ellassona MS is based on an antigraph that followed the same order of treatises that we find in the Meteora MS.

¹⁹ The exact meaning of the sign (f) after τὸ τίμιον τόδε is not evident. It does not seem to correspond to an alchemical ingredient (it is not recorded in the explanatory table transcribed at fol. 177v-179v of the Meteora MS). It could be interpreted just as a reference to the following treatise by the philosopher Anonymous.

²⁰ The expression 'sulphur water' is rendered in the MS with the alchemical signs: X (i.e. 'sulphur') and Z (i.e. 'water').

²¹ That is, 'those who investigate the matter', who are the subject of the verb ἐνοῦσιν.

Further evidence, in fact, can be provided to confirm this point. In the Meteora MS the two treatises by the philosopher Anonymous are not consecutive, since the second part of Synesius' commentary divides them. At fol. 114v the title of the above mentioned work *On the Whitening of Sulphur Water* is introduced, and the treatise ends at fol. 117r10, where the second part of Synesius' dialogue starts. The dialogue ends at fol. 122v, where the second work *On the Making of Gold* by the philosopher Anonymous begins:

Meteora MS, fol. 122v14-17

[*explicit* of Synesius' commentary] θεοῦ δὲ βοηθοῦντος ἄρξομαι ὑπομνηματίζειν
[title of the second treatise by the philosopher Anonymous] ἀνεπιγράφου φιλοσόφου
κατὰ ἀκολουθείας χρίσεως ἐμφενῶν τὴν τῆς αποείας συνεπιτηγμένος σὺν θεῷ

On the contrary, the Ellassona MS hands down the two works by the philosopher Anonymous one after the other. However, the use of marginal signs shows that the copyist of the Ellassona MS relied on a source, where the second treatise by the philosopher Anonymous came after the *explicit* of Synesius' work (i.e. in the same position attested in the Meteora MS). The copyist, in fact, added a interesting marginal sign at the end of Synesius' treatise (Ellassona MS, fol. 68v1-2):

Θεοῦ (with the sign \acute{R} above the line) δὲ βοηθοῦντος ἄρξομαι ὑπομνηματίζειν (*sic*)

This *explicit*, introduced by the same marginal sign (\acute{R}) is copied again at fol. 70r1, in the upper margin above the *incipit* of philosopher Anonymous' second treatise (that is, the treatise that comes after the end of Synesius' dialogue in the Meteora MS):

(Ellassona MS, fol. 70r1-2): [upper margin: \acute{R} θεοῦ δὲ βοηθοῦντος ἄρξομαι ὑπομνηματίζειν] Ἀνεπιγράφου φιλοσόφου κατὰ ἀκολουθείας χρίσεως ἐμφενῶν τὸν τῆς αποείας συνεπιτηγμένος σὺν θεῷ

The repetition of the *explicit* of Synesius' treatise in the upper margin and the use of the marginal sign clearly show that the copyist of the Ellassona MS was reading a

source, in which Synesius' treatise and philosopher Anonymous' treatise *On the Making of Gold* were one after the other.

In the section following the treatise *On the Making of Gold*, it is possible to find further correspondences between the two manuscripts, although the Meteora MS seems to preserve a richer and more complete selection of texts. Both the MSS preserve some writings attributed to Zosimus of Panopolis; on the other hand, the Ellassona MS omits a few technical sections that are available in the other manuscript:

132r-157r	Zosimus, <i>On Virtue and Interpretation</i> = CAAG II 118,13-138,4 + 263,3-267,15 ²²	75r-90r	Zosimus, <i>On Virtue and Interpretation</i> = CAAG II II 118,13-138,4 + 263,3-267,15
157r-159v	Zosimus, <i>On the Evaporation of Sulphur Water</i> = CAAG II 138,5-140,8 ²³	90r-91v	Zosimus, <i>On the Evaporation of Sulphur Water</i> = CAAG II 138,5-140,8
159v-163r	(<i>sine titulo</i>) inc. Take eggs etc. = IX 1-81 Mertens	91v-93v	(<i>sine titulo</i>) inc. Take eggs etc. = IX 1-81 Mertens
163v-165r	<i>On the Composition of Waters</i> = X 1-16 Mertens	94r	<i>On the Composition of Waters</i> = X 1-16 Mertens
163v-165r	<i>On Fires</i> = CAAG II 144,10-145,14	94r-95r	<i>On Fires</i> = CAAG II 144,10-145,14
165r-169v	<i>On the Making of Glasses</i> = CAAG II 348-350,3 + 250,13-252,21	95r-98r	<i>On the Making of Glasses</i> = CAAG II 348-350 + 250,13-252,21
169v	<i>On Whitening</i> = CAAG II 211,3-12 ²⁴	98r	<i>On Whitening</i> = CAAG II 211,3-12
169v-171r	<i>Tinctures discovered by the Persians</i> = CAAG II 346,1-347,7		
171v	Originally blank		

²² This work ascribed to Zosimus represents the second part of philosopher Anonymous' treatise *On the Making of Gold*; see Lagercrantz 1927, 18-19.

²³ The last paragraph of the text (CAAG II 140,9-20) is omitted in the Meteora and Ellassona MSS,

²⁴ This section is probably part of Synesius' treatise; see Martelli 2014,150-151.

	[a later hand added two texts on the tincture of iron]		
172r-173r	<i>Thus did the Ancients speak about Eggs</i> = CAAG II 18-19,17 ²⁵	98r	<i>Thus did the Ancients speak about Eggs</i> (lacking of the end) = CAAG II 18,1-6

The last excerpt on eggs lacks of the final part in the Ellassona MS. This omission is not easily understandable: a mechanical loss of folia or squires (although not to be excluded) would not be a sufficient explanation for the incompleteness of this writing. A second scribe, in fact, started writing a new section on fol. 98v, which had been probably left blank by the earlier copyist. In any case, after the excerpt on eggs, the two manuscripts preserve two different selections of texts. In the Ellassona MS, at the fol. 98v a different section begins (as already seen, written by another copyist), which hands down a short collection of pharmaceutical and magical recipes. On the other hand, the Meteora MS includes a richer selection of alchemical texts in its last part:

	Meteora MS
173r-175v	<i>On the Making of Quicksilver</i> = CAAG II 220,17-222,17
175v-177r	<i>On Measures and Weights</i>
177v-179v	<i>Alchemical signs</i> = CAAG I 104 and 108
180r-180v	<i>List of Alchemists</i> = CAAG II 25,5-26,6
180v-202v	Collection of recipes ≈ CAAG II 321-337 ²⁶

The two introductory passages in the Meteora and Ellassona MSS

The opening sections of the two manuscripts deserve a special attention, since they preserve an interesting selection of passages serving as introductory texts. Both, in

²⁵ §§ 11-13 of the text in Berthelot's edition (CAAG II 19,18-20,15) are omitted in the Meteora MS.

²⁶ See below, § 4.

fact, hand down two short texts that seem to provide the reader with a preliminary description of the contents of the collection of alchemical writings copied in the two codices. The first passage does not occur in any other alchemical testimony known so far (such as the above-mentioned *Marcianus* gr. 299, *Parisini* gr. 2325 and 2327, and *Laurentianus* 86,16):

[Meteora MS, fol. 1r1-13 (red ink) = Ellassona MS, fol. 1r1-9]²⁷ Θαυμάζω τοὺς εὐρόντας τὰ γράμ(μ)ατα καὶ τοὺς κτισαμένους τὰς τέχνας ἀσπάζομαι, καὶ φιλῶ τοὺς ἀγαπόντας αὐτά. Ἐπαινετὴ ἡ ἑλικοειδῆς γραφὴ τῆς μεταλλικῆς τέχνης, ἐπεὶ ἡ ἀρχὴ τοῦ συγγράμματος τοῖς ἑλικτοῖς ἔοικεν [ἔηκεν MetMS] ὄφεσιν· οὗτοι τε γὰρ τὴν κεφαλὴν εἴσω τῆς πυρας [sic MSS; lege σπείρας cum Psello] καταλύποντες, τὸ λοιπὸν σῶμα προβέβληνται, καὶ τὸ βιβλίον τῆς τουτωθέσεως εἰσβαλῆ [sic MSS; lege τὴν τῆς ὑποθέσεως εἰσβολὴν cum Psello] ἐν μέσῳ διολισθήσασ<αν> ὥσπερ [κλήρω] κληρωσάμενον [τὴν] ἀρχὴν πεποίηται τὴν μεσότητα.

“I admire people who discovered these writings and I kindly welcome who laid the foundations of these techniques, and I like people who love this topic. We must praise this writing on the metallic art which has a spiral form: in fact, the beginning of the writing resembles coiled snakes; they conceal their head inside the coils and thrusts the rest of their body forward; so the book makes a beginning of its middle, and the onset of the story, which it has, so to speak, inherited, slips through (to end up) in the middle”.

The anonymous composer refers to a book on μεταλλικὴ τέχνη (‘the art of metals’), an expression that seems to summarize the contents of the collection of texts copied in the two testimonies. He focuses his attention especially on the structure of this collection, which is described as a ‘spiral-shaped writing’ (ἑλικοειδῆς γραφή). The expression introduces the reader to the second part of the passage, which clearly echoes the words used by Psellus to praise the plot-construction of the Hellenistic novel *Aethiopica* in his essay on Heliodorus’ and Achilles Tatius’ novels. In the short

²⁷ It is worth mentioning that both the MSS hand down the following note in the upper margin: ἀρχὴ τῆς ἱερᾶς καὶ θείας τέχνης.

treatise *What is the Difference between the Novels which Deal with Chariclea and Leucippe?* (Τὶς ἢ διάκρισις τῶν συγγραμμάτων, ὧν τῷ μὲν Χαρίκλεια, τῷ δὲ Λευκίππη ὑποθέσεις καθεστήκατον;), Psellus takes part in a contemporary debate on the artistic merits of the two novels²⁸ and defends the value of the *Aethiopica*, whose stylistic features are highlighted in different respects. The first point made by the Byzantine scholar regards the plot of the story: Heliodorus did not only open his tale *in medias res*, but he also constructed a complicated plot, in which the prior events are revealed only in the middle of the story. In order to emphasize the merits of such a sequence of events, Psellus introduces the comparison with a coiled snake, which reads as follows (p. 92, ll. 24-28 Dyck):

Καὶ αὐτὴ δὲ ἡ ἀρχὴ τοῦ συγγράμματος ἔοικε τοῖς ἐλικτοῖς ὄφεσι· οὗτοι τε γὰρ τὴν κεφαλὴν εἴσω τῆς σπείρας κατακαλύψαντες, τὸ λοιπὸν σῶμα προβέβληνται, καὶ τὸ βιβλίον τὴν τῆς ὑποθέσεως εἰσβολὴν ἐν μέσῳ διολισθήσασαν ὥσπερ κληρωσάμενον ἀρχὴν πεποιήται τὴν μεσότητα.

“The beginning of the work itself resembles a coiled snake: the snake conceals its head inside the coils and thrusts the rest of its body forward; so the book makes a beginning of its middle, and the onset of the story, which it has, so to speak, inherited, slips though (to end up) in the middle”.²⁹

The connection between such a stylistic analysis of a novel and the structure of an alchemical compendium is not completely transparent. We may certainly suppose that the anonymous writer of the above-mentioned introductory passage wanted to emphasize the difficulty of the alchemical *opus*, which could be accomplished only after a long investigation on the copied treatises. The reader of the alchemical collection had not to limit himself to study only the opening treatises, yet he had to carry on a deep investigation in order to fully understand the core of the preserved alchemical teaching. On the other hand, the choice of the anonymous writer could have depended on the authority that Psellus had gained in the field of alchemy. Many alchemical collections, in fact, include a short treatise that the Byzantine scholar

²⁸ See Dick 1986, 83.

²⁹ Transl. by Dyck 1986, 93.

wrote on the art of gold-making.³⁰ His reputation as an alchemist could have led the anonymous writer to look at other Psellus' writings in order to find alchemically relevant passages.

Moreover, we must note that the expression μεταλλική τέχνη ('the art of metals') is rare in the collection of Greek alchemical texts. It is therefore noteworthy that it occurs again in the second introductory text preserved by the Meteora and the Ellassona MSS, which read:

[Meteora MS, fol. 1r13-1v8 – Ellassona MS, fol. 1r10-21] Βίβλος μεταλλική καὶ χυμειτική περὶ χρυσοποιίας [αποΐας MSS], ἀργυροποιίας [σποιίας MSS], ὑδραργύρου [b MSS], πήξεως – ἔχων (*lege* ἔχουσα) αἰθάλας [gg MSS], βαφᾶς καὶ φρούμας [sic MSS; *lege* φούρμας] ἀπὸ βροντησίου – ὡσαύτως καὶ λίθων πρασίνων, καὶ λυχνίτων, καὶ ἑτέρων παντίων [sic] χρωμάτων, καὶ μαργάρων καὶ δερμάτων ἐρυθροδανόσις [*lege* ἐρυθροδανόσεως] βασιλικῶν. Ταῦτα δὲ πάντα γίνονται ὑπὸ ὑδάτων θαλασσίων [y MSS], ὠῶν [Ǻ MSS], διὰ τέχνης μεταλλικῆς.

“Book on metals and alchemy dealing with the making of gold, the making of silver, the solidification of mercury – it includes also vapours, dyes, and the hollow moulds made of copper – as well as green stones (emeralds), and rubies, and all the other colours, and pearls, and the red dyeing of royal leathers. All these (techniques) are based on sea waters, on eggs, according to the art on metals”.

This passage occurs in other alchemical manuscripts as well: it seems to work as an erratic textual block moving in different positions within four different collections. In MSS *Parisinus* gr. 2327 (fol. 240r24-240v5) and *Laurentianus* 86,16 (fol. 219v8-17) - - that are, the oldest MSS preserving this short text -- it is copied immediately after an excerpt from the work of the above-mentioned philosopher Anonymus (*CAAG* II 436,19-437,13). In their edition, Berthelot-Ruelle arbitrarily published this passage within the section devoted to Zosimus' writings (*CAAG* II 220,11-16). However, in a footnote, Berthelot suggested identifying the text with either the title or the preface of

³⁰ See Bidez 1928, 1-47; Katsiampoura 2008.

a Byzantine handbook of practical chemistry dating between the eight and the ten century, which probably included several recipes on a wide set of techniques (such as gold-making, silver-making, the making of precious stones, and so on).³¹ The opening position of this passage in the *Meteora* and *Elassona MSS* seems to confirm this interpretation: in the two manuscripts the text introduces to an extent the technical information preserved in the collection, whose structure was praised in the previous passage taken by Psellus. The two texts seem to complement each other, providing a general description of the structure and the practical contents of the alchemical ‘book’ that was copied down in the two manuscripts.

The recipe-book in the *Meteora* manuscript

Some of the techniques mentioned in the introductory passages analyzed above (especially in the second one) are clearly described in the long collections of recipes, which is handed down in the last part of the *Meteora MS*. This collection largely overlaps with the recipe-book published in *CAAG II* 321,1-337,13, which was based on *MS Parisinus gr. 2327*, the only testimony of this book known so far. The manuscript hands down 57 metallurgical recipes under the general heading: ἐρμηνεία σὺν θεῷ τῆς τιμιωτάτης καὶ πολυφίμου χρυσοχοικῆς, “With the help of God, explanation of the very precious and famous art of goldsmiths”. A few of these recipes occur in a third manuscript as well, the *Laurentianus* 86,16 (= **L**), at fol. 253v-256r and fol. 286v-290v.³² The first section includes two recipes which coincide with *CAAG II* 336,12-337,9 (= **L**, fol. 253v1-254r12 ὕδωρ πιστῆς οἰκονομίας) and *CAAG II* 337,10ff. (= **L**, fol. 254r12-256r9 καὶ ἄλλος ψησίον); the second section includes 15 recipes, six of which coincide with six recipes edited in *CAAG*:

- (1) **L**, fol. 286v1-16, ἄλλος μέθοδος μυστική = *CAAG II* 332,1-11
- (2) **L**, fol. 286v15-187r20 ἕτερον ὕδωρ θεῖον = *CAAG II* 332,12-333,6
- (3) **L**, fol.287r21-287v12 ὕδωρ ἵνα ἐκβάλῃς χρύσομαν ἀπὸ ἀσήμην = *CAAG II* 333,7-17
- (4) **L**, fol. 287v12-288r3 ἕτερον ὡσαῦτος = *CAAG II* 334,18-27
- (5) **L**, 288r3-12 λαγάρισμαν χρυσαφίου = *CAAG II* 333,28-334,6
- (6) **L**, 288r12-288v3 περὶ τοῦ ποιῆσαι γράμματα χρυσά = *CAAG II* 334,22-335,2.

³¹ See *CAAG III* 360.

³² See Mertens 1995, xl-xli.

The remaining 9 recipes of this section (fol. 288v3-290r16) do not coincide with any of the *CAAG* recipes and have not been edited so far.³³

Against this picture the *Meteora MS* stands out as the testimony preserving the richest selection of recipes, which is opened by five recipes (not grouped under any general heading) that are not handed down in the *Parisinus* and that only in one case overlap with the selection preserved in the *Laurentianus*. A preliminary edition of these five texts is provided below:

(1) 180v10-181r4 Περί χρυσογραμμίας σιδήρου

Μελάνισον <έν> ἀρχῆ³⁴ τὸ σίδηρον· πύρωσον αὐτό καὶ τρίψον τὸ σίδηρον μετὰ στέατι αἰγείῳ· καὶ ἄλειψον αὐτὸ μὲ χριστέλαιον· καὶ γίνεται μελάνον· εἶθ' οὕτως σκίασον κλαδὶν ἢ γράμματα καὶ καθάρισαι αὐτὰ μετὰ τὸ ὕπερον· καὶ στυψίασον τὰ γράμματα με τὴν στύψιν· εἶθ' οὕτως χρῖσον [χρῦσον MS] αὐτὰ ὥσπερ τὸ ἄσημιν μὲ τὸν ὑδράργυρον καὶ ἄκρως πύρωνε· καὶ βουρτζίζε³⁵· καὶ χρῦσωνε.³⁶

How to write golden letters on iron

First make the iron black: set it on fire, break iron into pieces with fat of goats, and anoint it with the oil of Christ, and it will turn black. Then use it to sketch a twig³⁷ or letters and cleanse them (the drawings?) with a

³³ For an introduction to this section, see the preliminary description by Hammer-Jensen in Zuretti 1927, 57-58 (where not all the recipes are recorded): (1) L, 288v3-10 περὶ τοῦ ποιῆσαι κόλισιν καλήν ; (2) 288v10-13 ἄλλον; (3) 288v13-289v3 ἕτερον; (4) 289r3-17 ἕτεροι κόλισες; (5) 289r18-289v3 ἕτερον; (6) 289r3-10 ἑτέρα κόλισις ; (7) 289v10-21 ἐρμηνεία τῆς ἐλαιωκονίας; (8) 289v21-290r16 ἄλλον; (9) 290r9-16 ἄλλον

³⁴ The MS reads μελάνησον ἀρχή. The standard meaning of μελανίζω in classical Greek is 'to be black or blackish' (LSJ⁹ 1095), which seems to be maintained in Byzantine and Modern Greek too (see Trapp 991, s.v. μελανίζομαι, and Dimitrakos 4540 respectively). An active sense, on the contrary, seems to be necessary in the recipe.

³⁵ Trapp 292, s.v. βουρτζίζω, '(ab)bürsten'; DuCange I 222, s.v. βουρτζίζειν, *polire*; see *CAAG* II 329,19: θὲς εἰς ὕδωρ ψυχρὸν καθαρὸν καὶ βούρτζισον, "mets dans l'eau froide et brosse" (*CAAG* III 315); *CAAG* II 331,23 ἔπειτα τὸ ἄσπιρον καὶ βούρτζισον τὰ ἀχείροτα (*sic*), "ensuite, blanchis et polis ce qui n'a pas été travaillé" (*CAAG* III 317).

³⁶ The forms πύρωνειν and χρῦσώνειν are Byzantine (and Modern Greek) equivalents for πύρωω and χρῦσόω (see Colinet 2010, xxxvii). The MS reads πύρωνε and χρῦσωνε; the spelling with omicron is maintained by Berthelot in his editions of late alchemical texts: for πύρωνειν see *CAAG* II 392,15 (cf. DuCange I 1277, s.v. πύρωνειν, *urere*); for χρῦσώνειν, see *CAAG* II 328,4 and 10; 329,1 and 10.

³⁷ On this practice, see below, recipes n. # (= *CAAG* II 327,26) Περί τοῦ χρυσῶσαι ζῶα εἰς κούπαν ἢ κλαδὴν ἢ ἄλλον ἕτερον καὶ τὸ ἄλλον ἀχρῦσωτον, to be translated as suggested by Stephánidès 1922, 307: "Sur la manière de tracer dans une coupe des animaux ou un rameau ou toute autre chose dorée et de laisser le fond non doré"; recipe n. # (in *CAAG* II 331,7): ἔπειτα τὸ ποιῆσαι συρὲς καὶ φύλλα καὶ κλαδία καὶ ἄστροι κτλ., "puis, fais-en des fils, des feuilles, des rameaux, des étoiles, etc." (*CAAG* III 316).

pestle; mordant the letters with alum³⁸; then smear mercury on them as you do for silver; set (them) on an intense fire, brush (them) off, and gild (them).

(2) 181r5-181v2 ἐρμηνεία τῆς λυκο[...]ας = Laur. Plut. 86.16, fol. 289v10-21 (ἐρμηνεία τῆς ἐλαιωκόν<ι>ας)³⁹

Λαβὼν ἄσβεστον ὅσον χρίζης· θές αὐτήν εἰς σκάφην [σκάνφη MS]⁴⁰, καὶ βα<μ>βάκην στιβασμένον, καὶ λινέλι· καὶ δέρνε [δύρε MS]⁴¹ το ὅσον νὰ γένη ζυμάριν· ἔπ<ε>ιτα ἄλειψον τὰς μάζας τῶν μαρμάρων· εἰθ' οὕτως θές ὕδωρ [sic L : ὕδατι MS] ἐν λέβητι, καὶ τὸν ἀπέσω φλοῦν τοῦ πελαία<ς> [φθέ- MS], καὶ κρίθαριν, καὶ λινόσπερμα καὶ ἄς βράσουν καλῶς· ἔπ<ε>ιτα ἔπαρον τὸν χύλον καὶ μίξον καὶ ἄσβεστον καὶ μὲ κεραμίδιν τετριμμένον καὶ κοσκινισμένον, μὲ ὄν ὀρνίθειον καὶ κάν<ν>αβιν ἢ λύων [?; λύον L; *ft.* λίνον], καὶ μίξας ὁμοῦ τὰ πάντα· εἰθ' οὕτως ἄλειψον καὶ μυστροσθλίβωσον [μυστροκλήβωσον MS]⁴² παράνω μὲ λινέλιν.

Explanation of (how to prepare) a plaster made from lime and oil

Take as much lime as you need; put it in a washbasin along with cotton – which has been pressed to the bottom – and linseed oil, and pound it until it becomes a mush; then anoint the lumps of marble. Then put water, the internal bark of elm, barley, and linseeds in a pan, and make them boil

³⁸ In the earlier alchemical texts, the term στῦψις referred to the process of in an astringent substance (see Halleux 1981, 44-45); on the other hand, in later alchemical texts, στῦψις is often used to refer to the astringent substance itself (see, e.g., Colinet 2010, 140 *s.v.* στῦψις).

³⁹ The term ἐλαιοκονία refers to a 'plaster made from lime and oil' (LSJ⁹ 527), which is mentioned by Zosimus among other substances used to seal the different parts of distillatory devices (Zos. IX 13 Mertens). Stephanus too mentions this compound in his commentary on Hippocrates' *Aphorisms* (*in Aph.* IV 1 = II 208,24-26 Westerink): οὕτως οὖν <καὶ> οἱ ὑδραγωγοὶ ποιῶσιν τοὺς γὰρ σωλῆνας κατασφαλιζοῦσιν καὶ ἐμμοτοῦσιν αὐτοὺς ἐλαιοκονία ἢ κηρομαρμάρῳ καὶ τοῖς τοιοῦτοις, ἵνα μὴ ἀπόληται τὸ ὕδωρ, "Hydraulic engineers do the same: when connecting water-pipes, they caulk them with a mixture of oil and lime, or wax and ground marble, etc., so that no water is lost." A Graeco-Latin glossary records the term ἐλαιοκονίον, which is interpreted as *malta* (II 294 Loewe).

⁴⁰ In this passage L reads εἰς κάφην.

⁴¹ The same reading occurs in L (δύρε). My correction (δέρνε; see Trapp 348, *s.v.* δέρνω, 'schlagen, peitschen') is based on the comparison with the recipe 11 of the MS *Holkamicus* 109 (Colinet 2010, 44, H11, § 3, ll. 15-17): καὶ δέρνε το καλὰ ἕως ὅτου νὰ γένη ὡσάν ζυμάρι, "et battez bien le mélange jusqu'à ce qu'il se forme une sorte de pâte".

⁴² In this passage L reads μυστροστρήβωσον. I suggested to read the verb μυστροσθλίβω, from μύστρον, 'spoon', and σθλίβω, 'to rub' (see LSJ⁹ suppl. 274, *s.v.* σθλίβω; DuCange II 1363, *s.v.* σθλίβειν). For σθλίβω, see, e.g., CAAG II 323,4 εἰθ' οὕτως σθλίβωσον αὐτὸ μετὰ ἐλιάκοκον, "et frotte avec de la cendre d'olivier" (CAAG III 307); CAAG II 323,17 καὶ σθλίβωσον μετὰ κάλαμον, "puis frotte avec une plume" (CAAG III 310); CAAG II 334,26 σθλίβωσον με λιθάριν ἢ με λυκουδόντι, "polis avec une petite pierre ponce, ou une dent de loup" (CAAG III 320).

well. Take this decoction and mix lime with crushed and sifted bricks, with hen eggs, and hemp or flax (?)⁴³, and mix well all the ingredients together. Then anoint (the distillatory device?) and use a spoon to rub the surface (of it) with linseed oil.

(3) 181v3-15 εἰς τὸ χρυσῶσαι γράμματα

Θὲς πάμπανυ πετάλην αἴραν· ξυλόκουκα γ' καὶ ὑδάργυρον [ξυλόκουκον] α'· τριῖπον πρῶτον τὸ χρυσάφην εἰς μάρμαρον κοκκίνον· καὶ στάζε πρῶτον χριστέλαιον καθαρὸν ἄδολον [ἄδου- MS]· μία ἢ δύο στάλαγμούς· καὶ ἔπειτα θὲς τὸν ὑδάργυρον καὶ ἔνωσον ἅμα· καὶ τριῖπον ἄμφοτερα· πλὴν μετὰ προσοχῆς· καὶ εἰς τόπον νὰ μηδὲν πνέει ἀήρ· θὲς δὲ καὶ κρομμυδίου [κρομι-] ζωμόν· εἶτα βαλῶν ὅπου θέλεις θέσει· σύνασε⁴⁴ αὐτὸ μὲ πτερόν· καὶ ὅταν θέλης γράφε καὶ χρύσονε.

To gild letters

Set a leaf completely made of copper; silique, 3 parts and mercury, 1 part; first break the gold into pieces on a scarlet marble; and first drip (shed drop by drop) unadulterated pure oil of Christ, 1 or 2 drops; then set the mercury and amalgamate together; break both ingredients into pieces, but be careful, do not do it in an ventilated place. Put the juice of a small onion as well; apply it in the point (of the leaf) that you prefer, collect it with a feather and, when you want, write with golden letters.

(4) 181v16-182v9 ἄλλον

Λαβὼν ἄσβεστον κίτρινον ὅσον θέλης· καὶ ἄλας ἀμμονιακόν· καμπάνου ἄλλο τόσον· καὶ τριῖπον αὐτὰ λεπτῶς· καὶ θές τα εἰς τζουκάλιν⁴⁵ μικρόν· καὶ σκέπασέ τα μὲ πηλὸν τῆς σοφίας· καὶ θές ἐν φουρνε(λ)λίῳ καὶ ἄς σταθῆ μίαν νύκταν· καὶ τὸ πρῶι ἄρον αὐτὸν καὶ ἔασον ἵνα [ἦνα MS] ψυχρανθῆ· καὶ ἄρον ἐκ τὸ τζουκάλιν καὶ ζύμωσέ το· καὶ πρόσθεσ ἄλας

⁴³ The expression ἡ λύων [λύον L] seems to refer either to a different name for hemp or to an equivalent substance (substitute); many Byzantine lexicographers often link λίνον to κάνναβις; see Pollux, *Onom.* VII 72,6-7 καὶ ἡ κάνναβις δ' ὁμοίον ἐστὶ λίνω; Hesych. κ 673,1 κάνναβις ἔστι δὲ φυτὸν τι λίνω ὅμοιον.

⁴⁴ σύνασε as well as σύναζε are byzantine forms for σύναγε.

⁴⁵ The term (from Latin *zucca*) refers to an earthen pot; see DuCange II 1574, s.v. τζουκάλι (τζουκάλι τζουκάλιον) *olla fictilis*; Colinet 2010, xlv.

αμμονιακὸν τετριμμένον ἄλλον τόσον· καὶ ποιήσέ το πάλιν ὡσπερ πρώην με τὸ πυλὸν ἵνα μὴ εὐγῆ⁴⁶ οὐδεμία ἀτμὶς [ὑδῆμαμης MS]· καὶ πάλιν θές το ἐν τὸ φουρνε(λ)λίον· καὶ οὕτως ποιήσε το πᾶσαν φορὰν ὥστε να στραφῆ εἰς τὸν καμπάνον τὸν πρώτον· καὶ τότε ἐξήβαλε καὶ θές το εἰς ἀγγεῖον γύψινον νὰ (ἐ)ργ(άσης) [ναρ^γ MS]· καὶ θές τὸ εἰς ἴσκιον νύκτα μίαν· καὶ ἀπ' ἐκεῖνα τὰ νερὰ ρίξον⁴⁷ εἰς ἄργυρον ἀπάνω εἰς κάρβουνα· καὶ ὅταν ἴδῃς ὅτι φυρῶν τὰ νερὰ, ρίξον νερὸν πλεότερον ὥστε νὰ σκεπάσθῃ ὁ ἄργυρος· ὥστε νὰ φυράσῃ τὸ νερὸν ὅλον· καὶ ἔπειτα μίξον τὸν [? πον MS] ἄργυρον με χάλκωμα καθαρὸν· καὶ λῦσον αὐτὸ εἰς τὸ χωνίον ἐν τῷ ἅμα· καὶ ἀνάδεξάι τα· καὶ χῦσον αὐτὸ εἰς ῥυγλωχύτην⁴⁸· καὶ θές καὶ θέλει εἶσθαι [ἦσαι MS] ὠκονομήμενον [οἰκ- MS] διὰ πᾶσαν ὑπόθεσιν.

Another (recipe)

Take as much yellow lime as you want, and ammoniac salt, and the same amount of *kampanon*; grind them finely; the put them in a small earthen pot; cover them with the *lutum sapientiae* and set them in a small furnace and left it there for one night. In the morning take it and let it get cold. Take (the substance) out of the pot and knead it, and add another equal amount of ground ammoniac salt; perform the same operation you did before with the *lutum (sapientiae)*, so that no vapour gets out, and set again (the pot) in a small furnace; perform the entire process so that it turns into the previous *kampanon*. Then take it and put in in a vessel made of gypsum in order to work it; put it in shady place for one night, then pour part of these waters on silver (placed) on charcoals; when you notice that the waters evaporate⁴⁹, pour more water so that the silver remains covered; (do it) until all the water has evaporated, then mix the silver with

⁴⁶ See Trapp 430, s.v. ἐβγαίνω (εὐγαίνω <ἐκβαίνω) ‘herausgehen’.

⁴⁷ This form is an aorist imperative from ῥίγγω (DuCange II 1302), Byzantine cognate of ῥίπτω, ‘to throw, to cast’ (Colinet 2010, xxxvi). The form ρίξε occurs in an alchemical recipe preserved in MS *Holkhamicus* gr. 109 (H5 in Colinet 2010, p. 50, l. 7: καὶ ρίξέ τα μέσα εἰς τὸ ὑάλιν ὄπου ἔχει τὸ νερὸν τὸ καθαρὸν, “jetez-le dans le ballon qui contient le liquide pur”).

⁴⁸ DuCange II 1292 records the form ῥυγλωχύτης, “vas chymicum in regulae formam diductum, in quo liquatum metallum effunditur”. Also see Trapp 1502, s.v. ῥηγλίον, ‘Stange, Leiste’.

⁴⁹ The verb φυράω (‘to knead’ in ancient Greek; see LSJ⁹ 1962) seems to have taken on the same meaning than φυραίνω, ‘to be reduced, decrease, diminish in size/weight’ (see Dimitrakos 7730); I translated it as ‘to evaporate’, thus following Colinet’s translation of rec. 2 of the MS *Holkhamicus* 109 (Colinet 2010, 21): καὶ τότε βράσε αὐτὰς ἕως ὅτου νὰ φυράσῃ τὸ ἥμισυ,” faites bouillir jusqu’à ce que la moitié du liquid s’évapore”. Lagercrantz (1924, 57) commented on φυράσῃ: “‘abeat’, cf. ngr. φυραίνω· ἀπομειοῦμαι, ὑφισταμαι ἀπομειώσιν φύρα ἐλάττωσις ποσοῦ, βάρους ἢ ἀξίας (Héritès, *Lexicon*). Exemplum vetustius non novi.”

pure copper, and melt them together in a melting-pot; collect them and melt them in a ingot mould; take it and it will be suitable for any purpose.

(5) 182v9-13 ἄλλον

λάβε κασσίτερον καὶ θές εἰς χωνίον ἐν τῇ πυρᾷ· καὶ ὅταν λυθῇ, χῦσον αὐτὸ εἰς χύλον πηγάνου· καὶ κάμνη ἀγάπη· ὁ νοῶν νοεῖτω.

Take tin and put it in a melting-pot on fire; when it melts, pour it on rue juice; do hard work with pleasure. Who is clever will understand.

After this point, 59 recipes follow in the Meteora MS, which are grouped under the general title (fol. 183v13-15): ἐρμηνεία σὺν Θεῷ τῆς τιμιωτάτης καὶ πολυφήμου χρυσοχοικῆς [χρῦσωχοικῆς MS]. This recipe-book substantially overlaps with the version edited by Berthelot-Ruelle, except for the omission of four recipes – namely, CAAG II 323, 19-26; 324,1-6; 336,15-337,9; 337,10-11 – and the inclusion of a few texts that are not in the *Parisinus*. I list below the titles of the Meteora MS recipes and provide a preliminary transcription of two complete recipes (rec. 3 and 29), whose differences with respect to the versions edited by Berthelot-Ruelle are recorded in footnotes.

(1) 182v15-183v3 · ἀρχ(ῆ) εἰς λαγάρισμα χρυσαφίου [χρυσσαφίου MS], “*Incipit. To purify gold*” (= Recipe 1 in CAAG II 321,3-322,3: Περὶ τοῦ λαγαρίσαι τὸ χρυσίον).

(2) 183v4-15 Εἰς τὸ λαγάρισμα τοῦ ἀσημίου [ἀσημείου MS], “*To purify silver*” (= Rec. 2 in CAAG II 322,4-10: εἰς τὰ λαγαρίσαι ἄργυρον).

(3) 183v16-184v4 ἐρμηνεία τοῦ χρυσώματος (= Rec. 3 in CAAG II 322,11-23: same title).

Λαβὼν χρυσάφιν⁵⁰ ἐξάγιον α΄, σφύρισον αὐτὸ ἐν τῷ ἄκμονι ὡσπερ λεπτόν, καὶ κατάκοπον, καὶ θές ἐν τῷ χωνίῳ ἐν τῇ πυρᾷ ὥστε ἐρυθριᾷ⁵¹.

⁵⁰ CAAG II 322,11: χρυσίον.

⁵¹ CAAG II 322,13: ἐρυθρίαση.

Καὶ ἔκτοτε βάλε⁵² μέσον τὸ χρυσάφιον⁵³ νὰ ποιήσης <έ>ως ὥραν [ῶρα MS] πατέρ ἡμῶν. Καὶ βάλλον διάργυρον εἰς τὸ χωνὴν⁵⁴, καὶ μίξον, καὶ ἄρον ἐκ⁵⁵ τοῦ πυρός· καὶ βαλὼν ὕδωρ εἰς χηβάδιν [χρ- MS], θές εἰς [ἦς MS] κάρβουνα ζωντανὰ μέσον· καὶ σβέσον αὐτά· εἴθ' οὕτως [εἰλοῦτος MS] χῦσον τὸ χρυσάφιν μέσον τοῦ κο<γ>χυλίου ἢ εἰς τὸ χηβάδιν [χρ- MS]⁵⁶ καὶ ἄρον αὐτό, καὶ πλῦνον καλῶς ἐν τῇ χειρὶ σου· καὶ βαλὼν ὑδράργυρον ἕτερον, θές αὐτὸ εἰς τὸ ὕδωρ τοῦ κογχυλίου, καὶ διαργύρισον [-γύρησον MS : διαργύρωσον in CAAG] τὸ ἀσήμιν [καὶ] μὲ νεράντζι⁵⁷. Καὶ ἔκτοτε χρύσωσε⁵⁸ μὲ τὸ χρυσοτηρίον. Καὶ βαλὼν αὐτὸ ἐν τῇ πύρᾳ⁵⁹ κατὰ πέντε καὶ ἕξη φοράς, καὶ ὅταν ἴδῃς τὴν χροάν ὅτι ἐξεβαίνει, πύρωσον πλέον, καὶ θές τῷ ὕδατι· εἴθ' οὕτως σθλίβωσον αὐτὸ [*scripsi post CAAG II*; σκλήβοσον αὐτῷ MS], καὶ πάλιν πύρωσον⁶⁰, θές ἐν τῷ ὕδατι.

Explanation of (how to make) a gold object

Tale gold, one *exagion*; hammer it on an anvil to make it thin, cut it into pieces and put it in a melting-pot on fire, so that it turns reddish. From this moment put the gold in the middle of the crucible, so that you work it for the time of a *Pater Noster*. Then add mercury in the melting-pot, mix, and take it away from the fire. Pour water in a container, place it on burning charcoals, and quench them. Then melt the gold in the shell or container. Remove it and wash it in your hands. Add further mercury, pour it in the water of the shell and apply this mercury on silver with an orange (?); then gild it with a gilding tool. After setting it on fire for five or six times,

⁵² CAAG II 322,13: τότε βάλλον.

⁵³ CAAG II 322,13 τοῦ χρυσοῦ.

⁵⁴ CAAG II 322,14-15: ἐν τῷ χωνίῳ.

⁵⁵ CAAG II 322,15: ἀπὸ.

⁵⁶ The sentence θές εἰς κάρβουνα — ἢ εἰς τὸ χηβάδιν is missing in CAAG; however in the MS *Parisinus* gr. 2325, fol. 280v, we read: θές εἰς κάρβουνα ζωντανὰ μέσον τοῦ κογχυλίου εἰς τὸ χηβάδιν. As a matter of fact, the MS *Parisinus* seems to omit only the segment: καὶ σβέσον αὐτά· εἴθ' οὕτως χῦσον τὸ χρυσάφιν.

⁵⁷ CAAG II 322,18: τὸν ἄσημον καὶ μετὰ νεραντζίου. See Trapp 1075, s.v. νεράντζιον (< pers. *nārang*), ‘Pomeranze’. Berthelot-Ruelle translated: “et amalgame l’asèm jusqu’à ce qu’il prenne une couleur orangée” (CAAG III 309).

⁵⁸ CAAG II 322,18-19: τότε χρύσωσαι αὐτό.

⁵⁹ At this point the text as edited by Berthelot-Ruelle has a sentence that is missing in the *Meteora* MS: ἄρον αὐτὸ καὶ τρίψον μετὰ βρούτζον χοιρείαν. Καὶ πάλιν βαλὼν αὐτὸ ἐν τῇ πύρᾳ, “take it away from the fire, and polish it with a brush of pig’s hairs; then set it again on fire”. The lacuna may be justified as an instance of *saut du même au même*.

⁶⁰ CAAG II 322,23: πυρώσας.

when you see that the color comes out, burn it a bit longer, then put it in water; then rub it, burn it again, and put it in water.

(4) 184v5-185r2 χρύσωμα [χρύσομα MS] ἄλλον κλαπωτόν⁶¹ [κλαπόντον MS], “Another gold object suitable for gold wires” (= Rec. 4 in CAAG II 322,24-323,6: same title).

(5) 185r2-185v7 ἐρμηνεία εἰς τὴν ἔγκαψιν, “Explanation of an enameling technique” (= Rec. 5 in CAAG II 323,7-18: ἐρ. εἰς τὴν ἔγκοψις)⁶²

(6) 185v7-18 ἐρμηνεία ἐτέρα τοῦ σαπουν(ίου), “Another explanation of (how to make) soap” (= Rec. 8⁶³ in CAAG II 324,7-13: ἐρμηνεία ἐτέρου σαπουνίου).

(7) 186r1-9 ἐρμηνεία τῆς βασιλικῆς κολλήσεως⁶⁴ [κώλησις MS] τῆς χρυσοῦς, “Explanation of the imperial technique to solder gold” (= Rec. 9 in CAAG II 324,14-18: same title, except for the omission of τῆς χρυσοῦς)

(8) 186r10-186v2 περὶ τῆς βασιλικῆς κολλήσεως [κώλησις MS] τῆς ἀργυρῆς [-εἰς MS], “Explanation of the imperial technique to sold silver” (= Rec. 10 in CAAG II 324,19-24: same title)

(9) 186v3-12 ἄλλη ἐρμην(εία) εἰς τὴν ἀργυροκόλλησιν [ἀργυροκώλυσιν MS], “Another explanation of how to sold silver” (= Rec. 11 in CAAG II 324,25 – 325,2: ἄλ. ἐρ. τῆς ἀρ.)

⁶¹ See Trapp 835, s.v. κλαπωτός, ‘(gold)bestickt für Golddraht’; DuCange I 659.

⁶² We must note that the *Parisinus* gr. 2325, fol. 281r14 reads τὴν ἔγκαψιν. In the comment on this recipe (CAAG III 309, n. 3) we read: “Il s’agit sans doute d’une operation d’émaillage, désignée par le mot ἔγκοψιν, ἔγκαψιν ou ἔγκαυσιν”.

⁶³ Rec. 6 (CAAG II 323,19-26 : ἐρμηνεία τοῦ σμάρδου) and rec. 7 (CAAG II 324,1-6: ἐρμηνεία τοῦ σαπουνίου) are omitted in the *Meteora* MS.

⁶⁴ The genitive κολλήσεως would be possible as well, at least for the form κολλήση (Dimitrakos 4000, s.v. κόλλησις).

(10) 186v12-187r16 ἄλλη κόλλησις [κώλυσις MS] ἐγρηγόρη [ἐγλη- MS]· ἢ ἀλαμάρσα, “Another quick soldering, the *alamarsa*” (= Rec. 12 CAAG II 325,3-13 ἕτερα κ. ταχυτάτη, ἢ ἀλ.)

(11) 187r17-187v7 ἐρμηνεία νὰ ποιήσης χροάν [χρῶαν MS] χρυσαφίου, “Explanation of how to produce the colour of gold” (= Rec. 13 in CAAG II 325,14-18: ἐρ. εἰς τὸ ποιῆσαι χρ. χρ.).

(12) 187v7-5 εἰς τὸ ποιῆσαι χροάν [χρῶαν MS] ἐν ἀργύρῳ σκεύει χρυσομ(ένην) [χρυσο- MS], “To give a golden colour to an silver object” (= Rec. 14/1 in CAAG II 325,19-24)

(13) 187v15-188r3 εἰς τὴν ἔγκαμιν (-ην MS), “To enamel” (= Rec. 14/2 in CAAG II 325,24-26)

(14) 188r3-7 εἰς τὸ γανῶσαι [τὸ λανεῖσε MS] ἄργυρον, “To make silver shiny” (= Rec. 15 in CAAG II 325,27-326,2: same title).

(15) 188r7-16 σημείωσις [-εις MS], “Indication” (= Rec. 16 in CAAG II 326,3-7: same title)

(16) 188r16-188v5 εἰς στάλαγμα,⁶⁵ To produce a distilled substance (= Rec. 17 in CAAG II 326,8-11: εἰς μάλαγμα)

(17) 188v5-189r13 νὰ ποιήσης [-εις MS] φουρμάς,⁶⁶ “To make hollow moulds” (= Rec. 18 in CAAG II 326,12-26: περὶ τοῦ ποιῆσαι φ.)

(18) 189r13-189v7 Περὶ χρυσογραμμίας, “On gold writings” (= Rec. 19 in CAAG II 32327,1-8: Π. χρ. ἕτερον)

⁶⁵ The reading Στά^μ in the MS has been interpreted on the basis of the last sentence of the recipe, which reads: καὶ γίνεται ἀληθινὸν στάλαγμα (CAAG II 326,10-11 reads καὶ γίνεται ἀληθινὸν μάλαγμα).

⁶⁶ On the term φουρμά (and other Byzantine technical terms related to metallurgy), see Merianos 2014, 252, and Papathanassiou 2002, 123-125.

(19) 189v8-190v1 διήγησις νὰ ποιήσης [-ις MS] χρυσὰ κεφάλα(ια) εἰς βιβλίον, “Description of how to write gold capital letters in a book” (= Rec. 20 in CAAG II 327,9-25: Περὶ τοῦ ποιῆσαι χρ. κεφ. ἐν β.)

(20) 190v2-10 διήγησις ὅτι νὰ θέλ(ης) χρυσῶσαι [-όση MS] ζῶα· ἢ κούπ(αν) · ἢ κλαδὴν· ἢ ἄλλον ἕτερον· καὶ τὸ ἄλ<λ>ον ἀχρύσωτον, “Description of how to draw golden animals, or a (golden) coup, or a golden twig, or something else, without gilding the rest (of the object)”⁶⁷ (= Rec. 21 in CAAG II 327,26-328,4: περὶ τοῦ χρυσῶσαι ζῶα εἰς κούπαν κτλ.)

(21) 190v10-11 Περὶ τῆς ἐγκαύσεως, “On enameling”⁶⁸ (= Rec. 22 in CAAG II 328,5-6: same title)

(22) 190v12-191r1 εἰς τὸ χρυσῶσαι [-όσε MS] ζῶα εἰς κούπαν· καὶ ὁ κάμπος νὰ ἔναι ἄσπ(ρος), “To draw golden animals on a coup by leaving its bottom white” (= Rec. 23 in CAAG II 328,7-10: same title)

(23) 191r2-5 εἰς τὴν χρυσὴν τὴν κόλλησιν [κώλυσιν MS], “To solder gold” (= Rec. 24 in CAAG II 328,11-13: εἰς τὴν χρυσοκόλλησιν)

(24) 191r6-16 περὶ τοῦ χρυσῶσαι χαλκὸν μετὰ ἀσήμιν, “On how to gild copper with silver” (= Rec. 25 in CAAG II 328,14-20: Π. τ. χ. χ. μετὸν ἄσημον)

(25) 191r17-191v11 εἰς τὸ χρύσωμαν τοῦ ἀέρος τοῦ μαλάγματος, “To (make) a gold object made of a amalgam of bronze (?)”⁶⁹ (= Rec. 26 in CAAG II 328,21 – 329,1: περὶ τοῦ χρυσώματος τοῦ ἀ. τοῦ μ.)

⁶⁷ See above.

⁶⁸ See above.

⁶⁹ See Stéphanidès 1922, 308, who explains: “le ἀήρ μαλάγματος est le ἀήρ χρυσός (CAAG II 324, 22), c’est-à-dire des feuilles très minces (aériennes) d’or (l’origeau)”.

(26) 191v12-192r3 κόλλησις [κώλυσιν MS] ἐὰν κοπή ῥίνη [-οι MS], “Soldering if (??)” (= Rec. 27 in CAAG II 329,2-7: κόλλησις ἀνκοπυρίνη)

(27) 192r3-7 ὅταν χρυσῶνης ἀσημιν [-ήμην MS] καὶ οὐδὲν πιάνη [-ει MS], “If you gild solver and nothing holds” (= Rec. 28 in CAAG II 329,8-10: no title)

(28) 192r8-13 εἰς τὸ χρυσῶσαι [-ώσε MS] ζῶα εἰς κούπαν· καὶ ὁ κάμπος ἀχρῶστος, “To draw golden animals in a coup and keeping its bottom not gilded” (= Rec. 29 in CAAG II 329,11-14: εἰς τὸ χρ. ζ. εἰς κάμπον κούπας καὶ ὁ κ. ἔναι ἀχ.)

(29) 192r13-192v5 εἰς τὸ δῶσαι χροῶν [χρώ- MS] εὐμόρφην (sic) εἰς ἄσημιν [-ήμην MS] χρυσώμενον (= Rec. 30 in CAAG II 329,15-19. περὶ τοῦ ποιῆσαι χροῶν ὠραιστάτην εἰς ἄσημον χρυσώμενον)

Ἐπαρον τιάφην μέρη γ', καὶ τρυγίαν καθαρὰν ἀπὸ Μονοβασίας μέρη β', καὶ ἄλλας μέρος α', καὶ τρίψον καλῶς ἄς βράσουν καλῶς μετὰ ὕδατος. Εἴθ' οὕτως βάλε τὸ ἀσημιν⁷⁰ μέσον <ἐ>ως ὄραν πατέρ ἡμῶν. Ἐπειτα ἔκβαλον τοῦτο, θές εἰς νερὸν κρίον⁷¹ καθαρὸν, καὶ βούρτζισον [-ηζον MS].

To give a beautiful colour to silver.

Take sulphur, 3 parts, pure lees of Monemvasian wine, 2 parts, and salt, 1 part; grind them well and boil them well in water. Then put silver in the middle and (keep it) for the time of a Pater Noster. Then remove it, put it in pure cold water, and brush (it) off.⁷²

(30) 192v5-13 ὅταν σκάζη [-ει MS] τὸ ἄσημιν [-ήμην MS], “If silver is defective” (= Rec. 31 in CAAG II 329,20-24)

(31) 192v13-193r1 εἰς τὴν κόλλησιν [κώλυσιν MS] τοῦ σμάρδου,⁷³ “To solder an enamel”

⁷⁰ CAAG II 329,18: ἄσημον.

⁷¹ CAAG II 329,19: ὕδωρ ψυχρὸν.

⁷² See Merianos 2015, 255.

⁷³ See DuCange II 1404, s.v. σμάργδος, *encaustum*, *pigmentum metallicum*.

(= Rec. 32 in CAAG II 329,25-28: same title)

(32) 193r1-7 εἰς τὸ ποιῆσαι σύρμα [σή- MS] κούφιον, “To make a thin (metallic) wire” (= Rec. 33 in CAAG II 330,1-5: Περὶ τοῦ π. σύρμαν κ.)

(33) 193r8-17 νὰ κάνης [-ις MS] ἔγκαυσιν, “To perform an enameling technique” (= Rec. 34 in CAAG II 330,6-11 (Περὶ τοῦ ποιῆσαι ἔγκαυσιν)

(34) 193r18-193v8 εἰς τὸ ποιῆσαι χροάν [χρω- MS] εὐμορφον εἰς χρυσομένον ἀσήμιν [-ήμιν MS] “To give a good colour to gilded silver” (= Rec. 35 in CAAG II 330,12-17: Περὶ τοῦ ποιῆσαι χρ. εὐμόρφην εἰς χ. ἀσήμιν)

(35) 193v8-17 εἰς τὸ ποιῆσαι κόλλησιν [κώ^λσιν MS] τῶν κακαβίων εἰς λουτρὸν καὶ εἰς <σω>ληνάρια⁷⁴ [λινάρια MS], “To solder small pots (to make) a washbasin and tubes” (= Rec. 36 in CAAG II 330,18-23: Περὶ τοῦ ποιῆσαι κόλλησιν τῶν κακαβίων καὶ εἰς σουλινάρια λούτρον)

(36) 193v18-194r4 εἰς τὸ λαμπρῶναι μαργαρίτην, “To make a pearl shiny” (= Rec. 37 in CAAG II 330,24-27: same title)

(37) 194r4-6 ἕτερον εἰς αὐτὸ, “Another recipe for the same purpose” (= Rec. 38 in CAAG II 330,28 – 331,2: ἄλλον)

(38) 194r7-195v3 ἐξήγησις τῆς τιμιωτάτης καὶ ψιλωτάτης [ψυ- MS] καὶ ἀχειροθέτου (? ἀχειρο^{ττ} MS) τέχνης τῶν συρμάτων τῆς χρυσοχοικῆς τέχνης, “Explanation of the very precious and easy and divine (i.e. not belonging to human beings) art of (making metallic) wires for the art of goldsmiths” (= Rec. 39 in CAAG II 331,3-28: Περὶ τῶν συρμάτων τῆς χρυσοχοικῆς τέχνης)

⁷⁴ See DuCange II 1514, s.v. σωληναρίον (or σωλυ-), *tubus*.

(39) 195v3-196r24 σμάρδωμαν ἄλλον, “Another enameled object” (not included in CAAG)

(40) 196r24-196v5 ἑτέρα δουλία, “Another work” (= Rec. 40 in CAAG II 332,1-11: ἄλλη μέθοδος μυστική)

(41) 196v6-197v3 ἕτερον ὕδωρ X [i.e. θείου/θεῖον], “Another (recipe for) sulphur/divine water” (= Rec. 41 in CAAG II 332,12 – 333,6: same title).⁷⁵

(42) 197v4-198r4 ἕτερον θεῖον X [i.e. θείου] ὕδωρ· νὰ ἐκβάλης τὸ χρύσωμα [-ωμα MS] ἀπὸ τὸ ἄση(μιν), “Another sulphur/divine water to divide gold from silver” (= Rec. 42 in CAAG II 333,7-17: “Υδωρ ἵνα ἐκβάλης χρύσομαν ἀπὸ ἀσήμην)

(43) 198r4-198v5 ἕτερον εἰς αὐτό, “Another recipe for the same purpose” (= Rec. 43 in CAAG II 333,18-27: ἕτερον ὡσαύτως)⁷⁶

(44) 198v5-15 λαγάρισμα χρυσαφίου [-φήου MS], “Purification of gold” (= Rec. 24 in CAAG II 333,28-334,6: τὸ λαγάρισμαν χρυσαφίου)

(45) 198v15-199r5 ὁμοῖον εἰς ἄσημιν [-ήμην MS] χρυσώ<μενον> [χρυσὸν MS], “The same for gilded silver” (= Rec. 45 in CAAG II 334,7-11: ἕτερον ὁμοῖον εἰς ἄσημον)

(46) 199r5-8 ὅταν σκάζη τὸ ἀσήμ(ιν) ἢ [εἶ MS] τὸ χρυσάφιν, “If silver or gold are defective” (= Rec. 46 in CAAG II 334,12-14: same title)

(47) 199r9-13 τὸ πῶς νὰ σταγματίσης ἄργυρον, “How to harden silver” (= Rec. 47 in CAAG II 334,15-17: τὸ ποῦ σταγματίσις ὕδραργύρου)

⁷⁵ On sulphur/divine water, see Viano 1997; Martelli 2009.

⁷⁶ On recipes 42-43 see Halleux 1985, 56-57.

- (48) 199r13-199v3 ἄλλον, “Another (recipe)” (= Rec. 48 in *CAAG* II 334,18-21: same title)
- (49) 199v3-200r1 εἰς τὸ ποιῆσαι γράμματα χρυσά, “To make golden letters” (= Rec. 49 in *CAAG* II 334,22 – 335,2: περὶ τοῦ ποιῆσαι γρ. χρ.)
- (50) 200r2-13 εἰς τὸ ποιῆσαι ὠραῖον χαλκὸν ὡς ἀχρυσὸν [i.e. χρυσὸν], “How to make copper as beautiful as gold” (= Rec. 50 in *CAAG* II 335,3-10: περὶ τοῦ ποιῆσαι ὠραιόχαλκος ὡσπερ χρυσόν)
- (51) 200r13-16 ἕτερον εἰς σαπούνιον, “Another recipe for soap” (= Rec. 51 in *CAAG* II 335,11-12: Περὶ τοῦ σαπουνίου)
- (52) 200r17-200v2 ἄλλον, “Another recipe” (= Rec. 52 in *CAAG* II 335,13-14: ἕτερον)
- (53) 200v2-4 Τὸ ὑαλί [γεαλή MS], “Glass” (= Rec. 53 in *CAAG* II 335,15-16: ὁ ὕελος)
- (54) 200v4-201r7 εἰς τὸ λευκᾶν(αι) χαλκόν, “To whiten copper” (= Rec. 54 in *CAAG* II 335,17 – 336,3: Περὶ τοῦ λ. χρ.)
- (55) 201r7-201v8 εἰς τὸ ποιῆσαι χαλκὸν⁷⁷ ὡσπερ α [i.e. χρυσὸν], “To make copper like gold” (= Rec. 55 in *CAAG* II 336,4-14: Περὶ τοῦ π. χρ. ὡσ. χρ.).⁷⁸
- (56) 201v8-202r7 ἕτερα ἐρμηνεῖα εἰς τὸ ἀξυγγοσάπουνον [ἀξυγγοσάπουνων MS],⁷⁹ “Other explanation for a fatty soap” (not included in *CAAG*)

⁷⁷ The alchemical sign of copper is hardly readable in the MS.

⁷⁸ Rec. 56 (*CAAG* II 336,15-337,9: ὕδωρ πιστῆς οἰκονομίας) and rec. 57 (*CAAG* II 337,10-11: καὶ ἄλλος φησὶν) are omitted in the *Meteora* MS.

⁷⁹ Ἀξυγγοσάπουνον is a *hapax* that is not recorded in the lexica. The term ἀξύγγυ/ἀξύγγιον (Byzantine spelling for ἀξούγγιον, ‘animal fat, tallow, grease’; see DuCange I 94) refers to the main ingredient of the soap (σάπων or σαπούνιον), whose preparation is explained in the recipe.

(57) 202r7-202v6 εἰς τὸ ποιῆσαι φούρμας, “To make hollow moulds” (not included in CAAG)

(58) 202v7-12 *Sine titulo* (not included in CAAG)

(59) 202v13-17 *Sine titulo* (not included in CAAG).

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The relationship between alchemy and natural philosophy in Byzantine times

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Introduction

This presentation is a part of a research project in progress about natural philosophy, sciences and alchemy in the Byzantine era. The paper addresses a significant void in the current historiography of science by surveying and mapping a previously unexplored area: the relationship between alchemy and natural philosophy in the Byzantine era after 750 AD (according to historiographical borders of history of science and culture).¹ Although our aim is to explore the concepts of matter, its characteristics, properties and of course its potential transmutation, within the epistemological, educational, technical and also religious context of this period, and generally we don't adopt the epistemological tradition of the Great Man of History, our study is based mainly on the examination of the life and works of the scholars who presented works on both natural philosophy and alchemy. This methodological approach is a choice imposed upon, because, among the many difficulties in the study of the relation of byzantine natural philosophy and alchemy is that the sources are very few and fragmentary. However, except of the texts by scholars who wrote on alchemy and natural philosophy, other relevant sources, such as theological and philosophical texts, byzantine dictionaries, chronicles, laws etc., are also examined. On the other hand, philosophy, the arts, and technology were not separated by clear boundaries, as the surviving sources reveal. So, a clear definition of these disciplines, although is necessary, is very problematic. In addition, the more one examines the

¹ John Haldon, *Byzantium. A history*, Tempus Publishing Ltd, 2000, P. Brown, *The World of Late Antiquity*, Thames and Haudson Ltd., London 1971.

differences among texts, contexts, and even social roles of the Byzantine thinkers, the more one realizes how multiform and versatile this tradition is.²

In this paper the texts under the term “natural philosophy” are the ones having as a main subject the study of nature and the physical universe. Byzantines usually used the terms *physica*, or *physiki akroasis* (according to Aristotle), or natural science³, or *physikos logos* (discourse about nature) according to the definition by the *Suida Lexicon*, from 10th century, where we are reading: “*discourse about nature by philosophers, i.e. about bodies, principles, elements, about universe and space and vacuum*” etc.⁴

On the other hand, for the term “alchemy” in Byzantine texts, the term in use was “*chymeia*” in different forms (*χυμεία* or *χημεία* or *χυμία* or *χημία*)⁵, or *chymeftikos logos* (discourse about *chymeia*)⁶ and its definition, again by the *Suida Lexicon*, was the following: “*the making of silver and gold, which the relative books burned by Diocletian*” (here the *Lexicon* referred to Greco-Egyptian alchemical texts).⁷

Emperor Konstantinos Porphyrogenitus, in 10th century, gives the same definition in his work *virtutibus et vitiis*.⁸ In Byzantine texts the terms “*chrysopoiesis*” or “*poiesis chrysou*” or “*chrysopoia*” is also in use for the goldmaking, which is the main subject of the Byzantine alchemical texts from the middle Byzantine era and onwards, as we

2 Trizio Michele, “Byzantine Philosophy as a Contemporary Historiographical Project”, *Recherches de Théologie et Philosophie Médiévales*, vol. 74, 2007, p. 247-294

3 As Michael Psellos wrote: “[Aristotle] was the first which intentified the natural science” («[Ὁ Ἀριστοτέλης] τὴν φυσικὴν πρῶτον ἐπιστήμην ἀκρίβως»), Boissonade J.Fr. (ed.), Michael Psellus, *De Operatione Daemonum*, Norimbergae 1838, p. 163.

4 «Φυσικὸς λόγος παρὰ φιλοσόφους. Μετὰ τὸν ἡθικὸν διεξέρχονται περὶ τοῦ φυσικοῦ. τουτέστι, περὶ σωμάτων, περὶ ἀρχῶν, καὶ στοιχείων, καὶ περὶ τοῦ κόσμου, καὶ τόπου, καὶ κενοῦ. [...]»: *Suidae Lexicon*, ed. Thomas Gaisford, vol. II, Oxonii (Oxford) c. 3862.

5 Robert Halleux, *Les Textes Alchimiques*, Brepols, Turnhout, Belgium 1979, p. 45.

6 R. Henry, Photius. *Bibliothèque*, 8 vols, Les Belles Lettres, Paris 1959-1970. 170, 117a28: «ἀπὸ τῶν χεμευτικῶν Ζωσίμου λόγων».

7 «χημεία: Ἡ τοῦ ἀργύρου καὶ χρυσοῦ κατασκευὴ, ἧς τὰ βιβλία διερευνησάμενος ὁ Διοκλητιανὸς, ἔκαυσε. Ὅτι διὰ τὰ νεωτερισθέντα Αἰγυπτίους Διοκλητιανῶ τούτοις ἀνημέρωσ καὶ φονικῶς ἐχρήσατο. Ὅτε δὴ καὶ τὰ περὶ χημείας χρυσοῦ καὶ ἀργύρου τοῖς παλαιοῖς αὐτῶν γεγραμμένα βιβλία διερευνησάμενος, ἔκαυσε, πρὸς το μηκέτι πλοῦτον Αἰγυπτίους ἐκ τοῖς τοιαύτης προσγίνεσθαι τέχνης, μηδὲ χρημάτων αὐτοῦς θαρροῦντας περιουσίᾳ, τοῦ λοιποῦ Ῥωμαίοις ἀνταίρειν»: *Suidae Lexicon*, op.cit., c. 3899.

8 Porphyrogenitus used the form “*χημία*”: «χημίας ἀργύρου καὶ χρυσοῦ τοῖς παλαιοῖς αὐτῶν γεγραμμένα βιβλία διερευνησάμενος ἔκαυσε πρὸς το μηκέτι πλοῦτον Αἰγυπτίους ἐκ τοῖς τοιαύτης περιγίνεσθαι τέχνης, μηδὲ χρημάτων αὐτοῦς θαρροῦντας περιουσίᾳ, τοῦ λοιποῦ Ῥωμαίοις ἀνταίρειν»: T. Büttner-Wobst, A.G. Roos, *Excerpta historica iussu imp. Constantini Porphyrogenitini conflecta*, vol. 2, *excerpta de virtutibus et vitiis*, Weidmann, Berlin 1906, vol. 2.1, p.196, l. 6-10.

can see from the work by Anonymous from the 7/8 c.,⁹ Cosmas Ieromonachus¹⁰ from the 11th c., in vernacular Greek, Michael Psellos from the 11th c., Nikephorus Blemmydes from the 13th c.). In addition, references to goldmaking exist in non alchemical texts, such as in *Carmina Moralia* by Gregory of Nazianzos,¹¹ while the myth of Hermes, who discovered gold is common not only among the alchemists, as Julius Sextus Africanus,¹² but also among Byzantine chronographers who reproduce his narration.¹³

Alchemy in Byzantine era

The Greco-Egyptian alchemical tradition, according to different sources, was known to the Byzantine scholars from the early period. There are references to alchemy in philosophical, theological, historical texts, etc.

There is a lot of this kind of references. In the category of the philosophical texts, for example, Aeneas of Gaza, a Neoplatonist philosopher who became a Christian and lived in the 5th-6th centuries, in his dialogue entitled *Theophrastus* about immortality of the soul and the resurrection of the body, accepts that the change of matter is

9 « Άνεπιγράφου φιλοσόφου κατὰ ἀκολουθίαν χρήσεως ἐμφαίνον τὸ τῆς χρυσοποιίας συνεπτυγμένον σὺν θεῶν » (e cod. Venet. Marc. 299, fol.79r), M. Berthelot, C.É. Ruelle, Collection des anciens alchimistes grecs, vol. 2, Steinheil, Paris 1888, p. 424-433.

10 « Ἐρμηνεία τῆς ἐπιστήμης τῆς χρυσοποιίας ἱερομονάχου τοῦ Κοσμᾶ » (e cod. Paris. B.N. gr. 2327, fol. 159r), M. Berthelot, C.É. Ruelle, Collection des anciens alchimistes grecs, vol. 2, Steinheil, Paris 1888, p. 442-446.

11 As example, « ἐκ ψαμάθου δὲ μέγ' ἔξοχος ἔπλετο χρυσός », J.-P. Migne, Patrologiae cursus completus, tome 37, Paris 1862, col. 575. See also cols 914, 967.

12 « Μετὰ δὲ τὴν τοῦ Διὸς τελευτὴν, Φαῦνος ὁ υἱὸς αὐτοῦ ἐβασίλευσεν, ὃς μετωνομάσθη Ἐρμῆς. ἦν γὰρ λογιώτατος πάνυ καὶ μαθηματικός, ὃς καὶ τὴν τοῦ χρυσοῦ ποίησιν ἐφεῦρεν ἐκ μετάλλων ἀνθρώποις », Sextus Julius Africanus, Chronographia, M.J. Routh, Reliquiae sacrae, vol. 2, Oxford University Press, Oxford 1846 (repr. Hildesheim: Olms, 1974), fragment 12, lines 18-22.

13 « Μετὰ δὲ τὴν τελευτὴν τοῦ αὐτοῦ Πίκου τοῦ καὶ Διὸς ἐβασίλευσεν ὁ υἱὸς αὐτοῦ Φαῦνος ὁ καὶ Ἐρμῆς τῆς Ἰταλίας ἔτη τριάκοντα πέντε, ὃς ἦν ἀνὴρ πανοῦργος καὶ μαθηματικός· ὅστις ἐφεῦρεν τὸ μέταλλον τοῦ χρυσοῦ ἐν τῇ δύσει πρῶτος καὶ τὸ χωνεῦειν », L. Dindorf, Ioannis Malalae chronographia, Corpus scriptorum historiae Byzantinae, Weber, Bonn 1831, p. 20, line 9-13. « Μετὰ τὴν τελευτὴν τοῦ αὐτοῦ Πίκου τοῦ καὶ Διὸς ἐβασίλευσεν ὁ αὐτοῦ υἱὸς Φαῦνος ὁ καὶ Ἐρμῆς τῆς Ἰταλίας ἔτη τριάκοντα πέντε, ὃς ἦν ἀνὴρ πανοῦργος καὶ μαθηματικός, ὅστις ἐφεῦρεν τὸ μέταλλον τοῦ χρυσοῦ ἐν τῇ δύσει πρῶτος καὶ τὸ χωνεῦειν. γνοὺς δὲ ὅτι διαφθοροῦνται αὐτῶ οἱ ἀδελφοὶ αὐτοῦ οἱ ἀπὸ τῶν

γοναικῶν ὧν ἔσχεν Πίκος ὁ καὶ Ζεὺς ὁ αὐτοῦ πατήρ », L. Dindorf, Chronicon paschale, vol. 1, Corpus scriptorum historiae Byzantinae, Weber, Bonn 1832, p. lines 13-18. « μετὰ δὲ τὴν τοῦ Διὸς τελευτὴν Φαῦνος υἱὸς αὐτοῦ ἐβασίλευσεν, ὃς μετωνομάσθη Ἐρμῆς· ἦν γὰρ λογιώτατος πάνυ καὶ μαθηματικός· ὅστις καὶ τὴν τοῦ χρυσοῦ ποίησιν ἐφεῦρεν ἐκ μετάλλων ἀνθρώποις », I. Bekker, Leonis Grammatici chronographia, Corpus scriptorum historiae Byzantinae, Weber, Bonn 1842], p. 16, lines 16-19.

possible and uses as an example the making of gold from cheaper metals, such as silver and tin. Aeneas says that in the same way the bodies are joined with the souls.¹⁴ According to Aeneas, the alchemical process changes the *eidos* (form) of matter. About a century later, John of Antioch, a monk in the 7th century, apparently contemporary with emperor Heraclius, composed a chronicle (*Ιστορία Χρονική*), where he refers to the burning of alchemical texts by emperor Diocletian. As he writes, the reason for the burning was that Diocletian was afraid of the power of money Egyptians could have:

“ Ὅτε δὴ καὶ τὰ περὶ χημείας ἀργύρου καὶ χρυσοῦ τοῖς παλαιοῖς αὐτῶν γεγραμμένα βιβλία διερευνησάμενος ἔκαυσε πρὸς τὸ μηκέτι πλοῦτον Αἰγυπτίους ἐκ τοῖς τοιαύτης περιγίνεσθαι τέχνης, μηδὲ χρημάτων αὐτοὺς θαρροῦντας περιουσία, τοῦ λοιποῦ ‘Ρωμαίοις ἀνταίρειν».¹⁵

Both Porphyrogenitus and the *Suida Lexicon*, as mentioned above, repeat this sentence, such as other texts (*Acta St. Procopius*).¹⁶ The interesting point here is that there isn't any comment for the ability of the Egyptian alchemists to produce gold or silver.

Another chronicler, George Syncellus, from the 8th century, in his chronicle *Ecloga Chronographia* refers to Greco-Egyptian alchemists commenting on different types of their approach to the transmission of their alchemical knowledge.¹⁷

George Malalas, in his work titled *Chronographia*, describes the story of a fake alchemist, John Isthmeos, who, during the reign of Anastasios I, swindled many

¹⁴ «οὕτω δὴ τῶν ἀνθρώπων τὰ σώματα τῆ τῆς ψυχῆς ἀθανασία συμμιζαντα», «Καὶ οὐκ ἀπίθανος ἡ πρὸς τὸ κρεῖττον μεταβολὴ τῆς ὕλης. Ἐπεὶ καὶ παρ' ἡμῖν οἱ περὶ τὴν ὕλην σοφοὶ, ἄργυρον καὶ κασσίτερον παραλαμβάνοντες, καὶ τὸ εἶδος ἀφανίσαντες, ἐπὶ τὸ σεμνότερον μεταβαλόντες τὴν ὕλην, χρυσὸν κάλλιστον ἐποίησαν», “Aeneae Gazaei Philosophi Christiani, Theophrastus”, in J.P. Migne (ed.), *Patrologia Graeca*, vol. 85, 1864, c. 992A, 989C.

¹⁵ C. Muller, *Fragmenta Historicum Graecorum*, vol. IV, Paris 1883, p. 602, par. 145.

¹⁶ *Acta Sanctorum Julii*, vol. 2, J.de Moulin, Antwerpen 1721, 557c. G. Merianos, S. Sakorafou, «Μαρτυρίες περὶ αλχημείας στο Βυζάντιο σε μη αλχημικά κείμενα», in E. Μεργούπη-Σαβαΐδου, Γ. Μέριανος, Φ. Παπανελοπούλου, Χ. Χριστοπούλου (επιμ.), *Επιστήμη και τεχνολογία, Ιστορικές και ιστοριογραφικές μελέτες*, Εκδοτικὴ Αθηνῶν, Αθήνα, σ. 45-65.

¹⁷ «Δημόκριτος Ἀβδηρίτης φυσικὸς ἤκμαζεν ἐν Αἰγύπτῳ μνηθεὶς ὑπὸ Ὀστάνου τοῦ Μήδου σταλέντος ἐν Αἰγύπτῳ παρὰ τῶν τηνικαῦτα βασιλέων Περσῶν ἄρχειν τῶν ἐν Αἰγύπτῳ ἱερῶν. ἐν τῷ ἱερῷ τῆς Μέμφεως σὺν ἄλλοις ἱερεῦσι καὶ φιλοσόφοις, ἐν οἷς ἦν καὶ Μαρία τις Ἑβραία σοφὴ καὶ Παμμένης, συνέγραψε περὶ χρυσοῦ καὶ ἀργύρου καὶ λίθων καὶ πορφύρας λοξῶς. ὁμοίως δὲ καὶ Μαρία. ἀλλ' οὗτοι μὲν Δημόκριτος καὶ Μαρία ἐπὶνέθησαν παρ' Ὀστάνου ὡς πολλοῖς καὶ σοφοῖς αἰνίγμασι κρύψαντες τὴν τέχνην, Παμμένους δὲ κατέγνωσαν ἀφθόνως γράψαντος»: Alden A. Mosshamer (ed.), *Georgii Syncelli, Ecloga Chronographia*, Teubner, Leipzig 1984,

silversmiths in Constantinople. After this, the emperor had arrested him and exiled him to Petra.¹⁸ Cedrenus,¹⁹ and other chronographers tell the same story.

Another category of sources is the one referencing alchemy and alchemists. Photius, in his *Βιβλιοθήκη*, makes a synopsis of the work of Olympiodorus and refers to Zosimus.²⁰

Until the 11th century, the references to alchemy and alchemists show that the interest about them is alive among the Byzantines, as a subject for debate, according to Photius.

Also, in the late eleventh century, in a poem entitled *Dioptra*, which is in the form of a dialogue between body and soul, the monk Philip Monotropos uses the alchemical process too: just as an alchemist changes lead into gold, in the same manner Christ will change human nature.²¹

In our opinion, these texts are important because they show that the principles of alchemy, as Suidas defined it, have a continuous existence in Byzantine thought in a theoretical, not only practical, level.

In addition, there are reports in historical sources for the interest about alchemical practice. For example, the report of ‘Umāra ibn-Ḥamza (d. 814/815), the ambassador of caliph al-Manṣūr (754-775) to the Byzantine court, evokes the alchemical interests of emperor Constantine V Kopronymos (741-775). The report describes that two

¹⁸ «Ἐπὶ δὲ τῆς αὐτοῦ βασιλείας ἀνεφάνη τις ἀνὴρ ἐν Ἀντιοχείᾳ τῇ μεγάλῃ ὠν ἀπὸ πόλεως Ἀμίδης, ὀνόματι Ἰωάννης Ἰσθμῆος, χειμευτῆς ὑπάρχων καὶ φοβερὸς ἐπιθέτης». I. Thurn, *Ioannis Malalae chronographia*, Corpus Fontium Historiae Byzantinae. Series Berolinensis 35, De Gruyter, Berlin - New York 2000, 16.5.2 (from TLG). For more details, see M. Mertens, “Graeco-Egyptian Alchemy in Byzantium”, in P. Magdalino, M. Mavroudi, *The Occult Sciences in Byzantium, The Occult Sciences in Byzantium*, La Pomme d’ Or, Geneva 2006, p. 226-227.

¹⁹ «τὸτε καὶ ἀνὴρ τις χειμευτῆς, ἐκ τῶν τῆς χειμῆς τεχνῶν εὐφυῆς ὠν ταῖς ἀπάταις ὀφθαλμοπλανῆσαι, ὑπεδείκνυεν ἀργυροπράταις καὶ ἑτέροις χειράς καὶ πόδας ἀνδριάντων καὶ ἕτερα εἶδη χρυσᾶ, λέγων θησαυρὸν εὐρηκέναι, καὶ πολλοὺς ἀπατήσας εἰς πενίαν ἤνεγκε. φήμης οὖν περὶ αὐτοῦ γενομένης κρατηθεὶς ἤχθη τῷ Ἀναστασίῳ. ὁ δὲ προσήνεγκεν αὐτῷ χαλινὸν ἵππου ὀλόχρυσον διὰ μαργαριτῶν· ὄν λαβὼν ὁ βασιλεὺς ἔφη “ὄντως σύ, εἰ καὶ πάντας ἠπάτησας, ἐμὲ οὐκ ἀπατήσεις.” καὶ ἐξώρισεν αὐτὸν εἰς τι φρούριον, ἔνθα καὶ τελευτᾷ»: Ἰωάννης Κεδρηνός, *Χρονογραφία*, I. Bekker (ed.), Georgius Cedrenus Ioannis Skylitzae opera, vol. 1, CSHB, Weber, Bonn 1838, p. 629,8-15 (from TLG).

²⁰ R. Henry (ed.), *Photius Bibliotheca*, vol. 4, Les Belles Lettres, Paris 1959, 170 (from TLG).

²¹ «τὸ γὰρ συνάψε τῶν βροτῶν τὴν φθαρεῖσαν οὐσίαν / (260) τὴν γεγραμμένην τε καὶ ῥευστὴν καὶ κάτω πατουμένην· μετὰ τῆς ἄνω ὑψηλῆς καὶ θείας τῶν ἀγγέλων, / τοῦτο ἐστὶν ὃ εἶρηκα μειζόνως δοξασθῆναι· ὥσπερ μόλυβδου καὶ χρυσοῦ πόρρω ἀφεστηκότων/ἀποκισμένων ἐξ ἄμφοιν ἀπεσχισμένων λίαν· / (265) εἶτα σοφὸς τις τεχνουργὸς δεῖξαι θελήσας τοῦτου/τὴν τέχνην, τὴν ἐνέργειαν καὶ ἐπιστήμην ὄντως/αὐτὸν λαβὼν τὸν μόλυβδον καὶ χωνεύσας τοῦτόν γε· / καὶ ἀναπλάσας τὸν αὐτὸν χρυσὸν εὐρίζον δεῖξῃ/τοῦτο ἐστὶ τὸ θαυμαστὸν καὶ ξένον ὑπερλίαν· / (270) ὅτι χρυσὸς οὐκ ἦν τὸ πρῖν καὶ γέγονεν ἀρτίως· / ὁ μὲν χρυσὸς, καὶ ἦν χρυσὸς καὶ πάλιν χρυσὸς πέλει/ὁ δὲ, οὐκ ἦν καὶ γέγονεν, ὅπερ οὐκ ἦν τὸ πρῶτον»: Mag. Jürgen Fuchsbaauer, *Die Übertragung der Dioptra ins Slavische Ein Beispiel mittelkirchenslavischer Übersetzungstechnik Dargestellt anhand des vierten Buches des Werkes*, PHD dissertation, University of Vienna, Vienna 2010, p. 46-48.

experiments in the ambassador's presence transmuted lead into silver and copper into gold.²²

The discourse on matter in Byzantium

The tradition of Aristotelian physics in the Byzantine period is more or less known. The byzantine approach to nature was a Christian version based on Aristotelian works, with some elements of Platonic and Neoplatonic philosophy.²³

Here, the discussion will focus on the concept of matter, which was a common topic not only for the philosophers, but also for the theologians. Besides, most Byzantine scholars were both theologically and scientifically informed and they understood that theological beliefs necessarily entailed scientific beliefs and the opposite.²⁴

As mentioned above, the conversation (discourse) about matter was common among the Byzantine scholars. From Basil the Great, from the 4th century, until Nikephoros Gregoras, in the 14th century, the concept of matter attracts the interest of scholars and discussions are held not only about its creation, its eternity or not, but also about its characteristics and its properties, the possibility of transmutation etc.

In the Byzantine texts the concepts of sympathia, meixis and krasis and transmutation of matter exist very often. The process of meixis and krasis exists not only in alchemical or texts of natural philosophy, according to Suida, as mentioned above, but also in theological texts. Sometimes, the discussion is about the combination of the created and the non-created world, others about the union of soul and body or about the union of Jesus' divine and human nature, as we will see later in what Psellos writes.

Many Christian beliefs, which exist in Byzantine texts, are discussed in natural philosophy's and alchemical terms, such the transfiguration in Thabor mount, the resurrection of the body, the transubstantiation in the Eucharist. Aeneas of Gaza, for

²² Maria Papathanassiou, "Stephanos of Alexandria: A famous Byzantine Scholar, Alchemist and Astrologer", in P. Magdalino, M. Mavroudi, *The Occult Sciences in Byzantium*, La Pomme d' Or, Geneva 2006, p. 169.

²³ E. Nicolaidis, *Science and Eastern Orthodoxy*, The John Hopkins University Press, Baltimore 2011, passim. K. Oehler, "Aristotle in Byzantium", *Greek, Roman and Byzantine Studies*, 5, 1964, p. 133-146.

²⁴ D. Lindberg, "Medieval science and religion", in Gary B. Ferngren, *Science and religion. A historical introduction*, The John Hopkins University Press, Baltimore 2002, p. 57-72.

example, uses the alchemical finishing of basic metals to demonstrate the transfiguration of the resurrected body.²⁵

Theophylaktos of Bulgaria, archbishop of Ohrid from the 11-12th century and student of Michael Rsellos, also uses an example from nature, the combination of fire and iron, to explain the union of human will with the divine.²⁶

Nikephoros Gregoras, one of the scholars of the Paleologian Period (14th century), discussing about created and non-created things, wrote that all the created could be increased or reduced. In another section of this chronicle, he wrote that the only non-created thing is the divine nature. All the others are created, so they could change.²⁷ In his «*Ερμηνεία εις τον Συνεσίου περί ενυπνίων λόγον*» (Comments on Synesios' Discourse on dreams), Gregoras wrote that the world under the moon consists of the four elements and its nature changes (πάσχειν και αλλοιούται), giving examples for this change.²⁸

As we already said, another term which is very often in use by the Byzantine scholars in the discourse on nature is the one of sympatheia, a stoic principle whose origins were incorporated into Greek thought by Poseidonius (c. 135-51 BC), formed part of the early alchemical theory.²⁹ The concept of sympatheia is basic in the medical and astrological discourse and exists in ancient and Byzantine medical texts (by Galen, Aetius, Paul, John Actuarius, Symeon Seth), astrological texts (by Ptolemy etc.) and texts by pagan philosophers (Iamblichus, Simplicius, Proclus, John Stobaios etc.).

In the Christian Byzantine tradition, the concept of sympatheia remained in use for a long time: from Basil of Caesarea,³⁰ in the 4th century, to Theodorus Metochites, in the 14th century.³¹ Gregory of Nyssa, brother of Basil of Caesarea and also among the

²⁵ Aeneas of Gaza, "Theophrastus", in J.-P. Mignet, *Patrologia Graeca cursus completus*, tome 85, Paris 1860, cols 984, 992. See also Robert Halleux, op.cit. p. 141.

²⁶ Theophylaktos of Bulgaria, "Εκ της προς Τιβάνιον Αρμένιον επιστολής", in J.-P. Mignet, *Patrologia Graeca cursus completus*, tome 126, Paris 1864, col. 353, 356.

²⁷ Nikephoros Gregoras, "Byzantinae Historiae", in J.-P. Mignet, *Patrologia Graeca cursus completus*, tome 149, Paris 1865, cols 241, 244.

²⁸ Nikephoros Gregoras, «*Ερμηνεία εις τον Συνεσίου περί ενυπνίων λόγον*» (Comments on Synesios' Discourse on dreams) J.-P. Mignet, *Patrologia Graeca cursus completus*, tome 149, Paris 1865, cols 548, 595.

²⁹ G.E.R. Lloyd, *Greek Science after Aristotle*, Crete University Press, Herakleion 2007, p. 44-46. Sheppard H.J., "Gnosticism and Alchemy", *Ambix*, 6, 1957, p. 89.

³⁰ «Ὡσπερ δὲ ἐν ταῖς λοιμικαῖς συμπαθείαις καὶ οἱ κατὰ πᾶσαν/ἀκρίβειαν διαιτώμενοι τὰ ἴσα τοῖς ἄλλοις κάμνουσιν, ἐκ τῆς πρὸς τοὺς διεφθαρμένους ὁμιλίας τῆς ἀρρωστίας ἀναπιμπλάμενοι», B. Pruche, *Basile de Césarée. Sur le Saint-Esprit*, Sources chrétiennes 17 bis., Éditions du Cerf, Paris 1968, ch. 30, sec. 78, line 21-24.

³¹ «εἰς τὰ ὑπὸ τὸ οὐράνιον σῶμα φυσικὴ συμπάθεια, καὶ συνδιατίθησιν ὡς αὐτὰ, καὶ μυρίαν ἐν αὐτοῖς ἐμποιεῖ μεταβολήν», B. Bydén, *Theodore Metochites' Stoicheiosis astronomike and the study of natural*

Fathers of the Church, refers to sympatheia in different texts, discussing God, the human body and the creation of the world.³² Theophylaktos Simocattes, chronicler and natural philosopher in the 7th century, used the term to interpret the relation between iron and lodestone in his work “Dialogos peri diaforon fysikon aporematon” (Questiones physicae).³³ Here we can not fail to mention Ioannes Philoponus,³⁴ from the 6th century, and his text about the combination of natural bodies, and the work by Theodore Laskaris,³⁵ emperor of Nikaia and student of Nikephoros Blemmydes, in the 13th century.

It is therefore more than obvious from the previously mentioned sources that the alchemical terms constitute an important interpretative tool for Byzantine natural philosophy.

Texts about goldmaking, natural philosophy and their writers

Returning to the main question of this presentation, the relation between alchemy and natural philosophy, it's important to examine two interesting cases of Byzantine scholars and their work, Michael Psellos and Nikephoros Blemmydes. Both of them were monks, writers and teachers, and wrote about natural philosophy, medicine and

philosophy and mathematics in early Palaiologan Byzantium, Acta Universitatis Gothoburgensis, Göteborg 2003, ch. 5, lines 238-240.

³² « ἡ γὰρ τῶν πάντων πρὸς ἄλληλα σύμπνοιά τε καὶ συμπάθεια τάξει καὶ κόσμῳ καὶ ἀκολουθία διοικουμένη ἢ πρώτη τε καὶ ἀρχέτυπος καὶ ἀληθὴς ἐστὶ μουσικὴ », Gregory of Nyssa, « In inscriptiones Psalmorum », J. McDonough, *Gregorii Nysseni opera*, vol. 5, Brill, Leiden 1962, page 32 line 11-14. « τὴν πᾶσα κεφαλὴ (20) τῶ ὑποκειμένῳ σώματι ὁμοφυῆς ἐστὶ καὶ ὁμοούσιος καὶ μία τίς ἐστὶ τῶν καθ' ἕκαστον μελῶν πρὸς τὸ ὅλον ἢ συμφυῖα, διὰ μιᾶς συμπνοίας κατεργαζομένη πρὸς τὰ μέρη τῶ παντὶ τὴν συμπάθειαν », Gregory of Nyssa, « De perfectione Christiana ad Olympium monachum », W. Jaeger, *Gregorii Nysseni opera*, vol. 8.1, Brill, Leiden 1963, page 197, lines 20-24.

³³ « ἢ μαγνητις, ἣν καὶ Ἡρακλείαν λίθον φασὶ, τοῦ σιδήρου διέστηκε, καὶ ὁμῶς διὰ μέσου τοῦ ἀέρος ὀρώμεν τὴν ἐνέργειαν προβαλλομένην τὴν λίθον. ἢ δὲ καὶ περὶ τὸν φοίνικα τὸ φυτὸν γινομένη συμπάθεια ποίαν διάνοιαν οὐκ ἐξίστησι », L. Massa Positano, *Teofilatto Simocata. Questioni naturali*, Libreria Scientifica Editrice, Naples² 1965, p. 18, lines 1-5.

³⁴ « πόθεν οὖν αἱ δυνάμεις αὗται, εἰ καθάπαξ ἄμοιρα ζωῆς τινος ἦσαν τὰ ἄψυχα; τί δὲ βούλεται αὐτῶ ἢ διαπλοκὴ τῆς ψυχῆς πρὸς τὸ σωματοειδὲς τοῦ κόσμου; λέγω οὖν ὅτι τριῶν οὐσῶν τούτων μίξεων, τῆς κατὰ παράθεσιν καθ' ἣν συνημμένοι εἰσὶν ἀλλήλοισι οἱ λίθοι ἐξ ὧν ἡ οἰκία, καὶ τῆς κατὰ κρᾶσιν, ὡς ἐπὶ τοῦ οἴνου καὶ τοῦ ὕδατος, καὶ τῆς κατὰ διαπλοκὴν ὡς ἐπὶ τῶν σχοινίων, ἢ μὲν κατὰ παράθεσιν ἀσυμπαθὴς ἐστὶν (οὐδεμία γὰρ γίνεται τῶν παρακειμένων πρὸς ἄλληλα συμπάθεια), ἢ δὲ κατὰ κρᾶσιν σύγγυσι τῶν κίρναμένων ἐργάζεται, ἢ μέντοι κατὰ διαπλοκὴν μέση πῶς ἐστὶν οὔτε τῆς παραθέσεως τὸ ἀσυμπαθὲς ἔχουσα οὔτε τῆς κράσεως τὸ συγκεχυμένον· συνάπτεται γὰρ ἀλλήλοισι τὰ συμπλεκόμενα κατὰ πλείονα μόρια », M. Hayduck, *Ioannis Philoponi in Aristotelis in Aristotelis de anima libros commentaria*, Commentaria in Aristotelem Graeca 15, Reimer, Berlin 1897, p. 20-21.

³⁵ « καὶ ἐν ἀέρι τροπῆς τινὸς γεγονυίας παρὰ τῶν ἐτέρων συστοίχων στοιχείων, γεώδεις ἐξ αὐτοῦ ἐκτελοῦνται ἀτμοί, οὐ φαινόμενοι μὲν, ἐκ τῆς ἐνεργείας δὲ γνωριζόμενοι, νόσους τελοῦντες οὐ κατὰ πρωτοπάθειαν ἢ κατὰ συμπάθειαν ἢ λύσιν τῆς συνεχείας ἢ τῶν ὁμοιομερῶν μερῶν παρὰ φύσιν περιοδικὴν ἢ συνεχῆ ἀνωμαλίαν », N. Festa, "Θεοδώρου τοῦ Λάσκαρι Κοσμικῆ Δήλωσις," *Giornale della Società Asiatica Italiana* 11-12, 1897-1899, here 11, p. 110, lines 2-7.

gold making. As mentioned above, the alchemical works from Byzantine period were about goldmaking, while the references to gold as material can be often encountered in other texts.

Michael Psellos

Michael Psellos was one of the scholars who attached particular importance to the study of the natural world, also as a subject for teaching. He was a scholar in the imperial court, monk for a while, head of the Imperial School of Philosophy under Constantine IX Monomachos (1042-1055) with the rank of the consul of the philosophers (*hypatos*), and was called “polyhistor” on the grounds of his multiplicity of interests. He lived in the 11th c., when the interest in the natural world essentially made its appearance³⁶ and was associated with a more general secularization of Byzantine thought. Psellos’ contemporary historiographers, like Zonaras or Skylitzes’ Continuatus, criticize his work from a traditional Christian perspective.³⁷ It should be noted that, earlier in the end of the 10th century or in the beginning of the 11th, the Byzantine scholars collected the surviving alchemical texts and compiled a coherent corpus.³⁸

It should be noted herein what Psellos himself writes in his *Chronographia* about his scientific and philosophical culture: After the study of Plato and Aristotle, he studied Plotinus, Porphyrius, Iamblichus and Proclus, and learned from them the scientific accuracy.³⁹ In another quotation, he writes that the aim of philosophy is to investigate the nature of beings and to interpret the arcane theories (ἀρρήτους θεωρίας).⁴⁰

³⁶ Kazhdan A.P., Wharton Epstein Ann, *Change in the Byzantine Culture in the Eleventh and Twelfth centuries*, University of California Press, Berkeley-Los Angeles-London 1985

³⁷ Ljubarskij J.N. *Η προσωπικότητα και το έργο του Μιχαήλ Ψελλού*, Kanakis editions, Athens 2004.

³⁸ Codex Marcianus Graecus 299 (= M), surviving in the San Marco Library in Venice.

³⁹ «Ἐντεῦθεν οὖν ὀρμηθεὶς αὐτῆς ὡς περὶ ἰσχυρῶν ἐς Πλωτῖνους καὶ Πορφυρίου καὶ Ἰαμβλίχους κατήειν, μεθ’ οὗς ὁδῶν προβαίνων εἰς τὸν θαυμασιώτατον Πρόκλον ὡς ἐπὶ λιμένα μέγιστον κατασχών, πᾶσαν ἐκεῖθεν ἐπιστήμην τε καὶ νοήσεων ἀκρίβειαν ἔσπασα· μέλλων δὲ μετὰ ταῦτα ἐπὶ τὴν πρώτην ἀναβαίνειν φιλοσοφίαν καὶ τὴν καθαρὰν ἐπιστήμην μυεῖσθαι, τὴν περὶ τῶν ἀσωμάτων θεωρίαν προὔλαβον ἐν τοῖς λεγομένοις μαθήμασιν, ἃ δὴ μέσην τινὰ τάξιν τετάχεται, τῆς τε περὶ τὰ σώματα φύσεως καὶ τῆς ἀσχετοῦ πρὸς ταῦτα νοήσεως, καὶ αὐτῶν δὴ τῶν οὐσιῶν, αἷς ἢ καθαρὰ συμβαίνει νόησις, ἵν’ ἐντεῦθεν εἴ τι καὶ ὑπὲρ ταῦτα ὑπέρνουν ἢ ὑπερούσιον καταλήψομαι», É. Renauld, *Michel Psellos. Chronographie ou histoire d'un siècle de Byzance (976-1077)*, vol. 1, Les Belles Lettres, Paris 1926, 38. 1-12.

⁴⁰

“ἢ δὲ φιλοσοφία τοῦ περιπτυσσομένου τὸν λόγον κάλλους ἤττον φροντίζουσα, τὰς τε φύσεις ἀνιχνεύει τῶν ὄντων καὶ τὰς ἀρρήτους θεωρίας παρίστησι”, É. Renauld, *Michel Psellos*, op. cit., 175.8-10.

Michael Psellos, as mentioned above, wrote a lot of works, some of them important for the study of natural philosophy in Byzantium. Among others, we should mention the *Omnifaria Doctrina* (*Διδασκαλία Παντοδαπή*),⁴¹ *Theologica*,⁴² *De Operatione daemonum*,⁴³ etc. but there are a lot of interesting quotes in other texts.

In his letter to patriarch John Xifilinos, Psellos argues for his interest on natural philosophy. According to his argument, the interest about nature was, on one hand, a main characteristic of a Father of the Church, such as Maximus or Basil of Caesarea, and, on the other, he says that matter exists everywhere...⁴⁴ So, the existence of matter per se is the motivation for the research. In the *Opuscula logica, physica, allegorica, alia* he discuss in detail the substance of matter, the matter and its qualities and the composition of bodies and its different forms (Περὶ τῆς διαφορᾶς τῶν σύνθετων σωμάτων), using gold and silver as an example.⁴⁵ In a letter to an unknown recipient (“Τῷ αὐτῷ”) Psellos, explaining the natural causes, says that among them is the sympatheia («διὰ τὴν ἐν τῷ παντὶ συμπάθειαν»).⁴⁶ In addition, we have to mention another Psellos’ text, «Περὶ παραδόξων ἀναγνωσμάτων», where the scholar on one hand says that he studied even vicious and hideous ideas to refute them, on the other refers to the alchemist Julius Sextus Africanus and his belief that technique is a process like birth-γέννησις.⁴⁷

After this outline of Psellos’ epistemological framework, let’s return to his main texts about alchemy and natural sciences.

The text *Περὶ χρυσοποιίας* (*On gold making*)⁴⁸ is a letter by Psellos to the Patriarch Michael Kerullarios or to John Xiphilinos, in which the writer, still relatively young, discusses the production of gold, outlining a number of possible methods.

An important point in *Διδασκαλία παντοδαπή* from an alchemical view is, according to Psellos, the relation between making and understanding. Psellos, talking about divine

⁴¹ Westerink L.G. (ed.), *Michael Psellus, De Omnifaria Doctrina*, J.L. Beijers N.V., Utrecht 1948.

⁴² Gautier P. (ed.), *Michaelis Pselli Theologica*, vol. I, Teubner, Leipzig 1989.

⁴³ Boissonade J.Fr. (ed.), *Michael Psellus, De Operatione Daemonum*, Norimbergae 1838.

⁴⁴ Ugo Criscuolo (ed.), *Michele Psello, Epistola a Giovanni Xifilino*, Università di Napoli, Napoli 1973.

⁴⁵ J.M. Duffy, *Michaelis Pselli philosophica minora*, Teubner, Leipzig 1992, 17. 1-70, 7.1-180, 8. 1-80 et passim.

⁴⁶ «πάντα γὰρ ἄγεται φυσικαῖς ὀλκαῖς, καὶ τὰ μὲν, τοῖς συγκενέσι προσκλίνεται, τὰ δέ, τοῖς ἀλλοτρίοις βιάζεται, διὰ τὴν ἐν τῷ παντὶ συμπάθειαν», Letter 188 «Τῷ αὐτῷ», Κ.Ν. Σάθας, *Μεσαιωνικὴ Βιβλιοθήκη*, τ. Ε, Τύποις Φοίνικος, Βενετία 1876, σ. 477.

⁴⁷ «Περὶ παραδόξων ἀναγνωσμάτων», A. Westermann, *Παραδοξογράφοι. Scriptores Rerum Mirabilium Graeci*, London 1839, p. 143-148.

⁴⁸ Bidez J., «Michel Psellus, L’Épître sur la Chrysopée», *Catalogue des Manuscrits Alchimiques Grecs*, vol. VI, Bruxelles 1928. For the tradition of text and its translations see C. E. Ruelle, “La chrysopée de Psellus”, *Revue des Etudes grecques*, tome II, no 7, 1889, p. 260-266.

and human mind, writes that the making is located in understanding in the same way the understanding is located in making.⁴⁹ This principle in the epistemic level is very serious for the scientific discussion in Byzantium as well as in the whole of Middle Ages, when the scientific observation of nature, precise description of what is observed and, the most important, experiment in accordance with a strict methodology, were unknown. As we can see, the making, the basis of alchemical process, is legitimized by Psellos in a philosophical context.

The first sentence of *Χρυσοποιία* is exactly about the relationship between philosophers and the practical art of alchemy (εμπύριος και βάνουσος).⁵⁰ Psellos claims that alchemy, which is accused as manual and crude according to the ancient Greek tradition of demarcation of sciences and arts, must become a philosophical discipline. His proposal is that the philosopher has to study the alchemical practices and techniques, which are valuable for scientific knowledge. So, according to Psellos, the alchemical practices and techniques become scientific activity, not occult or magic. A similar sentence exists in another text, a letter by Psellos, where he refers to cheese production and he stresses the importance of working manually.⁵¹

Here, a corresponding principle by Stephanos of Alexandria should be noted. Stephanos, in the 7th century, wrote that a born of God (θεογενής) and godly-minded (θεόφρων) man have to learn by doing, and by theologies and mystical orations.⁵²

The second serious point in *Omnifaria Doctrina* is Psellos' perception of Creation and functioning of the natural world. As he writes, God is the creator and the first cause, but after him in the natural world we could find a lot of causes, which explain the creation and function of bodies.⁵³ In addition, in another text, echoing mainly the Stoics,⁵⁴ he writes that things are in sympathy with each other, so they act in togetherness (in sympnoia – σύμπνοια) and all are under the first Cause.⁵⁵ So, this dogmatic principle allows the changes of natural bodies, by human action and

⁴⁹ «Και η ποίησις εν τω νοείν και η νόησις εν τω ποιείν», 28.10-11

⁵⁰ 1.4-10

⁵¹ Letter 206, in Kurtz E. (ed.), *Michaellis Pselli Scripta Minora*, vol. II, Societa Editrice-Vita E Pensiero, Milano 1941, p. 237.30-238.1.

⁵² «ἵνα ὁ θεόφρων καὶ θεογενὴς ἄνθρωπος διὰ τῆς εὐθείας ἐργασίας καὶ θεολογιῶν καὶ μυστικῶν λόγων μάθῃ», Ideler I.L. (ed.), «Τοῦ αὐτοῦ Στεφάνου σὺν θεῷ Πρᾶξι δευτέρα», in *Physici et Medici Graeci Minores*, vol. II, G. Reimer, Berlin 1842, p. 208, 31-34.

⁵³ «Ἀρχὴ τῶν ὄντων πρώτη μεν και υπεράρχιος ο Θεός, μετά δε θεόν πολλαί αρχαί τῶν φυσικῶν πραγμάτων εισί», §83.2-3.

⁵⁴ Sofroniou S.A., «Michael Psellos' theory of science», *Athena*, vol. 69, Athens 1967, p. 78-90.

⁵⁵ «διὰ τὴν ἐν τῷ παντὶ συμπάθειαν», Letter 188, in Sathas K. (ed.), *Bibliotheca Graeca Medii Aevi*, vol. V, Phoinix, Venice 1876, p. 477.

intervention. The scholar, supporting the relative autonomy of the laws of nature, legitimizes the human effort to change the natural bodies on the basis of natural laws. As he writes in a letter, the providence of nature is wise.⁵⁶

On the same grounds, in *Χρυσοποιία*, Psellos on the basis of the principle that the cause of transformations in things must be sought in nature, he goes on to present and analyze the methods for producing gold. At no point in the text, there are to be found references to the divine will. Presentation and interpretation of the issues is transparently secular. The basic interpretative tool, i.e. the relationship between cause and effect, claims universal validity insofar as hermeneutic approaches to the natural world are concerned.

Another point, which relates Psellos' philosophy with alchemy, is his ideas about matter and things. In *Omnifaria Doctrina*, on Earth, all material things are under continuous change, as he writes in various paragraphs.⁵⁷ Material bodies can change quantitatively and qualitatively.⁵⁸ On the other hand, matter is the basis of the four elements (earth, water, fire, air), which we can keep in mind if we remove from them the qualitative characteristics. Nevertheless, this pure form of matter doesn't exist in the natural world.

On the above basis of the principle that the cause of transformations in things must be sought in nature, as well as that bodies could be changed quantitatively and qualitatively, Psellos in *Χρυσοποιία* goes on to present and analyze the methods for producing gold, emphasizing that for himself the question of transmutation of stones is of equal interest. As he writes, the alchemical art processes matter.⁵⁹ However, he limits the discussion on the one hand to methods for production of gold, on the other to directions for doubling of its existing quantity, improvement of its quality, and heightening of its lustre.

The last crucial point in *Omnifaria Doctrina* is the issue about mixing and constitution of bodies.⁶⁰ The argument for this process is related with alchemical process, so we can find here another relationship between the philosophical view of matter and alchemy.

⁵⁶ «σοφόν δὲ ἄρα ἡ τῆς φύσεως πρόνοια», Letter 206, in Kurtz E. (ed.), *Michaellis Pselli Scripta Minora*, op.cit. p. 236.30

⁵⁷ «Πράγματα ἀλλοιώτα και μεταβλητά», 17.4.

⁵⁸ See §86

⁵⁹ «Τας ὑλας μετακινεῖν και τας φύσεις μεταποιεῖν», 1.6-7.

⁶⁰ «Περὶ μίξεως και κράσεως», § 90.

In *Χρυσοποιία*, we can find a lot of examples for the aforementioned mixing. But these recipes seem to be only academic, so it's more possible that Psellos did not enter into alchemy.⁶¹ Nevertheless, this fact doesn't change the significance of his philosophical principles.

Finally, it is very important here to mention a quotation from Psellos work "What is the difference between the novels deal with Chariclea and Leucippe" («Τίς ἡ διάκρισις τῶν συγγραμμάτων, ὧν τῷ μὲν Χαρίκλεια, τῷ δὲ Λευκίππη ὑποθέσ εις

καθεστήκατον;») about the novels by Heliodore (3rd c. AD) and Achilleus Tatius (5th c. BC): "The beginning of the work itself resembles a coiled snake: the snake conceals its head inside the coils and thrusts the rest of its body forward; so the book makes a beginning of its middle, and the onset of the story, which it has, so to speak, inherited, slips through (to end up) in the middle"⁶².

This quotation with slight variations can be found as introduction in the manuscript 97, in Library of the Monastery of Aghios Stephanos, Meteora, from 1503/4⁶³, and also in the manuscript 197, in Library of the Monastery of Panaghia Olympiotissa, Ellassona, from 1507 and 1741.⁶⁴ One could argue here that the symbol of the snake used here by Psellos takes him into the tradition of the alchemists and it is another indication for his relation with them.

⁶¹ Mertens M., "Graeco-Egyptian Alchemy in Byzantium", in P. Magdalino, M. Mavroudi, *The Occult Sciences in Byzantium, The Occult Sciences in Byzantium*, La Pomme d' Or, Geneva 2006, p. 225.

⁶² «καὶ αὐτὴ δὲ ἡ ἀρχὴ τοῦ συγγράμματος ἔοικε τοῖς ἐλικοτοῖς ὄφει· οὗτοι γὰρ τὴν κεφαλὴν εἴσω τῆς σπείρας κατακαλύψαντες, τὸ λοιπὸν σῶμα προβέβληνται, καὶ τὸ βιβλίον τὴν τῆς ὑποθέσεως εἰσβολὴν ἐν μέσῳ διολισθήσασαν ὥσπερ κληρωσάμενον ἀρχὴν πεποιῆται τὴν μεσότητα», A.R. Dyck, *Michael Psellus: The essays on Euripides and George of Pisidia and on Heliodorus and Achilles Tatius*, Byzantina Vindobonensia 16, Österreichische Akademie der Wissenschaften, Vienna 1986, p. 92, lines 24-28.

⁶³ «θαυμάζω τοὺς εὐρῶντας τὰ γράματα, καὶ τοὺς κτισαμένους τὰς τέχνας ἀσπάζομαι, (καὶ) φιλῶ τοὺς ἀγαπόντας αὐτ(ά)· ἐπαινετὴ (δὲ) ἡ ἐλικοῖδης γραφῆ τῆς μεταλικῆς τέχνης· ἐπεὶ ἡ ἀρχὴ τοῦ συγγράμματος τῆς ἐλικοτοῖς ἔηκεν ὄφεισιν· οὗτοι γὰρ τὴν κεφαλήν· ἴσος τῆς πύρας κ(α)τ(α)καλύψειν (δὲ) τὸ λοιπὸν σῶμα προβέβληται· (καὶ) τὸ βιβλίον τῆς τοιοῦτω [sic] θέσεως, εἰσβάλλει ἐν μέσῳ διόλυστήσας, ὥσπερ κλήρω κληρωσάμενον· τὴν ἀρχὴν πεποιῆται τὴν μεσότητα», man. 97, Library of the Monastery of Aghios Stephanos, Meteora, f. 1r.

⁶⁴ [12.] (f. 1r) ἀρχη· της θειας κ(αι) ιερας τέχνης. Inc. (manu B): «Θαυμάζω τοὺς εὐρῶντας τὰ γράμμα(τα)· κ(αι) τ(οὺς) κτισαμ(ένους) τὰς τέχνας ἀσπάζομαι· κ(αι) φιλῶ τοὺς ἀγαπῶν(τας) αὐ(τὰ)· ἐπαινετὴ (δὲ) ἡ ἐλικοῖδης γρα(φῆ) τῆς μεταλικῆς τέχν(ης)· ἐπὶ ἡ ἀρχῆ τοῦ συγγράμμα(τος) τοῖς ἐλικοτοῖς ἔοικεν ὄφεισιν οὗτοιτε γὰρ τὴν κεφα(λήν) ἴσος τ(ῆς) πυρ(ᾶ)ς καταλύψαν(τες) τὸ λοιπὸν σῶμα προβέβλη(ται)· κ(αι) τὸ βιβλίον τοῖς τοιοῦτῶ θέσεως εἰσβάλλει ἐν μεσῶ διολιστήσας ὥσπ(ερ) κλήρω κληρωσάμενον τ(ὴν) ἀρχὴν πεποιῆ(ται) τὴν μεσότητα ἔτει».

Nikephoros Blemmydes

There are fewer sources for Nikephoros Blemmydes, monk and teacher of Theodore II Laskaris, emperor of Nicaea, which are related with his beliefs about natural science. Although Blemmydes wrote a lot of works in different subjects, he wrote only an extensive textbook under the title *Περὶ φυσικῆς ἀκροάσεως* (*Epitome physica*), for the students in his school in his monastery in Emathia, near Ephesus. The *Epitome* survived in numerous manuscripts up to the 19th century, an indication of the popularity it enjoyed at schools thereafter. On the other hand, unfortunately we have only the problematic edition in *Patrologia Graeca* but not a scholarly standard edition yet. Blemmydes wrote a work on alchemy too, where he mentions a recipe for goldmaking from eggs.⁶⁵

Nikephoros Vlemmydes, in the 32 chapters of *Epitome physica*, presented in detail the main topics of natural philosophy. He uses the Aristotelian works, mainly the *Φυσικὴ Ἀκρόασις* and *Μετεωρολογικά*, as well as the commentaries by Alexander from Afrodisias, John Philoponus, Simplicius and others.

The first chapter is about natural principles and causes, and Vlemmydes writes here that the first efficient cause is God and the first final cause is divine kindness.⁶⁶ In other words, God created the world and so someone could know God by knowing nature. Then, Vlemmydes presents the main principles of Aristotelian physics, adding Christian cosmological principles (God is the first cause Creation,⁶⁷ God is the architect who created the world⁶⁸).

Blemmydes in *Epitome* devotes a large part in the debate on matter and its properties, according to Aristotelian principles, changing only the first cause, which for him is the Christian God. However, some excerpts listed in other sections are very interesting. One of these refers to metals and their natural properties. Here, Blemmydes presents the properties of metals and their different types, such as metals and ores. These different types are made by different natural process. He states, for example, the exhalation and the burning, usual and frequent processes for the

⁶⁵ Berthelot M. (ed.), “Nicephore Blemmydes – Chrysopee”, in *Collection des anciens alchimistes grecs*, vol. II, G. Steinheil, Paris 1888, pp. 452-457.

⁶⁶ «Ὅθεν ποιητικὸν αἶτιον (καὶ) κυρίως καὶ πρώτως ὁ θεῖος ἐστὶ νοῦς καὶ τελικὸν ἢ αὐτοῦ ἀγαθότης, δι’ ἣν πᾶσαν κτίσιν ἐδημιούργησεν, ἵνα γνωρίζηται καὶ κηρύττεται», 1025γ.

⁶⁷ «γενέσεως ἀρχὴ καὶ αἰτία μόνη ἐστὶν ἡ παντουργὸς σοφία καὶ δύναμις τοῦ Θεοῦ», 1065 στ.

⁶⁸ «κατὰ τὴν νεῦσιν τοῦ μόνου σοφοῦ ἀρχιτέκτονος καὶ πανταίτιου Θεοῦ», 1097δ.

alchemists.⁶⁹ In other passages, he refers as natural caused processes the condensation and the sublimation.⁷⁰

In the alchemical text which passed down under his name, the *Crysopee*, Blemmydes gives a technical recipe for gold making, using mainly natural materials as eggs, earth, and water. He seems to know well the power of fire and in his text gives precise instructions for the amount of material and the necessary tools and utensils.⁷¹ It should be noted that these short text doesn't refer to any philosophical or alchemical principles.

Conclusions

A first conclusion from this presentation is that both scholars, Blemmydes and Psellos, were to a great extend familiar with the subject and shows that they believed in the theoretical possibility of transmutation, as a consequence of the laws governing the four elements.

In this context, they considered that the alchemical process is a natural processes, based on the properties of matter, and in agreement with the Divine will. Blemmydes, for example, mentions in the first and final lines of his text that his recipe was performed with the synergy of God.⁷² So, the maker-craftsman could change nature only with divine synergy and help. The Creator created the world but he gave to humans the freedom for changes. Therefore, alchemy is based on natural and divine principles and doesn't have any relation with occult practices or paganism. This rational schema shows a possible difference between the origins of alchemy and the Byzantine scholarly tradition, and in this way it is directly connected with the dominant Byzantine eschatological context of understanding of the world. .⁷³

Of course, the matters arising here are more complex. For example, the relation between laymen knowledge and formal knowledge. Alchemy is above all a practical knowledge based on the knowledge and skills of the craftsmen and therefore accessible by laymen and laywomen. An important issue therefore has to do with the

⁶⁹ Migne J.P. (ed.), «Νικηφόρου τοῦ Βλεμμίδου Εἰσαγωγικῆς Ἐπιτομῆς Βιβλίου Β. Περὶ φυσικῆς Ἀκροάσεως», *Patrologia Graeca*, vol. 142, 1863, c. 1211 C-D.-1213 A.

⁷⁰ As example in c. 1165, op.cit.

⁷¹ «Ἄπερ χρήζει ἡ παρούσα κατασκευὴ», in Berthelot M. (ed.), *Collection des anciens alchimistes grecs*, vol. II, G. Steinheil, Paris 1888, pp. 458-459.

⁷² «τῆ συνεργείᾳ τοῦ πάντα ἐξ οὐκ ὄντων εἰς τὸ εἶναι παραγάγοντος Χριστοῦ τοῦ ἀληθινοῦ θεοῦ ἡμῶν», Berthelot M. (ed.), «Nicephore Blemmydes – Chrysopee», op.cit., p. 452.

⁷³ John Haldon, *Byzantium. A history*, op.cit. (p. 250 in Greek edition).

extend that the knowledge of the craftsmen influenced formal/typical natural philosophy. And this brings us directly to the work by Edgar Zilsel.⁷⁴

Within the social and religious movements of the sixteenth century, new kinds of intellectual activities emerged that combined philosophical ideas with technical interests. The mathematical logic of scholastic philosophers was combined with the practical skills of artisan craftsmen into a new kind of instrumental rationality. The previously separated roles, or identities of scholars and craftsmen were mixed together in new combinations, giving rise to what Edgar Zilsel termed the modern 'scientific spirit'. At the same time, a range of movement intellectuals propounded ideas about making knowledge useful by adopting new methods for investigating both human and non-human reality. As such, the cognitive praxis of the Reformation provided a point of departure for the discourses, methods and practices that would later come to be characterized as modern science.

A last point for more research: It is also probable that the plans of the Emperor Konstantinos Monomachos (the Gladiator) for the foundation of an Imperial Technical School are connected with Psellos' interests on Alchemy (Νεαρά-Nouvelle 1047),

In the middle of the eleventh century technical training was provided in Constantinople through special schools. These schools were, possibly, functioning under the imperial authority. We assume, further, that the innovation in technical training was due to Constantine IX, and that this innovation aimed to reinforce the «new class» of merchants and craftsmen, which arose during his reign.⁷⁵

⁷⁴ Edgar Zilsel, *The social origins of modern science*, Kluwer Academic Publishers, Dordrecht 2003.

⁷⁵ Σταυρούλα Χονδρίδου, «Σημείωμα για την τεχνική εκπαίδευση στο Βυζάντιο τον 11^ο αιώνα», *Σύμμεικτα*, τ. 13, 1999, σ. 157-166.

Athanasius Rhetor and the Greek Chemistry in the 17th century Ottoman Empire

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Two unidentified Greek alchemical manuscripts

Andrée Colinet notes in the 11th volume's introduction of *Les alchimistes grecs* that “the Greek alchemical manuscripts [starting from the end of the Byzantine Empire] are very few and well-known”¹. And yet two manuscripts, at least, are missing from that general inventory. These missing manuscripts do not belong to the “relics”² which Paul Kraus was talking about, i.e. some alchemical recipes found among Medieval Greek texts of astronomy, astrology or magic. These two manuscripts represent a relatively important and coherent whole, and are – as for their form – totally new. They are rather late since they date from the 17th century. It might be the reason why nobody has been interested in them until now. They are too late for the scholars specialized in Byzantine period and too far from the interests of the historians of chemistry of that time who give more importance to the Western chemistry. The two manuscripts I am talking about are not unknown for all that, even if they have never been studied nor even perhaps been read: actually they appeared in the catalogue of the France National Library collections. They are the manuscripts “*Supplément Grec 1027*” (SG 1027) and “*Supplément Grec 1030*” (SG 1030) of the Department of the Western manuscripts. Their author is Athanasius Rhetor³.

The reason why these manuscripts have been preserved until now is that they were integrated – with other Athanasius' papers⁴ – into Chancellor Pierre Séguier's library at Athanasius' death in 1663 or as soon as 1655 when Séguier confiscated several

¹ Colinet A. (2010), *Les Alchimistes Grecs – Recettes alchimiques (Par. Gr. 2419; Holkhamicius 109) – Cosmas Le Hiéromoine 6 Chrysopée*, Paris: Les Belles Lettres, vol. XI, Introduction, p. xlvi.

² See Colinet, Avant-propos, p. vii.

³ Athanase le Rhéteur, *Lettres et extraits d'Athanase de Byzance (Athanasius Rhetor) (1) ; Extraits de Londres, 1643-1644 (137)*, Mss. Supplément Grec 1030, Département des Manuscrits Occidentaux, Bibliothèque Nationale de France, 161 f. And, Athanase le Rhéteur, *Lettres, etc. d'Athanase de Byzance, 1615-1616*, Mss. Supplément Grec 1027, Département des Manuscrits Occidentaux, Bibliothèque Nationale de France.

⁴ The other papers of Athanasius included to Séguier's library concern particularly philosophical and theological matters.

manuscripts from Athanasius. We know that the Ms. SG 1027 appeared in the 12 August 1672 inventory of Séguier's library⁵ several months after his death. But even if none of Athanasius' papers had been included to the detailed inventory of the Greek manuscripts published by Bernard de Montfaucon in 1715, entitled *Bibliotheca Coisliniana*, a stamp on Athanasius' manuscripts attests that these documents (recipes, letters, notes, rough drafts, and a dozen unpublished Athanasius' writings⁶ as well) were in the 18th century in the library of Séguier's grandson and heir, Henri-Charles de Cambout de Coislin, bishop of Metz. It was only in the 19th century that Athanasius' papers were taken into account when Séguier's collection was added to the France National Library through the abbey of Saint-Germain-des-Prés collections⁷, with the following classification marks: Coislin 138-143, Coislin 162, Coislin 391, Fonds Grec 2106, SG 582, SG 1014, SG 1026, SG 1027 and SG 1030⁸, the last two concerning chemistry. Therefore, thanks to the preservation of Séguier's entire library, Athanasius' papers have been saved.

Athanasius' biography

Unlike compilers and copyists of the Greek alchemists' corpus, the broad outlines of Athanasius' life are known. But in order to clear up a possible misunderstanding, let us specify immediately that Athanasius was not a copyist; if he was a copyist, he was the copyist of his own writings, as we shall see. Athanasius was first and foremost a Greek scholar who used to write down chemical notes and recipes for himself and perhaps for a few Greek-speaking people of the Levant, too. He was a man who had devoted, as he said, all his life to study⁹; and he had for chemistry, at least at some point of his life, an unquestionable interest.

⁵ The Ms. SG 1027 was the ancient Ms. Séguier 385; see the "procès-verbal de prise de la bibliothèque grecque du Chancelier Séguier, dressé le 12 août 1672" (Devresse R. (1945), *Bibliothèque Nationale, Dépt. des manuscrits, Catalogue des manuscrits grecs II Le Fonds Coislin*, Paris, p. X).

⁶ About Athanasius' unpublished writings, see O'Meara, D. J. (1977), "The philosophical writings, sources, and thought of Athanasius Rhetor (ca. 1571-1663)", *Proceedings of the American Philosophical Society*, 121/6: 487-493 and 494-498.

⁷ On the Greek manuscript collections at the France National Library, see Omont, H. (1888), *Inventaire sommaire des manuscrits grecs de la Bibliothèque nationale*, 3:XIII; Omont (1902), vol. 2, Appendices: 853-858; Devresse, pp. II-VIII; Astruc, C., Consty, M. L. (1960), *Bibliothèque Nationale, Département des Manuscrits, Catalogue des Manuscrits grecs, Le Supplément 3*, Paris; and O'Meara (1977), 498-499.

⁸ We can add the Ms. 1018 (Suppl. R grec & latin 268 bis, in 4°) of the Bibliothèque Sainte-Geneviève (which is a rough draft of 1641 Athanasius' book).

⁹ Athanasius' 1662 letter to the king Louis XIV of France (*placard in-folio* which is part of the Ms. 17562, *Fonds français* collection, France National Library; see Legrand, E. (1894-1903), *Bibliographie*

The links between Séguier and Athanasius go back to the late 1630s. Since 1635 Séguier had been Chancellor of France and Athanasius was for more than 10 years in Paris where he was taking part in the intellectual debates and polemics of his time. He must have belonged by this time to the entourage of Séguier to whom he dedicated several works. Thus in 1639 and 1641, he published three philosophical and theological books.¹⁰ The first one (about the knowledge of God and the eternal truths) was only dedicated to the Chancellor Séguier, the second one (on the vices and virtues of the human beings according to Iamblichus who was a rather rare Neoplatonic reference at that time) to Cardinal Richelieu and the third one (against those who were claiming that the rational soul was mortal and that this was Aristotle's position) to Séguier, as well as to the bishop of Saint-Malo, Achille de Harlay de Sancy, who was ambassador of France to Constantinople during the period 1610-1619. In 1655, 1657 and 1662, Athanasius published five more volumes on the union of the Christian churches and against the 1637 Parisian edition of Campanella's *De sensu rerum et magia* (in February 1638 Athanasius had already received for this purpose the authorization of the Sorbonne's theological authorities to print this book); volumes were dedicated to Cardinal Spada, Latin patriarch of Constantinople, to Séguier and to Louis XIV. The East was thus regularly represented through Athanasius' dedications. Athanasius was born in Cyprus, in Costanza precisely, about the year of the Turkish invasion of the island in 1571¹¹. He lost his parents when he was rather young, but he managed to move to Constantinople where he was taken into care by the Patriarchate.

Hellénique ou description raisonnée des ouvrages publiés par des Grecs au dix-septième siècle, Paris, (republished in Paris, 1963), vol. 3 (1895: 421-422).

¹⁰ Here are Athanasius' books:

- 1639: P.[atris] A.[thanisii] O.[rat]oris *Opuscula philosophica quatuor: quorum inscriptiones in singulorum videbis principiis*, (Latin and ancient Greek), Paris, dedicated to Séguier.
- 1639: *Delitiae animae sive hortus ex iis quae Iamblichus magno elaborate sunt consitus*, (Latin and Greek), Paris, dedicated to Richelieu.
- 1641: P.[atris] Athanasii *Rhetoris Byzantini. Aristoteles propriam de Animae immortalitate mentem explicans. Opus vere singulare ... ex multi sac variis Philosophis collectum Aristotelis ipsius Auditoribus, qui sibi ex ordine successerunt, sententiae dogmatum ipsius initiati, praesertim vero admirabili & magno Iamblichoi*, (Latin and Greek), Paris, volume 1 dedicated to Séguier, volume 2 dedicated to Achille de Harlay.
- 1655 (1657 for the second edition) and 1662: D.[octoris] Athanasii *Rhetoris Presbyteri Byzantini Anticampanella in Compendium redactus adversus librum de sensu rerum & Magia*, (Latin only), Paris, dedicated to Cardinal Spada (and to Séguier) and Louis XIV.

See Legrand, vol. 1 (1894: 404-405; 416-419), vol. 2 (1894: 82-87; 96-98), vol. 3 (1895: 417-426), vol. 5 (1903: 51); and O'Meara (1977), pp. 485-487 and 493-494.

¹¹ On Athanasius's life, see SG 1027 ff. 347r-350r; Legrand, vol. 3: 417-418; Omont, H. (1902), *Missions archéologiques françaises en Orient aux XVII^e et XVIII^e siècles*, Paris, 1: 1-26; Astruc, Consty, p. 113; and O'Meara, 483-484.

Then he became *hieromonachus* (i.e. a priestmonk) and *Protosyggelos* (i.e. vicar-general) of the Church of Constantinople. Although he was Orthodox, Athanasius was also educated in a Jesuit College, at the Patriarchs' expense¹². It is certainly under such influences – but also in a particular climate of the Orthodox Patriarchate's pursuit of a Western support against the Turks – that Athanasius became an ardent defender of a catholic Orthodoxy; and his position gave rise to controversy in 1614 with Hilarion, Metropolitan of Heraclea. About that time, “for the love of learning”¹³, Athanasius decided to go to Rome in the hope of joining the Pontifical Greek College ‘Saint Athanasius’ (he had converted to Catholicism meanwhile). Indeed, he was rejected because of his age (he was around 50 years old); however, he stayed in Rome. Then he came to Paris probably in 1615¹⁴ and in the 1620s he settled there where he got in touch with, inter alia, Séguier.

At about the end of the year 1642, Séguier had the project to enrich his library with Greek manuscripts. For that purpose, he sent 71-year-old Athanasius to the East in order to buy and send to him rare and precious manuscripts. On 1 August 1643, Athanasius introduced himself to the ambassador of France in Constantinople, Jean de La Haye, before starting his mission in monasteries in Constantinople, Cyprus, Thrace, Macedonia and Thessaly¹⁵.

Almost at the same time – in 1643 – Cardinal Mazarin thought of enhancing his own library with Greek and Eastern manuscripts, too. To this end, he wrote to the ambassador of France in Constantinople to request his assistance. About the middle of the following year, Jean de La Haye sent a capuchin, Father Romain, towards Mount Lebanon to explore the Arab libraries, and Athanasius towards Thessaloniki. Athanasius was thus in charge of an identical mission on behalf of two different and powerful figures.

His mission was long and rather perilous (Venetian blockade, pirates, corsairs, aggressiveness of the monks, health problems). Athanasius spent 10 years in the East

¹² It should be noted that the Jesuit mission in Constantinople – set up in 1583 – enjoyed the patronage of the kings of France and the full support of the French ambassadors to the Porte. Furthermore, a manuscript in Athanasius' hand in the France National Library (Coislin 391) contains a Greek version of Jesuit manuals of Rhetoric, Logic and Physics. See O'Meara, p. 483.

¹³ See O'Meara, p. 483.

¹⁴ Besides, Athanasius might have also gone to Rome, then to Paris, as part of a mission about a possible unification of the Christian churches (as suggested by Blanchet, L. (1920), *Les antécédents historiques du 'Je pense, donc je suis'*, Paris, p. 130).

¹⁵ Athanasius might have gone to Jerusalem, too. See Michel Nau (1680), *Ecclesiae romanae graecaeque vera effigies*, Paris, p. 260 (quoted by Legrand, vol. 3: 419).

and sent more than 300 Greek manuscripts to France. As far as Séguier was concerned, he paid 4,500 pounds for his acquisitions. Nevertheless, it has to be said that Athanasius did not devote all his time, during the 10 years he stayed in the East, to the achievement of his mission. He was living as a priest with the authorization of Patriarch Parthenion¹⁶. Moreover, it is strongly probable that Athanasius also devoted his time to the learning chemistry, to the meeting of craftsmen and chemists, and to the writing of the recipes of SG 1027 and SG 1030 manuscripts as we will see.

Upon his return to France, Athanasius was to be responsible in Séguier's library for the Greek manuscripts he had chosen and sent¹⁷. But a disagreement very quickly appeared between him and his patron. By 1655, the Chancellor Séguier acquired – through the seizure of a baillif who spent a whole day in Athanasius' home to this end¹⁸ – 116 Greek manuscripts which Athanasius had brought for his own account from the East. He never managed to get them back, nor to get money in compensation¹⁹. On 13 March 1663, Athanasius – 92 years old – died in rue Saint-Jean-de-Beauvais, in a house depending on the abbey of Sainte-Genevieve, and was buried in the church of Saint-Etienne-au-Mont. A fortnight later, Séguier was officially granted Athanasius' 116 manuscripts (*par droit d'aubaine*); Athanasius' other possessions were given to a musketeer of the king and to his footmen. However,

¹⁶ See Legrand, vol. 3: 422-425.

¹⁷ Indeed, the following quotation could intimate that Athanasius was acting as a kind of librarian in Séguier' library for the Greek manuscripts: “Je trouvay, par le moyen de M. d'Herouval et d'un autre de mes amis, toute entrée dans la bibliothèque très magnifique du Chancelier, qui, étant luy-même très sçavant, avoit de la joie que ses livres et ses manuscrits, qui étoient en fort grand nombre, pussent servir au public. Mais comme je sceus qu'entre les manuscrits de cette bibliothèque, nouvellement apportez du Levant par un moyne grec, et scellez, il y en avoit un de S. Climaque, qu'on disoit estre très beau et très ancien, j'usay d'adresse avec le sieur Blaise, bibliothécaire, afin d'engager ce moyne à nous le montrer, quelque grande répugnance qu'il y eust. Nous lui parlâmes d'un autre de la Bibliothèque du Roy, que nous jugions pouvoir être ancien de 800 ans et dont nous lui relevâmes beaucoup la beauté extraordinaire et l'exactitude [...]. Après que nous l'eûmes fait enfin résoudre à nous faire voir ce livre, nous y trouvâmes la chose du monde la plus surprenante. [Le manuscrit du moyne grec] apporté nouvellement du Levant se trouve si parfaitement conforme à celui de la Bibliothèque du Roy [...]” (from *Mémoires de Pierre Thomas, sieur du Fossé*, quoted by Omont (1902), p. 21).

¹⁸ Legrand, vol. 3: 419-420.

¹⁹ Athanasius appealed in vain to Séguier, then to Baluze, at the time – 1661 – working for the bishop of Toulouse Pierre de Marca, and in 1662 to the king himself in the hope of finding a solution to the disagreement with Séguier. See Omont (1902), 1: 22-24. At this occasion, Baluze described him at about this time as “learned, but ragged and poor (in his notes of his *Beati Servati Lupi ... Ferrariensis ... opera*, Paris, 1664, p. 443). “However, de Marca did not deem the man contemptible on that account, a man in whom were present, apart from good mind and extensive knowledge of sacred matters and of divine and human philosophy, a modesty worthy of a Christian and a blameless character” (Omont (1902), p. 22, and O'Meara, p. 484).

the books that Athanasius owned were preserved at the abbey of Sainte-Genevieve's library²⁰.

Presentation of Athanasius' alchemical papers

Athanasius was the subject of a few studies (theological, philosophical or philological studies from the late 19th century to 1970s)²¹. His name is still occasionally quoted about an inventory of collections or studies of a particular Greek manuscript which he sent from his mission in the East²². Nevertheless, Athanasius' alchemical papers have gone completely unnoticed²³.

The Ms. SG 1027 contains 522 folios and has a 17th century parchment binding. As for the Ms. SG 1030, it is made up of 161 folios and is bound with a simple cardboard from the 19th century. Only a proportion of these two manuscripts concerns chemistry. Chemistry in these papers represents more than 250 pages for more than 300 recipes, and is close to craftsmen's chemistry (dyeing, whitening, preparation of metals and coins, purification of natural substances, preparations of saline and acid bodies, preparations of some clays, pharmacological preparations against arthritis, plague,

²⁰ Omont (1902), p. 25.

²¹ Marini, N. (1898-1899), "Un tentativo d'unione delle chiese orientali dissidenti da parte di un prete bizantino nel secolo XVII", *Bessarione*, IV: 405-412; V: 115-149; Marini, N. (1899), *Il Primato di S. Pietro difeso del prete byzantino Pietro Atanasio*, Rome, (french translation of Le Monnier, M. (1900), *La primauté de saint Pierre défendue par le prêtre byzantin Pierre-Athanase le Rhéteur (XVIIe s.)*, Arras: Sœur-Charruey, 32p); Omont. (1902), 1:1-26 and 2: 853-858; Blanchet, 130-132; Petit, L. (1931), *Dictionnaire de Théologie catholique*, Paris, vol. 1: 2187-2188; Korolevskij, C. (1932), "Athanase le Rhéteur", *Dictionnaire d'Histoire et de Géographie Ecclésiastiques*, IV: 1394-1396; Arabadjoglou, G. M. (1933), *Φωτίειος Βιβλιοθήκη*, 1: 73-76; Devresse, II-VIII; Arabadjoglou, G. M. (1948), *Ορθοδοξία*, 23: 184-189; Manousakas, M. J. (1949), "Ανέκδοτα πατριαρχικά έγγραφα περί Αθανάσιου του Ρήτορος", *Επετηρίς των Μεσαιωνικού Αρχείου τής Ακαδημίας Αθηνών*, 2: 134-151; Arabadjoglou, G. M. (1952), *Ορθοδοξία*, 27: 12-15; Dalsgaard Larsen, B. (1977), "Un témoignage grec tardif sur Jamblique et la tradition platonicienne: Athanase le Rhéteur", *Cahiers de l'Institut du Moyen-âge grec et latin*, Université de Copenhague, 20: 1-37; O'Meara, D. J., 483-499; Pissas, M. N. (1978), "Αθανάσιος Κύπριος ὁ Ρήτωρ, 1571-1663", *Κυπριακός Λόγος*, 10: 109-120; Podskalsky, G. (1988), *Griechische Theologie in der Zeit der Türkenherrschaft (14-53-1821). Die Orthodoxie im Spannungsfeld der nachreformatorischen Konfessionen des Westens*, München, 191-194; Manousakas, M. J. (1990), "Οί περιπλανήσεις τοῦ Ἀθανασίου τοῦ Ρήτορος ἀπο τήν Κωνσταντινούπολη (1607-1614) στην Ἰταλία καὶ ἀπο τήν Ἰταλία (1614-1619) στο Παρίσι (1620)", *Ἑλληνογαλλικά. Ἀφιέρωμα στον Roger Milliet. Mélanges offerts à Roger Milliet*, Ἀθήνα, 483-501; Franckowiak, R. (2014), "Athanasius Rhetor: a Greek in Paris, a Priest in Alchemy", in G. Katsiampoura (ed.), *Scientific Cosmopolitanism and Local Cultures: Religions, Ideologies, Societies*, National Hellenic Research Foundation, Athens, 95-100

²² For instance: Omont (1888), 3: XIII; Darrouzès, J. (1950), "Les manuscrits originaux de Chypre à la Bibliothèque National de Paris", *Revue des études byzantines*, 8: 162-196; Constantinides, C. N., Browning R. (1993), *Dated Greek manuscripts from Cyprus to the year 1570*, Nicosia: Texts and Studies of the History of Cyprus 18; de Leeuw, M. (2000), "Der Coislinianus 345 im Kloster Megisti Lavra (Athos)", *Zeitschrift für Papyrologie und Epigraphik*, 131: 58-64.

²³ In the French National Library Catalogue's description of the Mss. SG 1027 and SG 1030, it is just written, from time to time, "alchemical notes" or "alchemical recipes".

gout, eye diseases, or to preserve the memory, to give strength) as well as alchemy (preparations of philosopher's stone, potable gold, metal transmutation, fixing or extraction of mercury, gold and silver production by more or less complicated chemical combinations).

There is certainly a reason why the Ms. SG 1030 had not been correctly bound as soon as it was integrated Séguier's possessions neither written down in Montfaucon's inventory. Unlike the Ms. SG 1027, the chemical papers of the Ms. SG 1030 contain many recipes crossed out and/or carelessly written. As far the chemical folios are concerned, the Ms. SG 1030 gathers indeed Athanasius' rough drafts, original versions and notes of a rather large proportion of recipes neatly written in the Ms. SG 1027. Actually, around 30% of the recipes in the papers are in two, even three, similar versions. Thus, these two manuscripts show us an extremely lively way how Athanasius used to work and study chemistry (and perhaps also how authors of Greek chemical manuscripts generally used to work): notes, rough drafts, choices, translations, additions, corrections, and writings up of recipes, and sometimes annotations and questions on the recipes.

Recipes in Athanasius's papers can be distinguished on the basis of the language in which they were written. Approximately 60% of the recipes are in Italian and 40% in (classical and demotic) Greek. But if one withdraws the recipes obviously not written by Athanasius' hand, a balance is achieved: half in Italian, half in Greek. In addition, a few recipes are also in French (3) and Latin (1). It would be tempting to think that the language used in the papers indicates the geographical origin of the recipes. Nevertheless, the criterion of the language might not be so pertinent about Athanasius who was educated in both languages, Greek and Italian; two languages he apparently used to practise very fluently. So the Italian language does not necessarily indicate a western source. As we will see, an eastern recipe could be directly written in Italian, and a western one in Greek. On the other hand, a more significant criterion to make a distinction between eastern and western recipes would be rather based on the units of weight employed by Athanasius in his papers. In some recipes were used "ounces" and "pounds" and in others "*okka*" and "*dramia*". The latter were not the result of any translation of western texts with conversion in Ottoman units of the ounces and pounds. The Ottoman units do reveal us an eastern chemical practice, maybe suspected but never seriously envisaged by historians of science to study it. We will

deal with this point further, after talking about the presence of Turkish terms in the recipes.

Very many Athanasius' recipes contain names of ingredients in Turkish²⁴. The most present are “*nisantiri*” [i.e. sal ammoniac], “*tourti*” [i.e. tartar], “*kouvergilé*” [i.e. niter], “*rastik tasi*” to say “*rastikopetra*” – grecized term which meant according Athanasius “*ferretto di spagna*”²⁵, i.e. “copper calcined with sulphur”²⁶ –, and “*soulima*” probably to say corrosive sublimate (or even perhaps white lead²⁷)²⁸.

As regards the Turkish vocabulary in some recipes of Holkhamicus 109, Lagercrantz suggested that there had to be a Turkish alchemy in the 16th century²⁹. As for Andrée Colinet, such a Turkish terminology simply related back to a trade name which helped the Greek alchemists to get their supplies from Ottoman traders³⁰. However, without denying the need to use Turkish names to get ingredients for the practice of chemistry in the Ottoman Empire³¹, the study of Athanasius' manuscripts would rather agree with Lagercrantz, even if one has more correctly to talk about a Levantine alchemy and not a Turkish alchemy, as long as in the Ottoman empire – made up of several communities – half of the 30 million or so inhabitants were Christian by 1600. The

²⁴ In Athanasius' manuscripts, the Turkish names could be written in Latin letters as well as in Greek letters but they were always phonetically written.

²⁵ See SG 1030 f. 71r/SG 1027 f. 475v and SG 1030 f. 83r/SG 1027 455v.

²⁶ According to the fourth edition of the *Lessicografia della Crusca* (1730, vol. 2, p. 436) (the 1691 third one said only it is a kind of calcined copper (vol. 2, p. 675)).

²⁷ Colinet (p. 102, n. 108) says that the ‘soulima’ could actually be the corrosive sublimate (i.e. mercury (II) chloride) but its meaning remains quite vague in alchemy.

²⁸ For example, here is a typical recipe with Turkish terminology: “A far oro. Rx ruch tutia δραμια 10 και λύσετε την, και όταν ανάπτη, ρίχνε απάνω ξύγκι. λυθείσης δε χύσε την εις το κανάλι. είτα κουπάνησον 20 δρ. ραστικόπετραν ψιλώτατα, και 10 δρ. τρίχαν ανθρωπινάς ψιλώτατα κομμένας, και ανακάπωσενταις με 30 δρ. νισαντήρι με την ραστικόπετραν, και ανάλυσέτα εις μίαν χούλιάραν σιδηράν, είτα ζύγασέ τα, και όσον λείπει βάλε πάλιν από το νισαντήρι, έπειτα τρίψετα, μετά τούτο κουπάνησε την ρηθείσαν τουτιά ψιλώτατα, και κόψε την τετράγωνος. Είτα Rx σταφίδας και εύγαλε τα σπυριά τους, έπειτα κουπάνησέ ταις, και εξ αυτών χρίσε ένα χωνή απ' ένδοθεν, και ξήρανέ το λιγάκι ή εις ήλιον ή εις πυρ. Είτα βάλε ολίγον από την ραστικόπετραν απάνω εις την σταφίδα, και απάνω από την ραστικόπετραν την τουτιά οπού έκαμες και απάνω απ'αυτήν, την ραστικόπετραν έως οπού να γεμίσει το χωνή, και να λείπεται ολίγον δια να γεμίση, είτα απάνω βάλε ύαλλον βενέτικον κουπανισμένον ψιλά ως ένα δακτύλι ώσπου να γεμίση ολότελα το χωνή ως απάνω, και από πάνω βάλε πυρ μέγα έως οπού να αναλύση ο ύαλλος, είτα βάλε πυρ και άνωθεν και κάτωθεν έως οπού να αναλύσουν όλα, είτα χύσε τα εις ένα πινάκι ξιρόν, έπειτα μάζοξε τα σπυριά τα κίτρινα και ανάλυσέ τα άσθις και χύσετα εις το κανάλι και έσται χρυσός άριστος, πλην ο σολυμάς τον τρώγει” (SG 1027, ff. 485r-486v).

²⁹ Lagercrantz, O. (1924) (ed.), *Les recettes alchimiques du Codex Holkhamicus*, in D. Waley Singer, A. Anderson, W. J. Anderson, *Catalogue des manuscrits alchimiques grecs*, vol. III: *Les manuscrits des Iles Britanniques*, Appendice, pp. 31-35 (quoted by Colinet, p. xlvi).

³⁰ Colinet, pp. xlvi-xlvii.

³¹ For the needs of trade with the Ottoman Empire, the practice to convert into Turkish the name of goods continued at least until the 19th century, as we can see for instance with the vocabulary from the “Convention conclue à Constantinople le 25 novembre 1838, et formant appendice aux capitulations garanties à la France par la Porte-Ottomane...”.

use of Turkish terms by Athanasius in his recipes was actually not systematic and met very variable criteria. Moreover, all the ingredients in Turkish could not necessarily be found at the market such as the roots called “*otoulki*” and “*zerdehiáf*” – for the cleaning of metals³² or for the preparation of gold³³ –, or even still plants acting as philosopher’s stone³⁴ like “*kaiapasha*” which was in Latin the ‘*parisia*’³⁵ and “*zevetounié*” which was the lunar herb ‘*borissa*’, according to Athanasius³⁶.

The Turkish terms written down by Athanasius were certainly already present in the original recipes taken up in his manuscripts; these original recipes could be transmitted to him through books, handwritten texts or even verbally, as we will see. Indeed, when Athanasius wrote down a specific word from a transmitted recipe, he used to adopt this word such as he read or heard it. For example, in SG 1027 f. 450v – translated from an Italian version – he wrote: “*Λάβε πράσινον χαλκόν και άλας αρμονιακόν*” [= ‘take green copper and sal ammoniac’] but he did not write “*Λάβε πράσινον χαλκόν και νισαντίρι*” [= ‘take green copper and *nisantiri*’] if he wanted to specify a trade name. In SG 1027 f. 452v, a sentence was translated from an Italian in the following manner: “*λάβε μερκούριο*” [= ‘take quicksilver’] instead of “*λάβε διάργυρο*” if Athanasius wanted to give an accurate translation into Greek, or “*λάβε γικιά*” [= ‘take *gika*’] if he wanted to show the Turkish term³⁷. In several recipes, he wrote in Greek letters “*κινάπριον*” [= ‘cinnabar’] borrowed from the Latin instead of “*κιννάβαρης*” or “*κινναβαρίτης*” in a correct form such as in SG 1027 f. 485v. Moreover, the Italian word «*solfaro*» was always preferred by Athanasius to say ‘sulfur’ – even if the recipe was written in Greek –, except once, in SG 1027 f. 485v,

³² Certainly to clean the copper: “*ρίζα ονομάζομένη τουρκιστί οτουλκί δράμια 30. σκόροδον καθαρισμένον [δρ.] 100. όξος δυνατόν δρ. 400. κόχλασον αυτά έως ότου καταλυθή το ήμισυ, και τότε λύσε το χάλκωμα και ρίψον αυτό ένδον. Και πάλιν λύσον και ρίψον ένδον, και ούτως έως πεντάκις δράσον*” (SG 1030 f. 52v).

³³ Indeed, for gold preparation: “*λέγουσι να βάλης τριμμένον ύαλλον εις το χονή, είτα τετριμμένην ρίζαν καλουμένην τουρκιστί ζερδεχιάφ, επ’ αυτή δέ μόλυβδον, είτα αύθις επ’ αυτήν την ρίζαν ως και υπ’ αυτήν. επί δέ αυτήν πάλιν, ύαλλον. και ίσθι ότι το χονή θέλει να είναι τριπημένον, όπερ θήσεις επάνω εις άλλο χονή γερό, έπειτα βάλεις εις το πυρ κατά τους χρυσοχούς, και όταν λυθή, έξαγε το ρυέν εις το γερό, και ευρήσεις χρυσόν. Δοκίμασον*” (SG 1030 f. 74r).

³⁴ Such vegetable philosopher’s stones were usually related to a particular planet. The best known is the lunar one that we can find in the 13th century writings of Paul of Taranto (*Theorica et practica*) and of Arnaldus de Villa Nova (*Liber noui testament*) as well as in the Latin and Byzantine medieval time hermetic herbaria of the astrological botanic. One of the lunar ones, the *borissa* comes from the Alexandrian period. See Colinet, pp. lxx-lxxxiii.

³⁵ SG 1030 f. 127 bis b: “*καίόπαχι τουρκιστί la parisia*”. And SG 1027 f. 442v.

³⁶ SG 1030 f. 105r: “*borissa zeβετουνιέ αραβιστί*”. And SG 1027 ff. 450v-452v / SG 1030 f. 78r.

³⁷ In SG 1027 f. 438p, Athanasius wrote that ‘*gika*’ means ‘*διάργυρο*’.

where he used the Greek word “διάφι”. And, in the Greek recipe SG 1027 f. 485r, he wrote precisely the word “ρακή” [= ‘raki’] and not any other brandy.

Through all these examples, we can put forward that the reason why some ingredients of recipes written in Greek or Italian appear with their Turkish names, was that such ingredients were already in Turkish in the original recipes transmitted to and copied or translated by Athanasius. Thus, the lists of chemical words in Greek with their translation in Turkish (in Greek letters)³⁸ which we find in Athanasius’ manuscripts can be interpreted as vocabularies helping to understand the Levantine recipes transmitted to him. And similarly, Athanasius drew up some lists of alchemical symbols with their meanings³⁹ in order to understand exactly what alchemical recipes he got said.

Here are, for instance, two similar recipes in Athanasius’ manuscripts about the composition of silver. The first one is doubly crossed out and comes from the Ms. SG 1030. It is the original but rough draft version of the second which is carefully written and comes from the Ms. SG 1027. From one to the other recipe, a word in Turkish ‘*tourti*’ disappeared to be translated into Greek ‘*tartaron*’:

- SG1030 ff. 30r-v (first version):

“10 dr. of mercury. 10 dr. of white *pontikofarmakon*. 10 dr. of *tourti*. 5 dr. of alum. Crush them well all together on a piece of marble. Then knead them with egg white, then put them in a piece of cloth and tie up its opening and hang it in a copper box and cover it with its lid and coat it

³⁸ For example, at SG 1027 f. 438r (whose the rough draft is at SG 1030 f. 35v without translation):

“ραστικόπετρα --- ραστίκ τάχ τουρκιστί
βιτρίολο ευρίσκειται εις την κύπρον και ρώμην --- ζάκκυβρίς
τούτια αλεξανδρεία --- τουτιά μαραζή.
άλας βουλλομένον. ευρίσκειται εν ικονίω. --- μυλχί εντρανί
μπορά.
σολυμά
σαλονίτριον. Ευρίσκειται εν καισαρεία της καππαδοκίας, και έστι διπλούν δι’ άργυρον και χρυσόν. ---
κουβεργίλέ.
αρσένικον έστι διπλούν δι’ άργυρον και χρυσόν. ---σισάνοθι
νισαντήρι ή sal harmoniacum. και ευρίσκειται εις την αίγυπτον.--- νισαντήρι
διάργυρο --- γικά.
sulpharum --- κηρίκ.
κινάπριον --- ζικίφρα
στίψιν. έστι διπλή λευκή και ερυθρά --- χιάπ
τάρταρον ---τουρτί
terra sigillata”.

³⁹ SG 1030 f. 54r and f. 105r.

entirely with the kind of clay that is used for making bowls or another kind that is fire resistant[.] Then bury it in common glowing charcoal and leave it for about six hours, then when it has cooled[,] open it and remove the mercury which will look like a shiny skin from the cloth, and gather it and melt it in a crucible, then in another crucible, melting one dr. of it together with 3 of copper, then take this, and 1dr. of silver and remelt it and you will see. And you will whiten it as goldsmiths whiten silver. It has been tried. Has been written down.”⁴⁰

- SG1027 f. 496v (second version) [see figure 1]:

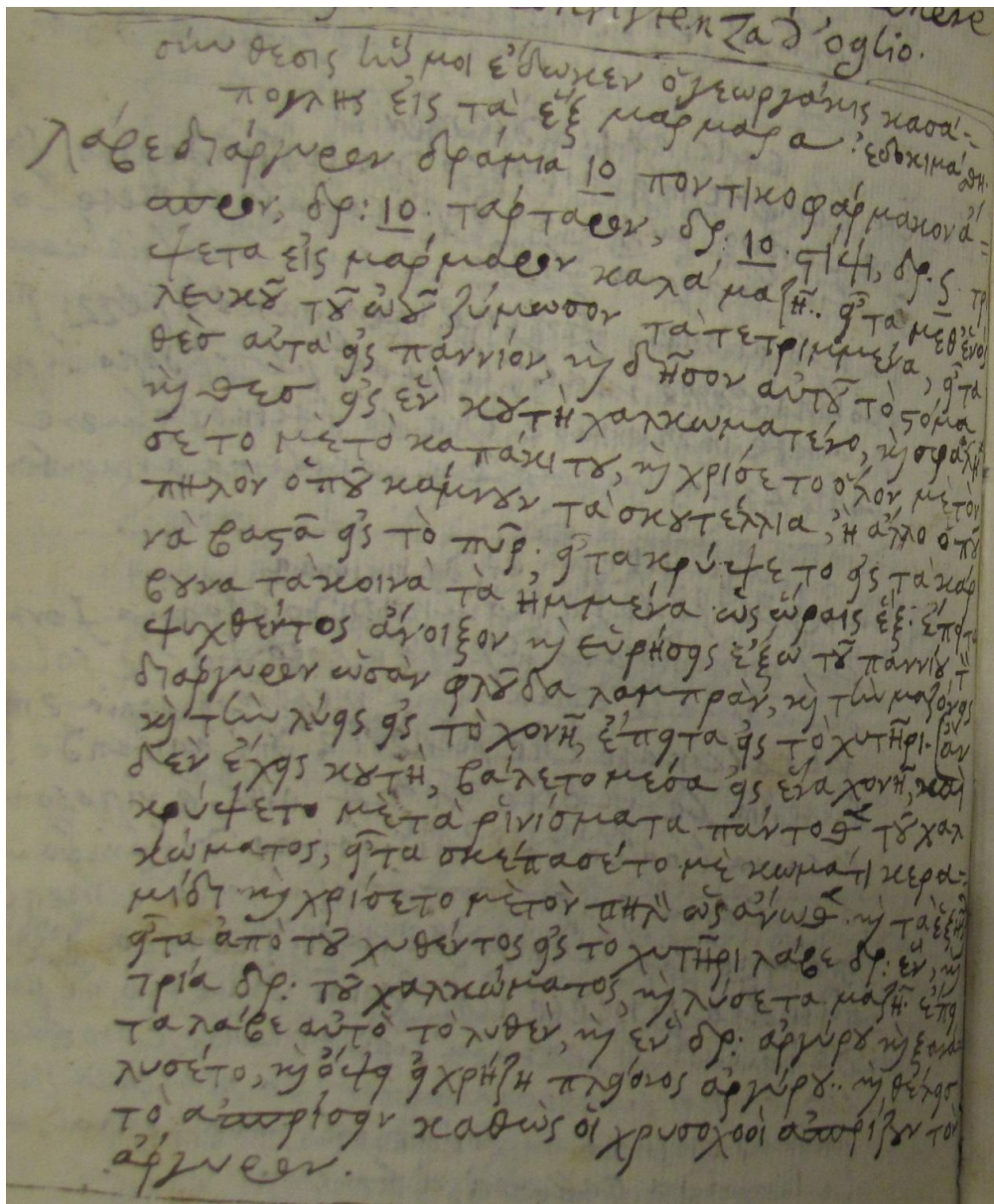
“Georgakis Kasapoglis from Ex Marmara⁴¹ gave me the composition. It has been tried.

Take 10 dramia of mercury[,] 10 dr. of white *pontikofarmakon*, 10 dr. of tartar, 5 dr. of alum. Crush them well all together on a piece of marble. Then knead them with egg white, then put them in a piece of cloth and tie up its opening and put it in a copper box, and cover it with its lid, and coat it entirely with the kind of clay that is used for making bowls, or another kind that is fire resistant. Then bury it in common glowing charcoal and leave it for about six hours. Then[,] when it has cooled[,] open it and remove the mercury which will look like a shiny skin from the cloth, and gather it and melt it in a crucible, then in another crucible. (if you do not have a box, put it in a crucible, and cover it all over with copper filings, then cover it with a piece of tile and coat it with clay[,] as said above. And the following), then from what was melted in the crucible take one dr., and three dr. of copper, and melt them all together. Then take the melted

⁴⁰ “διάργυρο δρ. 10. ποντικοφάρμακον άσπρο δρ. 10. τουρτί. δρ. 10 . στίψι δρ. 5 . τρίψε τα εις μάρμαρον καλά μαζί ήτα μεθ’ ενός ~~ωθ~~ λευκού του ωού ζυμόσεις τα τετριμμένα, ήτα θήσεις αυτά εις παννίον και δήσεις αυτού το στόμα και θήσεις εις ένα κουτή χαλκοματένο και να το σφαλήσεις με το καπάκι του και να το χρίσεις όλον με τον πηλόν οπού κάμουν τα σκουτέλια ή άλλο οπού να βαστά εις το πυρ ήτα κρύψετο εις τα κάρβουνα τα κοινά τα ημμένα έως ωρών έξ, ήπειτα ψυχθέντος άνοιξον και ευρήσεις εξω του παννίου τον διάργυρον ωσάν φλούδα λαμπράν, και την μαζόνεις και την λύεις εις το χονή, ήπειτα εις το χυτήρι, αφ’ού δρ. έν εις 3 του χαλκώματος λύνοντος μαζί, ήπειτα λάβε αυτό, και έν δρ. αργύρου και ξαναλύσετο και όψει. και θέλεις το ασπρίσει καθώς οι χρυσοχόι ασπρίζουν το ασίμι. εδοκιμάσθη. εγράφη” (SG1030 ff. 30r-v).

⁴¹ ‘*Ex Marmara*’ was a neighbourhood of Constantinople which is today ‘Alti Mermer’.

material, and one dr. of silver and remelt it, and you will see if it needs more silver. And you will whiten it as goldsmiths whiten silver.”⁴²



⁴² “σύνθεσις ἦν μοι ἔδωκεν ὁ γεωργάκης κασάπογλης εἰς τὰ ἐξ μάρμαρα. Εδοκιμάσθη.

Λάβε διάργυρον δράμια 10 ποντικοφάρμακον ἄσπρον, δρ: 10. τάρταρον, δρ: 10. στίψι, δρ.5. τρίψε τὰ εἰς μάρμαρον καλά μαζή. Εἶτα μεθ' ἐνός λευκοῦ τοῦ οὐοῦ ζύμωσον τὰ τετριμμένα, εἶτα θες αὐτὰ εἰς παννίον, καὶ δῆσον αὐτοῦ τὸ στόμα καὶ θες εἰς ἐν κουτή χαλκωματένο, καὶ σφάλισε τὸ με τὸ καπάκι του, καὶ χρίσε τὸ ὅλον με τὸν πηλὸν οὐοῦ κάμνουν τὰ σκουτέλια, ἢ ἄλλο οὐοῦ να βαστά εἰς τὸ πυρ. Εἶτα κρύψε τὸ εἰς τὰ κάρβουνα τὰ κοινὰ τὰ ημμένα ὡς ὥραις ἕξ. Ἐπειτα ψυχθέντος ἀνοίξον καὶ ευρήσεις ἐξω τὸν παννίον ὡσάν φλούδα λαμπράν, καὶ τὴν μαζόνεις καὶ τὸ χονή, ἔπειτα εἰς τὸ χυτήρι. (αν δὲν ἔχεις κουτή, βάλε τὸ μέσα εἰς ἓνα χονή, καὶ κρύψε τὸ με τὰ ρινίσματα πάντοθεν τοῦ χαλκώματος, εἶτα σκέπασέ τὸ με κομάτι κεραμίδι καὶ χρίσε τὸ με τὸν πηλὸν ὡς ἄνωθεν. καὶ τὰ ἐξίς) εἶτα ἀπὸ τοῦ χυθέντος εἰς τὸ χυτήρι λάβε δρ: ἓν, καὶ τρία δρ: τοῦ χαλκώματος, καὶ λύσε τὰ μαζή. Ἐπειτα λάβε αὐτὸ τὸ λυθέν, καὶ ἐν δρ. ἀργύρου καὶ ξαναλύσε τὸ, καὶ ὅψει εἰ χρήζη πλείονος ἀργύρου. καὶ θέλεις τὸ ἀσπρίσειν καθὼς οἱ χρυσοχοὶ ἀσπρίζουν τὸν ἀργυρον” (SG 1027 f. 496v).

An unnoticed network of eastern chemists

This recipe SG 1027 f. 496v is very interesting because it had been tried, but mostly because the name of the chemist who gave it to Athanasius was revealed, as well as the place where he used to live in Constantinople: Georgakis Kasapoglis from the neighbourhood called Ex-Marmara. This information was not mentioned in the original version SG 1030 ff. 30r-v in which other details were also absent. Considering that almost one third of the recipes in Athanasius' manuscripts are in two – or more rarely three – versions, this example of two versions of the same recipe inform us about the way Athanasius worked in chemistry. He used to write the recipes in two stages: first, he gets a recipe which he quickly retranscribed such as he has got it, secondly, he neatly rewrites it by including some details after having tried by himself the recipe or after having got some information in another way. And so, the second version – supposed to remain and perhaps to circulate among other chemists – erased the Turkish terminology but kept the peculiar compound called '*pontikofarmakon*' which seems to belong to the Greek chemistry in its own⁴³; both versions being here in demotic Greek. In addition, the second version became more complete and contains two details. One, put in brackets, is about a technical detail, the other completes a sentence which had remained unfinished (“[...] remelt it and you will see”) as its meaning was obvious when Athanasius wrote it down. Moreover, Athanasius might have even got the recipe verbally from Kasapoglis himself.

In fact, the verbal transmission of chemical practices to a scholar could be a quite common practice. In Athanasius' manuscripts, we found two specific pieces of evidence:

- In SG 1027 ff. 439r-439v: the recipe begins with the following comment: “*ο ειρηκώς μοι τούτο, είληφεν αυτού πείραν*” [= ‘the person who told me that did the experiment’];
- In SG 1030 ff. 81r-82r: the recipe was not written by Athanasius but contains two annotations of his: it is a strange enough recipe of gold preparation from partridges, bile and stomach of ox, worms, snake, sheep excrement, yolk, glass, lead mixed with wheat, which ends with the following mention: «*Κατά τον ληρούντα*

⁴³ The word “*pontikofarmakon*” appears also in a 1478 manuscript presented in Berthelot, M. (1888), *Collection des anciens alchimistes grecs*, III, “Cinquième partie – Les traités techniques – V.1 Sur la très précieuse et célèbre orfèvrerie”, Paris, recipe 49, pp. 335 (translation, p. 320); see pp. 307-308 for the presentation of that manuscript. In Bethelot's book, “*pontikofarmakon*” was translated into “litharge”.

τάτα τα ημίν απίθανα εγγράφωμεν » [= ‘we wrote all those things, for us incredible, according to the person who spoke them’].

So, what is really noteworthy to be emphasized in the example of the two versions of Kasapoglis’ recipe is that Athanasius in Constantinople – where he used to live up to 1610s and where he spent most of his time during his missions on behalf of his two patrons – was in contact with alchemists/craftsmen, not to mention the possibility for him to be part of a kind of network of people interested in chemistry.

Georgakis Kasapoglis’ name appears elsewhere – on a scrap of paper – in Athanasius’ manuscripts. Actually, other names of people are found on scraps of paper about chemistry in the Ms. SG 1030:

- f. 34r a: “*γεωργάκης κασάπογλις εις τα έξη μάρμαρα*” [= ‘Georgakis Kasapoglis in Ex-Marmara’]
- f. 126r b: “*νικόλα φαρσαλιότη εις τα βρούλα (sic) του ζωγράφου*” [= ‘Nikolas Farsaliotis in Vourla of Zografos’]
- f. 126r b: “*Χεχίς φεστλής έμηρις εις το πεσικτασι*” [= ‘Hechis Festlis emir in Besiktashi’]
- f. 127 bis b: “*παπά μιχαήλ μητροφάνη*” [= ‘Father Mihail Mitrofanis’]
- f. 132r b: “*mehemet dedé εις του κασουμπαχιά*” [= ‘Mehmet Dede in Kasimpasha’]
- f. 34r b: “*Malaheh il taloppia ?*”
- f. 34r b: “*Andrea grimaldi pretre trambuchi ?*”
- f. 34r b: “*baltasar andrigoy?*”

Let us specify that ‘Ex-Marmara’, ‘Vourla of Zografos’, ‘Besiktashi’ and ‘Kasimpasha’ were all Constantinople neighbourhoods.

It is reasonable to think that these names are names of people interested in chemistry or names of craftsmen with whom Athanasius was in contact in Constantinople. So it

should be noticed that among his chemical acquaintances there were Greeks, Westerners as well as Turks⁴⁴.

Athanasius' chemical papers contain other names of unknown people. This time, these names accompany some recipes and belong to authors of those recipes:

- f. 63v: “*αρχον καρητζή*” [= ‘sir Karitzis’]
- f. 64r: “del P. Carazzoli”
- f. 64v: “*Παπά κυρ Δανιήλ*” [= ‘Father Daniel’]
- f. 44r: “Monsieur Gras docteur en médecine demeurant chez mr devertrieu en dauphine à seriere”
- f. 44v: “Monsieur de St Sorlin recommande à la cortesie de mr lorange hoste du faucon à marseille”
- f. 45r: “Ph. Bordier - chez monsieur de Creil maistre de Requestes rue de Lions proche St. Paul à Paris”

So there are here a Greek, an Italian and Frenchmen.

It is difficult to know who these people were but we can point out that two manuscripts of Athos Mount dealing with pharmacological subjects, the Ms. Dionysiou Monastery 610 (17th century) and the Ms. Iviron Monastery 183 (18th century), were written by a certain Daniel; in the first case, Daniel was a hieromonk and, in the second case, a priest. Obviously, nothing permits us to link them to Father Daniel in Athanasius' papers.

An alchemist in action

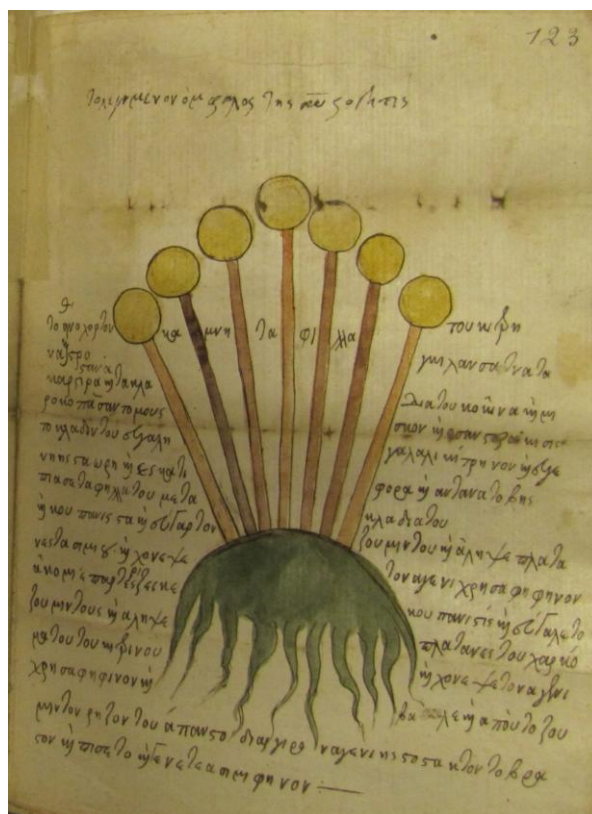
Athanasius was not an “alchemist by his pen”⁴⁵; he really used to practise chemistry. He was part of a network – made up of people working in chemistry and more or less concentrated in Constantinople – in which chemical recipes could pass from hand to hand. It is the reason why his chemistry, as it appears in his manuscripts, was very lively, not to say a chemistry of living people. The recipes he wrote were selected,

⁴⁴ Besides it is known that in the 17th century Ottoman Empire dervishes were interested in the pharmacy and were the most inclined to get in touch with Christians; now Mehmet Dede could be a dervish according to his name and he used to live in the neighbourhood of the imperial arsenal.

⁴⁵ Indeed, “alchemist by his pen” (*alchimiste de plume*) is an expression used by Andrée Colinet to characterize the copyist of the Holkhamicus 109 (Colinet, t. X, p. xciii), i.e. an alchemist practising only the writing of alchemical recipes without really carrying out them.

rewritten, completed or revised. And sometimes he might even have met chemists to ask them some questions about recipes.

Athanasius seems to have a preference for certain topics of alchemical recipes, as mercury congelation or metal transmutation by a plant. The latter was the subject of twenty or so recipes; some of them were illustrated⁴⁶. Thus Athanasius' papers contain a set of six anonymous drawings of such plants; for instance, “το λεγόμενον ομφαλός της Αφροδίτης” in SG 1030 f. 123r [see Figure 2]. One of those recipes on the use of a vegetable philosopher's stone is even rather similar to a recipe of Paul of Taranto⁴⁷. But it should be noted that such a philosopher's stone was already quite rare in the medieval alchemy, and since it had not been at all a topic of the western early modern chemistry. According to Athanasius, this kind of plant grew in Rhodes, Cyprus, Smyrna, *Πολύκανδρος* (i.e. Folegandros) or near Ancona in Italy, and in his manuscripts he gave its name in Greek, Italian, and French as well as in Turkish, Persian and Arabic. Thus we may see with the vegetable philosophers' stone a peculiar topic belonging to 17th century Greek or eastern alchemy.



⁴⁶ SG 1030 f. 31r, f. 34r, f. 44r, ff. 54r-54v, f. 66r, f. 78r, ff. 96v-97r, ff. 101v-102r, ff. 108v-109r, f. 113v, ff. 122r-125r, f. 127v, f. 128v, ff. 129r-ff. 130v-131r, and SG 1027 f. 442v, ff. 450v-452v, f. 453r, ff. 457v-458v, ff. 466r-467r, f. 491v.

⁴⁷ Indeed, the recipe SG 1027 ff. 450v-452v is rather similar, at least in its first part, to one of those of Paul of Taranto (in his *Theorica et practica*) pointed out by Colinet (pp. lxxi-lxxiv).

But Athanasius was not interested in all the recipes he could get: he used to pick some of them according to his personal interests and leave the rest. We can clearly see it for instance in the anonymous 55 page set of leaves in Italian included in the Ms. SG 1030. He marked several of its recipes he copied with the following sentence written next to the title of the concerned recipes: “*Questo non ho scritto*” [= ‘I did not write this one’]⁴⁸. Recipes without such a mark were in fact copied in Italian or translated into Greek by Athanasius elsewhere in his manuscripts⁴⁹. In addition, as we can see in the two Greek translations of same and quite long recipe concerning the philosopher’s stone from this Italian notebook⁵⁰, Athanasius only selected the passages he wanted⁵¹.

⁴⁸ For example, in SG 1030 f. 95v (“*Olio di tartaro col quele si fa l’argento dundeci legue*”).

⁴⁹ For example, the three recipes in SG 1030 96r (“*On Congellation di mercurio*”, “*A congelare et fissare il mercurio*”, “*Altro modo senza odor di mettalo*”) were copied by Athanasius respectively in SG 1027 f. 457r, ff. 457r-v and 1027 f. 457v.

⁵⁰ The Italian original version is in SG 1030 ff. 100r-101v (“*Della pietra d’un Certo filosofo Eccellentissimo*”), translated into Greek first in SG 1027 ff. 448r-450r (“*Lapis philosophicus – approbato*”) and secondly in SG 1030 ff. 35r-35v (“*Περί της πέτρας κάποιου φιλοσόφου*”).

⁵¹ For instance, here are the ends of the two Greek versions. The first version in SG 1030 f. 35v: “και ? αύξησον το πυρ μέχρι τρίτου βαθμού, διατί όταν αναβαίνειν άρζεται, εις το ανωτερον μέρος του αγγείου τότε τούτο το σούλφαρο εστίν άφθαρτον και όταν όλον αναβή εις γην fogliata ή εις θαυμαστόν άλας. λάβε ούν το νερόν το ανωθεν ρηθέν και θεσ εις bagno ut και δεστιλλαριστή ώστε μη πλέον δυνατο δεστιλλαριθηται, έπειτα έξαγε da bagno εκείνο το αγγείον, και εις το βάθος αυτού ευρήσεις πράγμα τι ερυθρότατον ; ήν λάβε και θεσ εις άλλο αγγείον καθαρόν και θεσ αυτό εις τέφραν, και κάλυψον αυτό επάνω μετά λαμπίκου. Είτα άναψον μέγα πυρ, και όταν όλη η ύλη εσται δεστιλλάτα, πάλιν επτάκις, το αυτό δράσεις, και εις την εβδόμη distillationem, ει χρόνον ολόκληρον μείνει εις το πυρ δεν ήθελε δεστιλλαριθή ; λάβε ούν το ρηθέν σούλφαρο, εις τον αυτόν υψοθέν και εχέτω το εαυτού βάρος, και θεσ εις ουροθήκην καθαράν επάνω θέμενος το 4^{ov} μέρος αυτού εκτου υποτεθέντος ελαίου, και σμίξον παντα ομού μέχρις ότου πάντα γένηται μία ουσία, είτα θεσ την ουροθήκην αυτή εις πυρ ου σφοδρόν debile ή εις λουτρόν ξηρόν, και εκεινεί η ύλη se digiarina et se fissara per tal colore και όταν όψει ξηράνθη, μη είης βραδύς εις το ποτίσει αυτήν, και δούναι αεί εις πόσιν το προρηθέν βαρος εκτού γαλακτος αυτού και ου τως ποιήσης μέχρις όλη εσται fissata, και χωρίς καπνισμόν, και θέλει τρέξει, και βρύσει ως κηρίον, και όταν ουτω εσται, τότες έφθασες τον σκοπόν σου και φύλαξον ~~αυτό~~ nellam projectione questo. έπειτα ει βούλει χρήσασθαι, λάβε εξ αυτού έν μέτρον, και θεσ επάνω δέκα εκ του ερμού θερμού και ου καπνίζοντος και όλον λυθησεται εις φάρμακον διήκον τρέπον et fissante, λάβε εκ τούτου του ερμού και θέσ έν μέτρον επάνω των δέκα άλλων, και εσται δεκα επάνω των εκατόν, και έξης αργύριον κάλλιστον finissimo ει δε θρέψης αυτό μετά του αυτού γαλάκτος, ~~ε~~ και τραφήσεται cum debile πυρ μέχρις ότου εκ της αυτού θερμότητος αναγκαιώς γενήσεται ερυθρότατον.” The end of this recipe became in the second version in SG 1027 ff. 449v-450r: “και όταν η γη ξηρανή, αύξησον το πυρ μέχρι τρίτου βαθμού, διότι άρζεται αναβαίνειν και υψούσθαι από το κάτω μέρος του αγγείου το ευλογημένον σολφαρον και άφθαρτον, και όταν πυρωθή και εξατμισθή όλον εις γην φογλιάταν ή εις άλας θαυμαστόν, ό και σόλφαρον ονομάζεται, περι ού ειρήται, τιμάτε τον βασιλέα ερχόμενον εκ του πυρός εστεμμένον διαδήματι, ού πατήρ ήλιος εστι, μήτηρ δε η σελήνη, τιθή δε και τροφός το εαυτού γάλα μέχρις ού γένηται fissato. λάβε ουν το θαυμάσιον ύδωρ, και θεσ το [in the margin : in bagno] ίνα δεστιλλαρισθή, μέχρις ού ουκέτι δεστιλλαρήσεται finche non destillara piu. έπειτα μετακίνησον και έξαγε dal bagno εκείνο το αγγείον, και εις το βάθος αυτού ευρήσεις έν τι πράγμα ερυθρότατον, ό λαβών θεσ εις άλλο αγγείον καθαρόν, και θεσ το εις την τέφραν, και κάλυψον αυτό επάνω μετά λαμπίκου, είτα άναψον μέγα πυρ, (διότι εν τριμήνω ουκ αν δύναιτο έτι δεστιλλαρηθήναι) και όταν όλη η ύλη δεστιλλαριθή, πάλιν επτάκις το αυτό δράσεις, και εις την εβδόμη δεστιλλατζίνεμ σημειώσαι ότι ει εν χρόνω ενί μείνη εν τω πυρί τω σφοδρώ, ουκ αν δύναιτο έτι δεστιλλαρηθήναι, και τούτο είναι ήτις αυτήν εαυτήν καλκίνα, λύει, αποκτείνει, ζωοποιεί, γαμεί,

It is obvious, in both Greek versions, that he experienced difficulty in translating into Greek some technical and alchemical terms⁵². But it is probably not for this reason, in the first one, he dropped all the alchemical rhetoric and theoretical developments of the original Italian version, and simplified the alchemical terms he used (except for the “*θαυμαστόν άλας*” [= ‘miraculous salt’] which remained in such a form). Athanasius apparently was an alchemist who used to pay more attention to the practice than to the theory. But it is quite problematic that, in spite of the simplifications of the original recipe, the conclusion could remain the same: this Greek version’s recipe leads to the philosopher’s stone, too. So, in the second Greek translation – based on the first one –, Athanasius reintroduced some theoretical developments of the Italian text into his recipe as well as some specific alchemical terms in order to restore the recipe’s alchemical sense: for instance, “*το νερό*” [= ‘the water’] and the common “*σούλφαρο*” [= ‘sulphur’] of the first Greek translation were substituted for “*το πολύτιμον ύδωρ*” [= ‘the precious water’] and the “*ευλογημένον σούλφαρον*” [= the ‘blessed sulphur’]⁵³.

Still more significant about Athanasius’ chemical practice is his critical reading of recipes he wrote down. For instance, in SG 1027 f. 456r, he clarified information of a recipe he was copying by a detail in brackets: “... *δίδοντας πυρ από το πρωί μεχρ τρίτης (δοκεί μοι ώρας)*...” [= ‘by heating from the morning to three ([three] the afternoon, in my opinion)’]. Or in SG 1027 f. 489v, just after a recipe in Italian on the

τρέφει, ζυμοί, ου μεθ’ετέρου πράγματος ό εξ αυτού ουκ εγένετο και ετέθη. λάβε ουν το ρηθέν σούλφαρον εις τον ουρανόν υψωθέν, και εχέτω το εαυτού βάρος, και θες εις ουροθήκην καθαράν επάνω θέμενος το τέταρτον μέρος αυτού εκ του υποτεθέντος ελαίου, και σμίξον πάντα ομού, μέχρις ότου πάντα γένηται μία ουσία, είτε θες την ουροθήκην αυτή εις πυρ ου σφοδρόν αλλ’ ασθενές debile ή εις λουτρόν ξηρόν, και εκεί η ύλη si digiarira et si fissara per tal calore, και όταν οφθή ξηρά, μη εις βραδύς εις το εις το ποτίσαι αυτήν, και δούναι αεί εις πόσιν το προρηθέν βάρος εκ του γάλακτος αυτού, και ούτω ποιήσεις μέχρις όλη έσται fissata, και χωρίς καπνισμόν, και θέλει τρέξει και βρύσει ως κηρίον, και όταν ούτως έσται, τότε έφθασες τον σκοπόν σου, και φύλαξον nella projectione questo. έπειτα ει βούλει χρήσασθαι λάβε εξ αυτού έν βάρος και θες επάνω των δέκα εκ του ερμού του θερμού και ου καπνίζοντος, και όλον λυθήσεται εις φάρμακον διήκον, τρέπον et fissante, λάβε εκ τούτου του ερμού και θες έν επάνω άλλων δέκα, και έσονται δέκα επάνω των εκατόν, και έξεις αργύριον κάλλιστον finissimum. ει δε θρέψεις αυτό μετά του αυτού γάλακτος, και τραφήσεται μετά ασθενούς πυρός, cum debile fuoco, μέχρις ότου εκ της αυτού θερμότητος αναγκαιώς γενήσεται ερυθρότατον.”

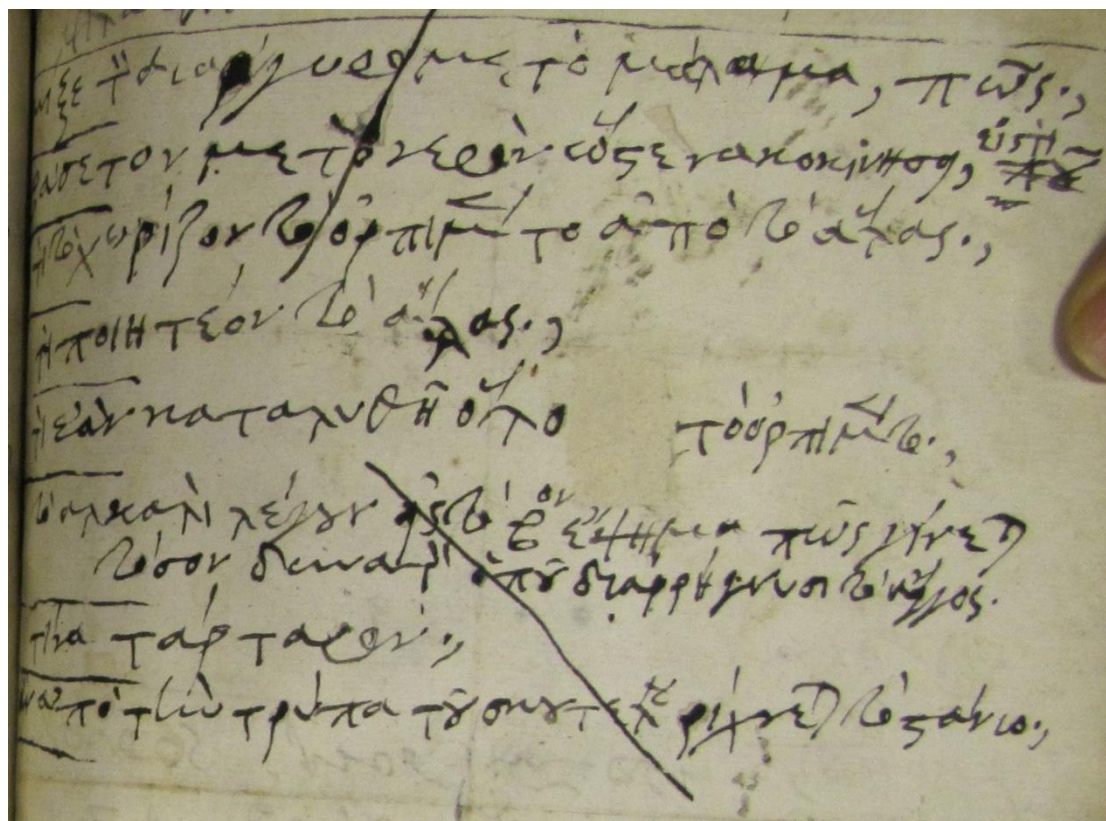
⁵² Such a difficulty appears very often in Athanasius’ writings, even in his philosophical ones. About Athanasius’ unpublished work on the discipline of Logic (in Fonds Grec 2106 (ff. 83-101)), O’Meara notes (p. 488, n. 32), for his own, that in “there are some lacunae in the text which seem to relate a problem Athanasius alludes to in ch. 8, namely the difficulty he is having in finding Greek equivalents for certain Latin terms”.

⁵³ Moreover, we can note that the second Greek version contains a sentence (“*η φύσις τέρπει την φύσιν, και η φύσις έλκει την φύσιν*” (SG 1027 f. 449r)) based on the famous sentence of pseudo-Democritus’ *Physica et mystica* (“*Η φύσις τῆ φύσει τέρπεται, και ἡ φύσις τῆν φύσιν νικᾷ, και ἡ φύσις τῆν φύσιν κρατεῖ*”) and present in the Italian version.

arcanum of tartar, he wrote in Latin: “*Quosto liquore servere per la transmutatione dei metalli. Sed ego ignoro modum*” [= ‘This liquor is used to transmute metals. But I do not know how’].

Athanasius did not at all comprehend passively the chemical practices he recorded. This is obvious in SG 1030 f. 67v [see Figure 3]. There are here only a few lines on a rough draft leaf but they are very practical questions in order to carry out several recipes and very interesting so as to understand what kind of alchemist Athanasius was:

- “- *σμίξε τον διάργυρο με το μάλαμα, πως* ; [= ‘Mix silver and gold, how?’]
- *β[ρ]άσε τον με το νερόν ώστε να κοκινήσει, είς τι* ; [= ‘Boil it with water until it turns red, in what (container)?’]
- *τι το χωρίζον το ορπιμέντο από το άλας* ; [= ‘What does pull the orpiment off from the salt?’]
- *τι ποιητέον το άλας* ; [= ‘What to do with the salt?’]
- *τι εάν καταλυθή όλο το ορπιμέντο* ; [= ‘What happens if all the orpiment disappears?’]
- *το αλκαλί λέγουν ειστό β^{ον} έψημα πως γίνεται τόσον δυνατόν οπού διαρρήγνυσι το άγγος*. [= ‘It is said that the alkali in the 2nd cooking becomes so strong that it breaks the container’]
- *τίνα τάρταρον* ; [= ‘Which tartar?’]
- *[πως] από την τρύπα του σκουτέλου ρίχγεται το στάνιο* ; [= ‘How can the pewter be poured through the spoon’s hole?’]



These questions are actually crossed out. Athanasius was in the habit of crossing out in the Ms. SG 1030 what he had copied or dealt with in the Ms. SG 1027. So that means that these questions have to get their answers in the Ms. SG 1027. Moreover, they have to refer to recipes in an original version in Ms. SG 1030. It goes indeed like that. So the two first questions refer to the recipe SG 1030 f. 67r and their answers are in two notes in the margin of the recipe SG 1027 ff. 485v-486r which is the same Greek recipe but neatly copied with a title in Italian “à far oro”:

- ‘Mix silver and gold, how?’ => “ὡς ποιούσιν οἱ χρυσοχόοι” [= ‘as goldsmiths do’]
- ‘Boil it with water until it turns red, in what (container)?’ => “μέσα εἰς δύο βεντούζαις” [= ‘in two phials’]⁵⁴

⁵⁴ Here is the recipe SG 1030 f. 67r enriched with the answers of the two first questions in SG 1030 f. 67v: “à far oro. Rx ραστικόπετρα δρ. 50 σαλνίτριο δρ. εκατόν βιτρίολο δρ. 50 τρίψε τα καλά, και σμίξετον μετὰ πέντε δραμίων χρυσοῦ [in the margin: ὡς ποιούσιν οἱ χρυσοχόοι], ἔπειτα βράσε τον [in the margin: μέσα εἰς δύο βεντούζαις] μετὰ τοῦ νεροῦ οπου ελαμπικαρίσθη και γίνεται ένα κόκκινο χόμα, και ὅσον βαρεῖ τούτο το χόμα, λάβε και ἄλλο τόσον κινάπριον και τρίψετο μετὰ τοῦ χόματος. ἔπειτα Rx 200 δρ. νισαντήρι, και σολνίτριο δρ. 100 και σούλφαρο δρ. 50 και λαμπικάσετα. Εἶτα Rx διαργύρου δρ. 50 και σμίξε τον. και το νερόν ευγή πότιζε την κιννάβαριν και το χόμα. Ποτισθέντος δε,

The same for the other questions:

- The three following questions refer to SG 1030 88r recipe and their answers are in SG 1027 484r-484v version.
- The sixth question concerns an original recipe not found in the Ms. SG 1030 but its answer appears in SG 1027 f. 485r recipe.
- The two last questions concern SG 1027 f. 485r recipe.

All the answers to these questions are in recipes copied one after another in two leaves of the Ms. SG 1027 (from f. 484r to f. 486v). Thus, Athanasius dealt with them at the same time. Having said that, in our turn we can ask: who did Athanasius intend to ask his questions to? Himself or the craftsman/chemist who would have given him the recipes concerned? Or another person from whom he expected some help to carry them out? Without any doubt Athanasius had carried out chemistry himself but also had mixed with chemists. So he could get directly, verbally, chemical recipes or even attend experiments carried out by a craftsman (actually some of recipes' versions in Athanasius' papers are abridged enough to make us presume that they were transmitted verbally). Thus the details added in the second version of Georgakis Kasapoglis' recipe we are talking about could correspond to answers of such Athanasius' questions, too.

The Ottoman units of weight

In order to tackle the last point of my paper, I would like to return to the strange anonymous partridge-based recipe for gold preparation mentioned above. Actually there are two versions of this recipe in Athanasius' manuscripts; both in Greek but written by two different persons who are not Athanasius. The first one⁵⁵ was verbally given to the copyist by a craftsman and reproduced thus the voice of the latter: it was written in demotic (every day Greek language⁵⁶), used a more prosaic terminology,

έπαρε κομάτι ασίμι πτανόν και πύρωσέτο να κοκινήση, και βάλε ολίγον απ' αυτής της κόνεως, και αν κιτρινήσει όλον, είναι καλόν, ειδέ μη, αλλά καπνίζει, πότισέτα ακόμι από του ειρημένου νερού, έως οπού να μην καπνίζει. Έπειτα λάβε εξ αυτής δρ.1. και ρίψον αυτήν εις εν δρ. χρυσού λελυμένου. Έπειτα αυτά τα 2 δρ. βάλε τα εις 10 δρ. αργύρου, και έσται χρυσός. εδοκιμάσθη" (SG 1027 ff. 485v-486r).

⁵⁵ SG 1030 ff. 81r-82r.

⁵⁶ But strangely the copyist put a dot on each iota of his text.

and gave more details (like the stench of the partridges after having their throats cut, and the lumpy consistency [*“τραχανά”*] of the lead/wheat mixture). As for the second version⁵⁷, it rather makes us hear the voice of an educated person who did not seem willing to carry out what the recipe said and who seemed to content himself with writing it: it was written in a pure Greek language (i.e. in ancient Greek) with a finer terminology. At the very beginning of this second version, the recipe was explicitly defined as a chemical recipe and it said with a certain contempt that the original version on which it was based was written in a very faltering Greek (barbaric Greek)⁵⁸. This second version erased all the foreign words of the first version (like *“τζουκάλιν”* [= ‘pot’] and *“άμπουλλα”* [= ‘phial’]), and corrected a misinterpretation. Actually, the craftsman’s version did not master enough the alchemical doctrine and the copyist who wrote down what he said wrongly pointed out that the “rain of May” was simply the “clean rain” in opposition to the “dirty rain” streaming from the houses’ roofs (while the rain of May was – alchemically speaking – the rain under the influence of the Lion constellation, i.e. a rain rich in virtues of the universal spirit); so a third but original version might have inspired the craftsman’s version. Nevertheless, what is important to notice here, in this partridge-based recipe, is the pedantry of the second copyist. He translated the first version into a pure Greek as far as the unit of weight is concerned: the Ottoman unit of weight ‘*drami*’ (*“δρόμι”*) became ‘*drachma*’ (*“δραχμή”*), the unit of weight of the ancient Greek time. The unit of weight changed but the quantities mentioned in the recipe – in both versions – related carefully to the divisions of the Ottoman ‘*okka*’ (made up of 400 *dramia*): 100, 200 and 400. This remark allows us to introduce the question of the recipes using the *dramia* in Athanasius’ manuscripts.

In Athanasius’ papers, all the recipes in Greek do not contain ingredients in Turkish but the use of the Ottoman units of weight is almost systematic. In Kasapoglis’ recipe the *dramia* are used as well as in those of the anonymous copyists and in most of the other recipes; the exceptions show us that Athanasius never mistook the Italian ounce for the Ottoman *okka*. The spelling in Greek of these two units sets them well apart. For instance, in the recipe SG 1027 ff. 456r-v, entitled *“εις το ποιήσαι χρυσόν μετά της marchesita”* – which came from the Italian recipe SG 1030 ff. 94v-95r using the

⁵⁷ SG 1030 ff. 128r bis-133r bis.

⁵⁸ *“Περί της ζητουμένης χυμείας εύρομεν και ταύτην την ερμηνείαν γεγραμμένηαι σολοικοβαρβάρως λέξεσι ταύταις λεγούσαις ημίν [...]”* (SG 1030 f. 128r bis).

ounces (i.e. ‘*uncia*’) entitled “*à far oro con marchesita*” – Athanasius was careful to always write “*ουγγία*”⁵⁹ while, elsewhere the *okka* was written “*οκγία*” or “*ογγία*” (for example, in SG 1027 ff. 442r-v). Furthermore, when the quantities in the same recipe changed from one version to the other, the right proportions were always respected; as with the two versions SG 1030 ff. 77r-v and SG 1027 ff. 440v-442r in which 40 *dramia* (i.e. 1/5 *okka*) of *seleima*, the same quantity of *nisantiri* and 10 *dramia* of arsenic became 50 *dramia* (i.e. 1/4 *okka*) for each of the two first ingredients and 13 *dramia* of the third one⁶⁰.

But it is important to add that the use of the Ottoman units of weight *okka* and *drami* was not specifically linked to the use of the Greek language. That only depended on the place where the recipes were carried out, that is probably Constantinople. So Levantine recipes could also be written in Italian, as the recipe SG 1030 f. 73v which contains measures in «*occa*» and which was rewritten half in Greek and half in Italian in SG 1027 ff. 490v-491r with right conversion of the *okka* unit into “400 *dramia*”. As mentioned by Athanasius, this recipe came from certain notebooks he got (“*rescriptum est in quaternionibus perfectus*”). At the end of the recipe SG 1030 f. 84r, he wrote too: “*questo é recopiato nelli quaternioni chimico in 4*”. This last recipe has another version in SG 1027 454v without the mention of its source but with a title which gives the following detail: “*a far oro, chè è stato provato d’un di nostra conossensa*”. So these notebooks seem to be laboratory notebooks of an Italian-

⁵⁹ ‘*uncie 2*’ / ‘*ουγγίας 2*’; ‘*uncia 1*’ / ‘*ουγγίαν 1*’; ‘*uncie 10*’ / ‘*ουγγίας 10*’; ‘*uncie 8*’ / ‘*ουγγίας 8*’ (SG 1030 ff. 94v-95r / SG 1027 ff. 456r-v).

⁶⁰ SG 1030 ff. 77r-77v: “Σελειμάν και νισαντήρι ομόζυγα άμφω ως 40 δράμια από καθ’ένα. τρίγετα καλά και τα δύο και βάλετα εις μίαν άμμουλαν και βάλετα εις τη χόβολη, id est στάκτη θερμήν και ασταθή τόσον ώστε οπού να κοπή ο καπνός οπού ευγένη από την άμουλαν[.] [...] και θέλη φάγη το ασίμι, τότες έπαρε αρσενικον και τρίψε το καλά, και κiuβεργκιλέ (ούτω γαρ οι τούρκοι τουρκιστί καλούσιν) ήγουν, σαλεμονίτριον, και τρίψε και αυτό καλά, και ας είναι ομόζυγα, ήτοι από καθε ένα δραμιά δεκα, και βάλε αυτά τα δύο εις μίαν βεντούζαν και χρίσε την ωσάν και την άμουλαν και αφήσε το στόμα ανικτόν και βάλε την εις τα κάρβουνα ώστε να ευγή όλος ο καπόν και στέκου από μακρα διά την υγίαν των οδόντων. και όταν ο καπόν καταλυθή αφισέ το να κριάνη και τότες τρίγετο εις μάρμαρον πορφυρούν ως κάμνουσιν οι ζωγράφοι και πότιζε το ολιγόν ολιγόν απεκείνο ο που έφαγε το ασίμι και τρίβετο ποτιζοντάς το ώστε να το φάγη όλον ήτοι ταις 4 ογκαις. Quere quod deest, ut argentum efficiatur.”

SG 1027 ff. 440v-442r: “λάβε νισαντηρίου όσον βούλει, και άλλο τοσοούτον από σελειμάν ως ειη ομόζυγα. λόγου χάριν ει μεν το έν ειη δρ. 50, και το έτερον δει είναι δρ.50. τούτο γάρ έστι το ομόζυγα. και τρίγον αμφότερα ευ λίαν, έπειτα θες αυτά εις φιάλαν, ήν θήσεις εις τέφραν θερμήν εις ήν τοσοούτον μενεί, ώστε μηκέτι καπνός εκ της φιάλης εξίη, [...] μέχρις αν βρωθώσι τα φύλλα του αργύρου, ού γεγονότος, λάβε αρσενικού δρ.13 και σαλονιτριού άλλο τόσον ευ λίαν, ουχ ομού, έπειτα θες αυτά εις μίαν βεντούζαν και χρίσον αυτήν καθά και την φιάλαν. το δε στόμα αυτης έστω άκλειστον, και θες αυτήν επί των ανθράκων, και στήθι μακρόθεν υγείας ένεκα των οδόντων. όταν δε ο καπνός παύσηται παντελώς, άφες αυτό ψυχρανθήναι, και τότε τρίγον αυτό εις μάρμαρον πορφυρούν, καθά οι ζωγράφοι ποιούσι, και πότιζε αυτό ολίγον ολίγον εκ του καταφαρόντος τον άργυρον τρίβων αυτό, μέχρις καταδαπανηθώσιν ολοτελώς αι 4 ογκίαις. Quere quod deest ut argentum efficiatur.”

speaking acquaintance who used to practise chemistry in the Ottoman Empire⁶¹. We found once more such a reference in the recipe SG 1030 f. 83r using also the *dramia*: “*tutte queste ricette sono recopiate nelle quaternioni chimici che sono in 4^o*”. The same recipe was neatly copied in SG 1027 f. 455v and completed with Turkish names for each of its ingredients. In addition, the recipe SG 1030 f. 73r is a rough draft in Italian using the *dramia* and the Turkish ingredient “*selymà*” (probably for “*solyma*”) written with the same stress as in Greek and in Turkish⁶². Thus all these recipes in Italian actually reflect a Levantine chemistry, as well as the Greek ones.

Conclusion

The present paper is the first study on Athanasius’ chemical manuscripts ignored until now. These manuscripts show a chemistry which was not in line with the 17th century Western chemistry. And yet Athanasius had lived in Rome and Paris for a long time and he knew Michael Sendivogius’ name which is written on a scrap of paper in his manuscripts⁶³ as well as the titles of some Johann Rudolph Glauber’s works⁶⁴. On the other hand, Athanasius’ chemical manuscripts do not just revive the byzantine alchemy’s tradition. These papers rather show us a really lively and particular 17th century chemistry: Constantinople chemistry with its own character. It used to be practised in two languages (Italian and Greek) but within the framework of the Ottoman Empire customs and with its specific corpus of recipes. So not only does the study of Athanasius’ manuscripts present a new character of the Greek alchemy’s history and state how writings of the early modern Greek alchemy could be shaped, but it also reveals the existence of a Levantine chemistry made up of craftsmen and chemists who could meet together and share their recipes. In this chemistry Christian and Muslim chemists might have even been in contact with one another.

⁶¹ In addition, these two versions contain some sketches of chemical apparatus.

⁶² In the recipe SG 1027 f. 477r in Italian, the Turkish ingredient “*solima*” is also present.

⁶³ Actually, Athanasius strangely wrote Sendivogius’ name with its anagram: “*Michael Sendivogius / divi leschi genus amo*” (SG 1030 f. 42v).

⁶⁴ Athanasius wrote down the following references in SG 1027 f. 435r (on scraps of paper): “*glauberus in prima parte de prosperitate germanie, non malé loquitur de miraculo panum quod christus fecit. pag : 4. dedicatariae. et pag: 22 de ebrietate.*” / “*glauberus in consolatione navigantium de embritudine pag : 77, et ante hanc et post, ubi in S^{um} : Joannem baptistam blasphemat.*”. Such quotations do not help us to precisely date Athanasius’ manuscripts, but they prove that the Ms. SG 1027 – at least – had not been already taken by Séguier in 1655, since Johann Rudolph Glauber’s *Prosperitatis Germaniae...* was first published in 1656 and his *Consolatio navigantium...* in 1657.

Nevertheless, for a Greek, studying chemistry in the Ottoman Empire was probably not without difficulty, where, indeed, printing books or getting books from the West was not so easy for the Christians. Consequently, the diffusion of the Greek 17th century chemistry in the Levant had to be a matter of handwritten texts circulating inside certain networks. It is certainly the reason why Athanasius copied some recipes of Guglielmo Gratarolo's *Verae Alchemiae Artisq̄ue Metallicae...* from an anonymous Italian handwritten source⁶⁵ (even if, as we know, he owned the 1561 Basel edition of this book at least at the moment of his death⁶⁶) and translated one recipe of Jean Liebault's often republished book, entitled *Quatre livres des secrets de médecine et de la philosophie chimique*⁶⁷, into Italian, then into Greek, from an anonymous French handwritten version. The question of Athanasius' sources is important and I will deal with it, as well as with a more detailed examination of his recipes, in a next study.

⁶⁵ Four recipes: SG 1027 ff. 468r-471v. Let us add that a recipe attributed to Archelaus is also found in that anonymous Italian source (SG 1030 ff. 97v-98r); this recipe is copied by Athanasius in SG 1027 458v. On Archelaus, see Colinet, pp. lix-lxviii.

⁶⁶ The Sainte-Genevieve Library has Athanasius' copy of Gratarolo's book with an explicit ex-libris.

⁶⁷ SG 1030 ff. 32r-32v. The French title of 1573 Jean Liébault's original version is "Huile de naphte, c'est à dire, de soufre, laquelle est incombustible, incensive & clarifiante des esprits".

Alchemical interpretations of ancient Mysteries

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Sacred initiation related to alchemy is a topic not widely diffused in alchemical texts, except in commonplace statements.¹ Yet it can be traced from the origins of alchemy up to the 20th century. In the *Physica kai mystica* of pseudo-Democritus, we are told that Democritus' master died before having completed the initiation of his pupil. He hid a secret formula in a column of a temple, which suddenly opened in front of Democritus. The temple will be later given a name: Memphis, and the master as well: Ostanos.² Specialists of Greek and Arabic alchemy might give us many other examples of such initiatic schemes, but in the Latin West, a real alchemical interpretation of ancient Mysteries cannot be found, to the best of my knowledge, until the early modern times, when poetry was no longer considered as mere lies (as it was in Aristotle's works, and more generally in medieval culture), but began to be commonly praised as "poetic theology," a way for the Ancients to hide divine truths behind fables.³

The notion of "poetic theology" was resonating with that of *prisca theologia*, *prisca philosophia*, or *prisca sapientia*, an idea which originated from late Antiquity philosophers such as Diogenes Laërtius, Iamblichus or Proclus, and Church Fathers like Augustine, Lactantius or Tertullian, according to which the most ancient theologians and philosophers – Hermes Trismegistus, Zoroaster, Orpheus, Pythagoras, Democritus or Plato –, though pagan they were, were in Egypt and received part of the teaching of Moses, the most ancient theologian of them all. Their doctrines were therefore imbued with part of the genuine Christian revelation, which made them invaluable, since they were closer to the origins of the revelation of God than any

¹ E.g. Jacques Gohory, preface to [Colonna] (1554), v^o of the title-page (*Jacobus Gohorius Parisiensis Lectori S.*): "Quæ arcana sub his architecturæ ac cerimoniarum involucris tegantur, vulgo non sciri, reip. interesse aiunt: sed ab iis tantum sanctioris Philosophiæ sacris initiati, sese in rerum abstrusarum contemplatione abdiderunt." Paracelsus (1568?), dedicatory epistle, fol.)(3 r^o-v^o: "Si tandem eorum vel minimus, qui sacris & abditis naturæ mysteriis operam dant, experientiaque sensuali Philosophiam veram exercent, opere quopiam nos aggredereetur certandi gratia: mox e Philosophis reddebamur asini literati saltem."

² See Martelli (2014).

³ On this topic, see Kahn (2013), 97-99 (with bibliography).

other doctrine. This idea was revived by the Florentine Renaissance in the second half of the 15th century.⁴ Classical mythology was understood by many Renaissance thinkers as the proper theology of the Greeks and Romans. It was therefore quite natural for Renaissance alchemists to investigate classical myths in order to discover a hidden truth in them. This was clearly expressed, for example, in 1585 by the English alchemist Richard Bostocke: “Divers Poets before the tyme of Plato, and also after his tyme did wrapp and hide this Arte in Riddles, darke speeches and fables. As by the fable of the golden Fleece [...]”⁵

Thus, Renaissance alchemists began to interpret alchemically Greek, Roman and Egyptian mythology, hoping to discover the alchemical truths hidden there by the Ancients. Fables, they argued, had preserved these truths more safely and faithfully than the alchemical writers did in their obscure treatises. Besides, Renaissance alchemists were now in a position to claim much older roots in history than before, when alchemy was still considered an Arabic import in Europe.

Within a few decades, the alchemical interpretation of classical mythology became an essential nutriment to alchemy. In 1544, Giovanni Bracesco assigned an alchemical meaning to a huge number of ancient fables in his influential treatise *La espositione di Geber filosofo*.⁶ At the end of the 16th century, Vincenzo Percolla interpreted no less than 209 myths in his manuscript *Auriloquio*.⁷ But the first alchemist to give a proper interpretation of ancient Mysteries was, not surprisingly, Michael Maier in his *Arcana Arcanissima*, published in London in 1614.⁸

Relying on Diodorus Siculus’ and Plutarch’s statements that Dionysos is obviously none other than Osiris, and on the common opinion that most of the Greek *prisci philosophi* had received in Egypt their knowledge in science and philosophy, Maier rhetorically asked why the Egyptian priests did conceal alchemical secrets under the veil of sacred celebrations, instead of disclosing them to all and everyone.⁹ – For two reasons, he answered: had anyone known that the Great Work was currently performed among Egyptian priests and that this was the actual meaning of these

4 Ibid., 109-110. On the *prisca theologia*, the major study is still Schmitt (1966). On mythology and alchemy, see Matton (1992).

5 Quoted by Debus (1987), 20. On Bostocke, see Harley (2000).

6 See Matton (1992), [11]-[17].

7 Percolla (1996).

8 On Maier, see Leibenguth (2002); Lenke, Roudet and Tilton (2014) (with bibliography).

9 Maier (1614), e.g. 4, 19-20, 47; Maier (2005), e.g. 25, 42-43, 77.

celebrations, then the celebrations would have been attended in droves by all nations; furthermore, Egypt would have been threaten by countless military expeditions sent at once by all kings from abroad. Therefore the priests made sure that everyone of them was forbidden, under death penalty, to disclose the secrets of alchemy. There were other reasons as well, including, Maier wrote, the very reasons why craftsmen always hide their processes to other people, and the fear that common people make a foreseeable misuse of this secret.¹⁰ Maier's more general argument was that all classical myths, considered as historical narratives, are entirely implausible, if not deeply shocking: they only make sense if we accept that they are intended to conceal mysteries. This argument was a blow to both the euhemerist and moral readings of classical myths.¹¹ Consistently, Maier explained the many prodigies occurring in ancient Mysteries, such as empty bottles put in the temple and found full of wine on the next morning, as mere trickeries performed by the priests in order to deceive the people: an explanation quite identical, by the way, to those given by libertine thinkers, in the same years, for pagan (and implicitly Christian) miracles.¹² But Maier's conclusion, of course, was different: these trickeries were not a proof that there are no gods, but that the meaning of the ancient celebrations was secret – *i.e.* alchemical.¹³ It is also interesting to see that in Maier's works, contrarily to many supporters of the *prisca theologia*, Orpheus is not given the prominent place, as the one who imported the Egyptian sacred celebrations in Greece: in Maier's opinion, the most plausible account of Orpheus' death is that he was struck by lightning for having disclosed initiatic secrets to ordinary people, which was a good revenge for God, not only for this sinful disclosure, but also for the dreadful idolatry which it caused everywhere in the world.¹⁴ This opinion reflects the Lutheran position of Maier, which was less dogmatic than that of Libavius, for example, and can be best described as a Christian humanism typical of the Protestant, post-Renaissance (or, let us say, post-Ficinian)

10 Maier (2005), 42-43; Maier (1614), 19-20.

11 On the euhemerist reading of classical myths by Natale Conti (Maier's main target), see Reiser (2011), 23-24.

12 Maier (2005), 238, 254, etc.; Maier (1614), 168, 179, etc. The best examples of libertine thinkers in Maier's times are Naudé (1625), and of course Giulio Cesare Vanini (1585-1619). See Montfaucon de Villars, ed. Kahn (2010), 65-74, 76-77, 191, 193, 206, 233.

13 Maier (2005), 256; Maier (1614), 180-181.

14 Maier (2005), 248; Maier (1614), 175-176.

thinking, where David, not Orpheus, was given the most prominent place among poets.¹⁵

Coming to the origins of the Eleusinian Mysteries, Maier recalled the legend of Demeter, who tried to make young Triptolemus immortal by secretly anointing him with ambrosia and laying him in the flames in order to gradually burn away his mortal self. Who cannot see at once, Maier wrote, that such tales are plain alchemical secrets? Who ever heard of children usually hidden under red coals? Triptolemus is our philosophical foetus, which is long hidden in fire and fed with fire as it were pure milk, until he is able to endure the violence of every fire.¹⁶ All the details of the Eleusinian celebrations were similarly alchemically explained by Maier, who referred to this general interpretation in his subsequent works and even added interpretations of other Mysteries, such as those of Samothrace.¹⁷

The alchemical meaning given to the Eleusinian Mysteries can also be found in the *Chryseis (Chryseidos libri IIII)* of Johannes Nicolaus Furichius, published in 1631. This less-known work written by a Strasbourg physician is one of the main early modern Latin alchemical poems. Chryseis is the name that Furichius gave to Proserpine, implicitly referring to the word *chrysos* (gold) and explaining it with this gloss in the margin: “Chryseis is imagined as Ceres’ daughter, because gold is taken out of the earth.”¹⁸ When Chryseis married Dis (or Hades), Furichius explains, she received the hidden caves of gold as a dowry and dwelt among the smoky sulphurs of the metal (an allusion to Hades’s words of comfort to Proserpina in Claudian’s *De raptu Proserpinae*).¹⁹ Whenever she returned on earth, she left clues to extract the seeds from crude gold. These clues have yet to be explained, for no one can understand them without help. The goal of the poem is to explain them. Not surprisingly, the secrets of alchemy are identified to the Eleusinian Mysteries through the character of Chryseis’ mother, expressly named “sanctae mater Eleusinae”, and through the metaphor of Dionysos’ cistus as the receptacle of all these secrets.²⁰

Michael Maier’s suggestions were taken for granted by a number of alchemists, among which we should first quote Isaac Newton, perhaps the most eager reader and

15 Leibenguth (2002), 88-89 and 280-283.

16 Maier (2005), 249; Maier (1614), 176.

17 E.g. Maier (1617), 101, 105-108.

18 Reiser (2011), 106 and 262.

19 Ibid., 106 and 263. The *De raptu Proserpinae* is dated 395-397 A.D.

20 Ibid., 172 and 342.

interpreter of Maier's writings, who transcribed and translated in a manuscript a brief marginal summary by Maier, taken from Maier's *Symbola Aureae Mensae*: "Sacra Bacchi (vel Dionysiaca) instituta by Orpheus were of a Chymicall meaning."²¹ This idea can be found again in several alchemical writings from the eighteenth century, such as the *Clavicula Hermeticae Scientiae ab Hyperboreo*, an anonymous work published in Marburg in 1746. There, in a historical excerpt, the Eleusinian Mysteries were named as a landmark of the transmission of alchemy.²² In 1773, the French alchemist Etienne Libois repeated this mention in his *Encyclopédie des Dieux et des Héros sortis des qualités des quatre éléments et de leur quintessence, suivant la Science Hermétique*.²³ Meanwhile, Maier's *Arcana Arcanissima* had been plagiarised, and even extended, by A.-J. Pernety in *The Egyptian and Greek Fables Unveiled and Reduced to One and the Same Principle*, a work published in 1758 and re-edited until 1795, which offered a pleasant, useful and learned rendering of Maier's views in the vernacular.²⁴ The weight of the Freemasonic rituals in the transmission of the alchemical interpretation of Ancient Mysteries throughout the second half of the eighteenth century should also be mentioned.²⁵

The alchemical reading of classical mythology often supposed the interpreters to be endowed with a considerable knowledge of Antiquity. In 1617, Michael Maier theorised this practice, locating it at the very core of the intellectual activity of the alchemists.²⁶ Maier wanted the alchemists to master the arts of discourse and language – especially poetics, since the very subject of poetry had first been to conceal alchemical allegories and enigmas, but even grammar, rhetoric and logic, which formed the basis of all other fields of knowledge. Besides, the alchemist had to know geometry, arithmetic, astronomy, and physics; and, of course, medicine. Without these arts and sciences, the alchemist was unable to interpret the allegories and translate them into laboratory processes, an ignorance which would bring about mere darkness, instead of the truth hidden behind the veils of the fables. In addition, the

21 Quoted by Dobbs (1975), 90. See Maier (1617), 101: "Orpheus Bacchi sacra instituit Thebis." Ibid.: "Sacra Dionysiaca esse Chymica." On Newton's deep interest in Maier, see Figala (1984), 192-206. Still more references to Newton's comments on Maier are given in Figala, Harrison and Petzold (1992), 158-159.

22 *Clavicula* (1751), 30. This work is sometimes attributed to the Swedish politician Gustaf Bonde (1682-1764).

23 Libois (1773), vol. 1, 455.

24 Matton (1992); Pernety (1992), vol. 2, 240 sqq. and 255 sqq.

25 See Le Forestier, ed. Faivre (2003). See also Kahn (2012).

26 Leibenguth (2002), 70-71.

alchemist must learn more specific arts like docimastics, which allows one to know the differences between all the minerals and metals, to analyze the purity of precious metals, to know what pertains to their colours, their vitrification. The arts of the goldsmith and smith were also of great help. Finally, the alchemist must become much experienced in the observation of nature (especially the nature of minerals), and perfectly learned and skilled in the very theory and practice of alchemy. Accordingly, the ideal alchemist, in Maier's opinion, was none other than an encyclopaedic scholar, competent in academic, scientific and technical fields at once, due to his major task: alchemically interpreting the classical myths in order to translate their secret learning into concrete laboratory operations.²⁷ Thus, alchemical research opened up to a genuine quest for universal knowledge.

The alchemical interpretation of ancient Mysteries still left traces even after the complete decline of alchemy, in the 19th and even 20th century, in the most unexpected places. Thus in 1829, the German classicist Christian August Lobeck began his *Aglaophamus* with a brief survey of the diverse interpretations of ancient Mysteries since the seventeenth century up to his time. Lobeck's purpose was to oppose the view of his contemporary colleague Georg Friedrich Creuzer that Greek mythology came from an Eastern source.²⁸ Creuzer was probably the last philologist to be a follower of the *prisca philosophia*. Lobeck aimed to show, on the contrary, that the ancient Mysteries were an integral part of the Greek religion and had no proper esoteric content. The first author mentioned in his survey of interpretations of ancient Mysteries was Michael Maier, "the most learned of the Spagyrics," who "stated that the principles of alchemy had been secretly transmitted in the Eleusinian, Samothracian and Olympian Mysteries".²⁹ Needless to say, Lobeck did not delve further into this subject.

The alchemical interest in ancient Mysteries can be traced further to the pioneer of the spiritualist 19th-century English revival of alchemy, Mary Anne Atwood. In her *Suggestive Inquiry into the Hermetic Mystery* (1850), Atwood devoted most of the second part to the "Mysteries".³⁰ Beginning with the assumption that "the Egyptian, that is the Hermetic Art, or Art of Divine works" (i.e. alchemy) "was by the Greeks

27 This encyclopaedic purpose was exemplified in 1617 in Maier's famous *Atalanta fugiens*.

28 Creuzer (1810-1819).

29 Lobeck (1829), vol. 1, 6. On Lobeck and the puzzling title of his book, see Brisson (2005), 120-121.

30 I owe this reference to Larry Principe.

called Theurgy”, Atwood could easily shift towards the ancient Mysteries: this Art, she went on, “was extensively practised at Eleusis”.³¹ Furthermore, Atwood connected alchemy, ancient Mysteries and Mesmerism: in Principe and Newman’s words, “Atwood claims that the trancelike state necessary for self-purification and the concentration or manifestation of the ‘matter’ was achieved in ancient times by the devotees of the Eleusinian mysteries and contemporaneously by the practitioners of Mesmerism – ‘the first key opening to the vestibule of this experiment’.”³² In Atwood’s book, the whole Great Work as she conceived it is likewise connected to the Eleusinian Mysteries.

A further interest in the alchemical interpretation of ancient Mysteries may be noticed in the early work of W. B. Yeats as well – not surprisingly, given Yeats’ temporary addiction to “occult” secret societies. Thus his tale *Rosa Alchemica* (1897) significantly opens, since its third edition (1914), on a quotation from Euripides celebrating those initiated into the rites of Dionysus.³³

Some thirty years later, another unexpected place to find a new alchemical interpretation of ancient Mysteries was the collection of essays *The Theatre and Its Double* by the famous French writer Antonin Artaud, published in 1938. This collection included a short text from 1932, *The Alchemical Theatre*, in which Artaud offered a comparison between his conception of theatre as a radical, ontological performance involving the whole being of the people composing the audience, and alchemy as he understood it through a number of readings into the contemporary esoteric literature.³⁴ Admittedly, in 1925, the French 20th-century alchemist Fulcanelli had perpetuated the alchemical tradition of Maier and Pernety in his first book, *Le Mystère des Cathédrales*, which offered an interpretation of the Eleusinian Mysteries partially based on new (and quite fanciful) elements.³⁵ However, it is highly implausible that Artaud, as early as 1932, knew Fulcanelli’s book. No one among, nor

31 Atwood (1918), 181.

32 Principe and Newman (2001), 391. See Atwood (1914), 186 sqq. and 542-543.

33 Euripides, *Bacchae* 72-77. See Yeats (1914), 190; Arkins (1990), 103.

34 « Le théâtre alchimique », in Artaud (1938), 50-55. A recent edition is Artaud, ed. Grossman (2004), 532-535. See Artaud (1958), trans. Richards, 48-52. The English translation by Corti is inaccurate and misleading: Artaud (1970), vol. 4, 34-37.

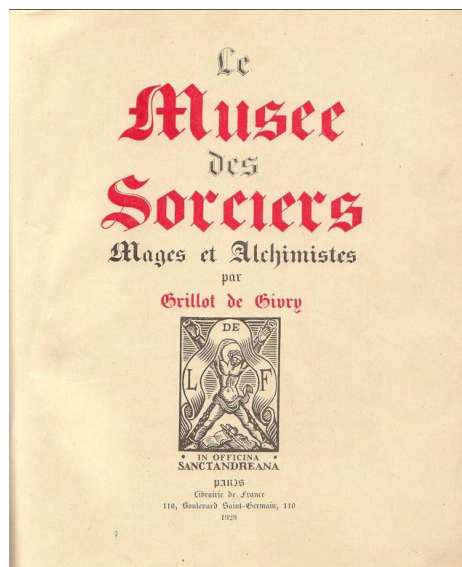
35 Fulcanelli (1964), 93, n. 1 and 192; see also 108-109.

around, the surrealists did know it – until the beginning of the years 1950, when André Breton met Fulcanelli's disciple René Alleau.³⁶

Artaud's comparison between theatre and alchemy rested upon the fact that the origins of theatre lay in ancient Mysteries. Theatre as Artaud conceived it had to recover the original strength which once characterised both (though differently) the Eleusinian Mysteries and the dramatic allegories used by the alchemists to describe the Great Work. Only this original strength was able to lead theatre toward the ideal Artaud dreamed of. In Artaud's words:

“the Orphic Mysteries which subjugated Plato must have possessed on the moral and psychological level something of this definitive and transcendent aspect of the *alchemical theatre*, [and] with elements of an extraordinary psychological density, [...] must have evoked the passionate and decisive transfusion of matter by mind”.³⁷

This is not exactly an alchemical interpretation of the Orphic Mysteries, but rather an analogy between these Mysteries and the alchemical allegories (termed “alchemical theatre” by Artaud). Yet this analogy was probably inferred from Artaud's reading of an attractive, coloured-illustrated anthology of alchemical texts published in 1929 by Emile-Jules Grillo de Givry (1874-1929): *Le Musée des sorciers, mages et alchimistes*. Artaud certainly did not draw directly from the ancient books of Maier or Pernety: reading through old books from a remote past was not Artaud's customary practice. Grillo de Givry, on the other hand, was also the author of an *Anthologie de l'occultisme* (1922), and translated into French John Dee's famous *Monas Hieroglyphica* (1925): all these publications immediately won the attention of



36 On René Alleau (1917-2013), see Dumas (1998), 125; Alleau (1998); the websites www.leseditionsdeminuit.com/f/index.php?sp=livAut&auteur_id=1469, www.arcane-17.com/rubrique,rene-alleau,1210593.html and www.archerjulienchampagne.com/article-18622923.html (accessed September 26, 2011), along with several essays of uneven calibre published in the French journal *La Sœur de l'ange*, 8 (2010).

37 Artaud (1958), trans. Richards, 52.

several members of the surrealist group, including Michel Leiris, a close friend to Artaud.³⁸ Grillot de Givry is, therefore, a very likely source of Artaud. In *Le Musée des sorcières*, Artaud could find a suggestive comparison between the athanor and the Orphic egg:

“the athanor, where the transmutation is performed, is an egg-shaped matrix, just as the whole world, which is itself a gigantic egg: the Orphic egg underlying every initiation, in Egypt and in Greece alike.”³⁹

As for the puzzling mention of Plato subjugated by the Orphic Mysteries, it needs to be explained. This view does not fit well with Plato's works. It was only held in late Antiquity, by such neo-platonists as Proclus.⁴⁰ To the best of our knowledge, Plato had only ironic remarks about the initiates in Orphic Mysteries.⁴¹

As it happens, Artaud's opinion only reflects the *status quaestionis* commonly held among early 20th-century scholars, especially in France. Before the works of Wilamowitz, Festugière and Linforth, it was currently accepted that Plato had borrowed his myths of the Afterworld from an Orphic cosmogony.⁴² In France, Mario Meunier's comments on Plato's *Phaedo*, published in 1922 and 1926, are a good example.⁴³ We cannot state that Artaud spontaneously read Meunier's edition, but Meunier's comments were abundantly quoted by the French writer Rolland de Renéville, Artaud's friend since 1925, in his best-seller on Arthur Rimbaud, *Rimbaud le voyant* (1929).⁴⁴ Artaud was most probably led to Meunier's edition by this very book. In addition, Artaud certainly read Édouard Schuré's best-seller *Les Grands*

38 Grillot de Givry (1922); Dee (1925); Grillot de Givry (1980). See Leiris (1927), esp. 63; Leiris (1929).

39 Grillot de Givry (1980), 386: “[...] l’athanor où s’opère la transmutation est une matrice en forme d’œuf, comme le monde lui-même, qui est un œuf gigantesque, l’œuf orphique qu’on trouve à la base de toutes les initiations, en Égypte, comme en Grèce [...]”

40 These opinions are conveniently quoted in the work of the late English neoplatonist Thomas Taylor (1790). On Plato considered as a follower of Orphism by late Antiquity Neoplatonists, see among others Brisson (1995); Brisson (2002).

41 For a recent reassessment on this subject, see Bernabé (2011).

42 Dodds (1951), chap. V, 147-148.

43 Plato (1926). See also Euripides (1923), e.g. 71; Bergson (1932), 234.

44 See Habrekorn's preface to Rolland de Renéville (1985), 7 and 22-23, as well as Rolland de Renéville's footnotes. The first edition is Rolland de Renéville (1929): see 37-81.

Initiés (1889), a work continuously reprinted until 1931, a chapter of which described Plato as an initiate into Eleusinian Mysteries.⁴⁵

Returning to Artaud's essay, what Artaud tried to express here was his conception of theatre as a kind of material basis arranged in order to induce a massive psychological impact on the audience, resulting in the transmutation of the spectators' minds. Thus, he spiritualized the alchemical meaning which, in the times of Michael Maier, had only consisted of plain laboratory processes. As an example, the castration of Osiris meant, according to Maier, that the penis of the god was « these black, useless faeces through which Osiris first took his growth, but which must be separated, after the dissolution, from the cleaned, pure rest of the body ».⁴⁶ However, Artaud's interpretation of alchemy was not a forerunner of the spiritualist interpretations given by Carl Gustav Jung and Mircea Eliade just a few years later. Artaud was not by far a spiritualist. Rather a monist, as were his former surrealist friends, he insisted on the necessary fusion of matter and mind:

“We are told that the Mysteries of Eleusis confined themselves to the *mise en scène* of a certain number of moral truths. I believe instead that they must have consisted of projections and precipitations of conflicts, indescribable battles of principles joined from that dizzying and slippery perspective in which every truth is getting lost in realizing the inextricable and unique fusion of the abstract and the concrete, and I think that by certain musics of instruments, by certain notes and combinations of colors and shapes, of which we have lost every notion, they must have managed [...] to resolve by conjunctions unimaginably strange to our waking minds, to resolve or even annihilate every conflict produced by the antagonism of matter and mind, idea and form, concrete and abstract, and to dissolve all appearances into one unique expression which must have been the equivalent of spiritualized gold.”⁴⁷

45 Schuré (1889). New editions appeared, among others, in 1918, 1921, 1927, 1931.

46 Quoted by Matton (1987), 213.

47 Artaud (1958), trans. Richards, 52 (slightly modified); Artaud, ed. Grossman (2004), 534-535: “Les Mystères Orphiques qui subjuguèrent Platon devaient posséder sur le plan moral et psychologique un peu de cet aspect transcendant et définitif du théâtre alchimique [...]. [§] [...] ils devaient mettre en scène des projections et des précipitations de conflits, des luttes indescriptibles de principes, prises sous cet angle vertigineux et glissant où toute vérité se perd en réalisant la fusion inextricable et unique de l'abstrait et du concret, et je pense que par des musiques d'instruments et des notes, des combinaisons

Strangely enough, Artaud's essay had an impact on further interpretations of ancient Mysteries, later on in the 20th century. In 1953, the French alchemist René Alleau, who was close to the surrealists, drew massively from Michael Maier for his own interpretation of the Samothracian Mysteries,⁴⁸ but Artaud was invoked by him as a major authority as well.⁴⁹ In the same period, the works of Jung, Eliade and René Guénon contributed much to strengthen the opinion that alchemy was a sort of gnostic, initiatic doctrine.⁵⁰ As long as this opinion prevailed, it was extremely difficult, as we know, to make real and tangible progress in the history of alchemy.

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de couleurs et de formes, dont nous avons perdu jusqu'à l'idée, ils devaient [...] résoudre par des conjonctions inimaginables et étranges pour nos cerveaux d'hommes encore éveillés, résoudre ou même annihiler tous les conflits produits par l'antagonisme de la matière et de l'esprit, de l'idée et de la forme, du concret et de l'abstrait, et fondre toutes les apparences en une expression unique qui devait être pareille à l'or spiritualisé."

⁴⁸ Alleau (1953), 52: Alleau evoked "les 'théurges du Feu', les 'Dieux Forts', les 'Puissants', les robustes Cabires de Samothrace dont les pieds touchaient les abîmes d'Hephaistos-Vulcain et le bonnet conique ou étoilé, les gouffres incandescents d'Helios-Apollon, tandis que de haut en bas et de bas en haut, en un mouvement incessant, circulait le verbe d'Hermès."

⁴⁹ *Ibid.*, 117.

⁵⁰ Guénon (1994), 91. On Jung and Eliade, see Principe and Newman (2001), 401-415.

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Texts and Practices:
**The Promises and Problems of Laboratory Replication
and the Chemical Explanation of Early Alchemical
Processes**

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For a long time historians of chemistry tended to give primary attention to the succession of chemical theories and understandings of chemical change (such as the nature of elements or atoms) or to the study of historical chemists' biographies or trajectories. But chemistry is first and foremost a *practical* endeavor. Throughout its long history, chemistry (or chymistry, or alchemy) has been predominantly about *making stuff*, producing new materials, often of commercial value. More recently, the history of science has begun paying greater attention to the practical and material aspects of the sciences. Within the history of chemistry, this broader focus now includes the more serious examination of such things as the technological applications and deployments of chemistry, as well as what chemical practitioners were actually doing in their workshops or laboratories, how they were doing it, and why they were doing it in particular ways.

Several methods can be used to explore the practical, materially-productive aspect of chemistry. There are the usual historical methods of examining written sources like books and manuscripts, especially laboratory notebooks when they survive. But a complementary method that I have long practiced and advocated, and that is now rather suddenly receiving broader interest, involves attempting to replicate historical processes and experiments.¹ In this way, one has the opportunity of experiencing (to some extent) what historical actors experienced. In chemistry this includes not only

¹ Two early examples from my own work are Lawrence M. Principe, "Chemical Translation and the Role of Impurities in Alchemy: Examples from Basil Valentine's *Triumph-Wagen*." *Ambix*, 1987, 34:21-30 and "The Gold Process: Directions in the Study of Robert Boyle's Alchemy," in *Alchemy Revisited*, ed. Z. R. W. M. van Martels, (Leiden: E. J. Brill, 1990), pp. 200-5, and more recently, *The Secrets of Alchemy* (Chicago: University of Chicago Press, 2013), pp. 138-66 .

seeing what they saw but often enough smelling what they smelled, and indeed, the highly *sensual* nature of chemistry, as a science predominantly of qualities, renders historical replication especially promising as an additional source of valuable information about historical events and ideas. Careful, circumspect replication can provide the historian with fresh insights that may help us reach a better understanding of what the authors were doing, of how and why they interpreted their results in certain ways, and of the texts they left behind. In this way, I see textual methods and experimental replication as not only complementary, but also dynamic, in the sense that the texts must initially direct the course of experimental research, the results of which should then help us better understand and interpret the texts, and the better understanding of the texts may thereafter allow us to modify the replication, and so forth.

The ability to replicate experiments is a foundational principle of modern science. But, as any practicing experimenter knows, this notion is usually a much easier to realize in theory than in practice. Every replication encounters the problems that arise when one person translates a practice into words and then another person tries to retranslate those words back into practice. Details that are obvious to, or unnoticed by, the first experimenter are often left unmentioned, yet these features may be unknown to, perhaps even unimagined by, the second. Personal experience and habits (of hand or of mind) can cause the second experimenter to misinterpret unconsciously the words of the first. Such difficulties only increase when we move to older and older texts, where the cultural, philosophical, theoretical, and linguistic contexts of writer and reader move ever further apart. I examine here a few of these difficulties as they emerge in some ancient texts that describe chemical operations, and point out how modern replications can help us better understand the texts and perhaps even help guide philological endeavors, especially in the translation of technical texts. I will also point out some problems that occur when modern chemical knowledge is too easily or casually applied to ancient texts--what I call "armchair" chemical interpretation--without the benefit of historically-sensitive replication.

I examine here a seemingly simple process, one practiced in various forms for over two thousand years, namely the production of a substance known as lead white (Gr. *ψιμίθιον*, Lat. *cerussa*). Lead white was used first as a cosmetic, and later for medical, artistic, and other purposes. It is cited as an ingredient in many Classical and

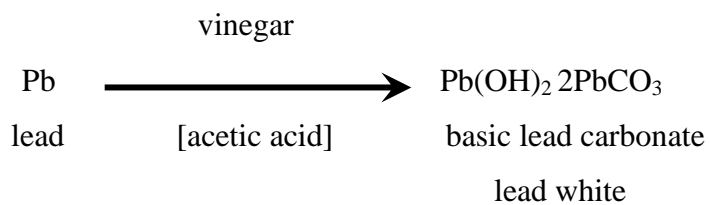
later chemical texts, such the *Four Books* of ps-Democritus and the Leiden Papyrus.² Its production is described in more or less detail by four important ancient authors: Theophrastus (*Peri lithōn*, 56), Vitruvius (*De architectura*, 7:12), Dioscorides (*De materia medica*, 5:88), and Pliny the Elder (*Naturalis historia*, 34:54). These four authors, and most of their successors, describe the basic method of making lead white largely uniformly. It *seems* a very simple process. Lead, either in thin sheets, scrapings, or brick-like blocks, is exposed to the action of vinegar. Notably, the lead is always kept above the surface of the vinegar and exposed only to its vapors. Thus the lead is either supported on a mat of reeds or wooden sticks, suspended by a cord or rod, or placed like a cover upon the jar containing the vinegar.

In order to replicate these conditions in a way that could be observed and recorded, I suspended a sheet of lead by a cord within a glass flask above a solution of 10% acetic acid.³ The flask was then covered and left on the laboratory benchtop for three weeks. A time-lapse video, with frames taken every thirty minutes, was taken over the course of 20 days. (Video 1: Note that the jittering movement of the lead is due to the winding and unwinding of the twine suspending the lead owing to changes in humidity levels and to changes in the lead's center of gravity as it corrodes.) After this time, it can be seen that a substantial layer of white crust has formed, significantly swelling the original dimensions of the lead. This white crust is easily scraped or flaked off. (Figures 1 and 2). The *overall* chemical reaction can be expressed thus⁴:

² Matteo Martelli, *The Four Books of Pseudo-Democritus, Ambix 60: Sources of Alchemy and Chemistry* 1, (2013): 279, and Robert Halleux, *Papyrus de Leyde, Les alchimistes grecs* 1, (Paris: Belles Lettres, 1981), p. 235.

³ Note that an *absolutely accurate* replication would have utilized wine vinegar, an earthenware vessel, and many other specifics of the ancient process. However, performing replications for historical purposes is not a type of antiquarianism but an attempt to gain further scientific and historical understanding, and for this purpose I advocate beginning with a "stripped down" version of the original process that limits the number of variables and potential chemical complications. Often this proves inadequate for achieving the original results, and further "complications" need to be added in order to achieve the desired results (see Principe, "Chemical Translation").

⁴ Because of the commercial importance of this process in the nineteenth and early twentieth centuries, the chemistry of the transformation was repeatedly investigated; it is clearly far more complicated than the simple reaction shown here--some of these complications are introduced later in the paper.



Scheme 1: The overall (simplified) transformation of lead into lead white



Figure 1: Before and after photographs of the lead white experiment; at the start of the experiment (left) and after twenty days (right). Author's laboratory



Figure 2: The flakes of crude lead white scraped from the residual piece of lead. Author's laboratory

Types of Problems in Understanding Practical Texts

I shall return to this chemistry shortly. But first it will be useful to classify the types of problems encountered in texts, particularly in the technical literature. These problems can be conveniently broken into two main groups--those stemming from the texts, and those stemming from the readers. In regard to the texts, the authors were often not themselves practitioners; this is certainly the case in the example of lead white. It is highly unlikely that Theophrastus or Dioscorides ever made lead white themselves, and very possibly never even saw it being made. Their accounts are at best second-hand, and therefore their knowledge of the process was itself more or less imperfect. In other words, there is an unavoidable gap between the (probably illiterate) artisans who actually made the product and the literate scholars who wrote about it. It is difficult to assess how much crucial or simply pertinent information failed to be transmitted across that gap. This problem may not be as significant when the authors

are themselves practitioners; however, there remains of course the well-known problem of unexpressed, or “tacit” knowledge. In such cases, a replication aims at spanning that gap by bringing the modern reader closer to the practitioner, perhaps enabling the recovery of some information lost in the original transmission from practitioner to author.

A second problem in the texts is technical vocabulary--were the authors aware of it and did they use it? If they were not aware of it, they might have failed to make distinctions in language that the practitioners considered crucial. In short, even if the authors understood a process fairly well, did they use the right words to describe it? Modern English offers a good example of this problem: non-chemists often conflate the two words “melt” and “dissolve” because both *melt* and *dissolve* describe the transformation of a solid into a liquid. But speaking correctly, melting occurs strictly as a result of heat, and dissolving strictly by means of a solvent. Thus when we are presented with a historical text it can be difficult to determine at what level of technical and linguistic proficiency we should interpret its vocabulary.

The second main category contains problems due to the reader. The reader could either be a modern historian, or an historical author copying or paraphrasing an earlier text. The first problems come from the reader being a non-practitioner. This is almost always the case, rarely does a reader have first-hand practical knowledge of what he is reading about in a historical technical text. Experimental replication addresses this problem most directly by providing, or at least approximating, first-hand practical knowledge. Without the information provided by replication, several errors can arise from imperfect knowledge of the processes, and these are similar to those faced by non-practitioner *authors*. More critically, and in my experience most commonly, a good historian endeavoring to understand a technical text goes to modern technical literature to get a better understanding of what he is reading about. Unfortunately, historians are not necessarily--and can hardly be expected to be--familiar with the intricacies (and potential pitfalls) of the scientific literature, and so this potentially very promising solution can instead produce fresh problems. In some cases this occurs by innocently using outdated or substandard sources, or by missing crucial details and creating oversimplifications. Chemical experimentalists know how complicated even a theoretically “simple” process can really be in practice. Unfortunately, chemists (or at least chemical textbooks) have the unfortunate tendency to keep that experience a

secret. Oversimplifications can also occur by assuming that modern chemical substances are equivalent to ancient ones, without taking into account the presence and role of impurities, or the very different technical conditions of apparatus, heating methods, and physical environment. Finally, there is another feature to the problem of technical vocabulary mentioned above; namely, even if the author uses technical vocabulary correctly, will a subsequent reader be able recognize it as such and understand it? This is obviously most serious with languages that are no longer spoken, in which we might have very few usages of a particular word, or perhaps only one as in the well-known philological problem of the *hapax legomenon*. A similar problem can occur however even with common words. For example, the word “metal,” a common enough word with a clear meaning, is often used by seventeenth-century glassworkers to refer to the molten glass with which they are working, which usage proves highly confusing to those not familiar with it.

The Lead White Case-Study

A case-study of lead white offers examples of these problems and also demonstrates how replications can help solve them. Beginning with the problem of non-practitioner authors, I turn first to Pliny. His text reads

Psimithium likewise, that is, lead white, is produced in the workshops of lead-works, the most praised of which is at Rhodes. It is made when very thin shavings of lead are placed atop a vessel of very sharp vinegar, and thus produced by dropping down. Whatever falls off from the lead into the vinegar itself is dried, ground, and sifted....

[Psimithium quoque, hoc est cerussam, plumbariae dant officinae, laudatissimam in Rhodo. Fit autem ramentis plumbi tenuissimis super vas aceti asperrimi inpositis atque ita destillantibus. quod ex eo cecedit in ipsum acetum, arefactum molitur et cribatur...]⁵

⁵ Pliny, *Naturalis historia*, 34:54. All translations are mine unless otherwise indicated.

Here Pliny writes that the lead white is retrieved from the vinegar, presumably strained out and then “dried, ground, and sifted.” But in the replication of this process no white lead is found in the vinegar, as can be clearly seen in figure 1.

In fact, we should not expect to find lead white in the vinegar because lead white *dissolves* in vinegar. Indeed, throughout my replication of the process, fragments of the lead white “dropped down” frequently into the vinegar, but dissolved there in a matter of minutes. Tests on the residual liquid at the end of twenty days showed it to be full of lead in the form of acetates. Pliny is thus certainly mistaken, but how did he go wrong? A hint may be offered by his use of the crucial word *destillantibus*, “by dropping off.” It is surely Pliny’s Latin rendering of the Greek verb *katarrheō* which Dioscorides uses in his own account of making lead white--thus strongly suggesting that Dioscorides is Pliny’s main source for this process.⁶ But Dioscorides himself notes that the workers first put a mat of reeds into the jar over the vinegar, and then place the lead on top of that.⁷ What “drops off” of the lead would then fall onto the mat of reeds and be collected. So Pliny, presumably unfamiliar with the process and the properties of lead white, “over-edited” Dioscorides’ description and thereby gave an incorrect account. Readers should have been sceptical anyway. The whole value of lead white lies in its pure, dense white color. The vinegar that a Roman or Greek artisan would have used to prepare lead white was not the clear, colorless distilled vinegar of today, but almost certainly sour wine, probably sour red wine. Therefore, even though the residual liquid in the modern replication does give a very handsome lead white if it is allowed to evaporate very slowly, this method could not have worked in antiquity since the coloring matters in the crude vinegar would have ruined the product’s whiteness and thus rendered it worthless.

Applying modern chemical knowledge too easily to ancient texts can sometimes be as misleading as not applying it at all. In 1932, Kenneth Bailey, in his study of chemical subjects in Pliny, argued that what the ancients produced was not lead white (a basic lead carbonate) at all, but rather lead acetate, also known as sugar of lead. He based

⁶ On the controversies regarding Pliny’s use of Dioscorides and their potential common source, see Max Wellman, “Sextius Niger: Eine Quellenuntersuchung zu Dioscorides,” *Hermes* 24 (1889):530-569.

⁷ Dioscorides, *De materia medica*, 5:88; *Pedanii Dioscuridis Anazarbei De materia medica libri quinque*, ed. Max Wellman, 3 vols. (Berlin: Weidmann, 1907-1914), 3:61-62.

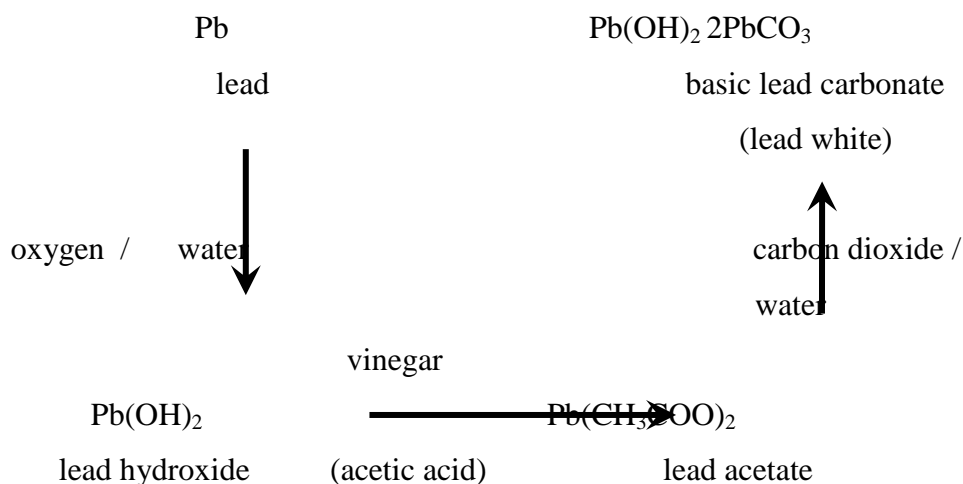
this claim on the fact that when vinegar acts on lead, lead acetate is produced first, and then carbon dioxide converts this acetate into the basic carbonate known as lead white. But since the vessels containing the lead and vinegar were sealed, he argued, no atmospheric or other source of carbon dioxide could enter, and thus the reaction would stop at the acetate.⁸ This is true as far as it goes, but proves the proverb that a little learning is a dangerous thing. Bailey was in fact not the first person to remark upon the apparent “lack” of carbon dioxide in the ancient recipes. The earliest indication I have located is from William Pulsifer in 1888, who concluded that the ancients did not distinguish between lead acetate and lead white.⁹ This conclusion is less than convincing given the widely divergent appearance and properties of the two substances. A similar observation regarding the lack of provision for carbon dioxide was also made in 1909 by C. D. Holley and in 1927 by J. W. Mellor. Yet neither of these two latter authors took the subsequent step of asserting that the ancients really produced lead acetate rather than the basic carbonate (lead white).¹⁰ What Bailey (and presumably Pulsifer as well) did not account for was an equally crucial first step, without which no reaction at all--not even to lead acetate--can take place. There must be atmospheric oxygen present in order to oxidize the lead before the vinegar can begin to act upon it. The need for oxygen, besides being obvious from chemical theory, has been known (and experimentally demonstrated) since at least 1842.¹¹ So, if the ancient jars were actually sealed air-tight, the conversion of the lead would have quickly come to a halt as soon as the oxygen trapped within the jar was used up. But since the ancient accounts are clear that the lead was indeed corroded, that means that oxygen must have had access to the lead, and if atmospheric oxygen had access then so did atmospheric carbon dioxide. Thus Bailey’s reasoning about the identity of the product is based on a false foundation.

⁸ Kenneth C. Bailey, *The Elder Pliny’s Chapters on Chemical Subjects*, 2 vols. (London, 1932), 2:204.

⁹ William Henry Pulsifer, *Notes for a History of Lead, and An Inquiry into the Development of the Manufacture of White Lead and Lead Oxides*, (New York, 1888), pp.207-209.

¹⁰ Clifford Dyer Holley, *The Lead and Zinc Pigments* (New York: Wiley, 1909) p. 3, and J. W. Mellor, *Comprehensive Treatise on Inorganic and Theoretical Chemistry*, 16 vols, (London: Longmans, Green & Co., 1922-1937), 7:841-52, on 846-47; the latter merely remarks that the ancients “did not recognize the part played by warmth and carbon dioxide” without claiming that the ancient product was actually lead acetate.

¹¹ C. Hochstetter, “Über Bleiweissbildung,” *Journal für praktische Chemie* 26 (1842):338-353.



Scheme 2: A more complete (but still simplified) scheme of the production of lead white from lead showing the critical roles of acetic acid, oxygen, carbon dioxide, and water

When such confident and apparently scientific or authoritative claims get into the historical literature they are difficult to purge. This result can be seen clearly in what the translator for the Loeb Classical Library did: he incorporated Bailey's erroneous chemical claim *directly* into his translation. He thus rendered Pliny's text as "psimithium also, that is cerussa or lead acetate, is produced at lead-works." He even supplies a footnote keyed to the term "lead acetate" that explains, based on Bailey, that the material produced is "sugar of lead, not the modern basic lead carbonate or 'white lead.'" ¹² The error should have been immediately apparent since "sugar of lead" is a colorless, crystalline, easily water-soluble material, completely unlike the bright white, powdery, water-insoluble white lead. Thus, sugar of lead (lead acetate) is completely unsuitable for use as either a cosmetic or a pigment. ¹³ While it is useful to clarify the identity of premodern chemical products, such direct "translations" of ancient terms into modern chemical ones should never be done; they are almost always misleading if not simply wrong.

¹² Pliny, *Natural History*, Books 33-35, trans. H. Rackham, Loeb Classical Library (Cambridge, MA: Harvard University Press, 1952), pp. 252-53.

¹³ This point had been made by Holley, *Lead and Zinc*, p. 3.

The question of where the necessary carbon dioxide was coming from garnered a number of responses over the years.¹⁴ Some writers, taking their cues from the “Dutch Process” that was in use for making lead white from the seventeenth until the mid-twentieth century and in which fermenting tan-bark was used as a source of carbon dioxide and gentle warmth, opined that some similar organic matter--perhaps grape residues in the crude vinegar itself--evolved carbon dioxide during its putrefaction. Besides being questionable whether an adequate supply of carbon dioxide could be generated in this manner, it does not resolve the difficulty (which was not pointed out by any commentator on the ancient processes of which I am aware) regarding the necessary role of oxygen. Bailey certainly overestimated the ability of premoderns to seal clay vessels air-tight. Yet, even if the jars of lead and vinegar were simply covered reasonably well (which is all the texts describe) rather than actually *sealed* how could a *sufficient* supply of oxygen and carbon dioxide get into jars to produce a reasonable yield of lead white?

Replication of the process made this clear, and partly by the kind of accident that is not uncommon in practical work. Some months after the video above was recorded, I attempted to make a similar video, but was frustrated to find that the process no longer worked the way it had previously. Multiple attempts were made, but with equally poor results: the production of the lead white was extremely slow, and soon came to a halt before anything more than a thin and partial crust, largely of lead acetate rather than of white lead, was produced (video #2). The only obvious difference was the seemingly incidental fact that in the meantime I had relocated my laboratory to a new building. The crucial difference turned out to be temperature control. The first laboratory had very poor temperature control, and the first video was shot during extremely cold weather such that the daytime and nighttime temperatures of the laboratory varied by as much as 10° Centigrade. The second laboratory had much more constant temperatures. The temperature fluctuations in the first locale

¹⁴ Lloyd G. Stevenson, “On the Meaning of the Words *cerussa* and *psimithium* (psimythion),” *Journal of the History of Medicine*, (1955):109-11; Pulsifer, *Notes*, pp. 211-214; and Caley and Richards, *On Stones*, pp. 187-88; it is especially noteworthy that the last of these authors carried out their own simple replication of Theophrastus’ process, they claim to have obtained only lead acetate but that after dissolving the crusts in water, atmospheric carbon dioxide caused the precipitation of a considerable amount of lead white. It is true that lead acetate forms first during the exposure to vinegar, but given moisture and carbon dioxide, this then converts to lead white; Caley and Richards experiment therefore was possibly not carried out for a long enough time.

meant that during cooler nighttime temperatures, the vinegar vapors within the vessel condensed and the enclosed air contracted in volume, thus pulling fresh external air into the vessel. During the warmer daytime periods, more vinegar evaporated and the air expanded, thereby pushing some of the “old” air out of the vessel. (In the first video one can at times observe the vinegar vapors alternately condensing and evaporating from the walls of the flask through the diurnal cycle.) Thus the temperature fluctuations produced a daily cycle of “breathing”; each night fresh air--containing oxygen and carbon dioxide--was pulled into the flask, thus allowing for both the formation of lead acetate and its subsequent conversion to carbonate. The ancients manufactured the material outdoors without anything like modern temperature controls, and where the difference between daytime and nighttime temperatures was significant. Accordingly, when I tried the replication in a sheltered place outdoors, the production of lead white was rapid and efficient. Since the daily “breathing” of the vessel is driven by differential air pressure, that means that even a very small opening into the vessel would suffice to permit the daily replenishing of the oxygen and carbon dioxide within the flask. Thus in this case, replication provided completely unexpected insights.

Replication As an Aid to Philology

Finally, let me turn to Theophrastus to illustrate how replication can potentially help clarify problems of technical vocabulary. The crucial passage (*De Lap.*, 56) regarding the elaboration of the lead white is rendered as follows by Caley and Richards.

...the part that is scraped off is ground in a mortar and decanted frequently, and what is finally left at the bottom is white lead.

[...τὸ δ' ἀποξυόμενον ἐν τριπτῆρι τρίβουσι καὶ ἀφιθοῦσιν ἀεὶ, τὸ δ' ἔσχατον ὑφιστάμενόν ἐστι τὸ ψιμύθιον.]

The consensus of the three Vatican manuscripts of Theophrastus provides a strange spelling of the verb [ἀφιθοῦσιν], which Caley and Richards, following Schneider, correct to ἀφιθοῦσιν, and translate as “decant,” implying that the scrapings were ground with water and the supernatant water poured off the top, leaving a washed

white lead behind at the bottom of the mortar.¹⁵ This rendering makes good chemical sense, and presumably incorporates results from the translators' own replication of the process. The use of water, although not explicitly mentioned in the text, would purify the desired product because the crude lead white, by my analysis, contains both insoluble basic lead carbonate (the lead white) and soluble lead acetate, often in roughly equal amounts by weight. Ancient samples of lead white discovered in burials have been shown by analysis to be the pure basic carbonate, suggesting that some method was employed to remove the acetate, and the simplest way of doing this is by washing the scrapings with water.¹⁶

Eichholz corrects the problematic verb further into the more common form ἀπηθοῦσιν and translates it as "strain away," which seems plausible enough philologically, but gives a translation that is hard to understand in practical terms: "the scrapings are pounded in a mortar and continually strained away [ἀπηθοῦσιν]; and the white lead is the material finally left deposited." What exactly is strained away? Where exactly is the lead white deposited? His commentary explains that water is poured on the scrapings and strained away, therefore presumably implying something close to what Caley and Richards suggest: washing away the acetate with repeated affusions of water, finally leaving pure lead white behind in the mortar or perhaps on a filter or strainer of some sort.

But when I tried replicating this part of the process, I discovered two unexpected problems. The first is that the scrapings contain many tiny particles of unreacted lead—five to ten percent of the weight. This result is because the lead, whether in the form of a thin plate or the kind of a brick [*plinthos*] that Theophrastus mentions, exfoliates dramatically during the reaction, sluffing off thin fragments of lead that are subsequently either fully or only partially converted to acetate or carbonate. Since the *psimuthion* was originally used primarily as a face powder or fine white pigment, the lead particles would make it gritty and grey rather than smooth and white. How did ancient workers remove the unreacted lead particles? The methods suggested by the translations above would leave these lead particles with the lead white. Second, grinding with water gave a bigger problem as can be seen in video #3.

¹⁵ Caley and Richards, *On Stones*, pp. 28 and 40; Johann Gottlob Schneider, *Theophrasti Eresii quae supersunt opera*, 5 vols., (Leipzig, 1818-21).

¹⁶ Caley and Richards, *On Stones*, pp. 189-190 and references therein.

The lead white produced by this method is so finely divided that *nearly all of it* comes off suspended in the wash water, as a fluid white like milk; the product is *not* left behind in the mortar. The lead white actually takes many hours to settle out, up to two entire days, thus it would have been impossible to “decant” the water directly or to “strain it away” without taking the lead white along. Indeed, measurements of the size of the particles of lead white produced by the exposure of lead to air and vinegar vapors indicate average diameters ranging from 0.04 to 0.3 microns (by comparison, a human blood cell is about 5 microns in diameter).¹⁷ Nevertheless, this discovery did solve the first problem: all the unreacted lead particles were left behind in the mortar. Since they are much denser, they settle out much faster than the lead white and so are not carried out of the mortar with the poured off water. These grey-black particles can be seen still in the mortar at the end of the video.

These practical results, if they in fact replicate accurately the experiences of the ancient workers, encourage us to turn back to classical philological methods for a resolution. Theophrastus uses this same (possibly problematic) verb in one other place. In his *History of Plants*, when describing the means of extracting juices from plants, he writes that some plants are so dry that no juice can be obtained from them by pressing or squeezing. He reports that in such cases, the workmen pour water over the crushed plants, and then “...ὑδωρ ἐπιχέαντες ἀπηθοῦσι καὶ λαμβάνουσι τὴν ὑπόστασιν” (9.8.3). What they collect is called here the *hupostasis*. The Greek medical literature uses *hupostasis* specifically to refer to the sediment that urine deposits upon standing for a day. In other contexts, it refers to the sediment or lees deposited by wine as it ages. Thus it would seem that Theophrastus’ use of *hupostasis* does not refer to material that remains on a filter or strainer, but rather to the solid that settles out from a liquid over time.¹⁸ So here the verb cannot mean something like our concept of filtration, a process that would remove all the solid material suspended in the liquid such that nothing would be left to settle out. There are two possible interpretations. First, the straining would be only to hold back the large pieces of vegetable matter, and the desired *hupostasis* settles out of the strained liquid upon standing. This kind of straining might have been done using the kind of sieves that the

¹⁷ Hochstetter, “Bleiweissbildung,” p. 353.

¹⁸ Suzanne Amigues, in *Théophraste, Recherches sur les plantes*, p. 21 and 121 renders *hupostasis* as *sédiment* but then implies that this *sédiment* is the solid left on a filter, which is correctly called a *résidu*.

ancients possessed--pierced metal sieves to strain wine, and woven sieves of reeds or fibers for processing grain. Such straining might instead have been more efficiently done by filtering through cloth. In either case, the openings in the sieves or in the weave of cloth would have been too large to retain very fine particles, and the strained liquid would then still have deposited this finest material as a *hupostasis* upon standing. The other possibility is that the verb means merely “draw off” or simply “pour off” and does not involve anything akin to filtration or straining through some sort of barrier. In this latter case, the larger solid particles would be left behind, while the poured off supernatant liquid would then in time deposit the fine particles it carried in suspension as the *hupostasis*.

Combining these interpretations with the results from the replication of the lead white process now suggests satisfactory explanations of what the ancient workers were actually doing. They may have poured the milky water out of the mortar through a cloth, which would have held back large material--perhaps particles of lead or foreign matter that may have become mixed with the crude material during processing. The lead white would pass through the weave of the cloth, and upon standing, deposit the lead white which could then be recovered. This interpretation preserves the idea of “straining” in the verb, but with the proviso that the lead white is not recovered as a residue on a strainer but from the liquid that passes through the strainer as a slowly settled-out *hupostasis* or sediment.

The other possibility, which I tend to think more likely, is that what Theophrastus is really describing in the lead white passage is a process known today as *levigation*. This is a particular kind of washing where different materials are separated based on their different rates of settling out of a liquid. Ancient writers do describe such a process, and very often particularly in the context of pigments--and indeed Theophrastus describes lead white in the middle of his section on mineral pigments. Pliny describes levigation clearly and unambiguously for the separation of a yellow pigment (litharge, a lead oxide) from lead dross: “after being finely broken up, it is washed in mortars until the water draws out the yellow color, and [that water] is poured out into a clean vessel, and this is done repeatedly until what it most useful settles out.”¹⁹ This process works by getting and keeping the finer and less dense

¹⁹ Pliny, NH 34:171: “lavatur haec in mortariis minutim fracta, donec aqua luteum colorem trahat, et transfunditur in vas purum, idque saepius usque dum subsidat quod utilissimum est.” In describing

particles of litharge suspended in the wash-water while the larger and more dense particles of lead and dross settle out. The colored wash-water with litharge in suspension is then poured off carefully into a new vessel where it is allowed to stand until the desired particles of pigment settle out, the water poured off and the pigment dried and collected.

Theophrastus does describe the process of levigation unambiguously in a passage adjacent to his description of the manufacture of lead white. For the preparation of cinnabar as a pigment, Theophrastus notes that the raw mineral is thoroughly ground and then “washed” [*plunousin*]. “Indeed, that which has gone underneath to the bottom is the cinnabar, that which is above and is the most part of it, is wash-water [γίνεται δὲ τὸ μὲν γὰρ ὑφιστάμενον κάτω κιννάβαρι, τὸ δ’ ἐπάνω καὶ πλεῖον πλύσμα]” (*De Lap.* 58). The top-quality cinnabar is thus “that which goes to the bottom” [*huphistamenon*] or sediment, described here using the same word that Theophrastus uses in the section on lead white. This is clearly a process of levigation, where particles of the very dense cinnabar (mercuric sulfide) settle out from the water much faster than those of the much less dense minerals with which it is found in the mine.²⁰ The wash-water [*plusma*] would still contain suspended a portion of the smallest particles of cinnabar along with the other lighter minerals, and thus retain some value “for painting walls” (presumably by allowing it to sit for a longer time until everything settles out, thus providing a paler, lower-quality pigment). Theophrastus notes that the yield depends upon a certain skill [*technē*] in carrying out the operation, presumably the experience of knowing exactly how long to allow for sedimentation; too short a time and the yield is low, too long a time and the product is poor-quality. A similar process of levigation might also be implied in the section immediately preceding lead white, where Theophrastus notes how the blue frit pigment *kyanos* is prepared in four different shades depending on the size of its particles (*De Lap.* 55). Although the use of water is not mentioned here, it is possible that the separation of *kyanos* particles by size was carried out by means of levigation. It is however also possible that the ancient artisans simply ground the pigment for a longer or shorter

levigation, Pliny notes the repetitiveness of the process [*saepius*] which may also be indicated in the lead white case by Theophrastus’ use of ἀεί.

²⁰ Note that here, the denser material is what is desired--the cinnabar settles out first--whereas in Pliny’s description of the yellow pigment, it is the lighter material that is desired--the lead settles out first (or never gets into suspension) and the pigment sediments later, after the washes are poured off. Both cases are examples of levigation.

period, even though that method would not have provided as homogeneous a product as levigation.

Reading Theophrastus' description of lead white either as straining followed by sedimentation or as levigation now better explains what he means when he says that the lead white is *eschaton huphistamenon*, literally "that which has gone underneath last." During the process of sedimenting or levigating lead white the desired product is in fact what is obtained last and "underneath." The finest material settles to the bottom of the vessel at the *end* of the process. This result is in opposition to a method of filtering or straining out a substance where the desired solid is obtained first and *above* (while the filtered or strained water trickles *below*), a process that could not have been successful in antiquity given the extreme fineness of lead white particles and the coarseness of available strainers. So I would suggest translating *eschaton huphistamenon* as "that which settles to the bottom last," a phrase which rightly distinguishes the lead white from the residual lead particles that settle out first, or any foreign matter than might be left on a cloth.²¹ Levigation and sedimentation also provide an additional benefit. As shown by the replication, during the length of time required for the finely-divided lead white to settle out of the wash water, atmospheric carbon dioxide acts upon the dissolved lead acetate, converting it to basic lead carbonate (lead white) which then precipitates and increases the overall yield.

Thus, combining the results of replication and philological analysis, and in light of the positioning of the lead white passage amid other pigments for which levigation is clearly employed, I would propose translating the critical passage from Theophrastus as

...that which is scraped off is ground in a mortar and continuously levigated, what settles out last is the lead white.

²¹ The phrase *eschaton huphistamenon* is similarly rendered as "what at last subsides to the Bottom of the Vessel" by Sir John Hill in his eighteenth-century translation of Theophrastus. He also follows the Aldus 1497 *editio princeps* by giving ἐφθοῦσιν for the problematic verb ἀφίθοῦσιν, which he then translates as "boil." Despite this philologically questionable modification, the resultant translation is at least chemically felicitous, as extended boiling allows much of the lead acetate to convert to basic carbonate under the influence of atmospheric carbon dioxide, thus enhancing the yield and reducing waste. Sir John Hill, *Theophrastou tou Eresiou peri Ton Lithon biblion: Theophrastus's History of Stones* (London, 1774), pp. 224-25.

I should mention that the verb ἀπθροῦσι might reasonably be rendered as “sift away,” which is certainly plausible and avoids the objection that Theophrastus does not explicitly mention the use of water for working up the crude lead white; however, other serious problems would arise. On the one hand, this translation would not work for the passage from *History of Plants*, where water is explicitly mentioned. On the other, no separation of the three chemical components of the scrapings (residual lead, lead acetate, and lead white) would occur. Also, by means of sifting, the fine-grained solid product one wants is collected below the sieve, but first not last. That said, the text of Dioscorides does appear to describe a process of dry sifting as the final operation, but that method does not fit Theophrastus’ text. Indeed, there is no sense in being needlessly reductionist by endeavoring to propose a single method used in antiquity, as there was surely some variation in operations between different manufacturing centers and over time. However, the process of levigation better fits both the sense of Theophrastus’ text and the practical process: it separates the unreacted lead particles from the lead white, dissolves away the soluble lead acetate, and the final product, purified basic lead carbonate, i.e. lead white, is collected at last as a fine sediment from underneath the poured off wash water.

So actually trying to reproduce a process provided several additional pieces of information, and this is, finally, the real value of replication--it provides us with an additional source of information and insight. That further information, of course, has to be subjected to the same critical judgement and assessment as the information gleaned from more traditional historical sources. However, in an enterprise as difficult as trying to understand the past, we should be happy to obtain additional information from any reasonable source for inclusion in our work.

The educational applications of the historical material and on the reproduction of alchemical procedures

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In this presentation, we will at first give a short account of the role of History of Science in Science Teaching underlying the merits of the historical approach in the science classroom. Following we will report on the design and development of a series of teaching activities based on the History of Alchemy (4th-17th centuries) as it is reconstructed through the collections of primary and secondary literature in the data bases of the project DACALBO.

Two sets of teaching activities have been designed and developed: 1) Activities aiming in the training of secondary teachers of Chemical and Life Sciences in using original (alchemical) texts for the reconstruction of apparatuses in the school laboratory and 2) Activities aiming in raising awareness on issues of cultural heritage for the wider public.

Namely, activities supported by innovative interactive charts and timelines, activities exploring the relation between the Greek, Arabic and European alchemical traditions, and activities highlighting the technical applications of Alchemy (eg. pigments), the relation of alchemy to medicine and the presence of alchemy in poetry, literature and myths.

Collateral topical activities have been also developed such as the description of the materials used for writing, the laboratories of copying (Scriptoria), the coloring of clothes and the use of plants during the Medieval and Modern period.

On how History and Philosophy of Science contribute to Science teaching and learning processes

The following points have emerged as crucial/fundamental with regard to the *contribution* of History and Philosophy of Science in improving teaching and learning Science, (Matthews M. 2007, p. 73):

- The History and Philosophy of Science present a more *human approach of the scientific task*, setting connections with additional aspects such as the moral or the cultural aspect.
- The Philosophy of Science, in particular, *enhances an individual's competence to analyse and rationalize*, thus contributing to a more refined critical thinking.
- The History and Philosophy of Science also *invest on mathematical formulas and equations, denotations and concepts*, so that they are not *understood under a purely instrumentalist perspective*, as a mere causal nexus of a rigidly rational structure.
- The History and Philosophy of Science further improve *teachers' training*, since they help develop a more profound and rich understanding of different scientific aspects. Furthermore, the teachers' viewpoints on the very nature of the science they teach directly affect/influence the way they teach it.
- The History and Philosophy of Science may also *provide indications regarding possible difficulties in understanding different concepts*. In science education, it is acceptable to form a cautious *comparison/parallel* between the way scientific knowledge is built and the way the student builds knowledge. The way science confronted each occasional difficulty could jointly form the potential strategy to be used in order to lift the alternative perceptions of the students.

Historiographical standpoints on Alchemy as a source of alternative ideas

It is generally accepted that, in terms of science education, the learning procedure is but an effort to bring together/mix new cognitive structures with the ones already present in the students' mind. In order to provide a teaching plan, it is essential to gather information on students' perception over the subject/item to be taught. Students' perceptions usually ignore the scientifically accepted/acceptable approach and it is necessary to identify them given the fact that it is the very substrate/foundation on which the teaching intervention will be founded/will build upon. It is therefore reasonable to consider that students' perceptions on Alchemy are formed within a context of different historiographical approaches available, whether modern or obsolete. Thus, it is absolutely necessary to list and identify the principle

question arising from said approaches, which could significantly contribute in structuring any teaching effort.

The use of the History and Philosophy of Science in order to teach Natural Sciences is predominantly based on historical examples stemming from the fields of Physics and Astronomy, while lacking examples from the fields of Biology and Chemistry, a scarcity usually explained given the far longer historical presence of the former (McComas 2008). Such perception relies on the, historiographically accepted, *complete distinction between Chemistry and Alchemy*, according to which, *Alchemy has no scientific background* whatsoever, while Chemistry on the other hand fulfills the standards which promote it to a scientific corpus of knowledge, as it is structured since the late 18th century, the relevant landmark being Antoine Lavoisier's influential textbook "*Traité Élémentaire de Chimie*" (Elementary Treatise of Chemistry).

From a linguistic point of view, similar perceptions have been encouraged by the belief that the concurrent use of the terms "alchemia" and "chemia" in 17th century Latin literature was but an indication of complete distinction between the two, an approach nowadays rejected by modern historians. On the contrary, it has been proved that the use of the term "alchemia" in Latin literature was used to describe methods and phenomena which are considered direct precursors of methods and phenomena that are unanimously considered to be integrated in the science of Chemistry ever since the 18th century. In addition, the term "chemia", has been used, again within Latin literature, to describe processes which aimed, among other things, to metal transmuting into gold. (Newman & Principe 1998). A similar interpretation is used for other terms present in different texts of the Byzantine literature such as "cheimeftos" / "chymeftos", which refer to enamel decorations. It has been claimed that this particular terminology was used to describe both purely technical and alchemical practices (Merianos & Sakorrafou 2013).

Accepting Alchemy as a non-scientific knowledge corpus, as opposed to Chemistry, is equally supported by influential interpretations constituted in psychological terms, the most emblematic among them being Carl Gustav Jung's *Psychology and Alchemy*. In such context, Alchemy is accepted as a *mainly psychic process*, de-materialised and independent from physical phenomena. Under this perspective, studying Alchemy is experienced as an ahistorical, completely self-referring process in terms of the alchemist's communication with physical phenomena; so, by completing alchemical

processes, said communication aims to *restore/reinstate the communication between the conscious and the unconscious mind*. The self-referring character of this process lies on the fact that within this particular interpretive scheme, the alchemical processes are conceived as the object on which the acting individual projects his/her emotional/psychological load. It is worth noting that Jung clearly accepts the historiographical distinction between Alchemy and Chemistry, in terms of a transition from theoretical patterns with no scientific characteristics to explanatory schemes with purely scientific conceptualisations.

There are also other perceptions with regards to the nature of Alchemy which have unequally promoted aspects which increasingly pinpoint issues relating to its so-called “esoteric” character.¹ This category includes hermeneutic schemes which are presented as a mixture of elements from the fields of witchcraft and mysticism whereas the corresponding perceptions completely lack any practical aspects, which are present in Jung’s point of view, even though it is weaker since it is merely a vector of convergence between the conscious and the unconscious. In some of these hermeneutic schemes, Alchemy is conceived as a *field expressing religious quests*, as primarily depicted by researchers such as Mircea Eliade.² In others, it is considered as *a field expressing arcane hermeneutic schemes*; said approach was mapped via the contribution of different researchers and was led by the works of Antoine Faivre. One of their predominant characteristics is the emerging influence of Hermeticism in texts which are part of the alexandrine Alchemy but also the Latin alchemic literature, dating from 12th century AD onwards. (1995, pp. 20-21).

In other cases, it is the *purely practical aspect* of Alchemy which is unequally promoted. With regards to its conception as a predominantly practical task, current historic research keeps pointing out the ability of Alchemy to assimilate different techniques from a range of professional areas (glassworks, metallurgy, pigment production, etc), but in a way that transcends the sterile adaptation of methods and *incorporates new technical paths of refining theoretical questions*. The alchemic practice was in continuous interaction with particular interpretive schemes regarding the structure of the material world; it adopted specific guidelines in accordance with

¹ Daniel Merkur, “The Study of Spiritual Alchemy: Mysticism, Gold-Making, and Esoteric Hermeneutics,” *Ambix*, 37, (1990): 35–45

² A typical example can be Eliade Mircea, *The forge and the crucible: The origins and structure of alchemy*, *University of Chicago Press*, Chicago 1974

them and was defining them through the continuous accumulation of empirical data. To that end, several indicative examples can be mentioned: one of them is Geber's *Summa Perfectionis*, where already known techniques, such as amalgamation or the exposure to organic acids, are used as a means to theoretically establish the structure of metals. (Newman 2011).

In an effort to reconsider perspectives such as the aforementioned ones, new research fields are now addressing the History of Alchemy, trying to delegitimize the *a priori* rejection of its subject matter as non-scientific, thus resulting to a constant accumulation of new information, growing in geometric sequences, during the past two decades (Martinon-Torres 2011). Even though it would not be accurate to treat the approaches of all Science historians who study Alchemy as equal, we should by all means consider there is a convergence as to *restore the scientific character of Alchemy*, in an effort to disengage it from the “non-scientific” rhetoric, which has been triggered for different reasons. These reasons relate to charlatantry with regards to its alleged potential, the effort, on behalf of the dominant social class, of exercising social control through such alleged potential, particularly in terms of gold-making, following the attacks it underwent by the newly established field of Chemistry, which began to define its identity mainly during the 18th century; other factors are to be considered as well. The point of view adopted within this framework is the one that wishes to re-approach Alchemy as a system where theory and practice intertwine; historical research should, thus, refrain from conceiving the alchemic task either as fraudulent or as a mere projection of ideotypical forms inhabiting psychological and occultist schemes or a purely technical process, striped of any theoretical structure (Principe 2011). However, this does not mean that a historiographic standpoint which would follow historical sources regarding the type of knowledge incorporated in Alchemy should put/push aside those aspects that pinpoint its psychological or occultist character, by turning to a fully positivist approach. A rather balanced mixture of all historical data should *take into account every single aspect, rejecting opinion dichotomies such as “esoteric vs scientific” and providing each one with the corresponding importance as it is defined through the findings of modern historical research* (Calian 2010).

Therefore, the entire teaching effort aims to provide the necessary conditions so that students change the idea/image they have on Alchemy, which probably results from

historiographical perspectives which are rather distorting as it is proved by current historic research.

On teaching goals using History of Science to teach Science

The use of History of Science in order to teach Science is part of the NOS (Nature Of Science) field. Within the NOS has been established a rather acceptable convergence between historians of science, philosophers of science, scientists and science teachers regarding the intended *goals* of such subject matter (Lederman et.al 2002). These include the following:

- Putting forward the *empirical character* and *creative nature of scientific knowledge*, in cases where there is no possibility of directly observing physical phenomena. A fundamental aspect of the goals resulting from this particular feature of science is to develop students' ability to evaluate the contribution of empirical observation as well as of their personal, creative involvement in providing explanatory schemes of the material world.
- Distinguishing between *scientific theories and laws*.
- Putting forward the fact that observational data are depending on the theoretical acceptance on which they are articulated (*theory ladenness of observation*).
- Putting forward the interdependence between the production of scientific knowledge and the *social and cultural context* which is defined by it and within which this knowledge is produced.
- Dealing with the issue of one (or not!) *single and unique scientific method*.
- The *provisional character of the scientific method*. In particular, the idea that this medley of facts, laws and theories are under constant transformation.

From one point of view, convergence on these matters has proved to be beneficial, since it has promoted their *integration into the teaching action*. From a different point of view, the mere fact of establishing such categories has led to a *dogmatic acceptance* of their constituent elements, which consolidates an attitude completely *opposite to the spirit of the goals* it aspires to promote. In addition, it has been pointed out that it favours the consolidation of specific dichotomies (the most characteristic one being the "scientific vs non-scientific"), the incoherent mix of epistemological,

sociological, psychological, moral and other issues. To respond to this tendency, the suggestion was to introduce a wider regulatory grid incorporating a wider range of debatable issues, directly falling to NOS through which they will be featured *not as goals to be achieved but as fields of conflict*. Such suggestion is summarized in the proposal of *Features Of Science* (FOS) (Matthews 2011), which maintains the basic elements the NOS revolves around, and are the following:

1. Empirical basis
2. Scientific theories and laws
3. Creativity
4. Theory dependence
5. Cultural embeddedness
6. Scientific method
7. Tentativeness

To these, we can also add, aspects such as:

1. Conduct historical experiments
2. Discuss on the creation and operation of models
3. The nature of the involvement of technology
4. Choosing between adversarial theories
5. The role of religion in science
6. The conflict between realism and constructivism

The important thing, however, is not the fact of expanding the issues related to the new model. What proves to be defining is the fact that those issues are not presented as predetermined teaching goals which must be achieved by the end of a predetermined teaching path but as fields where debate over them is favoured. This perspective of FOS is complying with aspects to be examined, which are stemming from the History of Alchemy. This is because modern Science historians understand Alchemy as a subject matter which is constantly growing, is particularly flexible and prone to constant re-views and re-interpretations, whose boundaries remain open to

interaction with other fields. As a consequence, it cannot be perceived in a dogmatic way by the teacher who will try to incorporate it in Science education.

On the methods of using History of Science in Science Education

Available methods within *formal education* regarding the use of the History of Science in Science education, include:

- lectures,
- reading and interpreting original historical sources,
- replicating historical experiments,
- creating narratives,
- role playing,
- descriptions of historical personalities and scientific objects, etc.

These methods work as a means to fulfill a wide range of teaching goals which may vary from merely instrumentalist ones, such as developing skills regarding the use of equipment, to goals aiming to redefine the perceptions related to the nature of science.

Beyond formal education, History of Science may also be used for the purposes of the *informal sources of learning such as scientific exhibitions, science centers and above all science museums.*

On the use of historical experiments in Science Education

The replication of historical experiments *within the framework of History of Science* is a research method with multiple benefits, which is becoming more and more popular. Under the term “historical experiments” we include those experiments whose scientific paradigms are no longer in use. Chang (2011) distinguishes three categories of historical experiments, each one having their own aims and restraints; these are historical replications, physical replications and extensions.

During a *historical replication* what is replicated is the precise experiment procedure, as it took place in the past. What is necessary for such task is a high degree of “completeness” on what concerns the available historical information. However, it is not always possible to make sure that the scientific instruments we have in our hands are in a condition which would ensure an accurate replication of the experiment. It is also possible that specific information, necessary for the replication, is not available,

precisely because it is taken for granted during the time the experiment was conducted, therefore it is omitted from its description. In any case, the procedure is structured based on the type of questions answered by the experiment as it was conducted in the past.

Physical replications aim mainly into reproducing particular physical procedures, without reproducing the entire amount of historical information related to the experiment as it was conducted in the past. During a physical replication, we are allowed to use modern-day instruments and techniques as long as they fully reproduce the desired phenomenon. The process is bound by the type of questions which are considered timely by modern science and not by science as it was structured at the time when the experiment took place for the first time. Furthermore, the role of the experiment designer is crucial since it is s/he who chooses the type of information to be presented.

The *extensions* are experiments which follow as a result of the historical and physical replications. They may be dealing either with additional parametrisation of well-known historical experiments or with innovative experimental devices which are used to verify questions which emerged after conducting a historical or physical replication.

The use of historical experiments *in science education* can fulfill a wide range of *teaching goals*, including:

- acquiring skills in using different instruments.
- presenting the scientific task not as an abstract set of ideas but as a project which includes a practical aspect as well, which takes place in science labs.
- favouring a more positive attitude towards science (Allchin 1999).
- through the participation into planning a historical experiment, emerges a set of tacit and explicit theoretical assertions on which an experiment is based.
- they can be used as a tool which can pinpoint and on the same time transcend/overcome the students' alternative ideas (Seroglou, Koumaras & Tselfes 1998).
- the production of scientific knowledge is presented as a process directly involving the human factor (Allchin 1999).

- through the use of historical experiments as the framework to provide arguments and counter-arguments, it is the historical debates that surface whereas scientific knowledge is not presented as a set of non-negotiable views but as a process of social nature. (Hottecke 2000).
- students become aware of what escapes a rational evaluation of the contribution of scientific practice to the individual who exercises it, an aspect known as tacit knowledge (Hottecke 2000).
- the phenomena examined are not considered individually but interrelated to others so that the scientific task appears all the more complete (Cavicchi 2008).
- precisely because the replication of historical experiments often requires that the intermediate stages be filled during the experiment, since they are not always included in its representation as it was preserved till our days, it is also possible to be considered as an opportunity for the students to fill the gaps of the intermediate stages so in that case, they will manage to get to the bottom of concepts (Chang 2011) but also of the History of science (Hottecke 2000).

On the methodology of conducting historical experiments

In order to achieve teaching goals, it is necessary to create a suitable *methodological tool*, which is usually structured in three levels: creating the device, in case students are to participate in that part, replicating the experimental procedure, and placing the experiment within a historical, philosophical, social context. The third level is included as such not in terms of temporal priority; it is present throughout the activities taking place during the experiment replication. Regarding the first two levels, this methodological tool must provide the following (Heering 2003):

- collecting an adequate amount of information, with regards to the experiment. More particularly, lab notes, original published papers, monographs, scientific conference proceedings are all to be used.
- drawing adequate information from historical sources regarding the structure of the experimental device (its individual constituent parts), construction material, special conditions while conducting the experiment, if applicable, etc.

- putting together the individual parts of the instrument. To complete this phase, experienced technicians must be involved. For the cases where we choose to involve students as well, during the construction phase, we also have the possibility to fill the gaps of the historical description of the experiment or proceed to the re-conceptualisation of particular elements of the historical sources, using information stemming from the way the device works.
- adjusting the device in order to replicate the results indicated in the historical sources.
- analyzing and interpreting the results following the experiment.

Teaching Activities in the context of the DACALBO project

In the context of the project:

1. *two historical experiments* were designed and conducted as replications of recipes found in the chymeutic book (Codex 107) of the Monastery of Olympiotissa in Ellassona, Larissa (central Greece).
2. *two alchemical instruments* were designed and built, in order to be used as display material in the context of informal sources of learning.
3. *a methodological tool* was developed *contributing to writing biographies* suitable for science teaching.

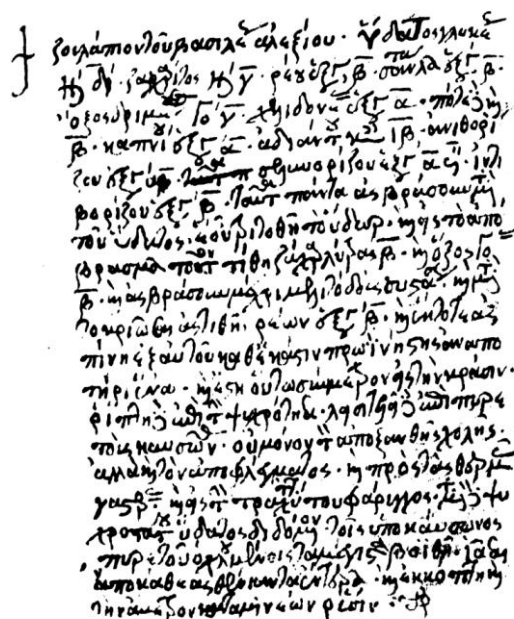
Historical experiments

The recipes which were designed and executed were “ζουλαπίον του βασιλέως αλέξιου” – *joulapion tu vassileos aleksiou* (i.e. King Alexios’ *joulapion*), as it was retrieved by page/sheet 99 of the Codex No. 197 (chymeutic book) from the Monastery of Olympiotissa in Ellassona, as well as “ζουλαπίον κινητικόν” – *joulapion kinitikon*, as it was retrieved by page/sheet 102 of the same Codex; both recipes are *ιατροσόφια* – *iatrossofia*, i.e. home remedies or nostrums. The term *ιατροσόφια*–*iatrossofia* describes simple notes or a synopsis used to treat an illness; they can be the product of a doctor’s/healer’s individual work in order to facilitate the medical/healing practice of his/her profession or of more doctors/healers, in the context of healing within hospitals; they are written in Greek language, probably between mid 15th century to late 19th century (Tselikas 1995). Quite often, they are the

compilation of popular recipes composed by monks based on ancient medical texts – Dioscourides’ recipes’ contribution is truly dominant – where there are also references in witchcraft, astrology and alchemy (Stefanidis 1913). The link between Alchemy and Therapy does not reduce itself to mere inline alchemical references while writing synopses of home remedies/nostrums: it emerges from the very names of the healing plants used for the therapeutic recipes. Quite often, particular names are used in both fields: in Therapy as healing plants and in Alchemy with qualities that reflect the products of chemical changes, such as oxidation. (Litsas 2008). The lack of extended historical research regarding home remedies/nostrums is mainly due to the lack of relevant sources and the resulting lack of a clearly defined study method (Touwaide 2007). In general, the historical study of home remedies/nostrums requires a combination of information from different fields such as the History of Science, Pharmacology, Botany, Folklore, etc.

Those particular historical experiments where designed to be included in physical replications; that is we were not interested in replicating the process exactly as it took place in the past (vessels, etc.), but to reproduce phenomena that took place while the recipe was executed, such as boiling, extraction, hydrolysis, etc. During the physical replication, the process which took place was the following:

a. Transliteration of the recipes from the original texts.



“Ζουλάπιον του βασιλέως αλέξίου”

Ζουλάπιον τοῦ βασιλέως ἀλεξίου. Ὑδατος γλυκέως # δ', ζαχάριτος # γ' ρέου ἐξάγια β', σαντάλου ἐξάγια β', ὄξος δριμύ οὐγγίας γ', χελιδονίας ἐξάγιον α', πότε δὲ καὶ β', καπνίου ἐξάγια α', ἀδιάντου κ' ἰβ', ἀνιθορρίζου ἐξάγια α', σελινορρίζου ἐξάγια α' S'', ἰντιβορρίζου ἐξάγια β'. Ταῦτα πάντα ἄς βράσουν μετὰ τοῦ ὕδατος ἕως οὗ τριτωθῆ τὸ ὕδωρ καὶ εἰς τὸ ἀπόβρασμα τούτων τίθει ζάχαρ λύτρας β' καὶ ὄξος οὐγγίας β' καὶ ἄς βράσουν μέχρι μελιτώδους συστάσεως καὶ μετὰ τὸ κρυῶσαι ἄς τιθῆ ρέων ἐξάγια β' καὶ ἔκτοτε ἄς πίνῃ ἐξ αὐτοῦ καθ' ἐκάστην πρωΐ νήστης ἀνὰ ποτήρι ἕνα καὶ ἔστι οὕτω σύμμετρον εἰς τὴν κράσιν. Ρίπτει δὲ ἐπὶ τὴν ψυχρότητα, λυσιτελεῖ δὲ ἐπὶ πυρετοῦς καύσωνας, οὐ μόνον τὸν ἀπὸ ζανθῆς χολῆς, ἀλλὰ καὶ τὸν ἀπὸ φλέγματος. Καὶ πρὸς τὰς θερμὰς γαστέρας καὶ εἰς τὴν τραχύτητα τοῦ φάρυγγος. Μετὰ δὲ ψυχροτάτου ὕδατος διδόμενον τοῖς ὑπὸ καύσωνος πυρετοῦ ὀχλουμένοις τὰ μέγιστα βοηθεῖ. Ἰᾶται ἀπὸ κάθε ἀσθένειαν τὰ ἔντερα καὶ ἐκκόπτει καὶ τὴν ἄμετρον καταμηνίων ῥύσιν.

“Ζουλάπιον κινητικόν”

Ζουλάπιον κινητικὸν πάνυ ὠφέλιμον καθέρον χολὴν καὶ φλέγμα. Λάβε κασίαν δράμια ι', συναμεκὴ δράμια ι', πολυπόδιον δράμια η', σταφίδες δράμια ν', κανέλλα δράμια α'. Ταῦτα πάντα βράσον με νερὸν ἕως ὅπου νὰ φυράσουν τὰ δύο μερτικά. Τὸ δὲ ἕτερον μέρος ἀνακάτωσον με τὴν κασίαν καὶ δὸς πιεῖν καὶ κοινεῖ τὴν κοιλίαν.

The transliterated form of the text is the main source from which students will try to replicate the recipe. In this way, they will also practice reading and interpreting original sources.

A. Tracing the terms that are important for the recipe.

The terms constitute 3 main categories: plant names, units of measurement, numbers representing quantities.

b. Plant names

The terms corresponding to plants do not go by the Linnaean taxonomy, since it was established after the recipe was written. Quite often, each term corresponds to a whole genus of plants, which may include several species. In order to have a clearer picture, we should trace the historical and cultural context this recipe was a product of. As a consequence, the demand resulting from the third level of the methodological tool on historical experiments replication, i.e. placing the experiment in its historical, philosophical, social, etc context, is also satisfied.

In some cases, the information that are necessary in order to render a term clearer are of *purely historic character*, such is case of the term “ζαχάριτος”- jacharitos included in the recipe of King Alexios’ *joulapion*. The only criterion allowing us to decide whether it refers to sugarcane or sugar beet is the time the recipe was written, probably sometime in the early 16th century. Sugar production from fodder beet was only introduced in mid-18th century. The triggering event to that was the “Law on molasses” that Great Britain imposed, in 1733, to sugar imports to North America by non British colonies; said law aimed at making the sugar market a British monopoly. Therefore, the sugar mentioned in the recipe is the one produced by sugarcane and not the one produced by sugar beet.

Other cases, however, demanded a much more complex approach; this was for instance the case of “reon”. To understand this term, we need to bring together different scientific fields.

- The *History of Science* informs us that Dioskouridis in “Περὶ ὕλης ἰατρικῆς”- Peri ylis iatrikis (On medical matter) refers to “ρα”-ra, “ρίον”-reon but also “ρήον”-rion, which he claims that grows in the area of Bosp(h)orus while he recommends the use of its roots only (Tselikas, 1998, p. 192). The reference of the name “ρα”-ra is often followed by comments on the red colour of the plant. “Ρα”-Ra was also the name the Scythians used for the river Volgas, used in the ancient times as the commercial channel used to carry reon in Ancient Greece.

- The term “ρέον”-reon corresponds to the Latin name of the genus Rheum. *Modern botany* indicates there two well-known species of the genus Rheum having a pharmaceutical use: Rheum Rhabarbarum and Rheum Officinale. The species with the distinctive red colour is Rheum Rhabarbarum; the name of the plant is linguistic loan from its Greek name “Ρα βάρβαρον” – ra varvaron (barbaric ra).
- *Modern pharmacology* points out that plants with pharmaceutical uses that belong to the Rheum genus owe their pharmaceutical properties to the anthranoids (Westendorf 1993). In particular, Rheum Rhabarbarum is used for its *antidiarrheal* and laxative action (Barnes 2007, p. 507), which is in accordance with the overall properties of the mixture, the *joulapion*, as it is indicated in the recipe. More specifically, the recipe recommends to drink the brew in order to cure, among others, stomach problems (*πρὸς τὰς θερμὰς γαστέρας- pros tas thermas gasteras –to cure hot/aching stomachs*).

For each ingredient, a separate profile is drawn up, based on the information collected for it from different scientific fields. 14 different ingredients were identified in total for both recipes and they are presented as follows: 1) Saccharum Officinatum (ζάχαρη) 2) Rheum Rhabarbarum L. (ραβέντι) 3) Santalum Album (σάνταλο, σανταλόξυλο) 4) Vitis Vinifera L. (στάφυλος) 5) Chelidonium Majus L (χελιδόνιο, χελιδονόχορτο, δοντόχορτο) 6) Fumaria Officinalis (καπνιά, καπνία, καπνόχορτο, φουμαριά) 7) Adiantum Capillus – Veneris (πολυτρίχι, μαλλόχορτο, καλλίτριχο, κα.) 8) Anethum Graveolens (άνηθος) 9) Apium Graveolens 10) Cinnamomum Cassia (κινέζικη κανέλα, κινέζικη κασσία, κασία) 11) Cassia Angustifolia (Senna, Tinnervelly Senna, Indian Senna, Cassia Senna) 12) Cassia Senna (Cassia Acutifolia) (Senna, Alexandrian Senna, Khartoum Senna, Egyptian Senna) 13) Polypodium Vulgare (δεντροφθείρι, πολύριζο) 14) Cinnamomum Verum (σιναμική, σιναμό)

c. Units of measurement

In order to calculate the exact quantity of each ingredient in the recipe it is necessary to convert the units of measurement mentioned in the text into the corresponding modern units. Through this procedure, it is once more the historical and cultural context of the experiment that emerges, under the perspective of metrology this time. Again, the timeframe in which the recipe is written plays a significant role, as the

same units correspond to different quantities throughout the different historical periods. This was the way that “ἐξάγια”- eksayia, “ούγγίες”-oughies, “λύτρα”-lytra, “δράμια”-dramia, etc, turned into grams.

Another important issue is the use of Letters to represent numbers. Most of the recipe ingredients are followed by letters of the Greek alphabet that indicate numbers. Knowing precisely the quantities of each ingredient makes it possible to reach to conclusions regarding the type of the brew. More particularly, in the recipe of the King Alexios’ *joulapion* the ratio of sugar to water is 3/4, which indicates that texture of the end product will probably be syrup-like, an element which is in accordance with the designation of the brew as a *joulapion*.

d. The identification of Other terms present in the recipees

“ζουλάπιον” - *joulapion*

The term “ζουλάπιον” - *joulapion*, which is also mentioned as “ζουλάπιν”-*joulapin* or “ζουλάπι”-*joulapi*, refers to a «liquid pharmaceutical mix, made out of water and flower extracts, sugar or honey, which is used either as an emollient and soothing product or as a means to dilute other medicines» (Kazazis & Karanastassis 2001).

The recipe about “*King Alexios’ joulapion*” is about a solution of water and sugar, from where the rest of the ingredients are extracted via ebullition; this is what is indicated by the specific quantities mentioned in the recipe. Water and sugar, the means in which the rest of the ingredients will be extracted, are to be calculated at 1280gr and 1600gr respectively, while all other ingredients are to be calculated to a few tens of grams.

In the recipe of “*Ζουλάπιον κινητικόν*”- *joulapion kinitikon*, the dominant ingredient is raisins. More particularly, the recipe indicates the use of 160 grams of raisins, much smaller quantities for the rest of the ingredients and no sugar at all. The much bigger quantity of raisins is responsible for the distinctive syrup-like texture of the *joulapion*, which is merely the result of the extraction of the raisin sugars.

Planning and conducting the experimental procedure

Planning the procedure includes collecting all of the ingredients to be used. Almost all of the plants for pharmaceutical use can be found in retail stores. In only one case,

“*polypodium vulgare*”, commonly known as “polypod” or “brake root” we had to collect the respective plant directly from Nature. The plant was finally collected, in high altitude, rocky and humid locations in the Prefectures of Evritania and Trikala (Central Greece).

King Alexios' joulapion

The preparation of the *King Alexios' joulapion* recipe indicated boiling all of the following ingredients in water, until their volume is reduced to 1/3 of its original quantity. The ingredients participating in the boiling procedure are presented below followed by the exact quantities in grams, after relevant unit conversion.

Unit conversion

1 λίτρα-litra	=	320 g approximately
1 οὐγγία-oughia	=	26.7 g approximately
1 ἐξάγι-eksayi	=	4.5 g approximately

Exact ingredient quantities

4 x 320	=	1280 g water
3 x 320	=	1600 g sugar
2 x 4,5	=	18,0 g rheum
2 x 4,5	=	9,0 g sandalwood
3 x 26,7	=	133,5 g strong vinegar
1 x 4,5	=	4,5 g χελιδονία (ή 9,0g)
1 x 4,5	=	4,5 g καπνίου
12 x 4,5	=	54,0 g αδιάντο
1 x 4,5	=	4,5 g ἀνιθόρριζον
1 x 4,5	=	4,5 g celery
2 x 4,5	=	9,0 g ἰντιβόρριζον

In order to prepare the syrup in the lab and proceed to the qualitative identification of the ingredients which are responsible for its pharmaceutical action, the mass of each individual ingredient used was reduced by 61% (the respective ratio within the recipe remained stable. The quantities were reduced so that the volume used during the

recipe preparation reaches 500ml. So, from the original quantities included in the recipe, the following quantities were weighted and used:

Sweet water	=	500,00 g (ml)
sugar	=	374,40 g (first addition/round)
		249,60 g (second addition/round)
rheum	=	3,51 g (first addition/round)
		3,51 g (second addition/round)
sandalwood	=	3,51 g
vinegar	=	31,24 g (first addition/round)
	=	20,83 g (second addition/round)
χελιδονία	=	1,76 g
καπνία	=	1,76 g
αδίαντο	=	21,06 g
ανιθόρριζα	=	1,76 g
σελινόρριζα	=	1,76 g
ιντιβόρριζα	=	3,52 g

The total amount of the ingredients mentioned in the recipe which are used during the first part of boiling were placed into a 1L conical container. Following that, the ingredients were boiled while on the same time they were constantly stirred. After 3h10', the volume of the solution was reduced to 1/3 of the original quantity. The product was then thrice filtered in vacuum, and the extra quantity of vinegar and sugar; as soon as the sugar was dissolved, a sample of the product was taken. The solution was left to boil until its texture was semi-liquid (*“μέχρι μελιτώδους συστάσεως”-until its texture was like honey*). Following that stage, it was left to cool down and the extra quantity of rheum was added then.

Ζουλάπιον κινητικόν – joulapion kinitikon

The preparation of the recipe *“Ζουλάπιον κινητικόν”- joulapion kinitikon* includes boiling all of the ingredients, except common cinnamon in water, until the volume of the solution was reduced to 1/3 of the original quantity. After that, the common cinnamon is also added to the solution. The ingredients participating in the boiling

procedure are presented below followed by the exact quantities in grams, after relevant unit conversion (1 δράμι = about 3,2 g).

In order to prepare the filtrate in the lab and proceed to the qualitative identification of the ingredients which are responsible for its pharmaceutical action, the mass of each individual ingredient used was reduced by 80% (the respective ratio within the recipe remained stable. So, from the original quantities included in the recipe, the following quantities were weighted and used:

common cinnamon	=	6,43 g
συναμεκῆ senna	=	6,60 g
polypod/brake root	=	5,17 g
raisins	=	32,12 g
cinnamon	=	0,69 g

The total amount of the ingredients mentioned in the recipe which are used during the first part of boiling were placed into a 500ml conical container, which was then filled up with water until the total amount of ingredients and water reached 500ml. Following that, the ingredients were boiled while on the same time they were constantly stirred for 2h30min. After the initial extraction, the total amount of the product was measured at 300ml. Then, the common cinnamon was added and the solution was left to boil for another 10min, while constantly stirred on the same time. Finally, the solution was thrice filtered, the first time not in vacuum but the other two in vacuum.

e. Analysis and interpretation of the findings

Both recipes replicate, on a macroscopic level, the characteristics of the brew type they belong, that is the *joulapion*. Following the evaporation of the largest quantity of water, they both obtain a honey-like texture, owed either to direct addition of sugar in “*King Alexios’ joulapion*”, or to the extraction of the sugars of the raisins in “*joulapion kinitikon*”. The different way each recipe chooses to produce the result of the syrup-like texture is indicative of the wealth –or lack thereof – of the person to whom it is addressed. “*King Alexios’ joulapion*” recipe which is made for King Alexios includes a large amount of sugar, a particularly expensive ingredient. On the

contrary, the recipe for “*joulapion kinitikon*” uses raisins to achieve the syrup-like texture, since they are much cheaper, but they are also used in a much smaller quantity. This information indicates that there is an *interrelation between the production of knowledge and the social and cultural context from which it emerges and which it jointly defines*.

At the end of the recipe regarding “*King Alexios’ joulapion*”, there are also the situations for which it is recommended to use it, whereas there are also information regarding the theoretical context within which the effectiveness of the ingredients is explained. Thus, we have the possibility to compare with the respective theoretical context of modern Pharmacology, the conclusion being that *the data observed are limited by the theoretical assumption on which they are articulated*.

The role of Historical Biographies

Biographies are perhaps the most frequently used method that actually leverages the History of Science for school textbooks, usually by providing, short excerpts regarding the life of famous scientists. The fundamental role of the scientist’s personality when writing a biography is what makes it fall in the type of narrative known as “heroic science story”. The “heroic science story” often creates perceptions regarding the role of the scientist, which are sometimes oversimplified and sometimes inaccurate (Allchin 2003). In particular:

- The scientist is presented as the sole vector of true knowledge about the world.
- Scientific knowledge is considered fully independent of any human filter, a fact which guarantees the truth even though it is the product of human work.
- The scientific task is often interpreted as a process of discovery.
- This point of view presents science as timeless and capable to be conceived outside of specific social, ideological etc restraints. (Milne 1998).
- It is claimed that scientists are mainly male, while women seem to be obliged to complete tasks that lack creativity and imagination (Brush 1985; Schiebinger 1987).
- Observation is considered more important compared to providing interpretive schemes and predictions (Milne 1998).

The central role of a personality when writing a biography, which is inevitably a result of its own structure, can also influence the following aspects:

- Pinpoint excessively specific personal traits, sometimes as part of an anecdotal description, which could give the impression that science is a particular type of knowledge addressed to certain people, a priori endowed with those characteristics which are necessary for their involvement with it, an aspect which could provoke the indifference of the students (Brush 1974; Duschl 1990; Martin & Brouwer 1991).
- Focusing unilaterally to the personal dramatized history of the scientist, so the romantic character of the narrative triggers parallels between the scientist and the student, within a subjective context. This could strip science from being considered as a task involving objective elements. (Solomon 2002).
- The uneven presentation of the intellectual aspect of the scientific task as opposed to its practical aspect.

However, the principal contribution of biography as a method to teach natural sciences lies to its ability to turn the abstract and impersonal image of science into a more “human” one. (Dagher & Ford 2005). The humanization of science is achieved when associating the students’ experiences to the practices adopted by certain scientists in such way that the scientific task is presented not as an abstract procedure of gathering information but as a procedure executed by individuals and a procedure which might overturn even the most deeply established scientific perceptions (Wang & Marsh 2002). Therefore, there must be a balance between the request for a humanised depiction of science and the request for avoiding an approach focusing on the individual with regards to the scientific work. To make this possible, the following could apply:

- Present a wider grid of social, ideological etc restraints which make up science. The scientist as an idea could be established as a channel of all those restraints, so that the degree of liberty of the scientific work is evaluated compared to the context within which it is shaped.
- In order not to identify the scientific task with the intellectual processes taking place into the scientist’s head/brain but to depict in a balanced way the

involvement of the intellect with the practical aspects of science με την πρακτική πλευρά της άσκησης της επιστήμης, it would be fit to create an image which will value both the special traits of a scientist's personality and the particular research methods s/he adopts as well as the way these methods invest her/his thoughts with new meaning.

- Writing a biography is balancing between creating a reality which shapes traits that are familiar with reality as perceived by the student now, so that it is more direct and stimulates her/his interest (Solomon 2002); however, it should not commit the error of completely recreating the narrative under the perspective of present perceptions. (Mayr 1990).
- Through the biographies, it is possible to upgrade the contribution of female scientists and minority groups to the production of scientific knowledge (Brush 1985).

a. Methodological Considerations

First of all, using biographies as a method to teach Science, means they are not exhaustive. Its extent and completeness serve particular teaching goals. However, it is recommended to produce different biographies on the same person as it encourages students to accept multiple representations of the same reality. (Milne 1998). The successive phases of writing a biography could be summarized to the following:

- First, *we collect all of the events/occurrences to be used* through available historical sources. They should be quite balanced in terms of the aforementioned aspects.
- Then, *we include those events/occurrences in different categories*, each one of which corresponds to a different level of teaching science, as they are described in the theoretical framework of the Story-Driven Contextual Approach (SDCA). Those contexts are the *theoretical, the practical, the social, the historical and the emotional context* each one of them aiming to bring out different aspects of the scientific task (Klassen 2006).
- After the events/occurrences put into categories, we use the theoretical context of the semiotic circle of Scholes (1981), the way Milne leverages it (1998). The semiotic circle is mainly constituted by facts which are chosen among

others. Once the text is invested with meaning and values, we proceed to its interpretations, which could transcend the historical live of events. In this way, under the light of new interpretations, the events may be invested with a new meaning and values, so that the narrative uses feedback to maintain a circular feed.

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