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Textbooks at the Crossroads: Scientific and Philosophical Textbooks in 18th Century Greek Education

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Abstract. Greek society of the eighteenth century did not have the institutional or theoretical background for the development of an original interest in scientific pursuits. The contact with the new scientific ideas aimed basically at the assimilation of these ideas in the body of the existing contemplative philosophy and the context where such undertaking took place was exclusively education. At the same time, education was the field where the political and ideological pursuits of various social groups intersected. A quasi modernistic profile of the educational activity was especially favored by a new generation of scholars who wished to assert their distinctive intellectual physiognomy, as well as by the emergent group of merchants who strove to establish their distinctive cultural and political authority. As a result, the new interest in the sciences reflects the confluence of the aims of these two social groups. The study of scientific textbooks, which were produced under these circumstances, depicts the consequences of this confluence and brings to light some important aspects of the social and intellectual environment within which the contact of Greek intellectual life with modern sciences occurred.

According to the standard definition of the word, a textbook is a book containing a systematic presentation of the principles of a subject, or a collection of writings dealing with a specific subject. In most cases, the purpose of the book or of the collection is to be used in education or as a reference work.[1] The word ''textbook'' occurs for the first time in 1730 but it acquires its contemporary meaning about half a century later.[2] Apparently, the discussion on scientific textbooks focuses on the use of didactic works in the context of scientific education. However, systematic scientific education is, for the most part, a product of the 19th century (Brock 1975, 1990).[3] This does not mean that scientific textbooks did not exist earlier. It rather means that those textbooks functioned in a different way than the ones written and/or used in the context of systematized educational programs. One purpose of this paper is to examine the function of scientific textbooks in a social and intellectual environment where an interest in original[4] scientific pursuits was characteristically absent. The other purpose of the paper is to use scientific textbooks as probes for the examination of the intricate social relationships that determined the physiognomy of the Greek intellectual life of the time. The present

study does not cover, of course, all the aspects of the theme. Many important issues will be left aside, since my objective here is to give an overview of the situation rather than presenting an all-inclusive account of the eighteenth-century Greek education. In what follows, thus, I will try to give a typology of the textbooks that were written and published in Greek from 1700 through the mid 1820s, a time interval which, for the purposes of our work, I shall call the ''extended Greek eighteenth century''. I will not focus on specific works but I will attempt to proceed with a cumulative study of the characteristics of a great number of textbooks, in order to bring forth the general tendencies of the Greek speaking education and the ways scientific textbooks were integrated in the cultural context of the emergent Greek society.

1. On Science and Education

Many studies on the introduction of the new scientific and philosophical ideas into the Greek intellectual life of the eighteenth century echo a common stereotype: The scientific and philosophical attainments of the European thought were inserted into the Greek context exclusively for educational purposes, and *thus* they represented only a simplified version of the European science and philosophy. Neither hard-core science and philosophy nor original intellectual production did occur in the particular context. A most typical representative of this perception, shared by many Greek historians, was the late Panagiotis Kondylis, whose work on Neohellenic Enlightenment was based on the presumption that

> ... Neohellenic Enlightenment did not produce original philosophical ideas. That is to say, the trends which were formulated during the second half of the eighteenth and the first third of the 19th centuries [...] and were different or contrary to the prevailing theological ideology had borrowed their ideas from the respective European trends. But even this borrowing was barely fertile, from a purely theoretical point of view, mainly because the Greek intellectual needs were rather scant and could be fulfilled [...] by second or third class works: And such were most of the books which were translated and read. Same things hold for the profile of the native philosophical production of the Neohellenic Enlightenment, which was of similar nature: Compilations and multilayer copies, unworthy of philosophical consideration; there were only a few elevations, which became visible just because the surroundings were even lower. (Κονδύλης 1988, p. 10; my translation)

Not all Greek historians share Kondylis' dismissive tone. Many representatives of the national historiography, for instance, find that due to the Ottoman rule over the Greek-speaking populations of the Balkans, even the mere attempt to bring Greek education in contact with the Enlightened Europe was a heroic endeavor.[5] Others elaborate a more sophisticated argument, according to which the assumingly low level of the philosophical and scientific production of the time reflects the real conditions of the

specific society and thus the question of originality is literally and metaphorically untimely (Ψημμένος 1988, vol. I, p. 31). The fact itself that specific scholars assimilated and spread the new ideas in the Greek intellectual space, countering popular ignorance on the one hand, and the established authorities on the other, was not only important for the revival of the Greek intellectual life, but also determined the subsequent political and ideological developments until the Greek war of independence (Henderson 1970, introduction). In any case, however, the latent premise behind such considerations is that the Greek scholars were, at best, enlightened teachers. Due to particular historical circumstances, their intellectual activity was confined to the limits of education, and this confinement marked decisively the character of their scientific and philosophical production. For reasons that did not depend on their will or their capabilities, Greek scholars were unable to share the creativity of modern European thought, but one should appreciate properly the pedagogical and ideological consequences of their works.

It is undoubtedly true that, throughout the whole eighteenth century and even the first three decades of the nineteenth, philosophy and the sciences were exclusively practiced within the context of the Greek-speaking education. The question is how is one to assess such a "backwardness" during a period when institutions of scientific production proliferate in Europe? It is well known that early modern years witnessed the emergence of scientific academies and specialized journals as restricted places where properly qualified persons were allowed to participate in cognitive undertakings. According to a widely held assumption, early modern Europe opposed these institutions to medieval education and, thus, set the foundations for the distinction between original scientific production and the sterile school philosophy exercised in the old-fashioned universities of the time (Westfall 1977, chapter 6). This distinction survives in many historical accounts, especially those dealing with the history of sciences in the periphery: Some places contributed to the scientific agendas of the center, while others remained for a long time content and self-sufficient within the shell of their scholastic education. The situation changed when the shell was penetrated by the new scientific ideas flowing from centers to peripheries, but even then education was nothing more than a passive receiver, separated from real scientific work.[6] As a result, historians who confine themselves to the examination of the dissemination of scientific ideas in the Greek intellectual life tend to eliminate the contribution of Greek-speaking education to the original scientific pursuits of the time and exclude it from the host of powers which participated in the "ferment of [modern] knowledge." However, recent studies on late Medieval and early modern Aristotelianism may help us reassess this image. C. Lüthy's acute remarks on the

significance and neglect of school philosophy during the early modern period are worth citing word for word.

> Numerically speaking, the overwhelming number of professional seventeenth-century philosophers were university professors who taught philosophy according to the inherited scholastic models, while, conversely, almost none of the celebrated heroes of seventeenth-century philosophy ever taught at a university: they were Lord Chancellors, private tutors, lawyers, or courtiers. The question is thus: is it legitimate for historians of philosophy to go about their business ignoring all salaried, professional philosophers, and to do this without saying a word about it?
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> The frequent neglect of school philosophy, while conspicuous all by itself, leads to a second injustice: it obliterates from our historical memory all those places where the expression of free gentlemanly thought was limited by ecclesiastical control and 'philosophy' could therefore only mean 'school philosophy'. In other words, the almost exclusive interest of historians of seventeenth-century philosophy in extramural anti-Aristotelianism means that there is nothing to report from Spain, Portugal, Italy, and Eastern Europe. The history of 'philosophy' thus becomes the history of some gentlemanly circles in residential cities of northwestern Europe. (Lüthy 2000, pp. 171–172)

In history of science things are a little better, but this happens only because some countries of the periphery (like Italy, for example) seem to meet the specifications of western European canon – and not because they deserve to be studied as alternative instances of the European intellectual activity (p. 173). What is important from our point of view, though, is that school philosophy is not a marginal aspect of the intellectual life of the time. Quite the contrary, it comprises the wide backdrop against which the new scientific and philosophical attainments acquire their distinctive and innovative character. But this is still a static image. However massive and widespread, school philosophy represented the old regime that was doomed to yield its reign to the upcoming power of the new natural philosophy. Again, recent studies on early modern Aristotelianism cast light on this widely admitted misapprehension: After its revival in the European intellectual context, around the 12th century, Aristotelianism had never been a dead body of commentaries, insensitive to the new trends of philosophy. In fact, according to Edward Grant's analogy with biology, even during the Middle Ages Aristotelianism was a wide range of philosophical undertakings, capable of surviving in various environments.[7] This is equally true for the early modern period; but here we have something more: In many cases, Aristotelian scholars established a comprehensive dialogue with the new natural philosophy, resulting in the assimilation of specific aspects of this philosophy within the Aristotelian framework (Mercer 1993). Thus, school philosophy not only was not a marginal aspect of the European intellectual life of the early modern period, but it also was an active participant in the developments of the new natural philosophy until, at least, the end of the seventeenth century.

It is important to bear in mind these clarifications when dealing with the Greek case. The fact that the Greek-speaking education of the eighteenth century comprised the framework of every scientific and philosophical undertaking, as well as the fact that many scholars of the time attempted to accommodate the new scientific ideas within the context of their local philosophical and theological traditions, under no circumstances assign the Greek intellectual life a marginal character. True that the Greek intellectual life did not contribute to the naissance of the new natural philosophy, as we perceive it today. But the above-mentioned evaluative judgments expressed by many contemporary Greek historians obscure the picture because they, apparently, compare disparate things: Either favorably or dismissively, they juxtapose the ''poor'' Greek scientific and philosophical production to the ''original'' attainments of the European thought, and from this juxtaposition they draw the conclusion that the confinement of the Greek intellectual life within the context of education is responsible for the watered-down character of the respective philosophical and scientific production. But there is nothing – apart from a convenient ideological stand – to convince us of such an assertion. On the contrary, Greek intellectual life never shared the priorities and the commitments of the new European philosophy; it rather comprised an integrated part of the diverse philosophical ''population'' which, while being attached to the principles of the Aristotelian tradition, established an open and mutually influential dialogue with the new natural philosophy. This change of perspective allows us to formulate a number of questions whose answers will, hopefully, articulate some new historiographic issues concerning the theme of the present inquiry: why do people living in such an intellectual environment need to produce scientific textbooks? What kind of scientific knowledge do these books contain? What is the aim of the authors and what are the expectations of the social groups who support them? How do the various strata of the emergent Greek society reflect themselves in the intellectual osmosis that occurs within these books?

2. Scientific Textbooks in the Greek Education of the Eighteenth Century

The particular features of the Greek-speaking education of the eighteenth century were a result of the specific historical circumstances that determined the physiognomy of the Greek society of the time. The Greek populations of the Balkans were part of the Ottoman Empire and lacked the institutional structures of a national state. They even lacked the geographical continuity that could form the basis for a uniform organization of the various social activities. The Greek society of the eighteenth century consisted of a network of sites where Greek populations developed various

economic and political activities. Besides Balkans, the Greek communities were dispersed along the main commercial routes of Eastern Europe, and within the most important cities of the Northern Italian peninsula, Hapsburg Empire, and the German states. Without going into details concerning the question of who is entitled to be called "Greek", we can mark out two strong unifying elements which differentiated these populations from others and assigned them a certain degree of internal homogeneity: The Christian Orthodox faith and the Greek speaking education.[8] Both were under the jurisdiction of the same authority, the Ecumenical Patriarchate of Constantinople; but both were also heavily tinged by the particularities of the various local communities. In this sense, education and Church were the two main institutions that hosted all kinds of fermentations, negotiations and collective pursuits concerning the political and intellectual identity of the emergent society.

Under these circumstances, the practice of teaching as well as the function of the educational material itself acquired a broader social significance. Throughout the eighteenth century, the figure of teacher retained a central position in Greek speaking education. Although in the course of time a certain curriculum tended to prevail, the director of every local school remained the ultimate authority who decided for the structure of the teaching and the textbooks to be used in each thematic area. This director was usually "the teacher" and was responsible for the "philosophical" instruction of his students, which also included what we now call "the sciences". The other instructors were called "assistant teachers" and they were mostly responsible for the literary and religious instruction of their students. The centrality of teacher's figure becomes obvious by the way he was appointed to the specific position. In the continuously changing environment of a society groping for its collective identity, the intellectual issues really mattered. The balance of power in the various local communities was always projected on the intellectual sphere and the various philosophical debates always encapsulated virtual political and ideological pursuits. Thus, the selection of a teacher for the local school was a major social and political issue. He was the person who would give the accent to the intellectual life of the place for the next years, the person who would instruct the younger members of the community and affect their future stance in the local matters, the person whose authoritative account would accredit certain ideological beliefs and political practices. In this sense, the teacher was chosen on the basis of what he represented as an integrated intellectual and political figure, and as such he was expected to function into the bosom of the community.

Given the size of the Greek speaking populations of the eighteenth century, the number of textbooks that were published throughout this

period was fairly big.[9] Almost every major scholar of the time was a teacher and most of them had published more than one textbooks. These scholars belonged to a transitional generation, though. By that time the intellectual life was dominated by the Aristotelian tradition established in the early seventeenth century by Theophilos Korydaleas (1563/74–1646). From the outset of the eighteenth century, however, the Greek-speaking scholars started moving all over Europe, and Italy ceased to be the almost exclusive place they would go for their studies. They also started traveling to Leipzig, Halle, Paris, Vienna, Saint Petersburg, and elsewhere. They were, thus, acquainted with a multitude of intellectual traditions and schools, related mainly to the recent developments of the European Enlightenment. When these people returned to their homelands, after having spent from 4 to 10 years in the European educational centers, they looked forward to gaining social recognition corresponding to their intellectual qualifications. The production of a new philosophical and scientific discourse played a significant role in the legitimization of the upgraded authority of this group. In many cases this program was carried out through the translation of philosophical and scientific books, or through the compilation of original works wherein the new attainments of European thought were assimilated in the context of the local cultural traditions (Patiniotis 2003, p. 69).[10] Such undertakings did not serve a homogeneous agenda of modernization neither did they gain the general consent of the local authorities; they were, however, in tune with the aspirations of some dynamic social agents who sought to assert their distinctive cultural and political profile. As we shall see in what follows, the production of the philosophical and scientific textbooks of the time reflects, in many senses, this intricate encounter.

In the first place, I would like to delineate a general taxonomy of the textbooks. As it becomes obvious from the graph in Figure 1, some types of textbooks had a very sound presence, others a marginal appearance, and a third group is totally missing.

Mathematical textbooks (MAT) comprise almost one third of the total number of educational treatises published during the eighteenth century. For an otherwise extremely contemplative education, the persistent circulation and the extended use of so many mathematical textbooks is quite an impressive phenomenon that calls for an explanation. However, when one goes into a detailed examination of the content of the books things become clearer. First of all, only very few of the books deal with the contemporary developments in mathematics while, at the same time, there is a big number of elementary handbooks of arithmetic aiming at the education of future merchants. What is most important, however, is that the largest number of mathematical treatises is devoted to Euclidean

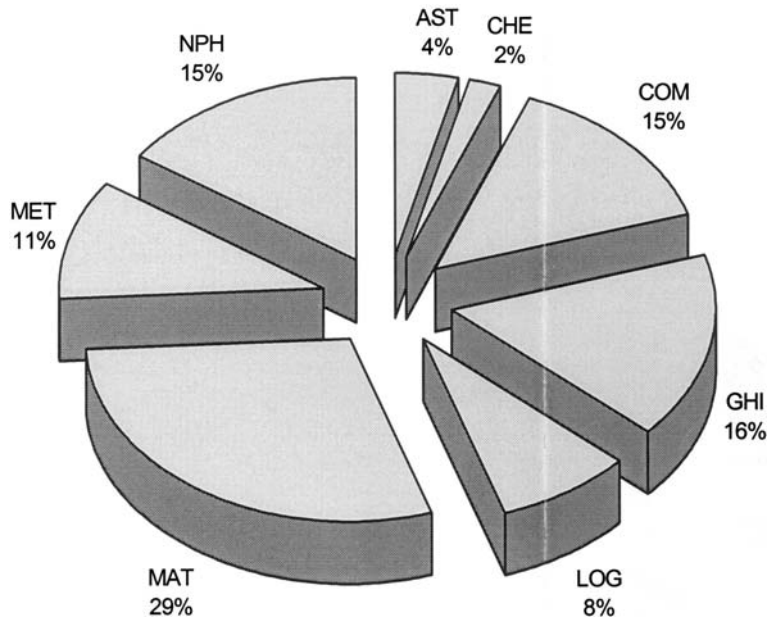

Figure 1.

geometry, conic sections and elementary algebraic knowledge. It is highly possible that the most significant factor that favored the circulation of those treatises was of ideological nature. It was a quite widespread assumption among the Greek-speaking populations of the time that the scientific attainments of modern European culture were, in fact, a product of the ancient thought. Thus, the acquaintance with the roots of this tradition was a major intellectual task for those who considered themselves the direct descendents of classical and Hellenistic antiquity. In this sense, the teaching of mathematics was, basically, meant to comprise part of the humanistic aspect of Greek-speaking education.

The second largest group consists of historical and geographical textbooks (GHI). In most of them the knowledge of historical events is described inseparably from the geographical knowledge of the areas where these events took place, and vice versa. But historical and geographical knowledge was not confined only to the books that aimed explicitly at this kind of education; it was also contained in another group of books that seems to be complementary to the former: The commercial textbooks (COM). In fact, this group of books is closer to the notion of handbook and was intended to serve not only as educational material, but also as a series of handy guides for the traveling merchants. The history and political geography of the populations these merchants were going to negotiate with, comprise integrated parts of these manuals and go hand in hand with

coinage conversion tables and navigation instructions. The combination of geographical/historical and commercial textbooks make up the other third of the total number of the Greek textbooks of the eighteenth century.

Philosophy occupies also a prominent position in this division of knowledge. It mainly appears in three different forms. Logic (LOG), natural philosophy (NPH) and metaphysics (MET). The former was considered the instrumental background for every kind of philosophical study. Metaphysics and natural philosophy, on the other hand, are very closely related to each other within the context of early modern Greek philosophical thought: For the most important scholars of the seventeenth and eighteenth centuries, physics or "physiology" was the cornerstone of every philosophical edifice. Metaphysics not only subordinated to physics, but also borrowed its inductive methodology in order to accomplish its philosophical mission. Of course, we should remember that in the eighteenth century physics was still mostly related to the Aristotelian notion of the term, and that was also the case with the Greek philosophical thought. The neoaristotelian tradition that had been established in the early seventeenth century and privileged natural philosophy over metaphysics marked all the subsequent developments (Tsourkas 1967, pp. 197–210, 237–252, and 260–265). Even when modern natural philosophy started affecting the Greek philosophical thought, physics retained its character as a philosophical consideration of the world *par excellence*. The departure of physics from philosophy seemed to be inconceivable for the Greek speaking scholars of the time.[11] Thus, natural philosophy and metaphysics along with their instrumental supplement, logic, comprised an integrated section in the Greek education of the time.

Let us now come to the absences in which I shall also include the two groups of textbooks that seemed to have a very marginal presence in the above chart. Astronomy (AST) and chemistry (CHE). As to the latter group, it is important to note that throughout the eighteenth century chemistry was totally absent from Greek-speaking education. The three textbooks of chemistry included in our sample appeared in the beginning of the next century and, although they made a systematic attempt to create a space for the new discipline by translating chemical nomenclature into Greek, they still remained a marginal enterprise.[12] The absence of astronomical textbooks is more interesting. Elementary astronomical knowledge was usually included in other groups of textbooks: Mathematical, geographical, and commercial. This kind of astronomical knowledge was exclusively utilitarian and served as a context for the placement of other pieces of knowledge, e.g. navigation instructions. Discussions pertaining to the cosmological problem only rarely appeared within this context and they were never crucial. But same things hold for the

astronomical textbooks themselves. Their small number and their moderate content indicate that observational astronomy and the respective theories concerning the constitution of the universe never comprised an important part of the Greek education of the time. After all, according to the taxonomy of the period, cosmology was one of the three parts of metaphysics (the other two being ontology and psychology) and not a part of astronomy. As a result, the assimilation of the cosmological innovations that emerged during the Scientific Revolution took place almost exclusively in the context of philosophical textbooks, and the various arguments about the validity of the heliocentric system considered, above all, the place of human being in the divine order of the universe.

Other absences are equally interesting. We cannot find, for example, even a single textbook of natural history throughout the whole eighteenth century. The only book of natural history published in Greek was a compilation of natural observations and folk tales about real and imaginary animals, and under no circumstances was it a textbook. It was published in the seventeenth century and circulated widely as a popular reading. What does this absence of natural history indicate, then? Although this is a matter of further investigation, we could risk the working hypothesis that the lack of a collective interest for the representation of natural world reflects the lack of a proper social subject capable of supporting such an enterprise. The landowning class that flourished in medieval Europe and gave birth to the pastoral culture of Renaissance had very little in common with the Greek-speaking elite of the Ottoman Empire. The latter were mostly merchants who traveled along the commercial routes of the Balkans, central Europe and Russia. In the commercial fairs, the big urban centers and the Mediterranean harbors they exchanged their products, usually with other products, and departed for their next destination. Thus, the relationship these people developed with Nature was mediated by the various local merchants and the peasantry who gathered in the markets, while the only ''natural laws'' they needed to observe were the rules of economic transactions between equal subjects (Stoianovich 1960).[13] Under these circumstances, their interest in representing natural world in its own right was minimal. Moreover, the fact that they very rarely left the well-known European and Mediterranean areas in order to travel to more distant countries precluded the development of a – typical to many European cultures – curiosity for the ''other'', namely the unknown and distant Nature that had to be explored and conquered by the human.

Another absence has to do with textbooks in such fields like practical mechanics and experimental physics. Such textbooks circulated widely in central and western Europe during the eighteenth century and many Greek

scholars came across them during their studies in the European universities. However, when they compiled their own textbooks they confined their references only to the findings of their contemporary experimental philosophy, while they left totally aside the experimental method itself. For Greek scholars, experiments were demonstrations intended to motivate students and to convince them for the validity of the qualitative interpretations about the relationships between various phenomena. The heuristic role of experiment and its instrumental use in the quantitative investigation of an external natural world was outside their scope. After all, their world was still a variant of the Aristotelian cosmos and their cognitive enterprise conformed to the epistemological principles of the Aristotelian philosophy. The mere fact that their cosmos was now enriched by the findings of experimental philosophy did not affect its constitution and, accordingly, their epistemological commitments. Thus, the existing philosophical background deemed appropriate for the assimilation of every new knowledge; and the proper context for this knowledge to be placed in were still the textbooks of natural philosophy and not specialized textbooks of experimental physics.

The distribution of scientific textbooks we have so far examined brings to light a quite idiosyncratic feature of the eighteenth-century Greek-speaking education, especially if we take into account the missing parts of the image: On the one hand, Greek education was devoted to the reproduction of the traditional philosophical discourse enriched, in many cases, with the findings of the new natural sciences. The empirical dimension was totally absent from this aspect of education. The textbooks of natural philosophy aimed basically at the assimilation of the new knowledge within the existing philosophical background, while they showed a characteristic indifference toward the experimental and quantitative aspects of the new sciences. In a quite similar way, mathematical textbooks were more interested in displaying the ancient geometrical wisdom rather than laying the foundations of rational mechanics and promoting the idea of a mathematical representation of natural world. At the same time however, Greek education had a strongly empirical aspect. The ''commercial science'' was a crucial area of the intellectual and material life of the emergent Greek society. As a result, whatever had to do with the commercial activity of the Greek-speaking populations of the Balkans was systematically exposed in a big number of textbooks, which besides their educational function were destined to accompany, as handbooks, the future merchant in his everyday transactions. Geographical and historical knowledge was part and parcel of this educational program, but equally important were all those textbooks containing practical financial information, templates of accounting reports, navigation instructions, ship itineraries, applications of practical

arithmetic in commercial transactions, etc. Apparently, the two aspects of Greek education did not aim at the same social groups. However, what is most important from our point of view is that the co-existence of those two aspects produced a framework, which while enabling the assimilation of specific scientific ideas, ruled out the most significant feature of modern science, namely the development of a scientific discourse that would mark the departure of natural philosophy from its traditional, contemplative womb.

3. A Tale of Two Cities

Let us now come to another important issue. Where were the Greek scientific and philosophical textbooks published? The question is important because it helps us highlight the social and intellectual environment that gave birth to these works and supported their spread in the Greek-speaking populations of the Balkans.

Generally speaking, the works we examine in this study were printed in various European cities: Venice, Vienna, Bucharest, Bologna, Jassy, Jena, Constantinople, Leipzig, Paris, Moscow, Trieste, Halle etc. However, the large majority of Greek scientific textbooks published during the eighteenth century (actually 84% of them) were printed in just four cities: Venice, Vienna, Leipzig and Moscow. And most importantly, 75% of them were printed in only two cities, Venice and Vienna. After all, the story of Greek textbooks seems to be ''A Tale Of Two Cities''.

Before we proceed with our examination we should give a necessary clarification concerning a quite common misunderstanding. ''Why were the Greek books printed abroad?'' This is a spontaneous and frequently asked question. What this question fails to take into account is that the word ''abroad'' does not make any sense in the specific historical context. Since at that time a Greek national state had not been established yet – the Greek world being only a widespread network of Greek-speaking communities within and without the Ottoman Empire – Venice, Vienna and other European urban centers were not ''abroad''. On the contrary, they were the seats of active Greek communities, with thriving commercial and intellectual life. Printing business was an integrated part of their broader social and economic activity. In this sense, Greek books were not printed ''abroad'', but within the geographical and cultural limits of the extended network that comprised the Greek society of the time. At the same time, however, striking as it may be, the contribution of the center of this network in the printing activity was very limited. Despite the repeated attempts for the establishment of an official Patriarchical printing house in Constantinople, the number of books, which were actually printed there,

was extremely low. The very few textbooks that were included in this production were basically practical guides aiming to facilitate the transactions of the commercial guild of the city. Neither scientific nor philosophical books were published in Constantinople. This is surely a strong evidence in favor of the hypothesis that the political and religious leadership of the Greek-speaking populations lay separated from the centers of intellectual life of these populations.[14]

However, even when we come to the two cities that comprised the printing centers of the Greek textbooks, interesting differences come up concerning the quantitative distribution of the various works. As it becomes obvious from the graph in Figure 2, in some categories the textbooks printed in Vienna are equal or slightly more than those printed in Venice; in two categories the former are multiple; and only in one category are the numbers inverse. In order to interpret these differences one has to take into account the deep social and political differences between the various parts of the Greek speaking populations.

Venice was the most important Greek printing center since the sixteenth century. The Venetian printing houses served the Greek-speaking intellectual life diligently for a long time, printing a lot of books – from classical works of the ancient authors to liturgical books and paterical texts. This local tradition was reinforced by two factors. Firstly, from the time of Renaissance the printers of the city acquired the know-how of handling the complex Greek alphabet (actually the Greek "complexes" they inherited from manuscript tradition) and the even more complex Greek language. Secondly, from the mid-sixteenth century a lively Greek community was established there and, gradually, it came to occupy an

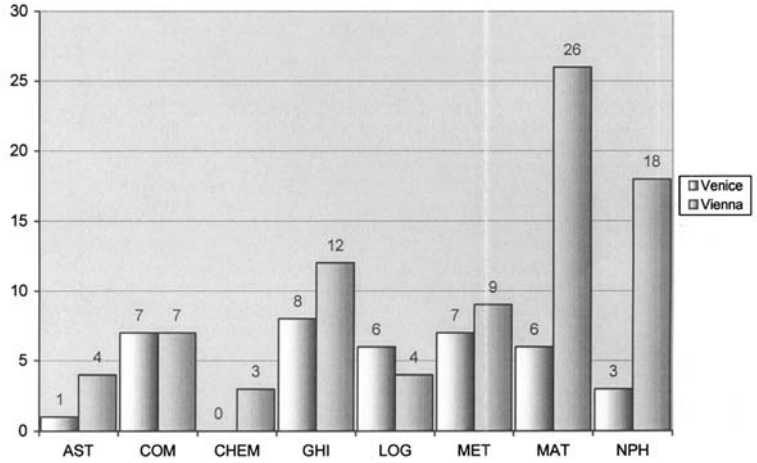

Figure 2.

important position in the economic and political life of the city. These two factors encouraged the emergence of a group of people who specialized in editing, proof-reading, censoring, and printing Greek books. As a result, when the turn from manuscript to printed textbooks started, the first place which served this purpose was Venice (Τσικνάκης 1993, pp. 531–532, 546, 550–551).[15] But the local printing activity was "tradition laden". It is interesting to notice in the above chart that almost none of the textbooks of natural philosophy was printed in Venice. In fact, only three, but the two of them were late editions of Korydaleas' commentaries on Aristotle's *Physica* and *De generatione et corruptione*, while the third, published in 1816, was an extended treatise written by a late advocate of Aristotelian physics, who made an ultimate attempt to protect traditional education from the flood of modern ideas. At the other end we find the case of logic. Contrary to the general tendency, the number of textbooks of logic printed in Venice is larger than the number of textbooks printed in Vienna, although this is partly owing to the publication of a multivolume series in 1804. At any rate, it seems that the local intellectual traditions, as well as the network of political and religious relations favored the publication of certain books while discouraged the publication of others. It goes without saying that the matter involves both a qualitative and a quantitative dimension, which deserve a more detailed examination.

In the case of mathematics and natural philosophy we observe a significant asymmetry. The number of textbooks printed in Vienna is essentially larger than the number of those printed in Venice. The asymmetry pertains to the content of the textbooks, as well. Vienna is the place of publication of a bunch of mathematical and natural philosophical textbooks, which were to a significant extent informed by the achievements of modern science; Venice on the other hand, focused mostly on the traditional philosophical and mathematical knowledge. As in the above-mentioned case of natural philosophy, so in the case of mathematics only six textbooks were published there, half of which were a three-volume series containing Euclid's *Elements* and other ancient and Byzantine authors. Same things hold for chemistry. Notwithstanding the special interest of Venetian publishing houses for medical treatises (due to contiguity of the university of Padua), it seems that the science of chemistry left the intellectual community of the city absolutely indifferent. Thus, in addition to their small number, all Greek chemical textbooks were published in Vienna and none in Venice.

Similar conclusions can be reached concerning the astronomical and the commercial textbooks. In addition to the marginal presence of astronomy in Greek education, all astronomical textbooks were printed in Vienna with the unique exception of an early eighteenth-century treatise based on

Proclus' *Sphere*, which was published in Venice. The commercial textbooks, on the other hand, display a deceiving equality, at first sight. The truth is, though, that this equality is due to the fact that a multi-volume commercial encyclopedia was published in Venice. Otherwise, most of the commercial manuals were printed in Vienna. The situation is more balanced in the cases of History-Geography and Metaphysics. In the former case, the numbers of textbooks are comparable. What is interesting, however, is that the asymmetry in the content of the works is still maintained. Historical and geographical textbooks printed in Venice are mostly multivolume series, drawing especially upon ancient sources and promoting the cosmological model of geocentric system. Those printed in Vienna are relatively small treatises that pay special attention to keep up with the newest developments in the science of Geography and create an appropriate model for the teaching of this science. Finally, in the case of metaphysics not only numbers but also the contents are very close. Both in Venice and in Vienna extensive treatises on contemporary metaphysics were published in order to be used as teaching material in the higher schools of the Greek-speaking communities. What adds a particular tint to this resemblance is the fact that all textbooks of metaphysics were published in both cities between 1804 and 1820.

What do all these differences indicate? In order to contextualize the present analysis, it would be very helpful to start by placing the publishing activity in its specific timeframe.

What the graph in Figure 3 reveals is that the publishing activity in Vienna was actually a boom, while the respective activity in Venice (especially if we take into account the increase of the total number of printed

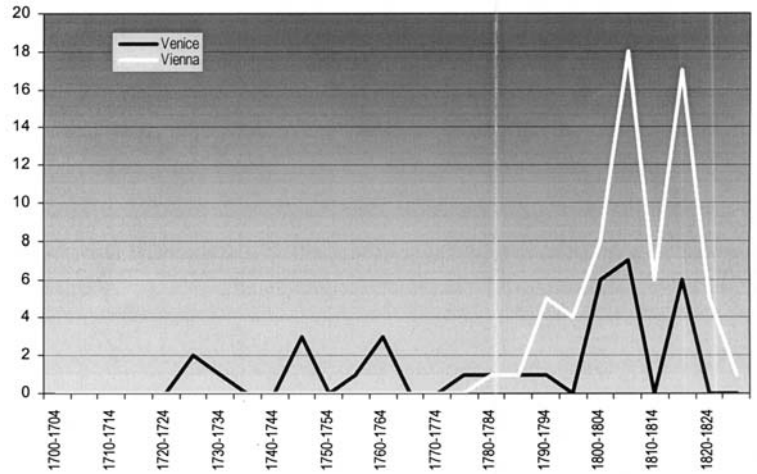

Figure 3.

books towards the end of the eighteenth century) spanned a longer period without manifesting important elevations. It is obvious that something happened, or more precisely, something changed during the late eighteenth century. True that even at that time most of the Greek-speaking scholars still used to go for higher studies to Venice and Padua. On the other hand, although a fairly big number of Greek speaking scholars had visited Vienna, none of them studied at the university of the city (Patiniotis 2003, pp. 60–61). What, then, makes Vienna the place of publication of the most ''advanced'' Greek textbooks of the time? The answer must lie in the combination of two factors: A centripetal force attracting towards Vienna and a centrifugal force repelling from Venice.

The Greek community of Venice was an old community originated from the ''Fraternity of Saint Nicolas'' in the mid-sixteenth century. The members of this community were Greek speaking merchants and scholars coming from the various acquisitions of the Venetian Republic in the Ionian and Aegean Islands. They maintained a loose relationship with the Ecumenical Patriarchate (Venice was the seat of the archdiocese of Philadelphia) but they were also in a continuous negotiation with the Catholic Church about doctrinal and ritual matters. The conversion of important members of the local society to Catholicism was a quite frequent phenomenon indicating the fluid cultural borders that separated the community from the rest of the Venetian society (Τσικνάκης 1993, pp. 531–532). Moreover, such phenomena, as well as the successful careers of many Greek scholars in Venetian administration and education indicated the tendency of the Greek community to be integrated within the cultural context of the Venetian Republic. The Greek community of Venice was a kind of *diaspora* as opposed to the Greek communities of Central Europe, which were mostly *communities of immigrants*. Interestingly enough, this particular feature instead of increasing the distance of the community from the Ecumenical Patriarchate brought about a more tight (but tense) political bond between the two. Especially from the point of view of the Ecumenical Patriarchate, the Venetian community was a sphere of influence that under no circumstances should be lost. Its strategic positioning in the geographical heart of Catholicism and its privileged relationship with the antipapal Venetian state made it an invaluable diplomatic channel and a potential weapon in the debate between the two Churches. The mid-eighteenth century was a period during which the plots and the antagonism between the various participating powers culminated. It seems, thus, that under such circumstances, a drastic change in the intellectual atmosphere of the city was not particularly desirable. Neither the local Greek-speaking scholars nor the Venetian authorities (represented in publishing matters by the corps of ''riformatori'') were willing to affect the sensitive balance of

power (Πανοπούλου 1993, pp. 288–289, 292–293 and Τσικνάκης 1993, pp. 546–550). The decline of the Venetian Republic during the eighteenth century contributed even more to this stagnation. Venice, gradually, ceased to appeal the scholars of the time. This becomes apparent, among others, by the turn of the stream of Greek speaking students, who used to crowd the university of Padua, towards the German Universities of Leipzig, Halle and Jena (Patiniotis 2003).

The publication of textbooks was drastically affected by this situation. For the young Greek-speaking scholars who aimed at the promotion of their distinctive intellectual profile through the publication of scientifically informed didactic manuals, Venice gradually ceased to be the first choice. The turn to Vienna was made possible by the fact that, towards the end of the eighteenth century, people who were willing to fund such publications were mostly connected with the central European commercial network based in Vienna and many of them had already been established there.

The Greek community of Vienna was quite different from the Greek community of Venice. It was a fairly new and lively community, consisted mainly of merchants and tradesmen who started immigrating there massively from the mid-eighteenth century. As I have already mentioned, an important difference of this Greek-speaking population from the community of Venice was that it was a population of immigrants. They were mostly Orthodox Christians originated in Epirus and Macedonia, who maintained strong cultural and economic ties with their homelands. In the course of time, these populations came to develop a thriving commercial activity, since they functioned as intermediaries between the Ottoman Empire and the Central European economic centers. Eventually, they dominated over the commercial routes and they built a continuous chain of Greek speaking communities connecting Southwestern Balkans with Vienna (Cicanci 1986 and Λουκάτος 1961). Along with their economic thriving they gradually came to assert their distinctive cultural and political profile within the broader context of the emergent Greek society. Intellectual life and especially education comprised a field where these pursuits were projected *par excellence*.

Aiming at the legitimization of a political center in the geographical area of their origin, that would represent their social and economic pursuits, they encouraged by all means the creation of an active intellectual life and promoted a quasi-modernistic profile for the local education. It was along this path that they met with the new generation of scholars, who strove to assert their own distinctive intellectual profile (Patiniotis 2003, pp. 61–62). The elaboration of a new philosophical discourse, capable of keeping up with the scientific developments of European thought, but without breaking up with the local intellectual traditions became an important stake for all sides

involved. Thus, a network of patronage relationships was created that attracted many scholars to Vienna and encouraged the publication of their works, in order for them to be distributed to various schools of the Southwestern Balkans, upgrading the social status both of their authors and their patrons. In this sense, the character of printing activity in Vienna differed significantly from that of Venice. The scholars here not only secured the necessary funds for the publication of their works but they also had the chance to take advantage of the patronage network in order to find a job as teachers in one of the rich communities of Southwestern Balkans. At the same time, the socioeconomic background and the ideological pursuits of the merchants helped the gradual formation of an intellectual space, which by being distant from the traditional centers of Greek intellectual life enabled the establishment of new ideas that would have been unaccepted in other environments. The content and the quantity of philosophical and scientific textbooks printed in Vienna was a safe indication of the new situation.

4. Conclusions: Textbooks *as* Crossroads

The hybrid quantitative–qualitative analysis I employed in this study gives us some initial hints about the character and the function of scientific and philosophical textbooks in the Greek-speaking education of the eighteenth century. Many important aspects of the subject have been left aside, though. The role of audiences, the pedagogical theories employed in the writing of textbooks, and the usage of textbooks in real terms are some of them. However, the cumulative processing of a number of general characteristics of the scientific and philosophical textbooks of the time brings forth some important aspects of the topic. Although scientific education is a product of the nineteenth century, Greek education is one of those cases where scientific textbooks had a sound presence even during the eighteenth century. But, interestingly enough, this presence did not contribute in the formation of the respective scientific disciplines. Given the particular character of Greek education as the *locus* of intellectual life in general, and as the field where the social and political endeavors of various Greek-speaking populations were projected and pursued, Greek scientific textbooks found themselves at the crossroads. Although they manifested an authoritative character they scarcely reflected the established knowledge of a specific field; although they made explicit their didactic orientation they barely promoted the unification of scientific teaching under a uniform program; although they aimed at wide audiences they represented the intellectual and ideological priorities of diversified social groups; although they were used as teaching material they were meant to affect the balance of power between the established authorities of the time.[16]

This brings up a plausible question: How do scientific textbooks function in diverse historical contexts? Are they mediators between the production and the re-production of science; or are they intermediaries between science and society? Strange as it may sound, the Greek case indicates that scientific textbooks played an important role *before and during* the formation of modern Greek society and *well before* the establishment of distinctive scientific disciplines in Greek education. Hence, it is likely that the study of scientific textbooks in the periphery of Europe can help us broaden the image by bringing in new dimensions of an otherwise underestimated subject.

5. Notes

[1] Webster's Third New International® Dictionary, Unabridged, Copyright© 1993 Merriam-Webster, Inc.

[2] Online version of the *Oxford English Dictionary*, 3rd ed. (March 2002).

[3] On the same issue see also an interesting discussion, especially focusing on chemistry in Brooke (2000).

[4] I am, of course, aware of the anachronistic meaning of the term. However, the more or less explicit distinction between "original" scientific production and the dissemination of scientific ideas is a quite common stereotype in reception studies. As it will become clear in what follows, my purpose here is to reject this distinction by placing the Greek intellectual life in an entirely different historiographic context.

[5] Most characteristically, in secondary education historical textbooks the names of the protagonists of these attempts appear under the rubric "Masters of the Nation" [= *Διδάσκαλοι του Γένους*].

[6] For a recent exemplification of this perception see Lértora Mendoza et al. (1999).

[7] On the use of biological metaphors in the study of Aristotelianism see Grant (1987) and Sperber (1996). See, also, the comments on the same issue in Des Chene (2000), p. 145.

[8] For a discussion especially of the latter issue see Roudometof (1998) and *Κατσιαρδή*-Hering (1995).

[9] The original material this inquiry is based upon consists of 134 volumes of scientific and philosophical textbooks, written in Greek and published between 1710 and 1820. In the taxonomy that follows it is also taken into account that many of them refer to more than one scientific subjects. The taxonomy itself is based on the grouping of textbooks according to their content. A further historical grounding supporting the specific classification is offered by the structure of the eighteenth-century Greek-speaking education: The curricula of the most important schools of the time included the disciplines employed in this classification as distinct courses delivered in various levels of higher education. See, for example, the curriculum of "Hegemonical Academy of Bucharest" composed in 1707 by a leading scholar of the time, Chrysanthos Notaras. According to the guidelines suggested there, the students should be introduced to philosophy through successive but relatively independent courses of logic, natural philosophy and, finally, metaphysics (Hurmuzaki 1915–1917, pp. 392–394).

[10] For an interesting comparison with another group of intellectuals of the same period see the description of *estrangeirados* in the paper of Carneiro, Diogo & Simões, "Communicating the new chemistry in 18th century Portugal..." in this volume.

[11] An analysis of the features of philosophical and scientific discourse in the context of eighteenth-century Greek education in Dialetis et al. (1999), Γαβρόγλου (1995), and Γαβρόγλου & *Πατηνιώτης* (1997).

[12] Medical treatises are not included in the present study. Thus, one could plausibly wonder whether this absence affects the distribution of disciplines depicted in Figure 1. It is a well known fact, for

example, that in many cases chemical treatises or at least chemical subjects were incorporated into textbooks intended for the training of students of medicine or of pharmacy. (For an extended discussion on this topic see three other papers of this volume: Carneiro, Diogo & Simões, "Communicating the new chemistry in 18th century Portugal..."; García Belmar & Bertomeu Sánchez, "New and old chemistry in late 18th century Spain..."; Seligardi, "The followers of Lavoisier's followers ...".) This does not hold for the Greek case, though, basically for two reasons: First and foremost, because during the years preceding the war of independence medical education was totally absent from the curricula of Greek schools. People who wished to study medicine used to go to the university of Padua and, later in the eighteenth century, to some distinguished German universities (Halle, Jena, etc.). Most of these people pursued careers as medical doctors and thus the medical knowledge aquired in the European universities was not reproduced as such in the Greek intellectual milleu. Secondly, because the greatest number of medical treatises (printed or manuscript) that circulated during this period were practical guides intented to help people who had not access to (or distrusted) authorized medical treatment to deal with the most common diseases of their time. The biggest part of this group were the so called "medico-philosophical" treatises containing prescriptions both of medical and (mainly) of popular origin, as well as a body of knowledge drawing upon ancient authors like Hippocrates and Galen (Καράς 1994, pp. 14–16). It is true that in the sub-group of "medico-philosophical" treatises one might detect the occasional presence of some elements of chemical and botanical knowledge, but the purpose of this knowledge was exclusively utilitarian focusing on curative results rather than on the empirical investigation of natural substances themselves. For these reasons, medical books cannot be included in a paper devoted to Greek scientific textbooks, but they are surely worthy of being studied as an excellent example of the encounter between the scholarly and the popular cultures of the time.

[13] For a discussion on the diverse perceptions of space in Medieval and early modern Europe see Bergier (2000).

[14] Concerning the limitations imposed on printing activity by a traditional religious environment see also Gouzevitch's paper in this volume "The editorial policy as a mirror of petrine reforms...".

[15] See also the comprehensive study of G. Veloudis on the Venetian printing house of the Glikis family (Veloudis 1974).

[16] One might plausibly assume that the conclusions of the present study are biased by the fact that I exclusively focused on printed textbooks and left aside the huge manuscript tradition that prevailed in Greek-speaking education throughout the seventeenth and the greatest part of the eighteenth centuries. In truth, my project included too a section devoted to manuscript tradition, but it was left out of the present paper due to space limits. The outcomes of that section not only are in agreement with the general conclusions drawn here but they also offer additional arguments in favor of the speculative character of Greek education. Another important issue that springs from this (ommited) section relates to the fact that most Greek scientific textbooks were printed between 1770 and 1820, while the same texts in manuscript form had been extensively used for educational purposes throughout the previous decades and, in some important cases, even during the previous two centuries. Thus, what really changes after 1770 is not the character of scientific textbooks but the proportion of printed textbooks with respect to manuscripts. The interpretation of this turn is an issue of further investigation that might be perfectly combined with the exploration of the other questions that were left outside the scope of the present paper.

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