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Historical Studies on the Transmission, Adoption and Adaptation of Knowledge

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Eclecticism and Appropriation of the New Scientific Methods by the Greek-Speaking Scholars in the Ottoman Empire

Manolis Patiniotis

Implicitly or explicitly, a great deal of recent historiography of science takes the distinction between scientific centers and scientific peripheries as granted. Historians who inquire into the emergence of modern science primarily focus on areas and events that gave birth to what we now consider "original" science, and confine the rest of the story to a more or less straightforward process of distribution of the sciences to areas which did not participate in the formation of the "original" theories and practices. Due to the lack of local innovation, those areas are described as importers of "new products, new technologies, new ideas" which emanated from the centers and were transferred to the periphery by means of migration.[1]

Usually, the story goes as follows. Peripheries were conquered by the sciences thanks to the self-evident explanatory power of their methods and the obvious social usefulness of their findings. The scholars of the periphery, actually unable to fully assimilate the new methodological developments, contented themselves with simply copying and mechanically reproducing the original research. Indeed, many of them were at pains to compromise their religious and scholastic convictions with the spirit of modernity that started emerging in their local social contexts. As a result, they picked up and combined ideas and practices they considered important for upgrading their intellectual profile, but their adherence to the contemplative dimension of the philosophical discourse and the rejection of experimental and mathematical methods in natural philosophy bear witness to their inability to unequivocally embrace the dynamics of modern science.

The standpoint taken in this paper is different. First and foremost, it aims at problematizing the notions of scientific center and scientific periphery. Instead of

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[1] P. Selwyn, "Some Thoughts on Cores and Peripheries," in D. Seers, B. Schaffer and M. L. Kiljumen, eds., *Underdeveloped Europe: Studies in Core-Periphery Relations*. Hassocks: Harvester Press, 1979, pp. 37–39.

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examining the spread of the sciences from their birthplaces to a more or less receptive periphery, one might examine how the very notions of scientific center and scientific periphery resulted from the fact that a certain way of philosophizing about Nature dominated over a variety of other such ways.[2] In order to investigate this process one should examine in strictly historical terms the social and intellectual status of these other ways of philosophizing and the means by which they were displaced by the sciences. To what extent did pre-scientific perceptions of Nature correspond to the needs of the various local societies? Which were the factors that stimulated the change of perspective and what kind of social or intellectual demands did they serve? Did all places and all scholars react in the same way to the advent of modern scientific discourse? Did they unconditionally subscribe to its truth and to its social usefulness? Beyond the superficial level of acceptance or rejection, which were the attitudes of the various groups of local scholars towards the attainments of the "moderns"? How did they appreciate the new ways of philosophizing about Nature? And, most importantly, which were the characteristics of the philosophical discourses they articulated in order to accommodate the new ideas and practices in their intellectual universe?

The case study presented in this paper addresses, of course, only some aspects of the above questions. In what follows I will be dealing with eighteenth-century Greek intellectual life and I will try to show how a change of perspective may help us reconsider the relation of a local culture with the emergent scientific spirit of modern times.

Historiographical Remarks

In the eighteenth century, the greatest part of the Greek Orthodox populations lived in the territories of the Ottoman Empire. Due to the geopolitical fragmentation of the Empire, however, these populations lacked the continuity that would allow for a coherent organization of their social activities. What gradually came to be modern Greek society at that time basically consisted of a network of communities where Greek Orthodox populations developed various social, economic and political activities.[3] Besides the Balkans, the Greek

[2] K. Gavroglu, M. Patiniotis, F. Papanelopoulou, A. Simões, A. Carneiro, M. P. Diogo, J. R. Bertomeu Sánchez, A. García Belmar, A. Nieto-Galan, "Science and Technology in the European Periphery: Some Historiographical Reflections," *History of Science,* xlvi (2008): 153–175.

[3] Γ. Τόλιας, "Η Συγκρότηση του Ελληνικού Χώρου 1770–1821 [The Construction of the Greek Space, 1770–1821]," in Β. Παναγιωτόπουλος, ed., *Ιστορία του Νέου Ελληνισμού, 1770–2000 [History of Modern Hellenism, 1770–2000],* vol. 1. Athens: Ελληνικά Γράμματα 2003, pp. 59–74; Γ. Τόλιας, "Ιερός, Κοσμικός και Εθνικός *χώρος* στην Ελληνική Γεωγραφική Φιλοσοφία κατά τον 18ο αιώνα [Divine, Secular and National Space in Greek Geographical Philosophy of the 18th century]," in *Η Επιστημονική Σκέψη στον Ελληνικό Χώρο, 18ος-19ος αι [The Scientific Thought in the Greek Space, 18th–19th Centuries].* Athens: Τροχαλία, 1998, pp. 147–172; M. Mazower, *The Balkans*. London: Weidenfeld & Nicolson, 2000.

communities were dispersed along the main commercial routes of Eastern Europe, and within the most important cities of the Northern Italian peninsula, Habsburg Empire, and the German states.[4] As indicated by the term "Greek Orthodox", the elements that played the most prominent role in unifying these populations were fundamentally cultural and ideological. Christian Orthodox faith and Greek-speaking education managed to provide a quasi common cultural identity to such different social groups as the Phanariots of Istanbul, the Vlach merchants of Epirus, the Greek fraternity of Venice, and the administrative elite of the semi-autonomous Danubian regions. Both Christian faith and Greek-speaking education were under the jurisdiction of the same authority, the Ecumenical Patriarchate of Constantinople; but in the light of the eighteenth-century developments both were also heavily colored by the particularities of the various local communities. This was especially the case with education because, due to the lack of other (state) institutions, Greek-speaking education became the ground upon which all negotiations and collective pursuits concerning the emergent society's identity converged. At the same time, however, education was the context wherein the local intellectual traditions came in contact with eighteenth-century natural philosophy, and this interweaving is of special importance to our story.

The second half of the eighteenth and the first two decades of the nineteenth century witnessed the publication of many scientific and philosophical books aiming to cross-fertilize Greek intellectual life with the achievements of the European Enlightenment. The protagonists of this initiative were almost exclusively teachers. But at that time the profile of teacher was gradually redefined. The image of the teacher-priest whose work was a religious mission gave way to another kind of scholar: The great majority of these teachers were also priests, but their educational agenda became more secular and their actual work tended to be more *in tandem* with their contemporary philosophy. The scholastic teaching of the patristic literature and of ancient Greek philosophy, gave way to a curriculum determined through negotiations with the communities which had established and catered for the schools. The fact that teaching began to serve the social, political and ideological agendas of the local communities strengthened the relative autonomy of the scholars from the Patriarchate and reinforced their role as independent thinkers.

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[4] Ο. Κατσιαρδή-Hering, "Η Ελληνική Διασπορά [Greek Diaspora]," in Β. Παναγιωτόπουλος ed., *Ιστορία του Νέου Ελληνισμού, 1770–2000 [History of Modern Hellenism, 1770–2000]*. vol. 1. Athens: Ελληνικά Γράμματα, 2003, pp. 87–112; Ι. Κ. Χασιώτης, *Επισκόπηση της Ιστορίας της Νεοελληνικής Διασποράς* [A Survey of the History of the Modern Greek Diaspora]. Thessaloniki: Βάνιας, 1993; Απ. Βακαλόπουλος, "Ο Ελληνισμός της Διασποράς" [Hellenism of Diaspora] in *Ιστορία του Ελληνικού Έθνους [History of Greek Nation]*, vol. 11, *Ο Ελληνισμός υπό ξένη κυριαρχία (περίοδος 1669–1821) Τουρκοκρατία - Λατινοκρατία [Hellenism under foreign dominance (1669–1821) The Turkish and Latin rule]*. Athens: Εκδοτική Αθηνών, 1975, pp. 231–243; T. Stoianovich, "The Conquering Balkan Orthodox Merchant," *Journal of Economic History*, XX (1960): 234–313.

Thus, from the outset of the eighteenth century, Greek-speaking scholars started moving all over Europe, and Italy ceased to be the almost exclusive place they would go for studies. They were 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 and were appointed teachers in the local schools, 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 their upgraded authority. 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 attainments of European thought were creatively combined with elements of the local cultural and philosophical traditions. Such undertakings did not, of course, serve a homogeneous educational agenda neither did they gain the general consent of the local authorities; they were, however, in tune with the aspirations of the most dynamic social groups who counted upon these scholars to shape their distinctive cultural and political profile. But the constituents of this profile were still under negotiation. As a result, the Greek-speaking scholars of the time found themselves at the intersection of multiple cultural traditions and social interests. The textbooks they wrote and the philosophical discourses they elaborated (primarily for the use of their students) reflected exactly this ambiguous situation.[5]

Starting with the fact that, throughout this long and intricate period, philosophy and the sciences were exclusively practiced in the context of education, many historians studying the introduction of the new scientific and philosophical ideas into the Greek intellectual life arrive at a rather trite conclusion: 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. As a matter of fact, most of the Greek works of the time were either translations or "multilayer compilations", where pieces of knowledge and methodological declarations representing Enlightenment science mingled with the traditional philosophical discourse and moral instructions for achieving "true felicity".[6] The scholars themselves overtly admitted this attitude in the titles of their works: Expressions implying the selection from the whole range of the available wisdom – "ancient and modern" – occur very

[5] M. Patiniotis, "Scientific Travels of the Greek Scholars in the 18th Century," in A. Simões, A. Carneiro, M. P. Diogo, eds., *Travels of Learning. A Geography of Science in Europe*. Dordrecht: Kluwer Academic Publishers, 2003, pp. 49–77; M. Patiniotis, "Textbooks at the Crossroads: Scientific and Philosophical Textbooks in 18th century Greek Education," *Science and Education,* 15 (2006): 801–822.

[6] Π. Κονδύλης, *Ο Νεοελληνικός Διαφωτισμός: Οι φιλοσοφικές ιδέες [Neohellenic Enlightenment: The Philosophical Ideas]*. Athens: Θεμέλιο, 1988, p. 10.

often in the titles of the Greek scientific and philosophical textbooks. In this respect, the major intellectual task of the authors seemed not so much to be the acquisition of new knowledge through the impartial empirical study of Nature, as the use of already acquired knowledge to upgrade the philosophical traditions of their local cultural context.

Indeed, one issue that often puzzles historians about the intellectual disposition of the eighteenth-century Greek-speaking scholars is the latter's attitude towards experimental philosophy as it was practiced by their contemporary European natural philosophers. Greek philosophical and scientific textbooks contain a great deal of references either to specific experiments or to the value of experimental study of Nature in general. Beyond the verbal level, however, we have no evidence that Greek-speaking scholars conducted actual experiments. They mentioned experiments made by others, they commented on remarkable observations taken in European laboratories and observatories, they argued for the acquisition of experimental devices for the use of their pupils, and they declared their adherence to the new empirical method of investigation as opposed to the infertile scholastic explanations; but, as far as we know, they had never conducted actual experiments. At most (and according to scarce evidence) they organized some experimental demonstrations for the elucidation of their students or maybe of a wider learned public. The heuristic role of experiment and its instrumental use in the quantitative investigation of an external natural world was outside their scope.[7]

In fact, the ambiguous relationship of Greek-speaking scholars with experimental philosophy forms part of a broader discussion concerning the kind of philosophical discourse about Nature developed by these scholars. According to most historians, eighteenth-century Greek science altogether lacked originality and creativity. It was a vague reflection of the developments that took place in the centers of the Enlightenment, used in the Greek context almost exclusively for educational and ideological purposes. However, 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 is considered a heroic endeavor. Thus, historians elaborate an 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.[8] The fact, however, that specific scholars assimilated and spread the new ideas in the

[7] Χ. Ξενάκης, "Το Πείραμα ως Επιστημονική και Φιλοσοφική Μέθοδος Γνώσης [Experiment as Scientific and Philosophical Method of Knowledge]," in Γ. Καράς ed., *Ιστορία και Φιλοσοφία των Επιστημών στον Ελληνικό Χώρο (17ος–19ος αι.) [History and Philosophy of the Sciences in the Greek Space (17th–19th Centuries)]*. Athens: Μεταίχμιο, 2003, pp. 514–555 (see pp. 518–520, 535–536 (see. n. 713), 552–555).

[8] Ν. Ψημμένος, ed., *Η Ελληνική Φιλοσοφία από το 1453 ως το 1821 [Greek Philosophy from 1453 to 1821]*, vol. 1, *Η κυριαρχία του Αριστοτελισμού [The Dominance of Aristotelianism]*. Athens: Γνώση, 1988, p. 31.

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.[9]

The tacit premise behind such considerations is that 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 decisively marked 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 properly appreciate the pedagogical and ideological consequences of their work. In this respect, a most characteristic aspect of the historiography holding such views is that it persistently links the introduction of the sciences with the enlightenment of the "nation" in anticipation of national emancipation.[10]

Apparently, this historiographical approach takes the distinction between scientific centers and scientific peripheries – production and distribution of science – as granted, without examining the particular historical circumstances of its establishment. Our intention in what follows is to reconsider this approach. But before doing so we should briefly comment on an important issue. The mere fact that the Greek scholars directed their scientific and philosophical considerations towards educational purposes does not necessarily bear witness to the low level of their intellectual production neither does it prove that the only role they assumed for themselves was that of the popularizer or propagandist of science. One should very seriously take into account that for the greatest part of the eighteenth century, education and knowledge production were still inseparable. Notwithstanding the establishment of scientific societies and the spread of experimental philosophy, the practice of modern science remained mostly in the private sphere and whenever it was practiced in public it was either for popularization purposes or for a strictly limited audience of experts. Numerically speaking, the overwhelming number of professional eighteenth-century philosophers were university professors who taught philosophy according to the inherited scholastic models.[11] And these models demanded that the acquisition of knowledge should be pursued by means of literary devices contrived and applied in front of one's students or written and

[9] G. P. Henderson, *The Revival of Greek Thought 1620–1830*. Albany, NY: State University of New York Press, 1970, introduction.

[10] Γ. Καράς, "Η Επιστημονική σκέψη κατά την Περίοδο της Νεοελληνικής Αναγέννησης [Scientific Thought during the Neohellenic Revival]," in Γ. Καράς ed., *Ιστορία και Φιλοσοφία των Επιστημών στον Ελληνικό Χώρο (17ος–19ος αι.) [History and Philosophy of the Sciences in the Greek Space (17th–19th Centuries)]*. Athens: Μεταίχμιο, 2003, pp. 45–101 (see pp. 48 (esp. n. 9), 49–50, 74).

[11] C. Lüthy, "What to do with Seventeenth-Century Natural Philosophy? A Taxonomic Problem," *Perspectives on Science,* 8 (2000): 164–195 (see pp. 171–172).

diligently analyzed for the sake of one's students. The pursuit of knowledge, in other words, was part and parcel of the teaching process and vice versa. Therefore, the only conclusion one could draw from the educational orientation of the Greek-speaking scholars is that they conformed to the general disposition of the time.

L'Éclectism

Let us, now, make a short detour that will take us to a seemingly irrelevant issue. In the fifth volume of the *Encyclopédie*, Denis Diderot (1713–1784) published one of his many influential essays. It is a long account on the history of *Éclectism*, a philosophical trend initiated in the ancient era by some of the most prominent philosophers.[12] Diderot follows the subsequent generations of philosophers who represented *l'Éclectism* throughout centuries, discusses the development of various sets of principles and expresses his ambiguous sentiments about the achievements of particular thinkers. What is important to our discussion, however, is not so much the historical account itself, as the programmatic ideas Diderot articulated as a general context for his narrative.

The definition he gives for *l'Éclectism* is not historical, as one might expect. It refers to contemporary philosophy and stresses the fact that eclecticism is a philosophical attitude rather than a specific belief or system of doctrines. It is characterized by impartiality and insistence on selecting from other philosophical systems only those ideas that are in agreement with reason and experience. The purpose of this selection is not the building of a new system or the rescuing of an old one, which falls apart; in fact this is exactly what syncretism tries to achieve by means of loans from every available source, leading to grotesque multicolor constructions. Quite the contrary, eclecticism is an active intellectual stance aiming at philosophical self-realization. The people who practice it borrow from the various existing systems because they believe that everybody should first get acquainted with the existing wisdom and then try to enrich it with new principles and findings. Thus, they do justice to whatever other people or systems of knowledge have contributed to philosophy, but they are aware that all systems with no exception have, in the course of time, fallen apart. In search of a new land where philosophy will be practiced beyond the limitations and the distortions of specific sects they set reason and experience as the ultimate criteria either for the selection and compilation of existing philosophical doctrines or for the suggestion of new

[12] D. Diderot and J. Le Rond d'Alembert, eds., *Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers,* vol. 5, *Discussion-Esquinancie. Par une société de gens de lettres; mis en ordre et publié par M. Diderot,… et quant à la partie mathématique, par M. d'Alembert*. Paris: Briasson, David, Le Breton, Faulche, 1755, pp. 270–293.

ones. In either case, philosophizing in one's own means is what best expresses the eclectic way.

The greatest philosophers in history had always been eclectic. Their followers, however, failing to share the originality and the intellectual independence of their teachers confined themselves to sectarian systems which do not serve anymore the progress of philosophy. In modern times, people like Giordano Bruno (1548–1600), Girolamo Cardano (1501–1576), Francis Bacon (1561–1626), Thommaso Campanella (1568–1639), Thomas Hobbes (1588–1679), René Descartes (1596–1650), Gottfried Wilhelm Leibnitz (1646–1716), Christian Thomasius (1655–1728), Andreas Rudigerus (1673–1731), Johann Jacob Syrbius (1674–1738), Jean Leclerc (1657–1736), Nicolas Malebranche (1638–1715) gave new impetus to eclecticism. To take up Diderot's metaphor, systematic eclecticism tries to build the new edifice of philosophy using stones spread on the ground from the collapse of the old philosophical systems. Soon, though, modern philosophers realized that many stones were unfit for their purposes and even more were missing. Thus, they started looking for new material to fulfill their mission. They searched into the depths of the earth, in the waters and in the atmosphere. This quest (along with its methodological developments) initiated *l'éclectism expérimentale*, which aims at accumulating as much new material as possible for the future building of new philosophy.[13] It is in this sense that Diderot considers Francis Bacon, actually, "le fondateur de l'*Eclectisme* moderne".[14] There are two kinds of eclecticism, though. Experimental eclecticism is occupied with natural investigation, without, for the time being, venturing into major theoretical syntheses. The other kind is *l'éclectism systématique*, which places emphasis on the selection and the combination of truths, either those recently unearthed or those originating in the philosophical systems of the past. Reasoning and cognitive manipulation are crucial for this kind of eclecticism, as it spends most of its time and effort in examining all the possible combinations among the available materials. It is a time-consuming and, actually, inconclusive process but it results from the persuasion that it is already possible to start erecting at least some parts of philosophy's edifice, even though this may overstretch the resources. Thus, concluding his programmatic contemplations, Diderot states:

> On voit qu'il y a deux sortes d'*Eclectisme*; l'un expérimental, qui consiste à rassembler les vérités connues & les faits donnés, & à en augmenter le nombre par l'étude de la nature; l'autre systématique, qui s'occupe à comparer entr'elles les vérités connues & à combiner les faits donnés, pour en tirer ou l'explication d'un phénomene, ou l'idée d'une expérience. L'*Eclectisme* expérimental est le partage des hommes laborieux, l'*Eclectisme* systématique est celui des hommes de génie; celui qui les réunira, verra son nom placé entre les noms de Démocrite, d'Aristote & de Bacon.[15]

[13] Ibid., pp. 283–284.

[14] Ibid., p. 271.

[15] Ibid., p. 284.

On Defining Science

Let us now turn back to Greek intellectual life and try to contemplate on some key-features of eighteenth-century natural philosophy. The first of these features relates to the fact that almost all major eighteenth-century Greek-speaking scholars, who had dealt with natural philosophy, had also published at least one book on logic and or metaphysics.[16] Most European scholars who placed themselves in the context of the new natural philosophy adopted more and more a discourse built around experimental philosophy and mathematics, and one might argue that the adherence of Greek-speaking scholars to the traditional philosophical discourse depicts their inability to assimilate the new methodological and philosophical developments of the Enlightenment. The point, however, is that the content of their works on logic and metaphysics was *in tandem* with these developments: Overt support to empirical research of Nature, denunciation of the fruitless scholastic methods, re-definition of the principles of logic on the basis of recent philosophical discussions, incorporation of the scientific findings into the metaphysical discourse, re-arrangement of the traditional fields of metaphysical contemplation according to the emerging disciplines of modern science. Therefore, the conclusion one could draw from the adherence of Greek-speaking scholars to the traditional form of philosophical discourse is not about their support or rejection of the new natural philosophy, but about the way they perceived their role in the new context. In this respect, if one examines in detail their compilations and translations it becomes quite clear that their main concern was to secure the unity of philosophy. Being aware of the new methods of natural investigation, of important findings and theories that subverted the received world-image, and of the limits of traditional philosophy's speculative character they were willing to embrace all these developments, but only as long as they would not sacrifice the universal character of philosophy. Consequently, the reason why these people considered it important to "frame" their scientific contribution with metaphysical and logical works was their deep conviction that even this new and revolutionary kind of knowledge was apt to comprise part of an integrated

[16] Βενιαμίν Λέσβιος, *Στοιχεία της Μεταφυσικής [Elements of Metaphysics]*. Vienna, 1820; Ε. Βούλγαρης, *Η Λογική εκ παλαιών τε και νεωτέρων [Logic, from ancient and modern sources]*. Leipzig, 1766; Ε. Βούλγαρης, *Στοιχεία της Μεταφυσικής [Elements of Metaphysics]*, 3 vols. Venice, 1805a; Κ. Κούμας, *Σύνοψις της ιστορίας της φιλοσοφίας [An Abridged History of Philosophy]*. Vienna, 1818a; Κ. Κούμας, *Σύνταγμα φιλοσοφίας [Constitution of Philosophy]*, 4 vols. Vienna, 1818b; Γ. Κωνσταντάς, *Στοιχεία της Λογικής, Μεταφυσικής και Ηθικής [Elements of Logic, Metaphysics and Moral Philosophy]*, 4 vols. Venice, 1804; Ι. Μοισιόδαξ, *Ηθική Φιλοσοφία [Moral Philosophy]*, 2 vols. Venice, 1761–1762; Χ. Παμπλέκης, *Περί Φιλοσόφου, Φιλοσοφίας... [On Philosophers, Philosophy…]* Vienna, 1786; Δ. Φιλιππίδης, *Η Λογική παρά του Κονδιλλιάκ* [*Logic by Condillac*]. Vienna 1801; Α. Ψαλίδας, *Αληθής Ευδαιμονία [True Felicity]*. Vienna, 1791.

synthesis, which would maintain the qualitative features of traditional philosophical discourse.[17]

The second feature of Greek-speaking scholars' scientific activity refers to the *subject* of this activity. Matter is the unshakable background upon which they tried to organize all available knowledge. Historians of the Scientific Revolution have long ago agreed that the metaphysical category of matter was one of the first notions to be expelled from the realm of Newtonian natural philosophy.[18] As the mechanization of the world-picture proceeded, the attention of natural philosophers shifted to quantitative relationships between pieces of matter devoid of any causal, intentional or qualitative content. This wasn't quite the case with Greek-speaking scholars, however. Being the heirs of the seventeenth-century neo-Aristotelianism they insisted on perceiving matter as the *substratum* of all natural phenomena. And although, according to this tradition, it was motion that gave life to Nature, even motion was a "passion" of matter. As a result, matter in both senses, either as prime matter, conceived as the bearer of all natural transformations or as material body, substantiating particular physical qualities and inclinations, was the necessary ontological basis of every natural discourse. This philosophical preconception retained its central position even when Greek-speaking scholars came to deal with the new natural philosophy.

In fact, there was no actual reason to break with this notion, since it is in principle possible to attribute all the observed phenomena to the inherent qualities of natural bodies. Indeed, and contrary to a widely held assumption, in the mid-eighteenth century some of the most prominent supporters of Newtonian physics had almost a similar perception about the ontological importance of matter. Quite a few of them opened their works with an account of "those things which we find to be in all bodies", that is the essential qualities inherent to natural body's material substratum: "extension, solidity, inactivity, mobility, a capacity of being at rest or having a figure, [. . .] gravity and the power of attraction".[19] In this respect, it is not only legitimate but also in accordance with, at least, some aspects of their contemporary natural philosophy for Greek-speaking scholars to retain the ontological predominance of matter in their natural discourse. It is

[17] Κ. Γαβρόγλου, "Οι επιστήμες στον Νεοελληνικό Διαφωτισμό και προβλήματα ερμηνείας τους [The sciences during the Neohellenic Enlightenment and Problems in their Interpretation]," *Νεύσις*, 3 (1995): 75–86.

[18] F. Cajori, "An Historical and Explanatory Appendix," in A. Motte, trans., F.Cajori, ed., *Sir Isaac Newton, Principia*, vol. 2. Berkeley, Los Angeles, London: University of California Press 1962 (First edition 1934), pp. 627–680 (esp. pp. 633, 638); I. B. Cohen, "A Guide to Newton's *Principia*," in *Isaac Newton, The Principia. Mathematical Principles of Natural Philosophy. A New Translation*. trans. I. B. Cohen and A. Whitman. Berkeley, Los Angeles, London: University of California Press, 1999, pp. 1–370 (see pp. 89–94 and elsewhere).

[19] P. van Musschenbroek, *The Elements of Natural Philosophy. Chiefly intended for the Use of Students in Universities, by Peter van Musschenbroek, M.D., Professor of Mathematicks and Philosophy in the University of Leyden. Translated from the Latin by John Colson, M.A. and F.R.S., Lucasian Professor of Mathematicks in the University of Cambridge*. 2 vols. London: J. Nourse, 1744 (First Latin edition: 1734), p. 10.

important to stress this point, because the notion of matter comprises the "material" counterpart of the philosophical attitude described above: The unity of the philosophical discourse about Nature pursued by the Greek-speaking scholars could only be achieved on the basis of such an all-encompassing and deep-rooted concept as matter. The reduction of all natural phenomena to the essential qualities of material bodies might help organize the laws and findings of modern natural philosophy upon a concrete and homogeneous ground.[20]

The third feature that pertains to the intellectual activity of the Greek-speaking scholars has to do with the *aim* of natural philosophy. What was the purpose of natural investigation, and what were the prospective results of such an undertaking? In the early nineteenth century, Theophilos Kairis (1784–1853), one of the most erudite scholars of the time, ventured to give the definition of scientific knowledge.

> Knowledge is the perspicuous understanding of beings. *Partial* or *individual* knowledge results from individual observations or experiments; *empirical* knowledge results from many such experiments and observations; *scientific* knowledge, finally, is the knowledge which [on top of these] also includes the *reason* of the being and can be combined with other such pieces of scientific knowledge.[21]

Although this is one of the clearest statements of its kind, one can find a great deal of similar theoretical declarations in the philosophical works of the time. No doubt those Greek scholars honored the new experimental philosophy and were eager to represent its findings and its cognitive dynamics in their work. But how did they appreciate this particular cognitive enterprise? What value did they attach to, and to what extent did they perceive themselves as part of it? The picture one draws from their various statements is that, beyond the manifest praise of the moderns, they perceived themselves as seekers after a deeper kind of natural truth, which would transcend the level of mere appearances and would guide them to the heart of Nature's secrets. The word Nature (φύσις) itself retained in the philosophical language of the time a great deal of its original Aristotelian sense denoting the deep *causal structure* either of individual beings or of all beings as an efficiently organized whole.[22] According to the above definition, thus, the goal of moderns was, mostly, *empirical* knowledge, while the goal of the Greek-speaking scholars, who pursued understanding through the *principles* of beings, was real *scientific* knowledge.

Neither this attitude, however, was entirely untypical to the highly diversified eighteenth-century natural philosophy. It echoed a speculative tradition that dated back to the sixteenth-century Paduan Aristotelianism and retained its currency until at least Newton's time. Speaking of Zabarella's methodological investigations, H. J. Randall cites his reflections about the distinction between "resolutive" and "demonstrative" method. Both the phrasing and the conceptual content of Zabarella's contemplations are tellingly reminiscent of Kairis' definition.

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[20] Καράς, op. cit., pp. 72–73.

[21] Cited in Καράς, op. cit., p. 77; translation and emphasis are mine.

[22] Cf. G. E. R. Lloyd, "The Invention of Nature," in idem, *Methods and Problems in Greek Science*. Cambridge: Cambridge University Press, 1991, pp. 417–434.

> Since because of the weakness of our mind and powers the principles from which demonstration is to be made are unknown to us, and since we cannot set out from the unknown, we are of necessity forced to resort to a kind of secondary procedure, which is the resolutive method that leads to the discovery of principles, so that once they are found we can demonstrate the natural effects from them. Hence the resolutive method is a subordinate procedure, and the servant of the demonstrative… The end of the demonstrative method is perfect science, which is knowledge of things through their causes; but the end of the resolutive method is *discovery* rather than science. […] It is certain that if in coming to any science we were already in possession of a knowledge of all its principles, resolution would there be superfluous.[23]

Greek Eclecticism?

Let us now recapitulate by bringing all pieces together. When in 1993 Andrew Cunningham and Perry Williams published their programmatic paper about the reorientation of Scientific Revolution studies, they aptly noted:

> It is necessary to identify the particular and specific 'projects of enquiry' in which people in the past were engaged in their investigations of nature. […] When we read texts from the past, we need to ask ourselves, "to what *question* – both what immediate question, and what project of enquiry – in the life and world of the person who wrote it, was this text the *answer* for its author?". For without knowing the project that a particular historical actor was engaged on, the results arrived at by that historical actor are meaningless to us; the answer is meaningless without the question. […] [This principle] suggests that we should direct our attention, not simply to statements about the natural world in past texts, but to the precise enterprise of which these thoughts and statements were part and which gave them their identity and meaning.[24]

The extended reference to Diderot's account on eclecticism in the previous section did not, of course, aim at serving an assessment of whether or to what extent eighteenth-century Greek-speaking scholars implemented his intellectual program. On the contrary, it aimed at offering a contemporary testimony which, in the sense of Cunningham and Williams, would allow us to better understand the intellectual atmosphere wherein Greek-speaking scholars articulated their cognitive enterprise.

Two major conclusions which can be drawn from Diderot's account are the following: Firstly, that the predominance of experimental philosophy was questionable even in the late eighteenth century. Although it was clear that the impartial experimental investigation of Nature could free philosophy from its Sisyphean destiny, the weight of the past was huge and people could not easily ignore the legacy of ancient wisdom. Thus, not all natural philosophers in Europe had yielded to the irresistible appeal of experimental philosophy, although this

[23] Cited in H. J. Randall, Jr., *The School of Padua and the Emergence of Modern Science*. Padova: Editrice Antenore, 1961, p. 52.

[24] A. Cunningham and P. Williams, "De-centring the 'big picture': *The Origins of Modern Science* and the modern origins of science," *British Journal for the History of Science,* 26 (1993): 407–432 (see p. 420).

does not mean that those who departed from it were necessarily incapable or unwilling to appreciate the new developments. Secondly, and most importantly, that there were two kinds of cognitive enterprises to be pursued by the scholars of the time. One aimed at understanding Nature's workings either through the collection or through the combination of particular pieces of knowledge. The other aimed at producing an overarching synthesis, which would unite the contemplative with the empirical dimensions of natural philosophy leading to a sounder way of knowing. In Kairis' phrasing, the former comprised "individual" and empirical "knowledge" while the latter pursued real "scientific" knowledge. Those who would achieve the latter goal, Diderot noted, would see their names glow among the names of humanity's greatest philosophers.

The cultural dispositions, of course, were decisive in the distribution of these roles among the various communities of philosophers. Originating in an anti-scholastic Aristotelian tradition, which emphasized the inquiry into natural causes and even placed physics above metaphysics, Greek-speaking scholars were apt to participate in the discussions about the new ways of natural investigation.[25] The close ties of neo-Aristotelian philosophy with Renaissance naturalism, and the empirical background of many treatises resulting from this relationship helped these scholars get familiar with the inductive method of modern science and appreciate its findings. At the same time, though, it is a fact that Greek-speaking scholars never ventured into the empirical investigation themselves. What they valued as knowledge proper was a well organized and hierarchical set of principles that would allow them to reduce all observed phenomena to the deeper layer of natural causes.[26] They did not reject the notion of natural law that could be reached through experimental investigation, but they were convinced that such formulations sufficed only for the description of the appearances. To use the familiar Aristotelian terminology of the time, real physics was only "*justified* physiology" as opposed to "*historical* physiology" — causal accounts as opposed to mere qualitative or quantitative correlations.[27]

Eighteenth-century Greek-speaking scholars belonged to a community who shared with many other readers of *l'Encyclopédie* the desire to set up an intellectual enterprise that would meet the challenges of the time. In this respect, the decision they needed to make was not about the acceptance or rejection of a certain method of inquiry, but about the way they would get involved in the consolidation of their contemporary philosophy. And this decision was, to a great extent, dictated by their cultural dispositions: Many European natural

[25] Cl. Tsourkas, *Les débuts de l'enseignement philosophique et la libre pensée dans les Balkans. La vie et l'oeuvre de Théophile Corydalée (1570–1646)*. 2nd revised edition, Thessaloniki: Institute for Balkan Studies, 1967; Κ. Θ. Πετσιος, *Η περί φύσεως συζήτηση στη νεοελληνική σκέψη. Όψεις της φιλοσοφικής διερεύνησης από τον 15ο ως τον 19ο αιώνα [The Discussion about Nature in Neohellenic Thought. Aspects of the Philosophical Investigation from the 15th to the 19th centuries]*. Ioannina, 2002, pp. 137–176.

[26] Καράς, op. cit., pp. 63–66.

[27] Ε. Βούλγαρης, *Τα Αρέσκοντα τοις Φιλοσόφοις [Philosophers' Favorites]*. Vienna, 1805, p. 4.

philosophers confined themselves to systematically unearthing new stones for philosophy's future edifice; others laboriously combined old and new stones trying to retrieve the missing pieces of "les plans perdus de [l']univers".[28] Both enterprises were rather distant from Greek-speaking scholars' style of philosophizing. This style emphasized the investigation into the *principles of beings* as a means for achieving integrated and, thus, real scientific knowledge. The resulting intellectual endeavors might take advantage of the above enterprises but, at the same time, transcended their limited and inconclusive character. Thus, it was quite natural for Greek-speaking scholars to assume a place amongst the philosophers who, in line with Diderot's suggestion, would undertake the other major task of the time: Restoring the unity of the cognitive enterprises, simultaneously liberating philosophy from sectarianism and dogmatism. Having this in mind, they attempted to articulate *their own* syntheses, accommodating the most precious pieces of ancient and modern knowledge as parts of a perpetual philosophical inquiry. This was the way Diderot perceived modern eclecticism[29] and this was, actually, the way most Greek-speaking scholars seemed to perceive their role in the context of their contemporary philosophy. Their contemplative naturalism and the good command of ancient sources coupled with the knowledge of the new scientific attainments rendered them suitable for the specific intellectual task.

Taking this perspective may significantly change the idea we have about the intellectual attitude of the eighteenth-century Greek-speaking scholars towards modern science. As we saw, many historians believe that although Greek-speaking scholars did not really embrace the new scientific method, they did their best to propagandize it and, under the specific historical circumstances (Ottoman rule, poor material conditions, lack of proper institutions), this suffices to offer them a kind of historical vindication. In light of the above discussion, however, it becomes clear that it was not their difficulty, inability or unwillingness to follow the new developments that kept them at the periphery of modern scientific discourse. Quite the contrary, they even assumed a *patronizing* role for themselves, and *it was this role* which, in the course of time, resulted in their marginalization. To paraphrase Diderot's metaphor, they were the "genius (es)" who aimed at supervising the work of the "industrious" ones. Why and how these roles came to be reversed, why and how the quest for a systematic organization of natural philosophy yielded to the formal organization of empirical knowledge is, apparently, a matter of further historical investigation. It is worth stressing, though, that eighteenth-century Greek-speaking scholars considered themselves fit to embark on an ambitious intellectual project built around the question of the unity of philosophy. Understanding how this question came to be outmoded in the specific historical context will contribute to better understanding how modern science came to dominate over other forms of knowledge and other cognitive priorities.[30]

[28] Diderot & d'Alembert, op. cit., p. 283.

[29] Diderot & d'Alembert, op. cit., p. 271.

[30] Cunningham and Williams, op. cit., pp. 429–431.