BOTANY IN GREECE DURING THE 19th CENTURY: A PERIPHERY AT THE CENTER

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The independent Greek state of the nineteenth century belonged to what historians of science traditionally view as the European periphery.[1] It is a situation similar to that of the Greek cultural period in an extended eighteenth century (1700-1821).

We claim that in some cases however, Greek scientists from the second half of the nineteenth century do deserve some recognition by their colleagues in Europe. In this respect, Greek scientists engaged in the study of the Greek flora may be considered suitable for acknowledgement.

In this context, we will provide some idea of the development of botany in Greece, not just as a natural science, but as viewed by Greek scientists, as a factor which would demonstrate the existence of Greeks since antiquity, and thus their robust national characteristics and conscience.[2]

The holistic approach to scientific knowledge in Greece during the nineteenth century was influenced by the foundation of a University in 1837, which as an institution, gradually became responsible for creating a framework of principles for scientific practice. The science of botany is an example of this innovative act, representing a remarkable development in Greece, from the end of the nineteenth century, without any significant discontinuities and regressions characteristic of other scientific disciplines such as physics, chemistry and astronomy.[3]

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1 Kostas Gavroglu (ed.), *The sciences in the European periphery during the Enlightenment,* Dordrecht, 1999; Robert Fox (ed.), *Centre and Periphery revisited: The structure of European Science, 1750-1914,* Oxford, 2003; K. Gavroglu, M. Patiniotis, F. Papanelopoulou, A. Simoes, A. Carneiro, M.P. Diogo, J.R. Bertomeu Sanchez, A. Garcıa Belmar, A. Nieto-Galan, "Science and Technology in the European Periphery: Some Historiographical Reflections," *History of Science*, vol.46, 2008, pp. 153–175.

2 For a thorough and informative discussion of the subject see Robert Shannan Peckham, *National histories, natural states: nationalism and the politics of place in Greece,* London 2001.

3 George N. Vlahakis, "A note on the penetration of newtonian physics in Greece," *Nuncius*, vol.8, fasc. 2, 1993, pp.645-656. George N. Vlahakis, "The appearance of a "new" science in 18th century Greece: The case of chemistry," *Nuncius,* vol.1, 1995, pp. 33-50.

At that time one of the objectives of botany with particular interest for European researchers was undoubtedly the Greek flora.[4] In the framework of general scientific missions such as the well-known French scientific expedition to the Peloponnese[5] or on individual visits,[6] scientists and amateur naturalists, tried to collect and identify as many as possible of the rare and "exotic" plants from the Greek mainland or the Greek islands.[7] It is not accidental that, in the 18th century and especially during the course of the nineteenth century, about 250 texts, articles and books were published.[8] This specialized knowledge, though referred to as part of the Greek natural heritage, was not enforced directly on the Greeks but disseminated gradually and indirectly.

We argue that one of the reasons for this situation was the fact that foreign scientists, especially those engaged in the study of natural history, were imbued with a kind of "cultural imperialism", i.e., they viewed the "Orient" of which Greece was considered to be a part, almost without any noticeable exception, through the eyes of a superior or colonizer.

The pre-university period

During 1750-1821, a period known as the Neohellenic Enlightenment,[9] botany was one of the relatively less developed sciences in the broader Greek cultural area which under the political umbrella of the Ottoman Empire was covering the Balkans and Asia Minor. On the contrary, it seems that botanology, the use of herbs in practical medicine, had particular repercussions, establishing itself as a pseudo-science which view has not been eliminated even today. Besides, medicine, under the spirit of an interdisciplinary approach, considered the knowledge of plants and their properties to be essential for the preparation of the necessary medications.[10]

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4 See Nicholas R. Pearce, "John Stuart Mill's botanical collections from Greece (a private passion)," *Phytologia Balcanica,* 12(2), 2006, pp. 149-64.

5 The studies of this expedition concerning the Greek flora were presented in J. B. Bory de Saint-Vincent, Louis Athanase Chaubard, *Nouvelle Flore de Péloponnèse et des Cyclades,* 1838.

6 P. M. R Aucher-Eloy, *Relations de voyages en Orient de 1830 à 1838 (revues et annotées par M. Le Comte Jambert etc.),* Paris, 1843; J. Russeger, *Reisen in Europa, Asien und Afrika IV*, Stuttgart, 1848; C.S. Sonnini, *Voyage en Grèce et en Turquie*, Paris, 1801.

7 W. Greuter, "The early botanical scientific exploration of Greece", in Ioannes Tsekos and Michael Mustakas, *Proceedings of the 1st Botanical Congress,* Dordrecht, 1998, pp. 9-21.

8 See also E. Economidou, "Bibliographie botanique sur la Grèce (Plantes Vasculaires-Végètation)" *Veröffntlichungen des Geobot. Inst. ETH, Stiftung, Rübe, Zürich*, 56 (1976), pp.190-242.

9 For a thorough analysis of the period see Paschalis Kitromilides, *Νεοελληνικός Διαφωτισμός* (Neohellenic Enlightenment), Athens, 1999 (in Greek).

10 Regarding the plethora of manuscript herbaria of the era, see I. KARAS, *Οι επιστήμες στην Τουρκοκρατία. Χειρόγραφα και έντυπα* (The sciences during the Turkish occupation, Manuscripts and Printed

This belief is reflected in almost all medical books of this era, like the Greek translation of the book *A treatise on the health of the educated people* by Constantine Michael (Vienna, 1785); the original is Antoine Tissot's *De la santé des gens de lettres* (Lausanne, 1783).[11] The same opinion is also expressed in *A treatise on the treatment of venereal disease* by I. Nikolidis (Vienna, 1794); the original is part of the book *Praecepta Medico-Practica* (Vienna, 1791), written by Anton Stoerck (1731-1803).[12]

The same attitude is seen in the edition, in 1787, of two complementary books by George Zaviras,[13] *Medical advices* and *Botanical nomenclature in four languages*. The first book contains 183 recipes in the Greek and Latin language, while the second one, which was based on the Hungarian "Uj fuves es viragos Magyar kert" (New Hungarian botanic garden)[14] includes 771 plants used in these recipes with their names given in Latin, ancient Greek, modern Greek and Hungarian respectively. This book, despite its absolutely restricted horizon, can be considered in a sense as the first book on classical botany in Greece.

The next book directly related to botany, especially its history and methodology, was the edition of *An introductory address into the proceedings of the Linnean Society of London,* translated from Italian, delivered by Sir James Edward Smith,[15] the famous English botanist, owner of the library and botanical collections of Linnaeus and the first president of the Linnean Society of London.

The 10 volumes of *Εικονολογία παιδική* (a picture book for children including an attractive collection of tetrapods, plants, flowers, crops, minerals, dresses, etc. compiled from natural history, crafts and sciences), originally published in German by Friedrich Johann Justin Bertuch (1746-1822) under the

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Documents), vol. C, The life sciences, and the section titled "*Iatrikes syntages kai iatrosofia*" (Medical prescriptions and magic potions), Athens, 1994, pp. 160-319 (in Greek).

11 For more information see D. Karamperopoulos, *Η μεταφορά της επιστημονικής ιατρικής γνώσης μέσω των έντυπων ελληνικών βιβλίων κατά την εποχή του Νεοελληνικού Διαφωτισμού* (The dissemination of medical scientific knowledge through printed Greek books during the era of Neohellenic Enlightenment), Ph.D. Thesis, Athens, 1996 (in Greek), p. 43.

12 Karamperopoulos, cit. note 11, p. 49.

13 Regarding the case of Zaviras's *Botanical Nomencalture* see N. K. Vlachos, "Υπάρχει Φιλολογικό Πρόβλημα για την Ονοματολογία Βοτανική του Γ.Ζαβίρα;", (Is there a literary issue on the botanical nomenclature by G. Zaviras?), *Eranistes* 1975, 12, pp. 17-27 (in Greek).

14 The author of the original was the Hungarian physician at the town of Debrecen Jozsef Csapo (1734-1799). The book was first published in 1775 with a second edition in 1792. See also I. Karas, cit. note 6, p.57 (in Greek).

15 G.N. Vlahakis, "Sir James Edward Smith and the introduction of botany in Greece during the late 18th and early 19th centuries," *Archives of Natural History*, 26 (1), 1999, pp. 85-100.

title *Bilderbuch für Kinder*[16] and published in Greek by the Kapetanakis brothers in 1810-1812, reflect the idea that botany is related to beautiful pictures of plants.[17] This series is actually an encyclopedia of natural history useful for children at the level of primary or secondary education, where every page includes colored lithographs of excellent quality. Among them, the details of plant lithographs are particularly impressive.

Issues of botany, either scattered or organized in chapters, are met with in some books of general interest edited after 1800, such as *Popular physics against superstition* where, in the chapter titled "Kingdom of Plants", interesting issues on plant physiology were developed.[18] Extensive information of systematic botany existed in the edited volumes of another publication having a general encyclopedic character and related to subjects concerning commerce, *Ερμής ο Κερδώος* (Hermes the Profitable), where 200 plants of commercial interest were described.[19]

A reference should also be made to the translation of Jacquin's book *Anleitung zur Pflanzenkenntisse nach Linne's Methode* (Vienna, 1785[20]), postponed due to political circumstances as the Greek revolution for independence had already begun.

Of particular interest is also *Botany* or more precisely, *Practical botany adapted to medicine and economy,* a book written by Dionysios Pyrros, a Greek polymath with a wide range of interests.[21] This was already announced at the

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16 On this book see Arthur Koch, *Ein "Orbis pictus" der Goethezeit. Friedrich Justin Bertuch und sein Bilderbuch für Kinder,* Weimar, 1975.

17 D. Allen, "The struggle for specialist journals: Natural history in the British periodicals market in the first half of the nineteenth century," *Archives of Natural History*, 23, 1996, pp. 107-123.

18 S. Kanellos, *Φυσική δημώδης εις παύσιν της δεισιδαιμονίας* (Popular physics against superstition), Vienna, 1810, pp. 290-321 (in Greek). This book was a translation from the German original, best-seller at that time book of Johann Heinrich Helmuth (1732-1813) *Volksnaturlehre zur Dampfung des Aberglaubens*, first edition 1786, other editions 1792, 1795, 1798, 1803, 1810, 1822. Concerning the Greek translator D. Karamperopoulos supports that he must be not S. Kanellos but Z. Kavras, a prominent Greek physician of the period. On his arguments see D. Karamperopoulos, "Φυσική δημώδης εις παύσιν της δεισιδαιμονίας, Βιέννη 1810. Ποιος ο συγγραφέας και ο μεταφραστής του βιβλίου;" (Popular physics against superstition, Vienna 1810. Who was the author and the translator of the book?), *Ερανιστής,* 25, 2005, pp. 163-171 (in Greek).

19 G.N. Vlahakis, Διερευνώντας τη διεπιστημονική προσέγγιση της γνώσης στους χρόνους του πρώϊμου 19ου αιώνα. Η περίπτωση του Ερμή του Κερδώου (Investigating the interdisciplinary approach of knowledge in the years of the early 19th century. The case of Hermes the Profitable), *Proceedings of the Panhellenic Conference* "*Neohellenic Enlightenment-An attempt for a new research yield,"* Kozani, 1996, pp. 29-58.

20 *Ερμής ο Λόγιος* (Hermes the Scholar), 1817, p. 29 and p. 52.

21 Vlahakis, (cit. note 12) and George N. Vlahakis, "Dionysios Pyrros: An unknown instrument-maker in early 19th century Greece," *SIS Bulletin*, 59, 1998, pp. 5-8.

time of the Greek revolution but was published much later in 1838 after the establishment of the independent Greek state.

Pyrros referred in a dignified manner to the problems he faced when he tried to publish his book: "*Because I had already edited the "Textbook for Physicians" in Nauplia, I decided to publish a textbook for Botany. It included 35,000 herbs, of which only 200 were useful in medicine and economy; these were chemically analyzed and scientifically described. In order to print their colored pictures, I created my own lithography since the Bavarians did not allow me to print it because of their jealousy. They caused me a lot of trouble until I finally managed to finish, color, print and distribute it in Athens in 1838. No other Greek has ever created such a botanical textbook and all careful students are [previously] deceived studying incomplete botanical books without being able to understand and learn".*[22]

This bitter reference to the Bavarians contradicts the fact that the book was dedicated to the young and beautiful Amalia, Queen of Greece.[23] Probably it was due to the fact that despite his wish and efforts, Pyrros failed to be appointed as a professor in the recently established University of Athens (1837), and the desired chair was taken by the German Xaver Landerer who was also the King's pharmacist.

In the preface of the book, Pyrros provides some information concerning his sources. He points out that he uses the Linnaean system but he used books and works originally written by his professors in the University of Pavia. They are known to be Domenico Nocca (1758-1841), professor of botany, who wrote the book *Elementi di botanica* (Pavia, 1805), Giuseppe Raggi (1752-1816), professor of clinical medicine, Giovanni Rasori (1766-1837),[24] professor of pathology, Siro Borda (1761-1824), professor of materia-medica and finally Luigi Brugnatelli, whose *Pharmacopea* had already been translated into Greek.[25]

The book contains also ca. two hundred lithographed figures of the most useful plants according to Pyrros. The originals were taken from the already

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22 D. Pyrros, *Περιήγησις ιστορική και Βιογραφία* (Historical tour and biography), Athens, 1848, p.198 (in Greek).

23 D. Pyrros, *Βοτανική Πρακτική* (Practical botany), Athens, 1838 (in Greek).

24 See E. Rossi, "Giovanni Rasori; 1766-1837 or Italian medicine in transition," *Bulletin of history of medicine,* 29 (2), 1955, pp. 116-33.

25 George N. Vlahakis, "Against French science: Alessandro Volta and Luigi Brugnatelli in early nineteenth-century Greece," *Nuncius,* vol.16, 2001, pp. 191-210; Şeref Etker, "Brugnatelli Farmakopesi'nin 1818'de İstanbul'da Yayınlanan Elence Çevirisi" (La traduction en Grec de la Pharmacopée de Brugnatelli, publiée à Istanbul en 1818), *IV.Türk Eczacılık Tarihi Toplantısı Bildirileri (4-5 Haziran 1998; İstanbul) (Proceedings of the IVe Congress of the History of Turkish Pharmacy),* ed. E. Dölen, Marmara Üniversitesi Eczacılık Fakültesi Yay. No.15, Istanbul 2000, pp. 297-302.

mentioned encyclopedic work by Johann Bertuch, from the French *Encyclopédie* edited by Diderot and d'Alambert, from some unnamed edition of the botanical work of Dioscorides and from a relevant work composed by Philip Miller (1691-1771), an English gardener and botanist whom he erroneously referred to as German. It is of some importance however that the lithographs were printed by Pyrros himself by a method he had perfected for this very purpose, and he mentioned in the preface of his *Botany,* that lithography was "a necessary invention, very useful, even divine for humanity".[26]

Pyrros also provides information on his attitude towards the development of botany in Greece: "*No other European science teacher existed until then [1813,] except for me in Athens and Sofianopoulos in Patras of Achaia. I created a botanical garden including 300 herbs, and a museum with 300 different minerals in the house of Mr. Dimitrios Kalifournas, President of the Parliament. As everybody in Athens knows well, these were not as important as the present ones, but those we had then compared to the current noble ones, were incomparably greater. If the government spent 50 or 100 thousands five-drachma coins as they currently do in schools, almost everyone would likely become a philosopher or an engineer".*[27]

One can easily understand from the above quote, that even in the capital of a peripheral country like Greece, the idea of forming collections and cabinets of "natural curiosities" has been a fashion for the members of the political and financial elite, who wanted to imitate the habits of the upper class in the capitals of the centre, such as London and Paris.

Before ending this brief description about the state of botany during the pre-university period, we will mention the contribution of two men from Corfu, who wrote related books in Italian, namely Nicolo DallaPorta[28] and Michele Pieri.[29] Pieri published two books on the flora of Corfu. The first one is titled *Della Corcirese flora, centuria prima* (Corfu, 1808) and the second, *Della Corcirese flora, centuria prima, seconda e terza etc*., (Corfu, 1814). DallaPorta

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26 Pyrros, cit. note 18, p. 22.

27 Pyrros, cit. note 18, p. 72.

28 Niccolo DallaPorta was a native of Cephallonia island. He was interested in chemistry. He translated Chaptal's *Elements de Chimie* in Italian (1792) and one year later he published also in Italian a short book under the title *Trattato elementare dei gas*, which received well by the Italian chemists of the period. He was also correspondent member of the Ionian Academy of sciences in Corfu. For more detailed information about Nicolo DallaPorta see G.Byzantios, *Λόγος επιτάφιος προς τον αείμνηστον ιατροφιλόσοφον Δρ. Νικόλαον Δελλαπόρταν, Συντεθείς μεν αυτοσχεδίως και εκφωνηθείς παρά Γεωργίου ιερέως Βυζαντίου* (Funeral speech to memorable Medical philosopher Dr. Nikolaos Dellaportas, improvised and delivered by George Byzantios of the Priest), Cephallonia, 1860 (in Greek).

29 For biographical information about Pieri see L. Brokinis, "Εργα, Βιογραφικά Σχεδιάρια" (Works, Biographical Sketches), issues A' and B'. ed.-introd. by K. Dafnis, *Kerkyraika Chronika*, vol.16, pp. 126-30 (in Greek).

wrote the book *Prospetto delle plante che si trovato nell'isola di Cephalonia, e che si possono ad operate a titolo di alimento o di rimedio del signor Nicolo DallaPorta, Medico, Physico* (Corfu, 1821). This book was written in a systematic and scientific manner by a man with recognized qualifications from the University of Padua and a good knowledge of all scientific developments during that period. It is impressive that, before the main text, he included a short description of the Linnaean system. We should also mention that both Pieri and DallaPorta, although they wrote in Italian, they highlighted the Greek influence in their introductions, and they contributed to the creation of modern Greek botanical nomenclature, giving Greek names to the plants wherever possible. Furthermore these works were of some importance in the wider European botanical community as we find reference to them in several works and journals such as the prestigious (at that time) *Flora* or *Botanische Zeitung*.

The university period

The situation seemed to change gradually after the acquisition of independence by a part of Greece and the establishment of the small Greek Kingdom in 1834. After three years, the authorities, and more specifically the Bavarian King Otto, decided to establish a University in 1837 which was organized according to German standards. This institution, as the only one of the highest educational level in Greek territory, immediately gained prestige in Greek society. Following the general policy of the King, most high ranking positions in public service were filled by experts of the same nationality and the University thus recruited mainly foreigners, especially scientists from Germany. To maintain political equilibrium a few Greek scientists who had shown significant prominence during the period of the Neohellenic Enlightenment, and particularly in the fields of theology, history and philosophy, were also appointed professors in the University.[30]

Botany was one of the first sciences which developed in the University of Athens at a time when other physical sciences like physics and chemistry were in a phase of decline. One possible reason was that botany could be considered as more compatible with the philosophical movement of romanticism introduced also from Germany during the first decades of the 19th century. Another one, also significant, was that for botany there was not any need for expensive scientific instruments and laboratories as botanical research was

[30] Regarding the recruitment of the University see K. Lappas, "Το διδακτικό προσωπικό του Πανεπιστημίου Αθηνών στον 19ο αιώνα" (The teaching staff of the University of Athens in the XIXth century), *Proceedings of International Symposium, University: Ideology and Education. Historical Dimensions and Perspectives*, Athens, 1989, pp. 137-147 (in Greek).

mostly focused at that time on the collecting of plant specimens from Greek lands.

The first professorship of botany in Greece was awarded to the German botanist Carl Nicolaus Fraas (1810-1875).[31] Fraas had studied botany in Munich. He came to Greece in 1835, was appointed Director of the Forest School of the Botanical Garden, and in 1837, adjunct professor of systematic botany. He resigned in 1842 and returned to Munich where he successfully continued his academic work. From his botanical output, we can mention *Synopsis plantarum flora classica* (1845*), Klima und Pflanzenwelt in der Zeit* (1847), and *Elements of Botany* (1837).

What we infer from Fraas' work is that although he was very hard working and productive he could not adapt himself to Greek customs and his scientific publications seemed rather to be addressed to his European counterparts rather than to Greek intellectual circles. In Europe he was considered among the best agronomists and botanists. It is of some interest that even Friedrich Engels referred to him in an 1868 text as a "darwinist before Darwin".[32] It is characteristic of Fraas's shortcomings including an inability to consider himself a member of the Greek scientific community that he never learned the Greek language to an acceptable degree and his writings were almost all in German with the exception of *Elements of botany*.

We cannot conclude the same for Fraas's successor in the chair of botany, Xavier Landerer (1809-1885),[33] who was already professor of pharmaceutical chemistry and prescription since 1844. Dionysios Pyrros had similar aspirations as previously referred to but they remained unfulfilled. The decision of the government to appoint the chair of botany to Landerer, reveals the nature of changes occurring at that time, as one of the important scholars of the pre-independence period was out-contested by an expert. This choice led to one of the first conflicts for a professorial position in the University environment.

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31 For more details on the life and work of C.N. Frass see F.A. Zehetmair, *Carl Nicolaus Fraas (1810-1875). Ein bayerischer agrawissenschftler und reformer der intensiven Landwirtschaft,* 1995. See also Heinz Kahleber, "Bavarian plant collectors in Greece-1. Franz Xaver Berger, Franz Zuccarini and Carl Nicolaus Fraas, *Willdenowia,* 36, 2006, pp. 565-76.

32 Annelise Griese (ed.), *Marx-Engels Gesamtausgabe*, Bd.31, Naturwissenschaftliche Exzerpte und Notizen, 1999, p. 892.

33 Ev. Varella, "Pharmazeutische Handbucher im Griechenland des frühen 19. Jahrhnderts - D. Pyrrhus und F.X. Landerer," *Geschichte der Pharmazie*, 45, 1993, pp. 49-53; Andreas Lardos, "The botanical *material medica* of the *Iatrosophikon*- A collection of prescriptions from a monastery in Cyprus," *Journal of Ethnopharmacology*, 104, 2006, pp. 387-406.

Several others would follow in the years to come.[34] However, based on all available evidence, nobody admitted this conflict openly. We can indirectly form an opinion from the evidence mentioned by Pyrros in his autobiography, and from the introduction of Landerer's book *Textbook of botany* (Athens, 1845). According to Pyrros:

> *When the King came to Athens, the doctors gathered, and, in order to find a permanent income, they agreed to create an Institution. Therefore, they founded a University, and they received large salaries for teaching…, they prompted me to write a report, teach one of the sciences and convince other teachers. In the beginning, knowing the idiosyncrasies of the doctors, I denied. So I stayed outside, like the wise A. Korais in Paris…, but everybody ran here barefoot and begging…*[35]

If one believes Pyrros's writings one can conclude that competing for a position of professor in the University was actually a strong factor for discord among the Greek scientists. Only a few such as Adamantios Korais, the leading figure of the Neohellenic Enlightenment, Pyrros and some others who had chosen to remain out of the running, decided to stay independent of the University.

Landerer pointed out the interdisciplinary nature of botany, "*which is the part of natural history that teaches us to recognize, differentiate and classify plants"* and "*is one of the most essential courses in medicine and pharmacology"*.[36] Influenced by the romantic philhellenes of the 19th century and justifying the undertaking of this task, Landerer mentioned: "*I wish, as long as I live and step on Greek land, to become as useful as possible for the revitalizing of knowledge in this ancient place"*.[37] This reference is not made idly. Landerer was truly fond of Greece. So much so that he repeats the aforementioned words in the prefaces of numerous books on Chemistry, Mineralogy, Pharmacology, etc. that he had published during his stay in Greece. It is thus evident he had a completely different attitude from Fraas.

Landerer also recognized the need for the creation of a stable and valid scientific language in Greek, though he admitted that he had not the appropriate knowledge of the Greek language, so that he considered his book as "raw

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34 George N. Vlahakis, "Επιστημονικές διαμάχες, ιδεολογικές αντιπαραθέσεις και προσωπικές έριδες κατά τον 18ο αι. - 19ο αιώνα στον ελληνικό πνευματικό χώρο" (Scientific debates, ideological confrontations and personal disputes in the Greek intellectual area from the 18th to the 20th centuries), *Kritiki. Crtical science and Education*, 4, 2006, pp. 57-66 (in Greek).

35 Pyrros, cit. note 18, p.48.

36 X. Landerer, *Εγχειρίδιον Βοτανικής* (Textbook of Botany), Athens, 1845, p.5.

37 Landerer, cit. note 32, p.6.

material ready for those who will elaborate it in the future." Going one step further, Landerer also made an appeal to scholars to comment on the names he used in his botanical nomenclature to improve a possible future edition. Following a tradition from the past century, he introduced a brief history of botany.[38] One of the first arguments in this historical account is that Aristotle was the founder of the scientific knowledge concerning the plants as we may conclude from the writing of Theophrastus, where though there is much valuable information one could be astonished by the great number of mistakes and inconsistencies. Commenting on that, Landerer wrote: "*It is impossible for anyone to understand how such childish ignorance and superstition could be at the same time presented with so great wisdom.*" According to Landerer some progress became evident in botany after Dioscorides and the Arabs, whose contribution raised the number of the described herbs to 1400. After the fifteenth century, through the work of Conrad Gesner (1516-1565) and Hieronymus Brunschwig (1450-1512), and more generally through the work of the German botanists[39] within a short period, the number of the known plants gradually reached a maximum of 80,000. This high number caused several problems concerning taxonomy but Linnaeus solved the problem successfully. More recently, new systems of plant classification were proposed by Antoine de Jussieu (1686-1758) and Augustin Pyramus de Candolle (1778-1841).

The new knowledge acquired during the eighteenth and nineteenth centuries makes unavoidable the division of botany into several branches with specialized subjects such as classical botany, physiological botany, and applied botany. Furthermore, applied botany could be separated into agricultural botany, medical botany and economic botany.

Consequently, Landerer tried to give to the readers of his introductory book, who were in fact the students in the University, some idea of a wide range of subjects like plant anatomy, plant physiology, plant diseases and plant taxonomy.

The contribution of Landerer to botany and especially to the study of the Greek flora is considered to exceed the level of popularized science. Relevant literature provides us with titles of his publications in accredited scientific journals in the German language such as *Oesterreichische Botanische Zeitschrift* and *Flora.*[40] These articles and his work in general were cited by

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38 Landerer, cit. note 32, pp. 7-11.

39 Landerer, cit. note 32, pp. 5-9, where he writes: "Germany took pride in founding the history of phytology."

40 Some of his publications in these journals are: "Über die in Griechenland vorkommenden kryptogamischen Pflanzen und deren Bedeutung bei den alten Griechen," *Öster. Bot. Zeitschrift*, vol.4,

several natural scientists of the time. Furthermore, Landerer wrote a number of articles in the daily press and the periodicals of that time, trying to inspire the Greeks with an interest for the study and preservation of the rich natural beauty of their country. This effort, to disseminate some basic principles and descriptions of botany through a popularized framework does not refute his vast scientific reputation as such an activity was usual, since there was difficulty in publishing specialized scientific journals in Greek, most probably because of the restricted number of interested people. Meanwhile, one should bear in mind the model of the nineteenth century scientist, who obsessed by the feeling of global offering did not stay locked in his laboratory, but being instead a component of the society, worked towards the materialistic and ethical development of society. That meant that he did not address his findings only to a specific scientific community but he tried to make them available to everybody, to make them useful for the advancement of living standards. In the field of botany that could be effected in two ways. Concerning the materialist component, by the description of the healing properties some herbs have. On the ethical side, the contribution of a botanist could be that he could promote the admiration of the natural beauty and subsequently to beauty as an abstract idea, which should be a part of everyone's culture, and especially to the culture of the Greeks which had recognized its value since ancient times.

If we bear in mind the above scheme it is not inexplicable that several articles - referring to certain plants as well as brief descriptions of the Greek flora - are found in journals of that period, written not only by specialized botanists, but also by doctors and naturalists. Of particular interest are the relevant themes from the *Parnassos Journal*, one of the most important periodical publications of the nineteenth century in Greece.[41]

It is characteristic and proves the opinion we have expressed in the previous paragraph that one of the first articles published in *Parnassos* was

1854, pp.82-84; "Botanischen Notizen aus Griechenland," *Flora*, vol.39, 1856, pp. 449, 647, 753; "Botanischen Notizen aus Griechenland," *Flora*, vol.40, 1857, p. 128; "Über die Forstgewächse in Griechenland," *Flora*, vol.40, 1857, p.85; "Botanische Notizen aus Griechenland. Über die Griechenland vorkommenden Schwamme," *Flora*, vol.41, 1858, pp. 675-683; "Zusammenstellung der am Meerstrande in Griechenland sich findenden Pflanzen," *Flora*, vol.42, 1859, p.516.

41 S. Kartoulis, "Εντομοβόρα Φυτά" (Insectivorous plants), *Parnassos*, 1877, vol. Α΄, p. 200 and "Άνθη Βαρόμετρα", (Barometer flowers), p. 639; E. Kechagias, "Γενικαί Οδηγίαι προς την κατ' οίκον υπό γονέων διδασκαλίαν των μαθημάτων της Φυσικής Ιστορίας" (General instructions on the teaching of natural history lessons at home by parents), *Parnassos*, vol. Β΄, 1878, p.50 ; S. D. Krinos, "Περί επιστημονικού προσδιορισμού των υπό των Ελλήνων γνωσθέντων φυτών" (On the scientific identification of the plants first studied by the Greeks), *Parnassos*, vol. Ε΄, 1881, p.7; Th. von Heldreich, "Η χλωρίς της νήσου Κεφαλληνίας" (The flora of the Island of Cephallonia), *Parnassos*, vol. Ζ΄, 1883, p.476; Th. von Heldreich, "Περί βοτανικής εκδρομής εν Αττική" (On a botanical field-trip in Attika), *Parnassos*, vol. Η΄, 1884, p.180; Th. von Heldreich, "Περί φυτολογικής εξετάσεως της Θεσσαλίας" (A study of the plants of Thessaly), *Parnassos*, vol. Ζ΄, 1883, pp. 257-266.

titled "Ethics, as developed by the physical sciences",[42] written by one of the most enlightened minds in the nineteenth century Greek society, Anastasios Christomanos (1841-1907), professor of Chemistry in the University of Athens.[43] In the standard columns of the journal we read also short articles about the "arts and sciences", "geography and travelling" and "meteorological conditions".

Of interest is also an article by Stephanos Kartulis (1852-1920), sent from Berlin, where the author had lived while studying medicine. It was based on Charles Darwin's *Insectivorous Plants* (London, 1875). Kartoulis's source was the German translation titled *Insectenfressenden Pflanzen, Deutsche Aufgabe von J.U. Carus*, and published in Stuttgart in1876.

It was one of the first references to Darwin's work in Greece and surprisingly received with very positive and enthusiastic tones as Kartulis referred to it as "one of the brightest sun-rays... which fairly raised the admiration of the scientists" and now "no doubt exists to the scientists... for the origin of the man".[44]

Kartulis was in any case a man of progressive views. Later, in the 1880s when he settled in Alexandria, Egypt he collaborated with the famous German physician Robert Koch (1843-1910) for the treatment of cholera and he was a member of the team which found its cause, namely the bacillus *Vibrio cholerae*.[45] Kartulis is also known for some other significant contributions to medicine and his portrait is preserved in the special portrait collection of the University of Liverpool.

The plants whose physiology Kartulis described in detail were *Mimosa pudica* and *Drosera rotundifolia.* The publication of such an article in a journal with a variety of subjects and a broad readership indicates the important role

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42 Anastasios Christomanos, *Parnassos*, 1877, pp. 50-57.

43 For his life and work, as well as his views for the role of science in the society see: George N. Vlahakis, "Alchemy survived? An alchemical manuscript, Anastasios Christomanos and the status of chemistry in the 19th century Greece," *Proceedings of the 5th International Congress for the History of Chemistry,* Lisbon, 2005, pp. 598-605; George N. Vlahakis, "Introducing sciences in the new states: The establishment of the Phypics and chemistry laboratories in the University of Athens," *Science, Technology and the 19th century State,* edited by Eft. Nicolaidis and Konst. Chatzis, Athens, 2000, pp. 89-106; Helena Maniati, "The educational utilization of elements of the history of natural sciences (19th century): Highlighting the cognitive continuity with Antiquity", *Science and Education*, vol.14, 7-8, 2005, pp.713-720.

44 S. Kartoulis, cit. note 37.

45 N. Howard-Jones, "Robert Koch and the cholera vibrio: A centenary," *British Medical Journal,* vol.288, 1984, pp.379-381.

these journals played in the formation of public opinion on several themes, not always using strictly scientific criteria.[46]

Stamatios Krinos (1815-1886) was one of the first Greek chemists. He was born in Constantinople and studied in Italy and France. In 1861 he became professor of pharmacy in the University of Athens. His article in *Parnassos* had the title "On the scientific identification of the plants first studied by the Greeks." The author proposed a method to find which plants were referred to by the ancients in their works and comparing his method with the results obtained by other European botanists. Thus we can see that the Greeks did not absorb the knowledge introduced from Europe as it was but they tried to test and change it according to their beliefs in a procedure of assimilation, seen also during the period of the Neohellenic Enlightenment.[47] That article was the core of an unfinished book which Krinos was planning to write and had the provisional title "On plants' archaeology".

There are not only the articles published in *Parnassos* but also in other similar journals like *Pandora* and *Hestia* which indicate clearly the degree of popularity botany had acquired in nineteenth century Greece.

The great interest in botany and more generally on subjects related to natural history is reflected by the comparatively large number of books treating relevant themes and published during the course of the century.

The further development of botany during the second half of the 19th century is based on two other persons: Theodoros Orphanides and Theodor von Heldreich.[48] Their contribution, the difficulties they encountered, and their achievements traced through available primary and secondary sources could be considered as a representative case for the status of all the scientific disciplines in Greece until the rise of the twentieth century.

Theodoros Georgios Orphanides (1817-1886) was a botanist and poet, a combination absolutely compatible with the romantic spirit of the era. He was born in Smyrna, Asia Minor and came to Greece with his family as a refugee. After completing his secondary education he became a journalist and poet. In 1844 he was sent by the Greek government to Paris for further studies. There he

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46 George N. Vlahakis, "Science and Society in 19th century Greece: The journals" in *Science, Technology and the 19th century State,* edited by Eft. Nicolaidis and Konst. Chatzis, Athens, 2000, pp. 117-124.

47 M. Patiniotis, "Eclecticism and appropriation of the new scientific methods by the Greek-speaking scholars in the Ottoman Empire" in F. Günergun and D. Raina (eds.) *Science between Europe and Asia.* Boston Studies in the Philosophy of Science, vol.275, Dordrecht, 2011, pp. 193-206.

48 M. K. Stephanidis, *Εκατονταετηρίς 1837-1937, Ιστορία της Φυσικομαθηματικής Σχολής* (The one hundred years between 1837-1937, History of the School of Physics and Mathematics), Athens, 1952 (in Greek).

studied botany in the Natural History Museum and in Sorbonne, having as professors the famous botanists Adrien-Henri de Jussieu (1797-1853), Adolphe Brongniart (1801-1876) and Joseph Decaisne (1807-1882). He returned to Athens in 1848 when he was appointed professor of botany at the University of Athens and stayed in that post for over thirty years. During his botanical excursions on the Greek mountains he discovered more than fifty new species. The main results of his research were distributed as *Flora graeca exsiccata* of which there are sets in many herbaria. He also published a 16-page *Prospectus flora graeca exsiccata* in 1850 and served as editor of the journal *Geoponika* (agricultural subjects), from 1872 to 1876. He contributed also to the development of the new Greek botanical nomenclature. We can see that Orphanides combined excellently pure and applied science for the promotion of agriculture in Greece.

Theodor von Heldreich (1822-1902) was born in Dresden and studied in Germany, France and Italy. In 1843 he came to Greece to study the Greek flora. In 1851 he became director of the Athens Botanical Garden. In 1855 he married Sofia Katakuzenos, the granddaughter of the well-known scholar of the Neohellenic Enlightenment, Konstantinos Koumas, a move which helped him to be favorably accepted as a member of the upper class Greek society.[49] He described hundreds of species and published two very interesting books in German: *Die Nutzpflanzen Griechenlands* (1862) and *Die Pflanzen der attischen Ebene* (1877). He wrote numerous articles and booklets on Greek plants and worked also for the establishment of reliable and permanent botanical nomenclature in Greece.

Both Orphanides and Heldreich, lived and acted in a university environment, where everybody, at least officially recognized the need for the development of sciences, especially chemistry and botany. Chemistry was based on the huge work of Anastasios Christomanos and physics tried to regain its lost prestige through the strenuous efforts of Timoleon Argyropoulos. At the same time Orphanides, besides his pure scientific research and student teaching, contributed to the acquisitions of the Botanical Museum - a vital necessity for the study of the Greek flora - and also to the development of relationships with foreign academic centers.

According to the final report of George Rallis as Rector in 1869:

"*Mr. Spiridon Zambeli(o)s who lived in Venice, gave to the Greek Deputy Consul Typaldos Forestis, a parcel containing 200 plants of the Apennine flora,*

[49] Asuman Baytop & Kit Tan, "Theodor von Heldreich (1822-1902) and his Turkish collections," *Turkish Journal of Botany*, vol.32, 2008, pp. 471-479.

collected under the supervision of the famous Italian botanist Mr. Loukianis. The Professor of Botany in Stockholm Mr. Anderson, curator of the Natural History Museum of the local Academy of Sciences, created a collection of almost all the Swedish flora, containing 1605 species…" [50]

Orphanides, after studying botany in France, was appointed at the University, where he met Heldreich, director of the Natural History Museum and Botanical Garden in Athens, and also Iraklis Mitsopoulos (1816-1896), professor of natural history and more specifically of zoology. Mitsopoulos was born in Patras. He studied with a grant offered by the first Greek governor Ioannis Kapodistrias in the High School of Aegina. In 1832 he became a public servant in the National Library of Athens. In 1837, with the help of another government grant, he went to Germany where he studied philology and natural sciences. On his return in 1844 he was appointed teacher of physics in the High School of Patras and one year later, professor at the University of Athens, a position he held for 47 years. These three men represented the corners of a triangle, giving for several years the impression of an admirable cooperation although an underlying current of conflict might have existed from the very beginning.

We consider this competition, which during its last stage was expressed in the most ridiculous and public manner as a result of general as well as personal limitations. One of them was that Heldreich had a very good knowledge of botany, and he believed that he knew much more than Orphanides concerning this matter. On the other hand Orphanides felt insecure and inferior as to his level of scientific knowledge. In a broader context there was a general, although never openly admitted, strong conflict between the French and the German influence not only concerning politics but also affecting culture and science.[51] In this particular case, Orphanides represented French culture, while Mitsopoulos, Heldreich and Kruper, were supporters of the German one.

Theobald Kruper (1829-1917) was born in Pomerania and studied in Stettin and Berlin. From these times he became acquainted with Otto Staudinger to whom he later sold some collections. Some of these collections are now in the Museum für Naturkunde in Berlin and the Slovakian National Museum in Bratislava. He collected Lepidoptera and birds' eggs. From 1858 onwards he lived in southeastern Europe and repeatedly visited the Ionian islands of Corfu and Cephalonia as well as the mountain Parnassos. In 1872 he became curator of the zoological department of the Natural History Museum of the University

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50 George Rallis, *Report to Athens University,* 1869, pp.60-61.

51 K. Krimpas, *Θραύσματα κατόπτρου* (Broken pieces of mirror), Athens, 1993, p. 83.

of Athens. He is considered the best collector of entomological collections in the Near East.

The unstable balance in the relationships of the above scientists was permanently destroyed in 1862, when Orphanides expressed his open conflict against Heldreich. The conflict continued in 1863, when Orphanides tried to obtain seeds of *Pinus peuce* legally from Heldreich. The quarrel peaked on 14th April 1865, when Heldreich was insulted by Orphanides in the presence of the Minister of Public Education. Orphanides accused Heldreich of being inadequate to perform his duties as curator of the Botanical Museum. Orphanides believed that Heldreich was responsible for the Museum's miserable status. Orphanides expressed his accusations in writing and justified them with a series of arguments in articles published at the *Nomimofron* (The law-abider), a newspaper of this period. The articles were finally published in the form of libel in a brochure entitled *The Situation of the Natural History Museum of the University*.[52]

In the preface of this brochure Orphanides tried to persuade the reader that the reason for his attack on Heldreich was only his concern for the smooth functioning of the Museum. In his attempt he admitted that almost everybody supported Heldreich and accused Orphanides as a hater and pursuer of the foreigners. Many have expressed the opinion that Orphanides hated Heldreich because he was an excellent botanist well-known even to the rest of the world. Orphanides wrote with an obvious sense of disappointment: "Nobody said that I am a zealot and I have acted according to my conscience." In the following pages Orphanides presented a series of evidence to prove the inadequacy of Heldreich and furthermore that Heldreich abused his position to sell rare insects, plants, fossils, etc. for his own profit.

This unhappy situation could not fail to attract the interest of the University Council, which appointed a committee with professors B. Oikonomidis, D. Aiginitis, K. Vousakis and P. Kyriakou as members, in order to investigate the validity of the accusations. The Committee's final decision was favorable for Heldreich. Taking this opportunity and playing on the positive climate for him, Heldreich had the chance for a victorious revenge. Therefore he decided to express his opinion in writing,[53] rejecting the accusations of Orphanides and adding heavy condemnations. Commenting on the speculated scientific inadequacy of Orphanides he wrote in a very scornful manner: "*It is*

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[52] Th. Orphanidis, *Η κατάστασις του φυσιογραφικού Μουσείου του Πανεπιστημίου* (The state of the University Museum of Natural Sciences), Athens, 1865, p.6.

[53] Th. von Heldreich, *Απάντησις.* (Reply), Athens, 1865, p.5.

very unusual for someone to sleep as a theater clown or a house-painter and wake up in the morning to be a University Professor without a diploma," according to the accusations published in 1864 in the newspaper *Elpis* (Hope) (issues no. 1266 and 1269). Heldreich went further and considered Orphanides a man of malicious character and actually not a scientist but a plant-trader who very willingly and for reasons none other than pure profit sold the heritage of the Greek nature to foreigners, thus revenging himself of the charges stated against him by Orphanides.

It is probable that both are partly correct as so happens in such cases. Charles Edmond Boissier (1810-1885), the famous Swiss botanist, cooperated with Orphanides as well as with Heldreich in the preparation of his monumental 5-volume work *Flora Orientalis* (1867-1884) and the content of his herbarium in Geneva indicates this conclusion.[54] According to the files existing in the Conservatoire et Jardin Botaniques in Geneva, the correspondence between Boissier and Heldreich was extensive and systematic. Unfortunately no records exist of letters to and from Orphanides.

Another characteristic of this debate is that, unusually, it was not based on existing or imaginary scientific oppositions on particular theories. Naturally each accused the other of scientific inadequacy but this accusation was not related to their support of the different taxonomic schools of thought in Europe. The main reason for their bad relationship was their competition, especially in the collectors' market in England, as we have found several advertisements in English magazines like *The Botanical Gazette* and *Hooker's Journal of Botany,* for collections to be sold either by Orphanides or Heldreich.

Heldreich and Orphanides had another even indirect scientific relationship. Alphonse Pyramus de Candolle (1806-1893), son of Augustin Pyramus de Candolle, was the professor of Heldreich and used the modified system of taxonomy proposed by Adrien de Jussieu, professor of Orphanides. [55]

Their scientific work, as shown in the titles of their publications,[56] gives the impression that Heldreich was closer to the truth despite the exaggerations

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54 Audrey le Lièvre, "A view of Edmond Boissier," *Curtis's Botanical Magazine,* vol.11, 3, 1994, p.130-143.

55 Krimbas, cit. note 47*,* p.104.

56 Th. von Heldreich, "Catalogo delle piante raccolte nel Peloponneso nell' anno 1844," *Giorn. Bot. It*., 1846; Th. von Heldreich, *Herbarium Graecum normale,* 1856-1861; Th. von Heldreich, "Über Pflanzen der Griechischen, insbesondere der attischen Flora," *Garten Flora,* 1861; Th. von Heldreich & August Mommsen, *Die Pflanzen der attischen Ebene*, (1872), Schleswig, J.Bergas, 1877; Th. von Heldreich, "Beitrag zur Flora von Epirus geliefert von Herrn N.K. Choldres," *Verh. Bot Ver. Prov. Brandenburg*, 21, 1879, p.61; Th. von Heldreich, "L'Attique au point de vue des caractères de sa végétation, " *Congr. Inter. Bot. Hort. Paris 1878,* Paris, 1880, p. 8; Th. von Heldreich, "Murinitia, eine Idylle von Korax mit

of the moment. This conflict and insecurity may have finally prevented Orphanides from proposing Heldreich for the post as the next Professor of Botany. Perhaps another reason for this decision was the German origin of Heldreich. We must not forget that Germans were the majority of the professors holding chairs in the University during the first period. As the climate became more nationalistic it is possible that opinion prevailed which supported the appointment of such highly esteemed positions only to Greeks. One way or other, the situation probably caused Heldreich some bitterness and the chasm between the two men remained unbridgeable. The speculation that good relations were finally restored is based on the fact that Heldreich delivered a complimentary speech at Orphanides' funeral. This hypothesis, however, cannot be verified, given that such an action practically restored the posthumous fame of a no longer dangerous rival, and presented Heldreich as a magnanimous and forgiving man.

The position of the Professor of Botany remained vacant for approximately 10 years, and was finally occupied in 1892 by Spyridon Miliarakis (1852-1919). He left for Paris for specialization in botany without even participating in the relevant competition for the position - announced in 1880 and finally decided in 1884. The senate, for reasons of equal treatment and so as not to be accused of favoring Miliarakis, sent Gerakis, a fellow-competitor, also to Paris. Miliarakis who studied with the famous professor Sachs in the University of Wurzburg had a good knowledge of cell physiology and published a textbook of botany which is still considered high in quality, containing terminology currently in use. He worked on higher plant systematics, enriching the botanical collections of the Museum.

Miliarakis was the last Professor of Botany at Athens University in the nineteenth and the first half of the twentieth century and therefore it is with him that we close our discourse on botany in Greece during the nineteenth century. His work on the progress of natural history in Greece undoubtedly deserves

topographische dendrologischen und philologischen Bemerkungen," *M. Deffner´s Arch. Mittel-neugrich.-Philol.*, 1, 1880, pp. 89-103; Th. von Heldreich, "Bericht über die botanischen Ergebnisse einer Bereisung Thessaliens," *Sitzungsber. Königl. Preus. Ak. Wiss*., 1883, p.115; Th. von Heldreich,

"Une Graminée de l'Atlas retrouvée sur le mont Taygéte en Grèce, *Bull. Inter., Ac. Geogr. Bot*., 1889; Th. von Heldreich, "*Η χλωρίς του Παρνασσού* (La flore de Parnassos)," *Parnassos,* Vol. ΙΓ΄(vol. XIII), 1890, p. 173-192, 257-274 (en Grec); Th. von Heldreich, "La flore du Pélion," *Palligenesia,* 1891 (en Grec); Th. von Heldreich & E. Boissier, "Delle piante raccolte dal Lig. Heldreich nel suo viaggio nel Peloponeso nell' anno 1844 secondo le determinazioni di Boissier e Heldreich" *Misc. Bot. Min*. (Genéve), vol. 16, 1844, p.373; Th. Orphanidis, *Ennumeratio chloridis hellenicae*, Athens, 1866; Th. Orphanidis, "Sur l'état actuel de la flore greque," *Act. Congr. Int. Bot*., Paris, 1866; Th. Orphanidis, "Deux discours sur quelques plant de la flore greque," *Congr. Int. Bot. Petersburg*, 1870; Th. Orphanidis, "Boute nuove et rare di Graecia," *Congr. Int. Bot. Firenze,* 1876; Th. Orphanidis, "Dissertation sur les charactères spécifiques du genre *Colchicum* et sur quelques espèces nouvelles découvertes en Grèce," *Congr. Int. Bot. Firenze*, 1875, p. 27.

additional study. He was one of the first and strongest supporters of Darwin's theory in Greece, publishing a series of favorable articles and pamphlets.[57] Heldreich[58] was also a supporter of Darwin. This was probably the reason why Miliarakis edited Heldreich's book *The Popular Names of the Plants Identified by Th. Heldreich* avoiding completely in the preface any reference to Orphanides. Though this book was printed at the beginning of the twentieth century, from the philosophical and stylistic viewpoint it belongs to the nineteenth century. It is characteristic that Miliarakis besides the practical usefulness of this knowledge added:

This opuscule will be useful both philologically and ethnologically because, while it reveals the great number of names that have remain unaltered since ancient times, on the other hand it shows through the changes, some of these names which have suffered during several periods and in several places to give us a picture of the evolution of the language during that time.

That was the situation among the members of the small botanical community in Greece during the nineteenth century. Personal conflicts and intrigues which marked this course happily did not prevent this science from being developed to a degree not significantly far from the level it had attained in Europe. We may thus conclude that for botany, at least Greece was somehow a periphery at the center.

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57 George N. Vlahakis, "Η υποδοχή των ιδεών του Δαρβίνου στην Ελλάδα" (The reception of Darvin's ideas in Greece) in K. Skordoulis (ed.), *Ζητήματα Επιστήμης: Ιστορία, Φιλοσοφία και Διδακτική* (Matters of science: History, philosophy, didactics), 2008, pp. 75-86 (in Greek).

58 Krimbas, cit. note 47, pp. 81-108.

Botany in Greece during the 19th Century: A Periphery at the Center

The science of botany is exemplified as a blueprint of the approach of scientific knowledge in Greece during the nineteenth century, a period in which the Greek flora is of particular interest to European researchers in the framework of general scientific missions or specific visits. In the time before the Greek Independence (1834) it seems that botanology established itself a pseudo-science and the importance of herbs in practical medicine is reflected in almost all medical books of this era. At that time some books, either original or translations, related to the history and methodology of botany were published.

The foundation of the University recruited either by foreigners or by Greek scientists, served as a starting point for the diversification of research. The succession of the first German professors of botany and the silent underrating of the Greek scholars who were active during the period known as Neohellenic Enlightenment (1750-1821) are discussed. This part of the paper deals with the contribution of C. Fraas and X. Landerer to botany as a scientific discipline in the University of Athens.

Another subject under investigation is the fact that despite the difficulty in publishing specialized journals in Greek, relevant themes were published in the *Parnassos Journal*, one of the most important Greek encyclopedic periodicals of the nineteenth century.

The development of botany is based on two persons, Prof. Th. Orphanidis - who essentially contributed to the enrichment of the Natural History Museum of the University and also to the development of relations with foreign academic centers, and Th. von Heldreich - curator of the botanical collections of the Natural History Museum. Their contribution, achievements and the long-term conflict between them are examined.

Keywords: Botany, Th. Orphanidis, Th. von Heldreich, Greece

Ondokuzuncu Yüzyılda Yunanistan'da Botanik: 'Merkez'deki 'Çevre'

Ondokuzuncu yüzyıl boyunca Yunanistan'da bilimsel bilgiye olan yaklaşımı anlamak için botanik bilimi örnek alınabilir. Söz konusu yüzyılda, Yunanistan florası, gerek genel bilimsel misyonları gerekse özel ziyaretleri çerçevesinde Avrupalı araştırmacıların ilgi odağında olmuştur. Yunanistan'ın bağımsızlığından (1834) önceki dönemde, botanoloji bir pseudo-bilim olarak var olmuş ve tedavide bitkilerin kullanımı o döneme ait tıp kitaplarının neredeyse tümünde yer almıştır. O dönemde, ister telif ister tercüme, botaniğin tarihi ve metodolojisi konusunda bazı kitaplar yayımlanmıştır.

Üniversite'nin ister yabancı ister Yunan bilim adamlarının katkılarıyla kuruluşu, araştırma konularında çeşitliliğin başlangıcı olmuştur. Bu çalışmada, Neohellenik Aydınlanma (1750-1821) olarak bilinen dönemde etkin olan Alman botanik profesörleri ile Yunan bilim adamlarının gizliden gizliye küçümsenmesi tartışılacaktır. Makalenin bu kısmında, C. Fraas and X. Landerer'in Atina Üniversitesi'nde botanik bilimine katkıları ele alınacaktır. Araştırılan bir diğer konu, Yunanca uzmanlık dergilerinde yayımlamanın zorluğuna rağmen, ilgili konuların ondokuzuncu yüzyılın Yunanca ansiklopedik dergilerinden *Parnassos Journal*'da yayımlanmış olmasıdır.

Yunanistan'da botanik, iki kişi sayesinde gelişmiştir. Bunlardan biri, Üniversite'nin Doğa Bilimleri Müzesi'nin zenginleşmesine ve yabancı akademik merkezler ile ilişkilerin gelişmesine katkıda bulunan Profesör Th. Orphanidis'dir. Diğeri ise Doğa Bilimleri Müzesi'nin botanik koleksiyonunun sorumlusu Th. von Heldreich'dır. Makale, bu iki kişinin katkısı ve aralarındaki uzun süren çekişmeyi de inceleyecektir.

Anahtar sözcükler: Botanik, Th. Orphanidis, Th. von Heldreich, Yunanistan.