

The Physical Sciences in Higher Education in Greece during the 19th century

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This paper deals with the institutional aspects of the physical sciences in two different universities during the initial phases of the Modern Greek State. We shall, firstly, give some background material for the Ionian Academy and the University of Athens, and, secondly, present the different factors which bore on the different outlook the two institutions adopted concerning the teaching of the natural sciences.

In this paper we shall try to correlate the problematic about modernization to the problematic related to the various efforts for the autonomy of the natural sciences and the foundation of a School of Physical Sciences as an independent School from the Faculty of Philosophy at the University of Athens. Dealing with our subject from the viewpoint of *history of science* may lead to a better understanding of the relations between the university community and the scientific community, at large, together with the legitimizing role of the university for the scientific activities in the Modern Greek State. The subject of our paper may also contribute to the *comparative study* of the universities in Western as well as Eastern Europe.

The Ionian Academy (I. A.)¹ is considered as the first Greek University and was founded in Corfu in 1824 by the government of Ionian Islands State, which was under British protectorate. Absolutely decisive in this undertaking was the role of Lord Guilford² who

¹ The information given in the footnotes concerns matters considered necessary for the understanding of subjects which are not widely known. We could give further information about the extensive bibliography (mostly in Greek and less in Italian, English, French and German) and existing material to everyone who is interested in. The basic bibliography for the Ionian Academy (I. A.) is: Andreas Papadopoulos-Vretos, *Notizie biografiche-storiche su Federico conte di Guilford, pari d' Inghilterra, e sulla da lui fondata Università Ionia con note critiche-storiche su varj personaggi e su varj avvenimenti di A. Papadopulo Vreto. Biographical-historical notes about Frederic [North], earl of Guilford...*, Athens 1846. P. Chiotis, *Historical memoirs of Eptanisos [Ionian Islands]*, Zante 1887, vol. 6th, pp. 244-252. G. and V. Salvanos, *The Ionian Academy, its founder earl of Guilford, its professors and students*, Athens 1949. K. A. Diamantis, «The Ionian Academy of earl of Guilford (according to a manuscript from the collection of John Vlahogiannis)», *Hellenic Creation*, vol. 31, 1949. D. Konomos, *The Ionian Academy*, Athens 1965. Eric Glasgow, «Lord Guilford and the Ionian Academy. A Study from his Surviving Papers in the Archives of the Kent County Record Office», *The Greek Gazette*, London, September 1977, n.121, pp. 9-16. G. P. Henderson, *The Ionian Academy*, Edinburgh 1988. G. Typaldos Iacovatos, *The history of the Ionian Academy*, edition-introduction-notes by S. Asdrahas, Athens 1982. Helen Angelomatis Tsougarakis, *The Ionian Academy. The chronicle of the foundation of the first Greek university (1811-1824)*, Athens 1997.

² Frederic North, 5th Earl of Guilford (1766-1827). He came of a noble family. He studied Law in Oxford and after graduating he traveled all over Europe and Orient. He served as a high ranking officer (at first as secretary of the regent in Corsica and then as governor of Ceylon) his country. For more than fifteen years until his death in 1827, he spent all of his energy and a great part of his fortune for the preparation and the organization of the

worked more than ten years for the preparation and organization of the Academy, and strongly supported its first three years of operation, until his death in 1827. In 1865, few months after the union of the Ionian Islands with Greece, and after forty years of continuous operation, the I. A. was closed, by a royal decree.

The organization and operation of the I. A. had patterned itself after the older European universities, especially those of Britain, Germany and France. The incorporation of the Physical Sciences into the curriculum of the School of Philosophy had been the result of the influence exerted by the organization of the universities in these countries. This way of organizing the Schools of Philosophy in the European universities was based on the outlook according to which philosophy was considered as «the mother of all the sciences». Thus, in the I. A. physics, chemistry and natural history (mineralogy, botany-phytology, zoology) were being taught within the framework of the School of Philosophy, in parallel to ancient Greek and Latin philology, history, archeology, philosophy and other related subjects. Nevertheless, there was no teaching of physics and astronomy, during the first year of I. A' s operation in 1824 and until 1844, these courses were being taught for short periods, without continuity and planning³.

Chemistry and natural history were being taught under better circumstances: Chemistry was being taught, without intermission, from 1824 to 1864, and branches of natural history, like botany, were also being taught, although with problems, until 1864⁴. A chemistry laboratory and a botanical garden were in operation during the same period of time from 1824 to 1864. However, although the circumstances of teaching were often difficult, the physical sciences were equal in rank with the other disciplines which were being taught in the School of Philosophy, in I. A.

In the independent Greek State, which was founded in 1830, the creation of a University was already decided in 1833, and was materialized four years later. However, it

Ionian Academy and the instruction of Ionian Islands as well. For a biography of Guilford, see: *Dictionary of National Biography*, London 1895, compact edition, Oxford 1975, vol. I, p. 1505/164, article of J. M. Riggs.

³ In 1827 professor Stamatelos Pylarinos (1796-1875) taught physics. During the period 1828-1833 professor George Therianos (1775-1850) -and professor W. Thisteltwait for a short period of time- taught physics, too. The Italian professor Francesco Orioli (1785-1856) taught physics –and philosophy- from 1837 to 1847. The professor of Medical School John Batiste Delviniotis (1795-1896) taught physics from 1848 until the closing of the Ionian Academy, in 1865.

⁴ The professor Athanasios Politis (1790-1864) taught chemistry continuously, from 1824 until 1864. After his death, his son Helias Politis was employed to the chair of chemistry and taught the laast year of Academy' s operation. The professor Stylianos Spathis (1776-1827) taught botany from 1824 to 1827. After his death, the lesson was not being taught and the next year was suppressed. It was being taught for a little while in 1837 and

seems that a section of the intelligentsia of that period was conscious of the haste characterizing this decision, since both the financial and the organizational preconditions for the operation of such an institution were absent. Nevertheless, the University came into operation not only thanks to the romanticism and the reveries of the young King Otto⁵, but also because it had to provide for the education of the persons who were going to staff the state services, to exercise judicial power, and to meet the medical and educational needs of the newly-established state.⁶

Due to the fact that the first people involved with the founding of the institution were mainly German, higher education in Greece followed the model of the German Universities. The German-type structure can be observed in the way the four Schools are organized and operate, –like in the Ionian Academy–, as well as in the incorporation of the Natural Sciences into the curriculum of the School of Philosophy. Although the teaching of natural sciences was continuous and systematic, there was a clear orientation towards classical culture, which assigned predominance to the study of the ancient Greek philosophy and philology, and, thus, the activities concerning the natural sciences were rather restricted.

The question we want to raise is whether it is possible to understand the different outlooks in the two institutions concerning the position and teaching of the physical sciences. Let us propose some aspects of the answers to this question.

Firstly, concerning the I. A., a prominent factor which supported and encouraged the physical sciences' equal position among the other sciences in the university was the remarkable teaching of Mathematics by professors who had studied at the Ecole Polytechnique in France. These professors kept up a significant tradition of Mathematics in

then, during the period from 1844 to 1865. But this last period, it was being taught in the curriculum of the Medical School by the professor Christopher Lavranos.

⁵ Otto (1815-1867). He was the second-born son of the King of Bavaria Louis A'. He became the first King of Greece in 1832 and he reigned over the country for 30 years.

⁶ Indicative bibliography concerning the history of foundation and the first operation period of the University of Athens is given below: I. Pantazidis, 'Chronicle of the first 50 years period of the Greek University, Athens, 1889. 'The 75th anniversary from the foundation of the Greek University (1837 – 1912), ed.: Estia, Athens, 1912. A.K. Skarpalezos (editor), 'From the history of the Athens University: historic written records and historic data', Athens, 1964. K. Papapanos, 'Chronicle – history of our higher education', Athens, 1970. K. Th. Dimaras, 'Athens, the 3rd of May 1937', ed. National and Kapodistrian University of Athens, 1987.

Ionian Islands⁷. This continuous and sophisticated level of the teaching of Mathematics created a favorable context for Mathematics as well as the Physical Sciences.

Secondly, the practical orientation, which marked the study and culture of Physical Sciences in the Ionian Islands from the very beginning⁸ must have contributed to the encouragement for teaching of these courses. After 1815, the ruling groups under the British Protectorate intended to give a practical orientation to the teaching of physics, astronomy and chemistry; they also intended to combine its study with local needs and activities (shipping, shipping trade, traditional kinds of cultivation), but also with wider state projects concerning agriculture, shipping, public health etc.

Furthermore, this practical orientation must have facilitated the incorporation of the Physical Sciences into the curriculum of Medical School which re-operated in 1844, after a 15 years' suspension. Its practical orientation was being emphasized, but both the pure character and the elements that termed them as independent sciences were being restricted. After 1844, the professors of the Medical School were -usually successfully- dealing with matters of public health, specifically with epidemics that often struck the Ionian Islands⁹. Because of this activity, both Medicine and the professors of the Medical School acquired great authority and prestige, part of which reflected towards the Physical Sciences. But, at the same time, their role as auxiliary/reference sciences was underlined.

Concerning the University of Athens and the inclusion of the natural sciences in the curriculum of the School of Philosophy, it must be pointed out that during the period the

⁷ Since the 18th century, when the Ionian Islands were still under the Venetian domination, there had been study and culture of Mathematics which was supported by practical matters relating to measuring of land (geodesy) and fortification of the islands.

In the early 19th century, for a short period of time from 1808 until 1815, Ionian Islands were under the domination of the Imperial French. They founded an academy in Corfu which patterned itself upon the academies and societies which had been founded during the Renaissance in Italy and during the 17th century, after the Scientific Revolution, in Continental Europe and Britain. In that first Ionian Academy, there was - among others- a section of Physical Sciences and Mathematics. Thus, the content of Mathematics was renewed, because the French introduced the achievements of mathematical science in France; those which had been produced in the 17th and 18th centuries but also the achievements which proceeded to be produced in the first decade of the 19th century, in Ecole Polytechnique and the military schools of Napoleon's France.

For a basic bibliography about the Ionian Academy of French, see: Hubert Pernot, *Nos Anciens a Corfou, Souvenirs de l' Aide-Major Lamare-Piquot*, (1807-1814), Paris 1918. S. Th. Lascaris, «L' Academie Ionienne. Un Institut Litteraire a Corfou sous la domination Napoleonienne», *Napoleon. Revue des etudes Napoleonniennes* 25 (1925). S. M. Theotokis, «About the education in Ionian Islands (1453-1864). Historical study», *Corfou Annals* 1956, pp. 9-142.

⁸ The French who introduced the study of physical sciences in Corfu, were oriented towards meeting their more practical needs and they undertook to combine this study with production, economy and other related activities. With the same purpose, they introduced in Ionian Islands methods of statistics.

⁹ G. Pentogalos, *The Medical School of the Ionian Academy (1824-1828, 1844-1865)*, Thessaloniki 1980, pp. 113-116.

University was founded, the philosophical and ideological trends which were prevailing in Germany, were strongly related to neo-classicism, to a return to the ancient Greek traditions and ideals, and to the study of the ancient Greek texts. It was within such a framework that the physiocratic theories had been formulated. Thus, an anti-naturalistic tendency which was being formed at the University of Athens, can partially explain the lessening of the emphasis on the natural sciences and the practical knowledge.¹⁰

Such an ideological trend with its emphasis on the classical heritage and in “establishing” the continuity of the Greek nation from the ancient times through Byzantium to the modern era, eventually became the dominant trend in the formation both of the ruling class in Greece and reflected itself in the curriculum of the School of Philosophy.¹¹ On the other hand, the intention of the Greeks for cultural penetration in the area of Eastern Mediterranean was reinforcing even more the orientation of the University –the only one in the Southeastern Europe– towards classical letters and philological studies, since such a movement presupposed the retrieval of the ancient heritage, through with its characteristic values and ideals.¹² For these reasons, the natural sciences were passed over, as they were considered unrelated to the humanistic culture and the ancestral tradition that would shape the national character of those living in the new Greek society.

Hence, and despite the discourse of the pre-revolutionary scholars in support of the natural sciences and the new physiocratic views during the 18th century,¹³ teaching during the 19th century was quite inadequate on all the education levels, whereas the School of Philosophy of the University of Athens was virtually changed to a philological school.

However, the university community of the natural scientists, from the very beginning of its scientific life, realized that its main concern should be thegnoseological upgrading of its subject matter. For this reason, they adopted a chain of arguments to speak in support of the

¹⁰ M. Stefanidis, *The history of the School of Physics and Mathematics*, vol. A, ed.: National Printing-office, Athens, 1948, p. 17.

¹¹ K. Tsoukalas, ‘Dependence and Reproduction. The social role of the education mechanisms in Greece (1830-1922)’, ed.: Themelio, Athens, 1922, pp. 565-566.

¹² K. Th. Dimaras, ‘Ideology at the starting-point of the Greek University’, *Proceedings of the Intl. Symposium on ‘University: Ideology and culture’*, IAEN, Athens, 1989, vol. A, p. 44.

¹³ It is about the representatives of the neo-Hellenic Enlightenment, who spread with their works the physiocratic spirit through the Hellenic area. They dealt with the new mathematics and natural sciences, and wrote the first schoolbooks of the modern physics and the new science of Chemistry. Eugenios Boulgaris, Nikiforos Theotokis, Iosipos Misiodakas and Konstantinos Koumas are among the most significant scholars who expressed this trend.

strengthening and the spreading of the natural sciences, while in parallel, they were aiming at a marked change in the orientation of the objectives and the role of the University: The latter should be geared to the new demands of modern science in order to be able to place the developments in natural sciences among the cultivation of the sciences in Greece. The cardinal argument the Greek scientists invoked in their effort to strengthen the interest in natural sciences, was the practical exploitation of the sciences for the benefit of the society. The terms by which this argument was expressed were clear, aiming to elucidate the need to remove the persistence in classical education and to adopt the western model for the inclusion of the sciences in education and in those institutions which would contribute to meeting the technical needs of Greek society.¹⁴ It is true that during the last quarter of the 19th century there was also, in Greece, evidence of a limited but in any case remarkable industrial development. Hence, a favorable frame was formed for the natural sciences to promote their reasoning, which not only was expressed quite early in their texts, but also it seems that it affected part of their activities.¹⁵

A.K. Christomanos¹⁶ was the main formulator of this rhetoric for modernization, and his name was identified with the reform movement for strengthening the natural sciences. Christomanos had every reason to believe that the natural sciences, and mainly Chemistry, are associated with progress, since he was a student of Liebig (1803-1873), in Giessen of Germany. Liebig was the first who connected Chemistry and the application of its achievements with other sciences, such as mineralogy, medicine, pharmacy, and above all, with industrial production.

Considering the natural sciences as a means for progress, and since the University was the natural domain for their cultivation and practice, many professors started arguing that the

¹⁴ It is now the period where a new physiocratic spirit was predominating among the German intelligentsia, thanks to which the physical and mathematical sciences had occupied a primary position in the Universities. At the same time, the experimental research and teaching had achieved a great progress through the establishment of new laboratories. Therefore, it was the most favorable time to put forward the demand of strengthening the natural sciences in the University of Athens as well. Such an opportunity had not been given in the years of the Ionian Academy, during which the natural sciences all over Europe were still part of the scientific field of the philological sciences.

¹⁵ Johann X. Landerer (1809-1885), who was a German pharmacist and one of the first Professors in the University of Athens, worked in this direction and tried to connect the scientific production with its social exploitation. Similar effort was also made by several other natural scientists during the first operation years of the University, as the H. Mitsopoulos, Th. Orfanidis, Th. Heldrigh, and K. Domnandos.

¹⁶ A.K. Christomanos (1841-1906). A remarkable chemist, who studied in the Polytechnics of Vienna and Karlsruhe, and in the Universities of Giessen and Heidelberg. Professor of General Chemistry in the Greek University from 1864 to 1905.

teaching of the natural sciences should be reinforced, and that they should be separated from the curriculum of the School of Philosophy. In October 1895 the University community of natural sciences drew up a petition¹⁷ by which they emphasized the need of separating the Department of Physics and Mathematics from the School of Philosophy, as well as the need of establishing an autonomous School of Natural Sciences. This movement was the crowning of the long efforts of the community, while at the same time it was revealing a dynamic way in negotiating related matters. Their expectations were indeed fulfilled years later, in 1904, after the humiliating military defeats of Greece, when an autonomous School of Physics and Mathematics was founded.

¹⁷ The petition is drawn up and signed by the Professors of the Department of Physics and Mathematics of the School of Philosophy, A.K. Crhistomano, K. Mitsopoulo, T. Argyropoulo, S. Miliaraki, and A.K. Dambergi (see M. Stefanidis, 'History of the School of Physics and Mathematics', p. 24).