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**The Advancement Of Science in Romania: The Second Half
Of The Nineteenth Century-The Beginning Of The
Twentieth Century**

Summary

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The main subject of this doctoral thesis is the analysis of the development of modern science in Romania in the second half of the nineteenth century and at the beginning of the twentieth. By the word „science” we refer to the physical and natural sciences, such as physics, chemistry, geology or biology. As a consequence, the development of the medical sciences, the mathematics or the social sciences was not analyzed.

Hence, the major objectives of the thesis are to indicate the particular way in which the modern science was introduced in Romania, a process which accelerated starting with the second half of the nineteenth century, and to describe some of the distinct mechanisms which supported this development. It should be emphasized that this research is not exhaustive. Sources that could be relevant to an investigation of the history of science in Romania proved to be numerous. So we had to operate a selection of those, but also of the episodes or developments to be highlighted. In terms of timeframe, the years 1860 and 1910 could be considered the chronological limits of the core of the thesis. Like any historical phenomenon, scientific development can not be circumscribed by objective limits, but only by some conventional ones. So the year 1860 can be considered as the one that marks the beginning of the modern scientific development in Romania. This date was chosen in the light of political and cultural changes that have begun in the seventh decade that influenced the subsequent advancement of science. The analysis of the development of science in Romania stops around the year 1910. After that, we consider that a further specialization of scientific literature and scientific branches took place. As a result, we consider the time frame selected a relatively homogeneous one in terms of the dynamic of the advancement of science.

The thesis is divided into six chapters. The first chapter tries to present a history of the emergence of modern science in the XVI-XVII centuries in the West, therefore, to analyze „The Scientific Revolution”. Hence, there are considered the main developments that have shaped this process, the main ideas and institutions that arose then, and why are they important for the subsequent history of science. This history is continued by presenting some specific aspects of history of science in the eighteenth and nineteenth centuries. The science of Enlightenment consisted in some previous acquisitions, but also in a range of disciplines which received their

modern embodiment in that age. Also, science gained prestige and social recognition throughout Europe. In the nineteenth century, the link between science, industry and progress has become almost inseparable and scientific work has become increasingly specialized. Specific developments of this century are treated concise, since some of them are contextualised more thoroughly in other chapters.

Chapter two, „A History of the Romanian science in the eighteenth century and the first half of the nineteenth century”, is divided into two parts. The first one presents the existing scientific spirit in the age of the phanariots, especially in the second half of the eighteenth century and the first two decades of the next one. This period coincided with the so called „Neo-Greek Enlightenment” and many leading representatives of this movement were professors at the Royal Academies of Jassy and Bucharest. So, paradoxically, although it is considered an era in which the relations with the West were diminished, some elements of modern science were introduced by the Greek teachers. However, all this development should be critically viewed, and therefore we have tried to compare it with contemporary developments in the Western world. The second part of the chapter analyzes the advancement of science in the period between 1821-1860. Although the first landmark was conventionally chosen, the third decade of the nineteenth century is the period of the reorientation of the Romanian cultural elite towards the Western models of development, including the ones of scientific development. We therefore analyze the routes and the activities of the Romanian scholars who were sent to the West for scientific studies. We also present the efforts to develop Romanian high education institutions. Another important part of the chapter is the presentation of the first Romanian scientific society, founded in Jassy in 1833 and inspired directly by the German scientific organization.

Chapter III is entitled „The first generation of Romanian scientists and its work”. In its pages, we tried to analyze the activity of what can be considered a first generation of the Romanian scientists: a group of scholars who, since 1860, tried to create a climate for the systematic advance of modern science in country. Accordingly, a first level is represented by the analysis of scientific popularization: in this practice, which was characterized by many facets, were involved most scholars of the time. Another level of analysis consist in the review of the introduction of new philosophical concepts inspired by the progresses of modern science: the positivism and the materialism. Their dissemination has in turn motivated some reactions from scholars with spiritualist and religious convictions. This attitudes are also briefly analyzed.

A third subchapter discusses the intellectual activity of Emanoil Bacaloglu, a scientist with a representative career for the first generation of Romanian scientists: author of the first original studies in the country in its domain, professor and textbooks author, popularizer and founder of scientific societies.

The fourth chapter studies the mechanisms by which the Romanian science was institutionalized: the scientific societies and associations. This chapter represents a central point of the thesis, since we consider the social organization of science one of its defining characteristics. Of course, scientific societies are a component of this kind of organization, but not the only one. Nonetheless, we believe that within the efforts to develop a modern scientific milieu which took shape in the second half of the nineteenth century, the scientific societies were an important pillar. We try to emphasize their activity in the light of several prospects to show their importance as a meeting place for scholars, within which the presentation, publication and dissemination of scientific ideas took place, as institutions through which Romanian scientists were able to integrate into Western scientific circuit and as a mean of creating a national community of scientists. Hence, we analyze the first institutions of this kind, dating from the early years of the 1860s. These attempts were lacking in continuity, but marked the beginning of a new stage in the history of Romanian science. We then pursue the institutions with greater continuity and importance to Romanian science: „The Scientific Section of the Romanian Academy”, „The Society of Physical Sciences” and „The Romanian Association for the advancement and dissemination of science”. We try to analyze the specifics and the individuality of each institution.

The fifth chapter is entitled „Some particular aspects of the evolution of the Romanian science at the end of the nineteenth century and at the beginning of the twentieth. The evolution of the universities. The nationalization of science” and deals with two important issues. The first one is to outline the development of the university education as an example of the gradual professionalisation of Romanian science, both in respect to diversification of the university departments and also research laboratories. We try to have a critical approach, since the pace of these processes has not always meet the scholars expectations.

In a second subchapter we analyze a component of the Romanian scientific discourse developed at the turn of the centuries, the nationalization of science. We therefore try to show the origin of this way of thinking and some of its effects in the organization of science and the

choice of research areas. We also analyze this discourse from a broader political-cultural view. The last chapter, the sixth, is called „A new paradigm to study the nature: the accommodation of darwinism”. In it it is analyzed how the theory of evolution stated by Charles Darwin was assimilated in Romania in the nineteenth century and early twentieth century. The title of this chapter was inspired by the outlook of the philosopher of science Mircea Flonta (himself inspired by the debates in the philosophy and history of biology) who considers that the theory enunciated by Darwin formulated a new way of looking at and studying nature, fundamentally different from the one existing in the physical sciences.¹ The enunciation and the diffusion of the evolutionary theory were perhaps the most important developments in nineteenth-century science. We explore this subject for several reasons: the theory had serious repercussions not only in changing the ideas and methods of the natural sciences but also in modifying and questioning the image about the world of the majority of educated people in the nineteenth century. It was the scientific theory that influenced in the most profound way the general public. Nearly the same effect occurred in the Romanian culture during the studied period: the theory provoked discussions over the nature of knowledge, the validity of religious concepts, but also of the ability of science to influence the social, political or cultural spheres.

Therefore, the expression „the advancement of science” covers both the development of the institutions and of other factors which enabled the introduction and development of modern science in the nineteenth century Romania, but also the gradual specialization and professionalization of the Romanian scientific community of that epoch. The use of this expression was inspired by the name of „The Romanian Association for the advancement and dissemination of science“, founded in 1902, which asked for a more significant support both from the state and from the society for the scientific endeavors and its results, but also was seeking to spread the scientific spirit to the general public.

The primary sources of the thesis are represented mainly by the specialized scientific journals of the time, like „Buletinul Societății de științe fizice”, „Analele Academiei Române” and the volumes issued after the congresses of „The Romanian Association for the advancement and dissemination of science”. Other primary sources consists in the collections of popular scientific journals of the nineteenth century such as „Natura”, „Revista Română pentru Științe,

¹ Cf. Mircea Flonta, „*Originea speciilor. O paradigmă a cercetării naturii*”, în Mircea Flonta, *Darwin și după Darwin. Studii de filozofie a biologiei*, Humanitas, București, 2010, p. 62.

Littere și Arte”, „Transacțiuni litterarie și științifice” și „Revista Științifică”. We could add to that the scientific related articles published in some more broadly culturally oriented magazines, such as „Atheneul Român”, „Revista Contemporană” „Contemporanul”, „Revista Teologică” sau „Convorbiri Literare”. We try to contextualize and interpret all this information using a vast secondary bibliography. Of these, the books and articles written by foreign historians of science have provided a professional model to approach the subject.