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Natural Scientific Societies in the History of Science

Scientific societies, so called "invisible colleges", have been an essential element in the scientific community since the beginning of organized science. Those organizations existed in the modern period were voluntary associations of scientists and amateurs, getting inspiration from the exchange of ideas. Both in the nature of their interests and in the form of organization, scientific societies reflected the level of development of science of that time and its structure. At the end of the 17th century, the activities of scientific societies expanded, as they began to publish their works and scientific journals. The tasks that societies set for themselves were extremely broad. They covered the most diverse issues of natural science, mechanics, mathematics, physiology, etc. Scientific societies were established in most of the European capitals' cities and sometimes even in small province towns in the 18th century. The process of knowledge differentiation, which began in the late 18th and early 19th centuries, led to the flourishing of natural science and the creation of corresponding specialized scientific societies, and, in general, to the growth of the number of scientific societies. The system of organizing science during that period included universities, academies, laboratories, etc. Scientific societies in that system played the role of a place for communication and cooperation among scientists of one or several discipline who worked in various scientific institutions. The societies and their publications gave to science the enormous practical benefits. The scientific revolution, which began at the turn of the 19th and 20th centuries, caused significant changes in the structure of knowledge and created the preconditions for the emergence of the new organizational forms of research work such as research institutes. However, scientific societies continued to function, but gradually lost their importance in the scientists' community and practice of science. Nevertheless, for the progress of science, its development in various forms is necessary. Scientific societies still exist that confirms the extreme stability and adaptability of that form of organization of science.

It is interesting that a serious imprint on the peculiarities of the existence and activities of scientific societies was imposed by the features of the national organization of science, since often scientific societies were and are precisely national associations. As a rule, most of the first scientific societies in different countries were precisely natural scientific societies.

One of the most famous scientific society of all time is Royal Society (Royal Society of London for Improving Natural Knowledge), founded in 1660. From the first day of its existence, the new private organization strove to focus its attention exclusively on the problems of natural science. The management of the society was carried out by a council of 21 scientists, which met three times a month. Council members, treasurer and secretaries

were elected by general vote. The composition of the council was re-elected a year later. The basis for the organization of society was the principle of electivity, which was strictly observed. In the 19th century, they were supplemented by the principle of accountability of the governing body and the publicity of its activities. At the beginning of the 20th century, the principle of equal representation in the council of all-natural sciences was clearly fixed. The principles of its organization formed the basis of all subsequent scientific societies. In the opinion of the founders of the society, its independence was best ensured by the patronage of the royal power. Since 1662, the society began to be called the Royal, although legally it had the status of a private independent organization.

The earliest form of self-organization of science in France was scientific societies, which in the first half of the 17th century united all famous scientists of that time. National academies — the French Academy, the Academy of Fine Arts, and the Royal Academy of Sciences — grew out of scientific societies later. The development of experimental sciences required large material expenditures, unbearable for the scientists themselves; therefore, they established payments for academicians, a special monetary fund for conducting physical experiments. However, the structure of the academies, which had been taking shape for a long time, retained some of the scientific societies features. Supported by government stipends, the Academy of Sciences was the center of scientific work for most of the eighteenth century and still one of the most famous scientific institutions in France, bringing together representatives of mathematical and physical, chemical, biological, geological and medical sciences.

In the German states and, later, in the German and Austro-Hungarian empires, scientific societies could not exist independently of the state, since the creation of each of them required the permission of the authorities. In the 18th century, German academies of sciences were created, the first of which arose in Berlin in the form of the Brandenburg Scientific Society, later renamed the Prussian Academy of Sciences. However, the leading role continued to be played by the universities. In the second half of the 19th century, research institutes began to appear. At the beginning of the 20th century, the Kaiser Wilhelm Society (1911) was created, since 1948 it has been the Max Planck Society, which today remains the leading private scientific organization in Europe. The Munich-based society includes more than 80 institutes and research centers.

The organization of its own scientific institutions in Japan began only in the last quarter of the 19th century, and the methods and forms of conducting research work were transferred to those that had previously developed in different European countries, mainly in the Netherlands, Denmark, England, Germany and France. In the middle of the last century, there were 1,061 scientific societies in Japan, of which 81 were engaged in natural sciences. The sizes of these scientific societies vary: from a few hundred members to several thousand.

In the USA, the first scientific and scientific-educational organizations began to emerge only in the 17th and early 18th centuries, and they were created according to the model and likeness of European institutions. The first scientific society in America was the Boston Philosophical Society, founded in 1683, but existed for a very short period. In 1743, on the initiative of B. Franklin, the American Philosophical Society was created in Philadelphia. Almost all branches of the science of that time, especially astronomy, medicine and astronomy, were included in the field of research of that society. The American Association for the Advancement of Science, founded in 1848, was a forum for scientists of discipline, and now it is the largest general scientific organization in the world.

In Russia, the first scientific society was created during the course of the enlightened absolutism of Empress Catherine II. It was the Russian Economic Society, founded in 1765. The first natural science societies began to be created from the beginning of the 19th century, most often at universities. They made a significant contribution to the development of natural science in Russia. Societies played an important role in the scientific community until the end of the 1920s. The rapid process of decline, both numerically and functionally, began at the turn of the 1920s–1930s, as there was a massive reorganization of all science at that time. All surviving scientific societies lost their autonomy. During their history scientific societies in Russia mostly concentrated in St. Petersburg and Moscow.

The history of natural scientific societies provides a valuable perspective to analysis of the importance of scientific societies in the system of science organizations and their place in the history of science, as for the long time period they were the primary communication networks for scientists and their work.

This issue consists of totally eight papers. Almost all of them give a validation of natural scientific societies merit, discussed features of their development in the history of science. The history of the Imperial Society of Friends of Natural Science, Anthropology and Ethnography ('IOLEAE') is well known. However, the paper by Ekaterina V. Minina and Maria M. Klavdieva shed the new light to the participation of the IOLEAE in the process of the creation of the Museum of Applied Knowledge (Polytechnic Museum) in Moscow. The authors analysis ideas of V.K. Della-Vos and A.P. Bogdanov (the IOLEAE members) on the creation and development of the museum. The relations between science and power in Russia always turned difficult, especially in turmoil periods like the 1920s. Elena F. Sinelnikova in her article considered the natural scientific societies relations with Soviet power in the initial period and tried to determine the place and importance of natural scientific societies in the system of science organizations in the first postrevolutionary years. By examining the history and main activities of the Russian Eugenic Society (1920–1929), Roman A. Fando points out that, in contrast to the eugenics societies in other countries, the Russian Eugenics Society was governed by strict scientific standards and skepticism towards pseudo-scientific utopias, as the late 1920s, the society provided the significant scientific and educational works, trying to solve the vital medical problems. James A. Pritchard presented a paper focused on the participation of the American Society for Mammalogy and the Ecological Society in one of the most famous episodes of wildlife conservation history in North America — the fight against federal predator control programs on public lands, which peaked in disputes during the late 1920s and 1930s, resurging again in the 1960s. Laurn Loison's paper aim is to show how a specific form of positivism was instrumental in shaping an epistemological attitude, shared by most scientists, that opposed any form of speculative theorization within biology. As a sample the author chose the France Society of Biology in 19th century. In his paper, Maxim V. Trushin described the material devoted to the issues of medical and general microbiology, which can be found in publications of different years in «Scientific Notes of the Kazan University», reflecting the activities of the Kazan Society of physicians. The paper Sergei A. Kozlov dedicated to the anniversary of one of the oldest scientific societies in Russia — the Moscow Society of Agriculture (1820–1930). Jerome Pierrel's article focuses on the Fifth International Congress of Biochemistry, which was hold in Moscow in 1961 and was the largest one which was held up to then (more than 5000 people have attended the Moscow congress).

An analysis of the processes of formation and development of the system of organizing scientific research allows us to draw a general conclusion that natural science societies have played an important role in the history of science.

Elena Sinelnikova, Roman Fando