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HISTORY AND ACTIVITIES OF THE U.S.S.R. ACADEMY OF SCIENCES DURING THE PAST TWENTY-FIVE YEARS

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THE Library of Congress has appropriately taken steps to recognize the heroic efforts of the Russian people, who are making a stand to safeguard their borders and their civilization. This effort is being made according to the most logical and modern concept of defense and progress, namely, through concerted scientific, technical and cultural development. The past twenty-five years has taken on the aspect of a new "Renaissance" of Russian culture.

At the Library of Congress there has been installed an exhibition portraying this new "Renaissance." The exhibition centers principally about the history and work of the U.S.S.R. Academy of Sciences. The Academia Imperiale des sciences de Saint-Pétersbourg, Imperatorskaya Akademiya naük, was projected in 1718 by Peter the Great in cooperation and with the advice of German scholars of that period, principally Gottfried Wilhelm Leibnitz and Baron Chretien Wolff. Peter died in 1725 and his widow, Catherine I, ordered the opening of the academy according to prepared plans. The first meeting was held on December 27, 1725, with Laurent Blumentrost (1692–1764) as the first president, and with a large and distinguished group of foreign scholars in attendance. Catherine furthered Peter's plan by appointing a faculty of mostly German-Swiss scholars to the university, which was at the same time the academy. Included in the large number of scholars appointed and associated with the academy were Jacques Hermann, 1678–1733, professor of mathematics from Switzerland; Chretien Goldbach, 1690–1764, professor of mathematics from Germany; Leonard Euler, 1707–1783, professor of mathematics from Switzerland; Nicolas Bernoulli, 1695–1726, professor of mathe-

matics from Switzerland; Daniel Bernoulli, 1700–1782, professor of mathematics from Germany . . . and many others. Under the guidance of this notable group of scientists, the first of a long series of publications entitled "Commentarii Academiae Imperialis Scientiarum Petropolitanae" was issued by the academy.

In 1747 the academy was officially divided into two sections—the academy proper and the university. The latter, however, for lack of students, ceased to function by 1754. The University of Moscow opened in 1755, and so great was the intellectual growth among the Russian people that other cities soon established universities.

During the short reign of Peter II, the academy was neglected by the Court and the stipends of its members were discontinued; but it was again patronized by Empress Anne, who added a seminar under the superintendency of the professors. Both institutions flourished for some time under the direction of Baron Johann Albrecht Korff (1697–1766). At the accession of Elizabeth, the original plan was enlarged and improved, and again foreign scholars were drawn to St. Petersburg (Leningrad). It was considered a good omen for the culture of Russia when two natives, M. V. Lomonosov (1711–1765) and S. I. Rumovskii (1732–1812), who were men of genius and had prosecuted their studies in foreign universities, were enrolled among its members. Further stimulation was provided by Catherine II, who utilized the academy for the advancement of national culture. By her recommendation the most able professors visited all the provinces of her vast dominion, with ample means for research and publication in the natural resources of the country. The result was that no country at that time could boast within so few years such a number of excellent official publications concerning the natural sciences, together with the geography and history and other cultural interests of the different provinces. All these publications were issued by the academy. The first transactions, "Commentarii Academiae Scientiarum Imperialis Petropolitanae ad annum 1726," with a dedication to Peter II, were published in 1728. This was continued until 1747, when the transactions were called "Novi Commentarii Academiae," etc.; and in 1777, "Acta Academiae Scientiarum Imperialis Petropolitanae," with some alteration in the arrangements and plan of the work. The papers, hitherto in Latin only, were now written indifferently in Latin or in French, and a preface added, "Partie Historique," which contains an account of the society's meetings. Of the Commentaries, fourteen volumes were published: of the "New Commentaries" (1750–1776) twenty. Of the "Acta Academiae" two volumes are printed every year. In 1872 there was published at St. Petersburg in two volumes, "Tableau général des matières contenues dans les publications de l'Académie Impériale des Sciences de St. Petersbourg."

This latter publication contains an excellent historical résumé of the academy's early work, membership and lists of the various transactions and proceedings published since the founding date.

The buildings of the academy were furnished with the latest apparatus and the finest selection of books for the library, together with a museum and lecture halls. Quoting Alexander Petrunkevitch, of Yale University:

> However, such was the status of scientific progress with the special group created by the Tsars in the early eighteenth century. During the nineteenth century, education for the people in general, especially in the field of science, was for a long period unpopular and was limited to a comparatively small group. Even during the early period of this century education had not yet penetrated into the larger masses. The purely clerical knowledge of the Tsarist Russia gave way to military training and to such education as was necessary for service in the bureaucratic institutions created by Peter the Great. Later, humanistic studies became the standard of good education and dominated Russian society and Russian thought until comparatively recently. Medicine, of course, was early recognized as necessary knowledge, yet the people regarded it in the light of special knowledge, somewhat detrimental to broad education. Applied science, such as engineering, was for a long time looked upon in the same way, with the additional stigma of mistrust. Pure science was considered rather as a hobby for men with sufficient means, dangerous in so far as it inclined to produce a critical attitude toward religion and the established order of things, undesirable inasmuch as it did not open any other field for activity than an academic career, and insufficient as a general basis for broad education. In the second half of the past century pure science came into its own, conquered the opposition of society.

Yet the fact remains, Russia has in spite of these limitations produced a galaxy of scientists and scholars in the history of science comparable to those in any country. A brief list of these great leaders will convince one that in the face of opposition success can be attained. In the words of Lessing, the great German philosopher, opposition makes for strength. Nikolai I. Lobatschewskiĭ [1793–1856] in mathematics, particularly in non-Euclidean geometry; Dmítrĭ I. Mendeléev, [1834–1907] in chemistry, particularly the periodic tables of the chemical elements; Ivan P. Pavlov [1849–1936] in physiology, the study of brain functions; F. G. Wilhelm Struve [1793–1864] and Otto Wilhelm Struve [1819–1905] in astronomy, parallax and double star studies—these names and many others will live in the memory of man, par-

ticularly in the great tradition of Russian scientific achievement. This is demonstrated again not alone in the names that have just been given, but by the leaders that are dominating the U.S.S.R. progress in science to-day. These leaders are not alone contributing to the war but to peace as well, and thus rendering a notable service to their country.

During the World War I or the Revolution of 1918, the Government of Russia was transferred from Leningrad to Moscow, but it was not until 1934 that the Academy of Science was also transferred. The forward-looking Russian scholars had planned a much larger and more modern structure built upon classical Greek motif; the World War II has delayed this program also. However, to-day the academy consists of approximately 136 academicians, more than 30 honorary academicians, about 224 corresponding members and over 5,000 scientific and technical assistants. Sixteen American scientists are now honorary or corresponding members of the academy. The portraits of some of the more prominent academicians have been included in the library's exhibition through the cooperation of the Embassy of the U.S.S.R. in Washington. Representative volumes of the more important works by members of the academy have been selected for display from the extensive collection of Russian materials in the Library of Congress, probably the richest to be found in any library in the Western Hemisphere.

The organization of the academy groups its activities in eight departments, to each of which a section of the library's exhibit is devoted: the departments of physico-mathematical, chemical, geology-geographical, biological and technical sciences, history, and philosophy, economy and law, and language and literature. Under these eight departments, the academy maintains 76 institutions, 11 laboratories, 47 stations, 6 observatories and 24 museums. There are also eight branches of the Academy of Sciences throughout the Soviet Union, under the supervision of which are 39 institutes, 28 stations, 3 astronomical observatories, 8 botanical gardens, 3 sanctuaries and 17 other scientific research establishments. The exhibit includes publications issued by each of the departments of the academy and some of its branches.

The peacetime work of the academy was suddenly interrupted on June 22, 1941, when Germany invaded Russia. From the very beginning of the invasion, the Academy of Sciences readjusted its activities to place its resources fully behind the Russian war effort. Even while Moscow was under heavy German attack, the institution continued the publication of its learned journals and texts. Books printed while the city was under Nazi bombardment are among those shown in the library's display.

Under the academy's direction, chemists have pioneered in manufacturing synthetic rubber, in photochemistry, in developing winter lubrications for tanks and planes, in producing new explosives and in extending the uses of helium. Soviet geologists have turned their energies to the problem of supplementing the stock of raw materials required by the Russian war machine, and agronomists have increased the productivity of agriculture. Physiologists and physicians of the U.S.S.R. have won international fame for their treatment of shock, tetanus, gangrene and other war maladies, and dieticians have found new nutritive substances, as well as new sources of vitamins, which have been used to help solve the food problems resulting from the war. Technologists have also scored notable successes in finding substitutes for scarce materials, in simplifying technological processes and perfecting the organization of war industries. Most of these activities are represented in one way or another by publications on display.

Exhibited items of particular interest include the first volume of transactions published by the academy, the "Commentarii academiae scientiarum imperialis petropolitanae," published in 1728 at St. Petersburg; pictures of the first building of the academy in Leningrad, its present home in Moscow to which it moved in 1934, and the architect's drawing of its proposed new building; numerous publications of various scientific establishments attached to the General Assembly, and current periodicals concerning the academy as a whole. It is interesting to note that, while the publications of the academy are published mainly in Russian, a number have been published in English as well, while others have titles and summaries in English. M. V. Lomonosov, whose portrait appears in the historical section of the exhibit, is described as "probably the most interesting figure in the whole existence of the academy."

The academy's usefulness and influence under conditions never before experienced by man are indeed most remarkable in the annals of the history of science. The administration and various functions of the Soviet Academy are directed by the following well-known scientists and scholars: Vladimir Komarov, botanist, is president of the Academy of Sciences of the U.S.S.R. since 1936. Abram Joffe, vice-president of the Academy of Sciences and director of the Leningrad Physico-Technical Institute, is known for his researches in the field of electron semi-conductors. Alexander Baikov, first vice-president of the Academy of Sciences, is an expert on astringents, metallurgy and metallography. Peter Kapitsa, physicist, is director of the Institute of Physical Problems of the Academy of Sciences. From 1921–35 Kapitsa worked in Lord Rutherford's laboratory in Cambridge. Sergei

Vavilov, physicist, is director of the Lebedev Physics Institute of the Academy of Sciences and chief of scientific research work of the State Institute of Optics. Ivan Vinogradov, outstanding Russian mathematician, is known for his new theory of numbers and his solution of the famous Goldbach problem. He is a member of the Royal Society of London and honorary member of the London and other mathematical societies. Leon Orbeli, vice-president of the Academy of Sciences, is head of the Institute of Higher Nervous Activity and of the Biological Station in Pavlovo. Trofim Lysenko is president of the All-Union Lenin Academy of Agricultural Sciences and vice-chairman of the Supreme Soviet of the U.S.S.R. Dmitri Prîanishnikov, founder of Russia agro-chemistry, has published more than 360 papers and written text-books on agro-chemistry and agriculture. Alexei Favorskiĭ is well known in the field of organic chemistry, in which he created a new branch . . . the chemistry of acetylene and its derivatives. Vladimir Obruchev, Russian geologist and geographer, author of 300 works, among the most important of which are "Ore Deposits" and "The History of Geological Research in Siberia." Eugene Tarle, historian, is the author of many volumes on the history of the West and of Russia, including "Invasion of Russia by Napoleon in 1812," "The Working Class of France During the Revolutionary Epoch." Viacheslav Volgin, vice-president of the Academy of Sciences, is a historian-sociologist. Nikolai Derzhavin, member of the Presidium of the Academy of Sciences, is a philologist, scholar of the Slav languages and of the history of literature. Alexei Tolstoi, member of the Academy of Sciences, is one of the foremost Soviet authors. His works include the long novel "Peter the Great."

One of the most interesting and historically significant facts bearing upon the new "Renaissance" of Russia is the ability of her people during her most trying period to advance nationally through the progress of science. Shortly before and during this present conflict, the Russian scholars have selected the historical medium for advancement by paying gracious tribute to England and the English-speaking world by acknowledging the work of the greatest figure in the history of physical science, namely, that of Sir Isaac Newton.

Under Peter the Great, there was some development in practical mathematics, but with the imported scholars, particularly after the founding of the Academy of Sciences in 1725, pure mathematics made some progress. Interest in astronomy, physics and biological sciences followed in rapid order.

In the academy's various publications, such as the Commentarii, Novi Commentarii, Acta, Nova Acta and Mémoires de l'Académie Impériale des Sciences, the contributions became more sound in scholarly importance and practical interpretation. We note that the works of Daniel and Jean Bernouilli, Leonard Euler and others in celestial mechanics and mathematical physics were most prominent. However, the influence of Newtonian philosophy made no great progress in Russia at this time. In contemporary France and Germany, Newton was rapidly accepted. The cause of this neglect of Newton in the vigorous new life of Russian interest in mathematical science is not apparent. It was not until two centuries later that formal recognition of Newton became evident. In 1927, Newton's "Optics" ("Optika ili traktat . . . sveta," S. I. Vavilov) was translated into the Russian language. In 1931, at the International Congress of the History of Science and Technology, held in London, the delegates of the U.S.S.R. presented a series of addresses in which it was shown that Newton's philosophy appeared to have influenced social consciousness, through the Marxian doctrine of social change and methods of production. That is, "the method of production of material existence conditions the social, political and intellectual process of the life of society."

Further expression of appreciation of Newton's works and influence on scientific thought is indicated by a translation in 1936 into Russian of the "Principia," first edition, namely: "Matematicheskie nachala natural'noi filosofii. Perevod s latinskogo," A. N. Krylova. This was followed by another translation of Newton's principal work in pure mathematics: "Matematicheskie raboty. Perevod s latinskogo," D. D. Mordukhai-Boltovskogo. In 1943 two publications were produced: one an interesting Russian interpretation of Newton's life, namely, "Isaak N'iuton," by S. I. Vavilov; and the other a volume containing eighteen papers given at a symposium in commemoration of the tercentenary of Newton's birth. These addresses were given by the leading scholars and scientists of Russia, more or less familiar to the American public.

The Embassy of the U.S.S.R. has just announced through its bulletin of information dated May 6, 1944, that fifteen Isaac Newton Scholarships for students in the mathematics and physics department of Soviet higher educational institutes were recently established by the People's Commissariat of Education. Three of the scholarships have been awarded to students of Moscow University. The Scientific Council of the University selected two girl students of mathematics and a student of physics as the most deserving candidates for the scholarships.

As a further expression of cordiality between the Soviet government and the British government, there took place in Moscow on January 6, 1944, an inter-

esting ceremony. This manifestation was in the form of a beautiful and specially bound copy of Newton's "Principia," presented by the Royal Society of London to the Academy of Sciences of the U.S.S.R. Accompanying this volume there was an original draft of a letter by Newton to Prince Alexander Menshikov, acquainting the latter with his election into the fellowship of the Royal Society in 1714. The prince was the first Russian to be elected to the Royal Society.

OBITUARY

CHARLES BENEDICT DAVENPORT

CHARLES BENEDICT DAVENPORT was born in Stamford, Conn., on June 1, 1866, and died on February 18, 1944, at the age of 77. He was tutored by his father, a former teacher, until he was fourteen years old. At that age he entered the Brooklyn Polytechnic Institute, where he received the B.S. degree in 1886. During the following year he was a member of the engineering corps engaged in surveying the Duluth, South Shore and Atlantic Railroad. He entered Harvard in 1887, received an A.B. in 1889 and a Ph.D. in 1892. At Harvard he served as assistant in zoology from 1887 to 1893 and as instructor from 1893 to 1899. In the latter year he became assistant professor of zoology at the University of Chicago and was associate professor there from 1901 to 1904. He was director of the Biological Laboratory at Cold Spring Harbor from 1898 to 1923. In 1904 Dr. Davenport was appointed director of the newly established Department of Experimental Evolution, Carnegie Institution of Washington, at Cold Spring Harbor, Long Island, N. Y. This post he held for thirty years, till his retirement in 1934.

Dr. Davenport early became one of the world's leaders in the new science of genetics. In three different ways he made important contributions to science: by investigation of biological phenomena, more particularly of the laws of heredity in domestic animals and man; by the organization of facilities for research upon animal, plant and human heredity; and by the publication of many books and monographs on heredity, anthropology and statistical methods in biology. In the earlier part of his career he gave particular attention to experimental morphology, to the statistics of variability, to the role of water in the growth of organisms, to the acclimatization of organisms to poison and heat, and to kindred questions regarding the lower animals. Later, however, his studies were conducted wholly on higher vertebrates and man. In 1910, at Cold Spring Harbor, he organized the Eugenics Record Office, a clearing house for data on inheritable traits of American families and for giving advice to individuals on marriage and to states on defective communities. The facilities of the Record Office led to the discovery of the method of heredity of epilepsy in man, how it is produced and how in later generations it may be prevented; also, to the method of inheritance of eye color, hair color, skin pigmentation and other characteristics in man. These studies were preceded by his purely experimental studies conducted on poultry, sheep and canaries. His studies on a very wide variety of animal and human materials notably increased our knowledge of the role of the genes in animal and human development.

During two to four decades Dr. Davenport served as editor or associate editor of several journals devoted to zoology, genetics, eugenics and anthropology. Among his published books the following are notable: "Experimental Morphology," Parts 1 and 2; "Statistical Methods in Biological Variation"; "Introduction to Zoology" (with Gertrude C. Davenport); "Inheritance in Poultry"; "Inheritance in Canaries"; "Inheritance of Characteristics in Domestic Fowl"; "Eugenics, the Science of Human Improvement by Better Breeding"; "Heredity in Relation to Eugenics"; "Heredity of Skin-Color in Negro-White Crosses"; "The Feebly Inhibited, Nomadism and Temperament"; "Naval Officers, Their Heredity and Development" (with M. T. Scudder); "Physical Examination of the First Million Draft Recruits; Methods and Results" (with Colonel A. S. Love); "Defects Found in Drafted Men" (with Colonel Love); "Army Anthropology" (with Colonel Love); "Body Build and Its Inheritance"; "The Nam Family" (with A. H. Estabrook); "Race Crossing in Jamaica" (with M. Steggerda); "The Genetical Factor in Endemic Goiter"; "How We Came by Our Bodies."

This partial list of his books reflects both the broad interests and the phenomenal energy of the man. Few men have applied themselves more continuously or more ardently to research. Few men could successfully withstand, as he did, the physical stress to which he regularly subjected himself. His retirement as director of a research institution involved no slackening in the pursuit of his own investigations. For Dr. Davenport life was, above all, opportunity for insistent, driving inquiry.

Dr. Davenport was a member of numerous American and foreign scientific societies. In 1923 he received the gold medal of the National Institute of Social Sciences. During World War I, he served as a Major in the Office of the Surgeon General, U. S. Army. He was active in many civic enterprises, and in 1942 he helped establish the Cold Spring Harbor