

Academician Nikolai Pavlovich Laverov, Eminent Scientist and Geologist Celebrates His 80th Birthday

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On January 12, 2010, eminent scientist, distinguished specialist, recognized leader of the national science of ore deposits, and vice-president of the Russian Academy of Sciences Academician Nikolai Pavlovich Laverov celebrates his 80th anniversary.

Nikolai Pavlovich was born to a family of peasants in the village of Pozharishche, Konoshskii raion, Arkhangelsk oblast. He entered the Kirov Mining–Chemical Technical School in 1945 and the Moscow Institute of Nonferrous Metals and Gold in 1949. On

graduating from the institute with honors in 1955, Laverov was invited by Academician A.G. Betekhtin to do his postgraduate studies at the institute. In 1958, he admirably defended his candidate dissertation.

As a student, Nikolai Pavlovich participated actively in field investigations oriented toward prospecting, exploration, and the study of uranium deposits. This was the time during which he formulated his future priorities and main lines of further scientific activity. The field of his activity extends from the geol-

ogy and geochemistry of uranium and other deposits, general metallogeny, and economics of mineral resources to advanced technologies of mining uranium and accompanying elements, global ecology, environmental impact of radiation, and disposal of spent nuclear fuel.

Laverov obtained his first significant results at the beginning of his scientific studies, which were devoted to the theory of the formation of uranium deposits. The studies culminated in his candidate dissertation "Geology and Genesis of Ores from the Kurdai Uranium Deposit (Southern Kazakhstan)." His further studies were focused on localization of uranium deposits and methods for forecasting and prospecting them. Along with colleagues—scientists and geologists from production enterprises—he succeeded in substantiating the relationships of uranium ore formation in Central Asia and Kazakhstan with intracontinental volcanism, distinguishing a new genetic type of uranium–molybdenum deposits. The studies of world uranium deposits allowed him to create the classification of their genetic and economic types, to reveal global trends in their localization, and to show a variety of deposits in size. Laverov elaborated the theory of evolution of uranium ore deposition in the Earth's history. In 1973, Laverov defended his doctoral dissertation "Geology and Formation Conditions of Uranium Deposits in Continental Paleovolcanic Regions." The practical use of these theoretical principles of forecasting, prospecting, and exploration resulted in a substantial growth in mineral resources for the USSR's nuclear industry.

Laverov contributed significantly to the interpretation of the genesis and formation conditions of exogenic–epigenetic stratal infiltration uranium deposits, as well as to the development of an inexpensive and safe technology for the underground leaching of uranium ore. He showed that stratal infiltration deposits are characteristic of the Cenozoic metallogenic epoch, which opened a new megacycle of migration and accumulation of uranium under continental conditions.

Since the mid-1970s, Laverov's interests have been focused on developing a new scientific line—the historic metallogeny of uranium, which provides insights into the evolution of uranium ore deposition in geological history and ascertains the spatiotemporal distribution of uranium provinces depending on geotectonic, magmatic, lithologic, hydrochemical, and other factors.

Laverov was one of the first Russian geologists to appraise the advantages of isotopic geochronology. This appraisal was mainly based on his personal experience in dating magmatism and hydrothermal ore deposition in the Chatkal–Kurama and other regions. The results of isotopic dating that he and his col-

leagues obtained introduced significant corrections to the understanding of the history of different regions. In charge of applied and later academic geology and exhibiting a deep insight into problems of isotopic geochronology, Laverov contributed significantly to the organization and development of this line of research in terms of geology, instrumentation, and methods.

In the 1970s–1980s, Laverov was engaged in elaborating new methods of uranium mining by underground leaching. He was a pioneer in the application of advanced technologies for recovering other metals as well, paying particular attention to protection of the environment. In 1979, Laverov was elected a corresponding member of the USSR Academy of Sciences in the Division of Geology, Geophysics, and Geochemistry.

Laverov is a leader in the ecological movement in Russia. He is the founder and organizer of a new scientific line called radiogeocology. The main objective of this line of research is to develop the basic principles of environmental protection in regard to radioactive contamination. Under his supervision and with his direct participation, the geological, geodynamic, geochemical, and hydrochemical criteria and factors have been established for choosing optimal conditions of underground disposal of radioactive waste and spent nuclear fuel, and the construction of effective geochemical barriers for cleaning territories contaminated by radiation. Mathematical models of the long-term evolution of ecosystems were developed, and recommendations were given for rational location of atomic industry enterprises. Moreover, Laverov devised geological and geochemical principles of the underground disposal of high-level radioactive waste, the most complicated and urgent problem in radiogeocology. Laverov has made great efforts to introduce ecologically safe technologies when large-scale industrial works are planned and organized.

Academician Laverov's innovative studies in the field of economics of mineral resources and their development, including nontraditional minerals, in the planning and organization of scientific and technical progress have received wide recognition. His scientific efforts facilitated the growth of strategic mineral resources in Russia. He participated in creating the state system of accounting for and structuring mineral resources, as well as publishing annual reviews of world mineral resources with an analysis of basic world and national tendencies in the consumption of mineral resources and their replenishment. Laverov has directed attention to new, nontraditional sources of mineral raw materials and the effective development of natural resources, including gas, oil, coal, and uranium.

In 1987, Laverov was elected a full member of the USSR Academy of Sciences in the Division of Geology, Geophysics, Geochemistry, and Mining Sciences.

Laverov is an undeniable leader in the field of studying catastrophic processes and elaborating technologies for reducing risks and minimizing aftereffects of natural and man-made catastrophes, as well as the impact of radioactivity on the environment. He supervised a series of scientific programs aimed at creating systems to reliably predict catastrophic volcanic and seismic events; at developing technologies for mitigating the adverse effect on the economy and ecology; and at improving the strategy of rational nature management. The most important outcomes of this activity were proposals on the transfer of the East Siberia–Pacific pipeline beyond the limits of the Lake Baikal basin, which were adopted by V.V. Putin and provided the basis for a government decree on approving the pipeline route.

Laverov is the author and coauthor of more than 550 scientific publications, including 30 monographs. Many of his works have been published in Australia, England, Germany, China, the United States, Cuba, and other countries. His works have played a large role in new technologies for developing and managing mineral resources for the atomic and other industrial branches in Russia. Of special note is the considerable attention Laverov devotes to training young researchers. He has founded and headed the scientific school on radiogeology, radiogeocology, and isotope geology. Under his supervision, more than 30 high-skilled specialists have defended doctoral and candidate dissertations and have gone on to successfully develop advanced lines of Russian science,.

Laverov successfully combines his fruitful research with scientific–organizational activity. He was in charge of the Department of Research Organizations in the Ministry of Geology of the USSR in 1972–1983, prorector of the Academy of the National Economy on the Council of Ministers of the USSR in 1983–1987, president of the Academy of Sciences of Kirghizia in 1987–1989, vice-chairman of the Council of Ministers of the USSR, and chairman of the State Committee for Science and Technology of the USSR in 1989–1991. From 1989 to the present, Laverov has been vice-president of the Russian Academy of Sciences; he is at the head of the Interagency Commission on Problems of Ecological Safety of the Security Council of the Russian Federation, the National Center for Developing Innovated Technologies, the Scientific Council of Russian Geologists, and the Interagency Committee on Ore Formation of the Russian Academy of Sciences. He is also a member of the Council for Science and Technologies of the President of the Russian Federation, the Scientific Coun-

cil of the Security Council of the Russian Federation, the Marine Board of the Government of the Russian Federation, the Governmental Commission on Fuel–Energy Complex and Reproduction of Mineral Resources in Russia, the Russian Pugwash Committee of the Presidium of the Russian Academy of Sciences, and the Board of the Ministry of Natural Resources of the Russian Federation.

Working in different organizations and holding different posts, Laverov has constantly been associated with the Institute of Geology of Ore Deposits, Petrography, Mineralogy, and Geochemistry, Russian Academy of Sciences (IGEM RAS). He came to the institute in the early 1950s as a student. He has grown at IGEM into a recognized leader in geology of ore deposits, he headed the institute for 15 years, and at present he is its scientific leader determining the most important lines of research.

Laverov was the editor-in-chief of the journal *Sovetskaya Geologiya* (*Soviet Geology*) from 1972 to 1983. He has headed the editorial board of *Geologiya rudnykh mestorozhdenii* (*Geology of Ore Deposits*) for 15 years (1989–2004). At this post, Laverov continued the journal’s traditions established by academicians Betekhtin and V.I. Smirnov and developed new lines that reflected the advanced tendencies of world science in mineral resources.

Laverov’s outstanding scientific results and his scientific–organizational activity were highly appraised by the government and scientific community. He was awarded the Badge of Honor (1971); Order of the Red Banner of Labor (1981, 1986); Order of Merit Third Class (1999), Second Class (2005), and First Class (2008); orders and medals from foreign countries; the Lomonosov Great Gold Medal of the RAS; and medals named after eminent scientists—academicians S.I. Vavilov, O.Yu. Schmidt, and V.I. Vernadsky. Laverov was awarded the Prize of the Government of the Russian Federation in Science and Technology (2001) and the Demidov Prize (1997). He was also an elected member of many scientific societies and associations, scientific councils, an honorary doctor of many national and foreign universities; he was conferred the rank of Honored Scientist of the Russian Soviet Federal Socialist Republic and Honored Scientist of Kyrgyzstan. The cycle of his papers “Geological and Artificial Barriers for Isolation of Actinides” was awarded the Grand Prize of the International Academic Publishing Company “Nauka/Interperiodica” in 2001.

In 2009, Laverov was awarded the International Global Energy Prize for his development of the fundamental principles of the theory of uranium ore deposition; introduction of new methods for forecasting, prospecting, and exploring uranium deposits, which resulted in the growth of mineral resources; and sub-

stantiation of the concept on isolating spent nuclear materials for the purpose of upgrading the fuel nuclear cycle; as well as for nonproliferation of nuclear weapons and materials. Laverov's life, that of a prominent scientist, organizer of science, and distinguished public worker, is a good example of unselfish service to, science, and geology, and country. His unique natural gifts, exceptional sense of purpose, amenability, and benevolence are the cornerstone of all his achievements.

Nikolai Pavlovich Laverov's jubilee finds him in the prime of his creative and spiritual life. He is full of new ideas and plans, surrounded by like-minded people,

both colleagues and students, the activity of which he supports and directs.

The editorial board and readers of *Geology of Ore Deposits* congratulate Nikolai Pavlovich on this glorious date and wish him good health and great success in his scientific and organizational activity.

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