Memorial to Dmitry Vasilievich Nalivkin 1889–1982

VASILY DMITRIEVICH NALIVKIN
All-Union Research Petroleum Geological-Prospecting Institute
Leningrad, 191104, USSR

Academician D. V. Nalivkin died on March 3, 1982, in the village of Komarovo, near Leningrad, after suffering severe pulmonary congestion and cardiac insufficiency. That day we lost one of the leading experts on the Devonian System, a father of curvilinear symmetry, a world-known scientist, and an extraordinary man.

D. V. Nalivkin was born in Petersburg on August 25, 1889. His father, Vasily Alekseevich Nalivkin, had studied geology of the western Russian plate and Donets Basin, but he died young while on field-work, trying to rescue a drowning friend. His mother, Olga Venidiktovna, was a teacher; she passed her fondness of art and natural science on to her daughter Elena, a younger son Boris, and to Dmitry. However, it was his father who imparted to him a love of geology. D. V. Nalivkin wrote:

"The summer of 1898 I spent with my father on field-work. . . . Once he took me with him and said that he would show me something interesting. We walked five or six kilometers. We came to a cliff on the coast of the Severnyi (North) Donets River. The cliff was covered with abundant fossils; they were very diverse: ammonites, echinoderms. I was dazzled; fossils were so beautiful, and I filled all my pockets with them. However, on the way back I had to throw some of them away: I had overrated my strength. My father laughed at me. I had thrown almost everything away, keeping only the most beautiful spines of echinoderms. At home, my father examined them, praised me and . . . took them for identification. But the interest for fossils has remained."

After his father's death, it was difficult to make ends meet, despite help from his former colleagues. Olga Venidiktovna married a revolutionary, A. F. Sverchevsky. Soon after their marriage, he was arrested and expelled to the town of Malmyzh. The family went with him. It happened early in the summer of 1901; in August, D. V. Nalivkin returned to Petersburg in order not to lose an opportunity to study at Tenishev College, then one of the best.

D. V. Nalivkin entered the Leningrad Mining Institute in 1906 and studied there for nine years. As early as the spring of 1907, a well-known petroleum geologist, D. V. Golubyatnikov, asked him to help on a geological survey of the Apsheron Peninsula. It is impossible to carry out a geological survey without collecting fossils, and this met the wish of the young student. He asked permission to collect and identify samples and D. V. Golubyatnikov allowed him to, but only on Sundays. Even so, he managed to collect an enormous number of bivalves from the Baku (Apsheronian) deposits. Bivalves are so alike that it is difficult to differentiate them. D. V. Nalivkin decided to use a statistical process—an innovation far from being widely accepted. However, he gave a profound basis, showing how environment affects the faunal composition on short segments of a section facies, and this effect is more important than that of faunal evolution. The work

was published in 1913. For this study, D. V. Nalivkin received the A. P. Karpinsky Distinguished Award, including a stipend which he used to go to the Russian Biological Station in Villefranche (France) to study recent mollusks. There he met A. K. Zvorykina who soon became his wife and lifelong companion.

In 1911 D. V. Nalivkin began work in central Asia. D. I. Mushketov invited him as a paleontologist who would be able to subdivide monotonous Paleozoic limestones. By 1915 he was already known as an expert in central Asian geology, though he was still an undergraduate. The Russian Geographical Society asked him to lead an expedition to study ancient glaciations in the Pamir. At that time, it was an inaccessible, almost unknown region. The expedition had to cross snowy passes, get over shaky hanging trails, cross deep canyons, and swim stormy rivers on air-filled sheep skins. Besides traces of two ancient glaciations, they studied a stratigraphic succession and compiled a tectonic map. For this expedition, D. V. Nalivkin was awarded the Small Silver Medal of the Geographical Society.

The study of the geology of central Asia continued. In 1926, a book was published generalizing all the geological data available for the region. Northern, central, and southern arcs were recognized in central Asia—Caledonian, Hercynian, and Alpine in age, respectively. These formed a basis for modern tectonic reconstructions.

In early 1917, D. V. Nalivkin was called up for military service, to a radiotelegraph company. In command was his brother-in-law, V. K. Zvorykin, who later became a famous American scientist in the field of radioelectronics, a father of television. D. V. Nalivkin was closely connected with the soldiers, and held advanced views. After the October Revolution, he was elected chairman of the Chelkar Soviet of Workers', Peasants', and Red Army-men's Deputies.

When he was demobilized, he enthusiastically continued to study Devonian brachiopods. There followed expeditions to the Urals, to the central European part of the USSR, and again to central Asia. Collections of Devonian fauna were sent to him from all the regions of our country. As a result, he became the leading expert in the Devonian System. He developed bases for stratigraphic charts for the Paleozoic of central Asia, and Devonian and lower Carboniferous of the Urals, Kazakhstan, the central European part of the USSR, and the Arctic. It is noteworthy that the faunal studies brought him to a non-geological, quite new, and important conclusion. His comparison of pelecypods and brachiopods resulted in the creation of curvilinear symmetry. The publication of 1925 (and later of 1951) presents the fundamentals of this principally new kind of symmetry. I. I. Shafranovsky wrote that the introduction of curvilinear symmetry went far beyond the limits of classical symmetry and led to the development of new concepts, such as similitude symmetry, antisymmetry, and color symmetry. Not only crystallographers, but also physicists refer to these works of D. V. Nalivkin.

Regardless of what he was studying, the Leningrad Mining Institute was always his main working place. In 1924 D. V. Nalivkin wrote his doctoral dissertation and became a professor; in 1932, he succeeded A. A. Borisyak as holder of the Chair of Historical Geology. Hundreds of his students now work in different parts of our country; among them there are many leading geologists, professors, and academicians.

When the Great Patriotic War broke out, the institute's teachers and their families, including ours, were evacuated to the town of Sverdlovsk. All the teachers began to work at the Sverdlovsk Mining Institute. However, D. V. Nalivkin could not peacefully read lectures in war time. He decided to help search for bauxites; the aircraft industry was in need of aluminum. Bauxites in the Urals are confined to the Devonian deposits. In a short time, resources of bauxites were increased, and a group of geologists, including D. V. Nalivkin, was awarded the State Prize of the USSR.

After the war, the activity of D. V. Nalivkin broadened. He continued to study Devonian and lower Carboniferous deposits; it was his idea to organize the Interdepartmental Stratigraphic Committee, which he headed. Being an outstanding scholar and very kind to people, he could restore quarreling sides to friendship. The committee became a prototype for the organization of stratigraphic surveys in other countries as well.

Activity increased in the compilation and publication of geological index maps of the Soviet Union. Before 1941, only two such maps were published. From 1950 to 1974, nine maps, edited by D. V. Nalivkin, were published. In 1956, the first map without "blanks" was published, at a scale of 1:2,500,000. D. V. Nalivkin was awarded the Lenin Prize, and at the International Exhibition in Brussels, the map received *Grand Prix*.

Paleogeographic studies carried out by D. V. Nalivkin differed from previous studies. In addition to the effect of marine environment on sedimentation, he also studied the effects of wind. He read hundreds of books and papers from different countries, and published a synthesis on hurricanes, storms, and sandstorms. He concluded that hurricanes bring marine fauna far inland and thus introduce confusion. Also, breaks and rhythmic patterns not associated with tectonic movements can be caused by waterstorms eroding deposits or by deposition of muddy sediments.

The administrative work of D. V. Nalivkin was enormous and diverse. He was a director of the Institute of Geological Mapping, vice-director of the Geological Institute of the Academy of Science, chairman of the Technical Council under the USSR Ministry of Geology, director of the Limnology Laboratory, chairman of the Commission on International Tectonic Mapping, president of the Presidium of the Turkmenian Branch of the USSR Academy of Sciences, and a member of the Science Board of the Russian Museum. He headed the Soviet Delegation at Session XXII of the International Geological Congress, as well as delegations at other international conferences and meetings. Politically, D. V. Nalivkin was a deputy to the Leningrad Town Soviet for twenty years. He was twice a deputy to the Supreme Soviet of the Turkmen SSR, was a vice-chairman of the Leningrad Regional Committee for the Defense of Peace, and took an active part in the work of the All-Union conferences of Partisans of Peace.

The multifaceted activity of D. V. Nalivkin has made him a hero of socialist labor. The government of the USSR decorated him four times with the Order of Lenin, the Order of October Revolution, and the Order of Peoples Friendship, as well as three times with the Order of the Red Banner of Labor. He was awarded the N. M. Przhevalsky Small Silver Medal of the Russian Geographical Society, the Karpinsky Gold Medal of the USSR Academy of Sciences, the F. Posepny Gold Medal of the Czechoslovakian Academy of Sciences, the P. Fourmarier Medal of the Belgium Academy of Sciences, the L. von Buch Medal of the German Geological Society, and the Silver Medal of the Peace Council.

D. V. Nalivkin was the Soviet Academician and an honorary Fellow of the German Geographical Society, Turkmen Academy of Sciences, CSSR Academy of Sciences, Serbia Academy of Sciences and Fine Arts, and the Paleontological Society of India. He was a Fellow of the Geological Society of America, as well as the Geological Societies of London, France, West Germany, Hungary, and Poland.

Academician B. S. Sokolov wrote in 1979, "In Russian geology Dmitry Vasilievich Nalivkin can be ranked alongside such academicians as A. P. Karpinsky and A. D. Arkhangelsky; the former was one of his teachers, the latter one of his elder colleagues. Currently, D. V. Nalivkin is a patriarch of Soviet geology, and is certainly one of the best-known geologists in the world."

D. V. Nalivkin worked continuously, without noticeable strain. To keep up the pace,

he took brief and effective breaks. He walked, examined stamps, or read books on art. He did not merely contemplate nature; he used to compare different phenomena to find relationships between them.

D. V. Nalivkin was a very handsome man and was liked by people. He was of medium height, slightly stooping, and rather stout. Even so, his movements were light and fast; he could walk for miles with pleasure. Most remarkable were his eyes; sparkling, young, and merry, but menacing when he got angry. He was kindly disposed toward people and always tried to help them. Everyone valued his wit and broadmindedness. However, if he learned that a man had behaved unworthily, their relations became quite official. He hated injustice, fraud, and those who preferred roundabout ways.

D. V. Nalivkin loved children very much and easily established contacts with them. He used to visit schools, give lectures to children, and run a geological circle at the Leningrad Pioneer Palace. He led three children's expeditions to the Urals. After the war, he also frequented the pioneer camps in the suburbs of Leningrad.

Apart from geology, D. V. Nalivkin had many passions. First of all, he liked nature and the whole world; hence, his passion for travel. Even short trips and strolls he turned into journeys. When he had to stay at home, he made journeys by means of illustrated guides to different countries and towns. Prague, Paris, and Warsaw were his favorite towns. From books and maps he learned more about Prague than most of its natives knew. His passion for books he owed to his mother. He took pleasure in looking through books at libraries and second-hand bookshops. Booksellers knew him well and kept rarities for him. At home, all the walls in his study and corridors were covered with bookshelves.

He also enjoyed collecting. D. V. Nalivkin once said, "I am a pure-blooded collector. . . . First, I collect fossils. I collect them from childhood. But fossils are not mine. It is State property. And it is very bad when a paleontologist collects for himself. I think it is inadmissible." He also collected stamps. He liked them because, as a rule, stamps are picturesque. He collected, but not so systematically, porcelain, postcards, envelopes, pictures, and even old sweetmeats.

D. V. Nalivkin was fond of music. In earlier years he played violin and went to concerts and the theatre. Later in life, when he was confined to his home, he enjoyed radio and TV music programs. He was also an art connoisseur. His knowledge of artists and their paintings exceeded that of the Soviet museum curators, often embarrassing them.

The range of his passions was as wide as that of his geological and geographical interests. This is a common feature of all outstanding people.

SELECTED BIBLIOGRAPHY OF D. V. NALIVKIN

(Works listed are in Russian.)

1914 Mollusks of the Baku Stage mount: Trudy Geologicheskogo Komiteta, Novaya Seria, vyp. 116, p. 1–50.

1924 Stratigraphy: Kubuch Publishers, 119 p.

1925 Elements of symmetry in the organic world: Izvestia Biologicheskogo Nauchno-Issledovatelskogo Institute pri Permskom Universitete, v. 3, vyp. 8, p. 291–297.

—— Spirifer Anossofi Vern. Group and the Devonian of the European part of the USSR: Zapiski Rossiiskogo Mineralogicheskogo Obshchestva, Ser. 2, pt. 54, vyp. 2, p. 267–358.

1926 A review of the Turkestan geology: Turkpechat' Publishers, p. 1–184.

1932 A treatise of facies: Gosudarstvennoe Nauchno-Tekhnicheskoe Gorno-Geologicheskoe Isdatelstvo, 208 p.
____ A course in historical geology: Geolrazvedizdat, 180 p.
1936 Paleogeography of Central Asia, *in* Scientific Results of Tajik-Pamir Expedition: Izdatelstvo AN SSSR, p. 35–86.
1937 Upper and Middle Devonian and Lower Carboniferous brachiopods of north-eastern Kazakhstan: Glavnaya Redaktsia Gorno-Toplivnoi i Geologorazvedochnoi Literatury, 200 p.
____ (ed.) Geological Map of the USSR. Scale 1 : 5,000,000.
1939 (with Petrov, L. S.) Second Baku (oil fields between the Volga and Urals): Izdatelstvo GONTI, p. 1–44.
1941 Brachiopods from the Main Devonian field, *in* Fauna of the Main Devonian Field: Izdatelstvo AN SSSR, p. 139–226.
1943 Geological history of the Urals: Izdatelstvo Sverdlgiz, 95 p.
1951 Curvilinear symmetry, *in* Crystallography: Izdatelstvo Metallurgizdat, p. 15–23.
1955 Treatise of facies: Izdatelstvo AN SSSR, v. 1, 534 p., v. 2, 1393 p.
1956 (ed.) Geological Map of the USSR. Scale 1 : 2,500,000.
1958 Geological catastrophe: Priroda, no. 6, p. 27–32.
1962 Geology of the USSR: Izdatelstvo AN SSSR, 814 p.
1964 Recognition of species in paleontology, *in* Problems concerning the regularity and trends in evolution of the organic world: Nedra Publishers, p. 29–38.
1969 Hurricanes, storms, and sand-storms: Nauka Publishers, 487 p.
1973 Brachiopods from the Tournaisian-Visean boundary beds from the western slope of the Urals: Nauka Publishers, 119 p.
1974 Problems pertinent to breaks, *in* Essays on stratigraphy: Nauka Publishers, p. 10–21.
1979 Tournaisian brachiopods from the Urals: Nauka Publishers, 247 p.
____ Our first women-geologists: Nauka Publishers, 215 p.
1980 Essays on geology of the USSR: Nedra Publishers, 158 p.
1981 From the remote past (remininscence of a student and professor of the Mining Institute): Nauka Publishers, 100 p.

Printed in U.S.A. 5/86