

Russische Geologische Karten als Dokumente der Wissenschaftsgeschichte

Russian Geological Maps as Monuments of the History of Science

Von

Natal'ja Evtodimovna KOTELNIKOVA ²⁰³

Schlüsselworte:

19. Jahrhundert
Geologie (Geschichte)
Geologische Karten
Geologischer Dienst (Geschichte)
Rußland

Abstract:

On the basis of investigation of the cartographic collection of the Library the unique geological maps and atlases of the 19th and early 20th centuries concerning Russia can be easily singled out. It has been established that the first insufficiently full and to a certain extent inaccurate geological map of European Russia was published by the English researcher STRANGWEIS in 1842. In 1841 the first adequate geological map, drawn by Academician GELMERSEN, was put out. It was, however, a small-scale map and he later improved it by supplementing it with new data, which showed the geological structure of the Urals and the Caucasus ranges (185). Along with geological map-making of the European part of Russia, regional map-making of the Urals, Caucasus, Moscow Province, Kurland and Livland Provinces also advanced. The establishment of the Geological Committee (1882) favoured the intensive development and improvement of geological maps. In that period a group of prominent Russian geologists and hydrogeologists, who actively worked at the creation of geological and hydrological maps emerged.

Work on the complex exploration of sources of the main rivers of European Russia began. The Hydrogeological Department was headed by S.N. NIKITIN. In the end of the 19th and the beginning of the 20th centuries, the interest of the geologists was directed toward the exploration of Asian Russia. The traditions, laid down by Russian geologists, are being continued in contemporary domestic geological maps.

The history of development of geological map-making in Russia is closely connected with the history of geological exploration, conducted by the Academy of Sciences. One of the main objectives of the Academy from the moment

of its establishment in 1724, was exploration and the preparation of regional surveys, which laid the foundation for the creation of general charts and regional geological maps.

The first general chart to be made in Russia on the basis of domestic and foreign materials, was put out in 1841. Its author was academician G.P. GELMERSEN, the prominent Russian geologist of the middle of the 19th century and the founder of the Geological Committee. Being a modest person and showing a critical approach to his own efforts, he wrote that the map had many gaps and inaccuracies. However, the outlines of the formations were not changed on maps, which were published after 1841.

Materials on geology of the Urals and the Caucasus, which had accumulated after the issue of the map, called for the generalization and the drawing of a new Geological Map of European Russia. Anticipating the great volume of work, which this task entailed, Grigory GELMERSEN turned for help to the geologists, who were engaged in regional geology in different parts of Russia.

In 1859 - 1860 he received maps from the following geologists:

Caucasus - from ABICH;
Moscow Province - from AUERBACH;
Kiev Province - from FEOFILAKTOV
Part of Finland - from PUZYREVSKY;
Kurland and Livland Provinces - from PANDER and
GREWINK

By that time the "Geognostic Map of European Russia and the Urals Range", prepared in 1845 by R.I. MURCHISON, E. VERNEI and A.A. KAISERLING, and supplemented in effect on October, 1849, by COLONEL A.D. OZERSKY, appeared.

The map bears the legend "Sedimentary system" and presents the "Tabular survey of sedimentary formations of Russia". Along with this, a geological section from St. Petersburg to the Azov Sea is given. Map signals for the Urals: sedimentary, metamorphic and other signals are shown separately.

Using all the materials at his disposal, G.P. GELMERSEN finished his work on the map in 1863 and published it in 1865.

He retained the same map signals of the Murchison map:

1: 4 200 000. On the GELMERSEN map of 1865 the geological structure of the Urals and the Caucasus is presented in a novel manner. According to GELMERSEN "The coal soil of the Urals has taken on different contours and appeared in a smaller size on the map."

In the Aral-Caspian lowland some new geological data, provided by Rear Admiral BUTAKOV, Captain MOZHAISKY, SEVERTSOV and others, appeared. However, some errors remained in the map and of them GELMERSEN speaks in his explanatory note to the map.

²⁰³ Anschrift der Verfasserin:
KOTELNIKOVA Svetlana, State Library, 3, Vozdvizhenkast,
Moscow 101000, Rußland

In the works of domestic geologists of the first half and particularly of the middle of the 19th century, significant attention was given to the characterization of sedimentary rocks and the conditions of their formation. In these works geological systems were called "soils". "Soils" Attracted the attention both of Agrarian Departments and of geologists, who were connected with the exploration of sedimentary rocks (elution of drifts, soils, etc.). Government agrarian bodies together with the Academy of Science, began to work on the soil map of European Russia, which was later presented in the "Economic and Statistical Atlas of European Russia" (1852). Repeated editions of the Atlas were put out in 1857 and 1869.

This map covers the entire territory of Russia in Europe, including the Urals and Crimea. Black soil, clay of all colours, sand, loam and sand loam, silt, saline, tundra and marshes and rocky places are presented in different colours on the map.

In the process of verification of the soil map the materials of such well-known geologists as P.S. PALLAS (on the southern Provinces), N.J. OZERCKOWSKI (on the Olonets Province), N.P. RYCHKOV (on the Orenburg Province), R.M. MURCHISON and BLAZIUS (on the black-soil belt), E.I. EICHWALD (on the western provinces) were used. The map represented a summary of the development of geological and soil science of that period. A new stage of development of geological map-making Russia is connected with the establishment of the Geological Committee in 1882.

Already in 1863, G.P. GELMERSEN suggested that the State geological service be organized. This suggestion was backed by many scientists yet the government responded to it only in 1871. Finally the Committee was established on January 31, 1882. G.P. GELMERSEN was appointed Director of the Committee and A.P. KARPINSKY (35) became the Secretary. The work in the Geological Committee fully coincided with his scientific interests.

It was in that period (1884) that the Geological map of the Eastern slope of the Urals (S 1: 420 000) in Russia and German, made by A.P. KARPINSKY, appeared. For many years it was the only existing generalized material dealing with this highly complex region.

Before that, in 1869, the "Geological map of the Western Slope of the Urals range", made by Valerian MELLER (S 1: 840 000) was issued.

In that period, the "Geological map of the Urals", prepared by General HOFMAN according to the government mountain districts of the Urals range, in the German language, was also put out. The map includes 5 sheets and the scale is 1: 210 000. Each sheet is provided with a legend. The map has a three-sheet supplement of geological sections.

In 1893, for the 10th anniversary of the Geological Committee, the "geological map of European Russia" (Scale 1: 2 520 000) was published. When the Geological Committee was founded it was decided that one of its main tasks would be the making of the geological map of Russia. This map was to be based on the topographic 10-verst (1 verst=3,500 feet), as this was the most detailed

map, which covered the entire territory of the European part of the Russian State, to exist at that time.

It was doubtlessly a much needed map for after the GELMERSEN Geological Map, no new summaries had appeared. The work, connected with the preparation of the map, was headed by A.P. KARPINSKY and such prominent geologists as S.N. NIKITIN, F.N. CHERNYSHOV, N.A. SOKOLY, A.O. MIKHAILOVSKY and others, were attracted to this project. This work was of a collective nature and members of the Geological Committee were sent to different regions of the country, where they conducted research and simultaneously collected materials for the future geological map. The Kanin Peninsula was supplemented with new cartographic materials. The Imperial Mineralogical Society and Central Mining Department lent substantial support to the creation of this geological map.

The use of a single legend, in which the insufficiently explored deposits (the Baltic layer, tertiary sands, the group of motly marls, sand, etc.) are distinguished by special symbols and colours, proved to be an important point in the making of the geological map. In the course of study of the geological history of Russia (Volga deposits, permo-carbon) special attention was given to widely spread deposits.

The map was made in two versions, in Russian and in French. A.P. KARPINSKY delivered his report at the 6th Congress in Zurich, during which he demonstrated the geological map of European Russia. Other trends in geological map-making also developed. Problems of water supply called for the search of surface and underground waters. Despite the long process of accumulation of data of a hydrogeological character, the science itself finally crystallized in the end of the 19th century, when the theoretical theses, explaining the regularities of the behaviour of underground waters had already been developed. During the conducting of the 10-verst geological survey much attention was given to hydrogeological aspects.

The first hydrogeological maps emerged on the scene and one of them, the "Hydrogeological map of the environs of St. Petersburg (between Narva and Tosna)", made by engineers M.I. ALTUKLHOV and M.B. FEIGING in the late 19th century deserves special mention. The scale is 1: 126 000. Different colours indicate deposits, horizontal lines show the levels of underground waters and special signals identify wells, bore holes, etc. A larger regional hydrogeological summary was prepared for the Moscow province. The result of the work in this direction is identified with the "Hydrogeological map of the Moscow Province" (1911), drawn by N.D. SOKOLOV. (S 1: 336 000). In its water-carrying horizons and marshes are shown in colour.

In conclusion we must say that the cartographic works, cited in this report, represent only a small part of the vast cartographic collection of the Russian State Library. This collection boasts of 250 thousand items and is notable for its multi-aspect character.

The tradition put down by the geologists of Russia have found continuation in contemporary domestic geological maps, which our collection holds.