— 340 —

Helmersen, G.P. 1872. Sir Roderick Impey Murchison: [Obituary]. Gorniy Zhurnal, 1872(2), 340–352. (In Russian). [Гельмерсен Г.П. Сэр Родерик Импей Мурчисон: [Некролог] // Горный журнал. 1872. № 2. С. 340–352.]

**Sir Roderick Impey Murchison.**

An article by Academician G.I. Helmersen, read at the ceremonial meeting of the Akademsh of Sciences on December 29, 1871 - October 11, 1871.

A full member of Academy, Sir Roderick Impey Murchison died in London, in the eightieth year of his life, which with such brilliant success was devoted to science. The learned world of all parts of the world with deep sorrow read the news of this death; but for us it is still especially regrettable because the scientific activity of Sir Roderick was closely related to Russia. The story of his life, which at the same time will be an instructive history and his scientific development, we expect from his compatriots. We, however, have an honourable duty with deep gratitude to remember the superior merits of the deceased in front of Russia. Our fatherland has lost in him one of its most zealous and devoted friends, science - one of its most remarkable figures.

Sir Roderick Impey Murchison was born on February 19, 1792, in Rossshire, in Tarradale, theestate of his father, Mr. Kenneth Murchison, from his marriage to Barbara McKenzie, the eldest daughter of Mr. Kenneth McKenzie. He received his initial education at the Durham School, from where he later moved to the Royal Military School, at Marlow. As soon as he reached the age of five, he had to take up the gun and go straight from school to military campaigning, in Spain, where at that time the Duke of Wellington carried the victorious British banner from one field to another. Murchison first entered the 36th Infantry Regiment, then was at the headquarters of his uncle, General Sir Alexander McKenzie, in Sicily, and finally, with the rank of captain, served in the Iniskilling 9th Dragoon Regiment. He had not yet turned seventeen years old, but he had already managed to participate in three big battles: at Rolis, Vimier, where he carried the regimental banner, and at Corunna.

— 341 —

In 1815, he left military service and married Charlotte Hugonin, the only daughter of General Hugonin. This marriage decisively influenced his entire future career.

Lady Murchison was an extraordinary woman, and science owes her deep gratitude. If she, as Frank Buckland said in the obituary of this remarkable woman, had not distracted her husband’s great mind fifty years ago from the simple busy life of a retired dragoon captain, and had not sent him into the field of science, England would not have had the opportunity to be proud of the famous baronet, who with such energy worked for the benefit of geology, and thanks to which the discoveries of England in this science are famous everywhere, and people use them wherever civilization exists and where industry develops the mineral wealth of the earth.

In his younger years, when Sir Roderick's gifts began to develop, Lady Murchison accompanied her husband everywhere, armed with a hammer, notebook or drawing book; she was inseparable with him in his scientific travels along the shores of England, in the Alps, in Italy, in Germany; she did not leave him in a peaceful office, where he was finishing his extensive work on the Silurian System. This was a woman who not only possessed extensive encyclopaedic knowledge on various branches of study, but she was also a thorough scholar on conchology; in addition, she was distinguished by her remarkable talent for drawing. Many of the drawings that adorn her husband's works come from her pencil; by the way, science owes it to her for the reliable depiction of the open landscape in Switzerland and so

— 342 —

glorified after the skeleton of the fossil fox — the very image that enabled Cuvier to identify this animal. Subsequently, she was a comforter and counsellor for her husband, supporting and encouraging him in the difficult struggle that he had to endure in order to withstand the new views introduced by him to geology. The outside world knew little about these difficulties, obstacles, and hesitations that the young scientist had to withstand, and which his female companion helped him to overcome. We must deeply honour, exclaims Buckland, the wife of a man who has ascended to such a height in the world, since a very significant share belongs to her in what he has done.

And so, Lady Murchison managed to distract her young husband from the battlefields and from military honours to peaceful activities in the scientific field. After several years in which Murchison remained on the European mainland, we find him, in 1822, in London, where he, on the advice of Sir Humphrey Davy, diligently attended the physics lectures at the Royal Institution; and a few years later, we see him busy with geological research in the south of England. In 1825 he presented to the London Geological Society an account of the geological structure of the northwestern part of Sussex and the adjacent parts of Hampshire and Surrey. In 1826, he investigated a coal deposit in Sutherland, and established that it did not belong to the Jurassic formation; and then, in 1827, accompanied by one of his oldest friends, the Reverend Adam Sedgwick, Professor of Geology at Cambridge, he went to the Scottish Mountains, and in 1828, together with Sir Charles Lyell, surveyed the extinguished Tertiary volcanoes of the French Auvergne. Both scientists then presented important explanations regarding the formation of the valleys from erosion. After that Murchison studied the Austrian and Bavarian Alps and published the results of this research together with Sedgwick in 1829 and 1830.

Thus, we see Murchison, already at the very beginning of his scientific career, a collaborator of the most prominent scientists in England, to which Buckland belonged. Sedgwick, Buckland and Murchison himself noticed a very important gap in the geological system,

— 343 —

namely, the lack of study and, as a result, the precariousness and some inconsistency of the classification and the sequence of the so-called Palaeozoic formations, that is, those sedimentary layers that occupy the place between the crystalline basement and the Triassic. The influence of Buckland can be seen in the fact that Murchison and Sedgwick devoted themselves to studying these formations first in their homeland, namely in South Wales, Herefordshire and Shropshire, and then in Belgium and the Rhine region. The fruit of this study was several classical works: the Silurian system, the one magnificent work of Murchison, which appeared to the world in 1839, and two other works composed in partnership with Sedgwick. Of these last ones, one was published in 1837 and its subject was the geology of Devonshire, namely, the composition and definition of the Palaeozoic formations of the named area, from where the name of the Devonian system was borrowed. Another work, published in 1842, introduced us to the composition, distribution and classification of Palaeozoic sediments in northern Germany and Belgium.

These three works, together with the works of the well-known English palaeontologist Phillips about the ancient formations of Great Britain, paved a new path in the geological system. In the most extensive volume and in the most thorough way, they proved that the sum of strata, which in the past were called the transitional or greywacke formations, falls into two very different formations, the lower of which Murchison called the Silurian System, and then the upper the Devonian System. The Devonian System was equally sharply separated from the Carboniferous Formation lying above, for the lower tier of which the Mountain Limestone was recognised.

In this way, the lack of clarity that had existed until then in this area was forever eliminated: a bright light dispersed the darkness, the knowledge and study of the named formations was laid on a solid foundation. The success was extraordinary. Geologists of the European continent, each in his own homeland, immediately set about re-investigating the Palaeozoic regions. In Russia, if there were already people before who had acquired the well-deserved of the study of the most ancient sedimentary forms, then Murchison’s works served as a guiding thread for them in their further work. In Murchison himself, a desire arose to

— 344 —

survey the vast Palaeozoic regions of the European continent and look for verification in them of the same divisions and the sequence of formations that were noticed by him in England, Belgium and the Rhine region. No other country seemed to be as convenient for this purpose as European Russia. Although at that time the geological structure was still insufficiently studied, however, it was already known from the preceding works of Strangeways, Eichwald, Pander and Gustav Rose, as well as from the works of Leopold von Buch: "Materials to determine the mountain formations in Russia", it was already known that the Palaeozoic formations in our fatherland occupy a vast area. In particular, the works of Pander and Buch inspired Murchison to want to visit Russia, since from them he was undoubtedly convinced that in the north of Russia there should be systems corresponding to the Silurian and Devonian systems of Great Britain.

Having finally decided to embark on a journey to Russia, Sir Roderick informed the Russian ambassador at the London court, Baron Brunnov, about his intentions, and by petitioning this dignitary, always ready to assist in science, he received not only consent to the idea he had conceived, but also assistance.

Murchison was not actually a palaeontologist; the special area of his work and study was predominantly stratigraphy and accounting for the sequence of formations. Therefore, in all his scientific journeys, he invited as a companion a specialist palaeontologist. At this point, he chose Mr. Verneuil, who had already accompanied him on his studies in Belgium.

At the beginning of the summer of 1840, both travellers arrived in St. Petersburg, where Baron Alexander Meyendorf, Count Alexander Keyserling and the Hanoverian professor Blasius, who were instructed by our government to produce some research in history and statistics of Russia, had gathered even before they arrived.

— 345 —

The former Minister of Finance, Count Kankrin, and the then head of the mining corps as an engineer, K.V. Chevkin, supported the travellers with their most active patronage. Prescriptions were sent everywhere that they should be provided with all the assistance they might need to achieve their goal. Our young fellow, then only a lieutenant of the corps of mining engineers, N.I. Koksharov, was appointed to accompany Murchison.

Exploring the surroundings of St. Petersburg, the expedition headed out, through Vytegra, to Arkhangelsk, from there to Yaroslavl and Kostroma, to Moscow and Nizhny Novgorod; then went down the Volga to Yuryevets, and finally, through Ryazan, Kolomna and Moscow, returned to St. Petersburg.

In this first journey, the members of the expedition several times had to disperse in different directions and again come together, since the difference in goals prevented them from travelling together at all times; Count Keyserling joined alternately in one or the other party. Although this first trip had already led to very important results, Eichwald had published his work on the Silurian system of Estlandia, Dubois-de-Montpere, a geological description of the Crimea, the Caucasus, Volhynia and Podolia, and the journey undertaken by Gustav Rose was published in the results of Humboldt's trip, and besides already several remarkable geological works of Russian mining officers and even a small general geological map of European Russia had been compiled - however, in these existing studies, it was evident that there was still too much missing to enable someone to build a general geological picture of Russia on more solid foundations than before. With this conviction, Count Kancrin asked permission of the Sovereign Emperor to invite Sir Roderick Murchison and Mr. Verneuil to undertake a second scientific journey across Russia. Count Keyserling, a native of Courland, meanwhile entered the government service. He joined the travellers, for whose escort Lieutenant Koksharov was again appointed.

— 346 —

They travelled around, accompanied by Count Keyserling, first to the provinces Vilna, Courland, Livonia and Estonia, after visiting St. Petersburg, where they had the opportunity to introduce themselves to the Emperor and were honoured by his gracious reception. Murchison and Verneuil then set off on their expedition to the Kaluga province to inspect the widely occurring Carboniferous formation, and then to the Urals, to Orenburg, to the Kyrgyz steppe, to the Bogdo mountain, to the Astrakhan Kalmyk steppes, to the lower Volga and, finally, to the Donetsk coal basin. On the way back, they explored the provinces Kharkov, Kursk, Orel and the Don valley near Voronezh. For this reason, the members of the expedition also divided their work among themselves, because only in this way and with the active assistance of K. V. Chevkin, did it turn out to be possible in such a short time to achieve these important results that this journey brought to science and our fatherland.

Before we try to present these results in a short essay, it should be mentioned that Murchison, in order to be able to compare the geological structure of Russia with the geological construction of neighbouring countries, travelled in 1842 over a significant part of Germany, Poland and the Carpathian mountains, and in 1843, Sweden and Norway; Count Keyserling, in the summer of 1843, together with the naval officer P. Kruzenshtern, explored the Pechora region, which the expedition of 1840 did not reach.

After the results of these journeys were presented, in several preliminary reports, to the Geological Society of London, there arrived, in 1845, a monumental work: "The Geology of Russia in Europe and the Ural Mountains". The first part of it belongs to Murchison himself; the second part, devoted to palaeontological studies, was compiled by Verneuil, Keyserling and by the famous French palaeontologist Alcide d'Orbigny.

In the same way, as Murchison's "Silurian system" had earlier paved a new path for exploring the Palaeozoic formations all over the globe, so the "Geology of Russia" of our three famous travellers led to a revolution in the geological studies of Russia. We will try to describe in brief words the meaning of this work.

— 347 —

The geological structure of Russia, which until that time was known more or less fragmentarily, and the graphic representation of which, in the form of known information, was sketched on two small maps, appeared in the named book with definite solid and clear features. Separate observations, made with rare insight by the three geologist-travellers, as well as the critically checked and corrected works of some of their predecessors, were combined, and each geological group was assigned a place that really belonged to it, and all of them were combined with Murchison's characteristic skill into an integrated geological picture of the country.

Although the geological map attached to the book, which included not only the Urals, but also the Caucasus, the Aral-Caspian lowland and the entire coast of the Black Sea, presented very few details, nevertheless, examining it, it was possible to completely understand the probable boundaries of the separate formations. The subdivisions that enter into the composition of each formation are presented very clearly and aptly in two ideal profiles placed at the side of the map, to which a great deal of value is added by the fact that at each level of each formation the names of the shells characterizing it and the name of the area where they can be observed are displayed. One has only to find in the text and in the beautiful vignettes of the first volume the lithological and stratigraphic conditions of each locality, and in the second volume depicting fossils - and thus, without leaving the office, you can make a very instructive journey throughout Russia.

As zoologists and botanists in their research to the present time rely on Pallas, it is as if Russia's geologists and palaeontologists will have to manage with Sir Roderick's excellent work for a long time to come.

— 348 —

First, from it we learned the new fact that even in the extreme north, in the lower reaches of the Dvina and in the Pechora region, there are Pliocene strata with well-preserved shell valves, which still live in the northern seas to this day. From it, we also learned that the younger Tertiary strata of the Aral-Caspian and Black Sea lowlands fall into two sections, which are very aptly named the most ancient and later Caspian. In the lower reaches of the Volga, we find older Tertiary formations.

Second, what Leopold von Buch had guessed before, namely that there are no representatives of the Cretaceous period in the northern half of Russia, was fully confirmed by Murchison’s “Geology of Russia”.

Third, the Jurassic formation, which until that time was known only in small, sporadically scattered depressions, suddenly appeared as huge continuous belts and areas between the course of the Volga and the Timan mountain range, between this range and the western Ural, and at the foot and eastern outskirts of the Caspian lowland.

Fourth, Murchison had previously admitted that the variegated sandstone, which until then had been looked at as the lower tier of the Triassic, should be separated from it and attributed to the first level of the Zechstein, considering it the upper level of the latter. When he saw that this new opinion was confirmed by a huge formation, occupying almost the entire eastern half of Russia and containing, at the foot of the Urals, copper ore, and further to the west, salty springs and rock salt, he called this formation "Permian", based on the fact that in no other locality is this formation found so extensively developed as in ancient Biarmia. Here, by the way, it will be noticed that the upper part of this formation, due to its great similarity in lithological relation to the Devonian system of Russia, Murchison originally took for this last one; but according to a more accurate study, he agreed with his young companion, Koksharov, who refuted this conclusion, since he already knew the much later origin of the great eastern formation.

— 349 —

Fifth, it was extremely important, even in practical terms, namely in the application to mining, that part of Murchison's work considered the Carboniferous formations of central Russia. Murchison and his companions found that this formation splits into two main levels, of which the upper never contains coal seams, and the lower, containing coal, lies directly on the Devonian beds. Each of these sections is so characteristically different in the accompanying shells and lithological conditions that it is impossible to confuse them. This was a firmly defined geological horizon, in which it was necessary to search for coal in central Russia, and the unmistakable accuracy of Murchison’s advice on this matter has been confirmed at hundreds of points. In addition, Murchison already then spoke out in favour of the suitability of these coals for use.

Sixth, a very important result was also given by the study of the Devonian strata of Russia, because only through them could Murchison make sure that he understood the composition of this system, which he took from his investigations in England and Scotland, and which was disputed by some geologists, for example Ferdinand Romer, who asked which view was really true.

Seventh, the study of the lower Silurian strata of Estlandia fully confirmed the previous assumption, which Murchison especially defended, that these strata contain the remains of the first, and therefore the most ancient animals that lived on the globe.

Eighth, the area hitherto known only by the name of Timan Ridge, on the western outskirts of the Pechora lowland, was investigated by Count Keyserling, and this study quite satisfactorily determined its direction, extent and geological structure, so that the designated area, with its palaeontological features, is now a special type in the geology of Russia.

Fearing to overstep the boundaries of a short discourse, we are content with listing these main results. Let us just note that Murchison's "Geology of Russia" opened a new path for science; it became the starting point and guiding star for many later works of our domestic geologists.

— 350 —

Regretfully, we must admit that in the course of twenty-five years we did not use the example that Murchison gave us and did not move forward the tasks that he left for us. The general geological picture of Russia, presented to us by the great English scientist, we supplemented only in a few separate parts, in such immense regions of our fatherland as the Perm Basin, the vast Tertiary region of the Aral-Caspian lowland, the coal formations of the southern Russian provinces, almost twenty years of they wait in vain, fulfilling this urgent task, with which so many Russian interests are connected. However, resolving it cannot be expected from individual persons or from random enterprises. This work can only be carried out by a state geological institution, working according to a definite and deliberate plan; such an institution exists in every educated country in Europe, such as the United States of North America and British India possess.

"Geology of Russia" is not the only work by Murchison, which the author has added to the benefit for the geologists of Russia. His other work, entitled "Siluria", which appeared to the world in 1859 and was recently published by a new edition, is devoted to the study of the Palaeozoic formations of the European continent and North America and can be considered a model of comparative geology! In this work, the characteristics of the ancient forms of Russia and the Ural gold-bearing deposits are especially important for us.

We tried to briefly count Murchison's merits regarding the study of Russia, but by calling him, at the very beginning of his speech, a zealous and devoted friend of our fatherland, we had in mind not only the circumstance that he, with such love, devoted his scientific activities to Russia, but also understood and had sincere sympathy for the inhabitants.

He expressed his reverence for the Emperor Nikolai Pavlovich and for His August Heir, both publicly and in the circle of his friends, remembering the true Monarch with the liveliest

— 351 —

gratitude, and in all respects the flattering reception that the Sovereign provided for him twice. The external signs of this Monarch's benevolence were dear to him, without which honours he never appeared when in London, in official gatherings, and when he had to welcome members of the Russian Imperial Family or other noble Russians. And what a hearty welcome Murchison's Russian friends and acquaintances always met when, on their way to London, they appeared at the hospitable house at No. 16 Belgrave Square! Murchison's letters to his friends in the distant east are full of eloquent expressions of unshakable and unchanging love for our country and for the people and sincere devotion to them.

That these feelings were unfeigned, we have many of the most convincing proofs. During the Crimean War, Sir Roderick became the head of the few Englishmen who had the courage in their homeland to make a public speech in favour of Russia and against the war against her. If in this case his voice was not respected, then in other circumstances his efforts were crowned with complete success. When, a few years ago, Russia would have been forced to move her victorious troops into Central Asia, all minds in England were alarmed; from everywhere rumours were heard about the approach of the Russians to the East Indies and about the danger threatening it, as it were. The excitement was strong, and the storm of political passions threatened to boil over. But a friend of Russia, Sir Roderick, again acted as her protector, and with a calm, impartial explanation, he managed to extinguish the excitement.

But with such love, Murchison treated not only his high patrons, not only his personal friends: he applied it to the entire Russian people, and kept this feeling for them until his death. The cordial hospitality and disinterested assistance, which he found in all classes of society, were deeply imprinted in his memory and a feeling of deep gratitude remained forever in his soul.

“

Recurring to that distinctive trait of national Moscovite character,” said Murchison in the

— 352 —

preface to the “Geology of Russia”, “a will which admits of no obstacle— they are bound to record, that their own impatient “forward” was ever cheerfully responded to by the *mojna* of the natives. With this talismanic word the Russian has, indeed, raised monuments on the Moskva and Neva, that rival the grandest efforts of ancient and modern times. Amidst such a people, no real difficulty could be experienced. If a bridge were broken, it seemed rebuilt by magic. Though a river-bed was dry, the travellers beheld it converted, as if miraculously, into a navigable stream Was the water too shallow, then did the athletic peasants cheerfully lift the boats over rocks, enlivening their progress with a merry carol. Wet or dry, hot or cold, no murmur escaped these resolute men, and *mojna* was their only cry.”

"To the illustrious Monarch, then, of the wide realms," concludes Murchison, “whose structure they attempt to describe, and to all His loyal subjects with whom they held communication, the authors beg once more to express their sincere attachment and lasting gratitude."

If, to all that we have said, we take into account that Sir Roderick was not only a full member of our Academy, but also an honorary member of the Russian Geographical Society, like Humboldt and Karl Ritter, and was in constant relations with both of these institutions, then it will be obvious to everyone that we have the right to consider him as one of our own more than any other scientist living outside the boundaries of Russia.

Thus, with deep, heartfelt gratitude, let us say about this man who laboured so much for the benefit of Russia: peace be upon him, honour to his memory!