

# **THE FINAL VERSION OF ROERICH EXPEDITION MAP IN CENTRAL ASIA**

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The Inner Asia gives unique possibilities to study its past. It's this region the expedition of Roerich explored. The main purpose of the expedition was to create a pictorial panorama of lands and nations of Central Asia. The second purpose was to study the possibilities of new archaeological investigations and future expeditions in this region. The third purpose was to study the languages and dialects of Central Asia and to collect pieces of culture in these regions. The Central Asiatic expedition was but insufficiently studied up to the end of 20<sup>th</sup> century. Proper mapping routes and places of archaeological discoveries should assist this work. Unfortunately there are no special maps concerning the Central Asiatic expedition. The map, which is being created, has been ordered by the museum of N. K. Roerich in Moscow for the exhibition devoted to his Expedition in Central Asia. Thanks to this expedition dozens of new peaks and passes were specified on the Map. They must be compiled and decorated involving both traditional knowledge and modern technologies.

The Inner Asia with its endless steppes and deserts, majestic plateaus and huge mountain ranges gives geologists and geographers unique possibilities to study Asia. The expedition of N. K. Roerich traveled and investigated this inner region of Asia for three years. During 1925 — 1928 years the expedition headed by N. K. Roerich crossed the lands of heart of Asia twice. They set out on a journey in India in August, 1925 and came back in May, 1928. The main purpose of the expedition was to create a pictorial panorama of Central Asia lands and nations. The second purpose was to study the possibilities of new archaeological investigations and future expeditions in this region. The third purpose was to study the languages and dialects of Central Asia and to collect artifacts of this region culture. The Central Asiatic expedition was insufficiently studied up to the end of 20<sup>th</sup> century although it collected a unique ethnographic and cultural material, thus having made an important contribution to geographical investigations of the Inner Asia.

The Roerichs were the first Europeans who crossed Trans-Himalayas, the Tibetan plateau. They mapped and specified dozens of peaks and passes. The figure of N. K. Roerich stands apart in this group of travelers. Roerichs undertook the first and practically only one expedition, which purpose was not only the wide spectrum of geographic and ethnographic, but also scientific, philosophic and art tasks This

Expedition went not only in geographic space but also in cultural space and enriched and added to the investigations of such travelers and orientalists as P. P. Semenov-Tanshanskiy, A. Nikitin, N. M. Przhevalskiy, G. N. Potanin, P. K. Kozlov, V. V. Vereshchagin, M. F. Larionov and others, who laid the foundation of scientific and artistic study of Asia.

The Central Asiatic expedition is of great importance, but many of its aspects and materials still remain unstudied. There's a lot of work to be done in respect to these problems. Proper mapping of routes and places of archaeological discoveries should assist this work. Unfortunately there are no special maps devoted to the Central Asiatic expedition. Those which are represented in museums and repositories are very sketchy and not pictorial in those parts that show thematic content. All these aspects tell negatively on people's perception especially on those who are not familiar with the Expedition. That's why now that a big work concerning the study of the expedition's materials is underway such a map is particularly important.

The previous map, which is exhibited in the museum, is based on a standard reference map scaled 1: 5 000 000. Separate lists showing the territory investigated by this expedition are glued together with a big reserve of territory. The settlements and the route are drawn by hand. Since the original map is for close view only, it's readability as a wall-map is very bad (see Figure 1).



Figure 1. This Map is now in museum of N. K. Roerich "Rout of Expedition to Central Asia (1924 — 1928)"

The new projected wall map is named as the «The Travelling Map of the N. K. Roerich's Expedition to Central Asia» in scale 1:5 000 000. It is a cartographic representation of the expedition route to Central Asia and prepared for the visitors of N. K. Roerich's museum in Moscow. This map introduces a clear-cut picture of places, where the expedition passed. It is therefore desirable to obtain such clarity that would make it possible to get the picture of locality and perceive the outer look of landscapes through which the expedition passed almost without using its legend. In addition, the map must be aesthetically attractive. It must allow a man to study this map with pleasure [3]. A specificity of this map is an extraordinarily wide circle of visitors of different ages and of different levels of knowledge.

The development of new map version for a museum was begun with collection and analysis of initial materials: literary, cartographic and other. This expedition has two independent routes. The first was actually research of Central Asia and India, the second was a journey of Roerichs to Moscow on purpose to deliver the letter of India

Mahatmas to the Soviet government. In this respect it is necessary to show the territory of most of Central Asia and India as well as the territory of the European part of Russia on the map in detail.

Taking into account setting of map, territorial scope, forms of the map territory and properties of the projection an equiangular conical projection of Lambert is most suitable.

As thematic matter, on a map, the roads and settlements come forward on the route of the expedition following.

All objects of the thematic content were made on the basis of additional cartographic materials: «Route of the Expedition to Central Asia (1924 — 1928)», «Map-scheme of N. K. Roerich Expedition route to Central Asia» and «Basic routes of the Expedition to Central Asia (1923 — 1928) on India, Mongolia, Tibet». Parts of compiling works are presentations of settlements, boundaries and roads, which must be shown for the period of an expedition time (20-30<sup>th</sup> years of 20<sup>th</sup> century). It was conducted with the use of the archived materials from the museum of Moscow State University for Geodesy and Cartography.

There are two main tasks on the map creation: compilation of geographical basis and design. The first one introduces difficulties coming from enormous territory which was covered by the expedition and, here, more expedient is to use the automated methods. On the other hand, the purpose is to do a map in the style of works by N. K. Roerich. For achieving this purpose it is important to pick up a faithful color gamma, and also to execute a high-quality artistic shading relief. Such a relief is most expressive, if executed by hand, but it is difficult to do it for such enormous territory. Different technologies of this map creation were therefore examined.

The first technology suggested automation of the process and at the same time decreasing the amount of handwork. In our case it was decided to use such software product which would contain a digital database about the Earth, and thus, a large volume of works on scanning and drawing the elements of the created map content would be eliminated. From a great number of the programs Global Mapper v9.0 was chosen as answering practically all requirements in the plan of content compilation. In this program the digital model of the Earth in scale 1 :5 000 000 was foremost used (see Figure 2), also digital bases of these rivers, lakes, settlements, political boundaries on 1920<sup>th</sup>. Also space picture (see Fig. 3) and texture of vegetation layer and soils were foremost used.

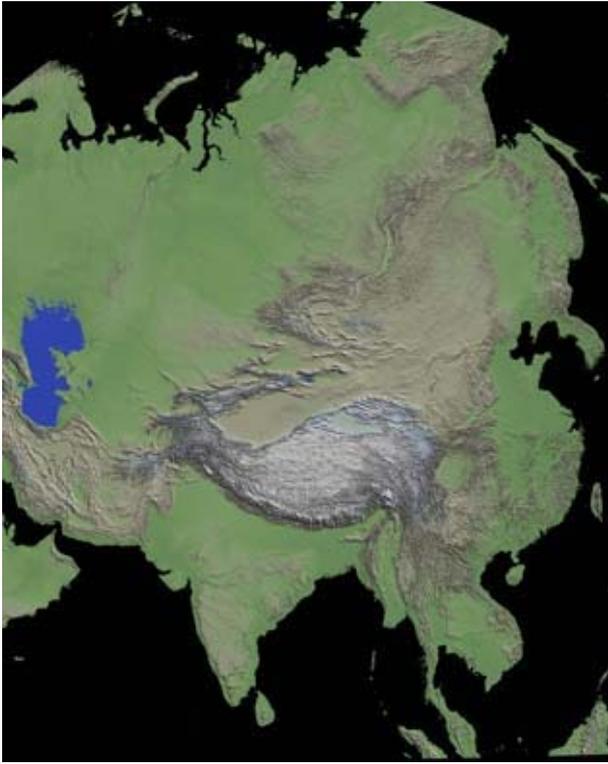


Figure 2. Digital model of the Earth on map territory in Lambert's projection

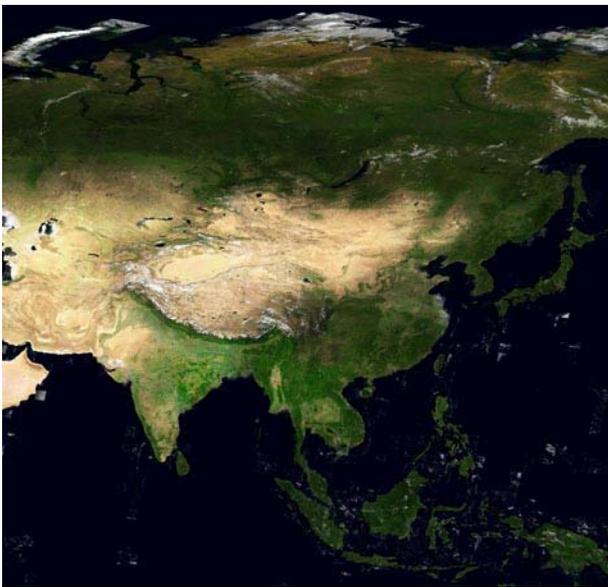


Figure 3 Space picture on map territory in a geographical projection

Originally a space picture was in the so-called geographical projection, therefore it was necessary to transform it in the projection which was chosen for map creation, namely Lambert's projection.

The variant of only relief model application was examined at the beginning, here only the coloring grades of heights and depths changed.

Different variants of picture superposition (see Fig. 4) were then considered on the relief three-dimensional model with subsequent coloring of water, and separately texture of vegetable cover and soils. Not only relief but also vegetation, hydrography and etc. are found a reflection in these two cases. This is very important, because the complex demonstration of all natural components, (not only relief but also natural areas underlines), give us much more information. Taking into account that the expedition of N. K. Roerich passed considerable part of route on mountain districts (Himalayas, Tibet, Kunlun and other mountain systems), during an expedition there were sharp overfalls of heights, and, consequently, the conditions of trip changed, it is therefore useful to give the complex picture of route environmental conditions.



Figure 4. Picture superposition on the three-dimensional relief model.

If we consider some picture, without the three-dimensional relief model, this image represents more clearly vegetation, hydrography and glaciers; in case of superposition on relief model all these objects become a little less clear (thus not losing clarity), but relief begins to be drawn.

By superposition of vegetation texture and soils on the three-dimensional relief model (see Fig. 5) a quite good result turns out. On the whole: the texture of the Earth surface and relief are well read identically.



Figure 5. Superposition of vegetation and soils texture on the three-dimensional model of relief.

But by increasing the image to the necessary sizes, expressiveness and detailed elaboration are not needed, especially in flat areas, which was the case in the first two cases.

The second technology was hand shading of all drawn a map territory with the use of Adobe Photoshop graphic package. A few tasks of cartographic character decided in the same program: on the flat areas of the drawn map territory used certain kind texture for giving expressiveness a terrain, more expressive, handwritten, working of main mountain ranges on Asiatic part of territory, as a program Global Mapper v9.0 is unable to fulfill this task. The third task is a color solution for relief shading.

By development of the artistic relief shading different color decisions were examined, here, a purpose was to put both aesthetical beauty of perception and aspiration to create a map in colors which N. K. Roerich usually used in the pictures for representing mountains. The conducted analysis showed rich, clean colors. Mainly it is red-orange and blue-violet color spectrums. Because the red color is too bright, a decision to use a blue-violet color spectrum was accepted.

For the choice of final map design the complex of experimental works, which consisted in development of the design elements best method, general geographical and thematic maintenance, and also coordination up of background, stroke and type design on purpose doing design well to read and easy for perception, was conducted.

Drawing and decoration are expedient to conduct separately in the different computer programs, that the developed technology must foresee. This is the wall map. Therefore all elements of strokes and inscriptions must be well read from large distance. For these aims the programs of vector graphics must be used. Thus, for comfort of drawing and correspondence quality printing on the finishing stage of design the thematic loading used one of the programs of vector graphics, namely, CORELDRAW 12. Drawing was conducted in the program Global Mapper v9.0, in which, as talked above, the digital bases of the rivers, lakes, settlements, roads and political boundaries were processed. Because export of information from Global Mapper v9.0 can be conducted only in Adobe Illustrator8.0, the first stage was an export of the got objects on layers in Adobe Illustrator8, and already after in CORELDRAW 12.

From all variants of design geographical basis considered above, artistic shading was chosen. Therefore decoration of the thematic loading was developed exactly for it (see Fig. 6). In the total a route is shown in different colors, because the way not only the expedition to Central Asia is shown but also antecedent trip of Roerich in India. Thus for the route of trip the class of roads is not indicated, not to divert attention of visitors on the main map subject. As additional information, as well as on an initial map, settlements in which family of Roerichs lived during the stay in India are shown.

The map of the expedition to Central Asia of N. K. Roerich executed as a work result will serve a good visual aid for the visitors of museum and simply persons interested to know activity and creation of great artist and philosopher N. K. Roerich. In addition, the developed technology befits for superposition and decoration of large territories, including on territory of all the Earth, and also other celestial bodies.

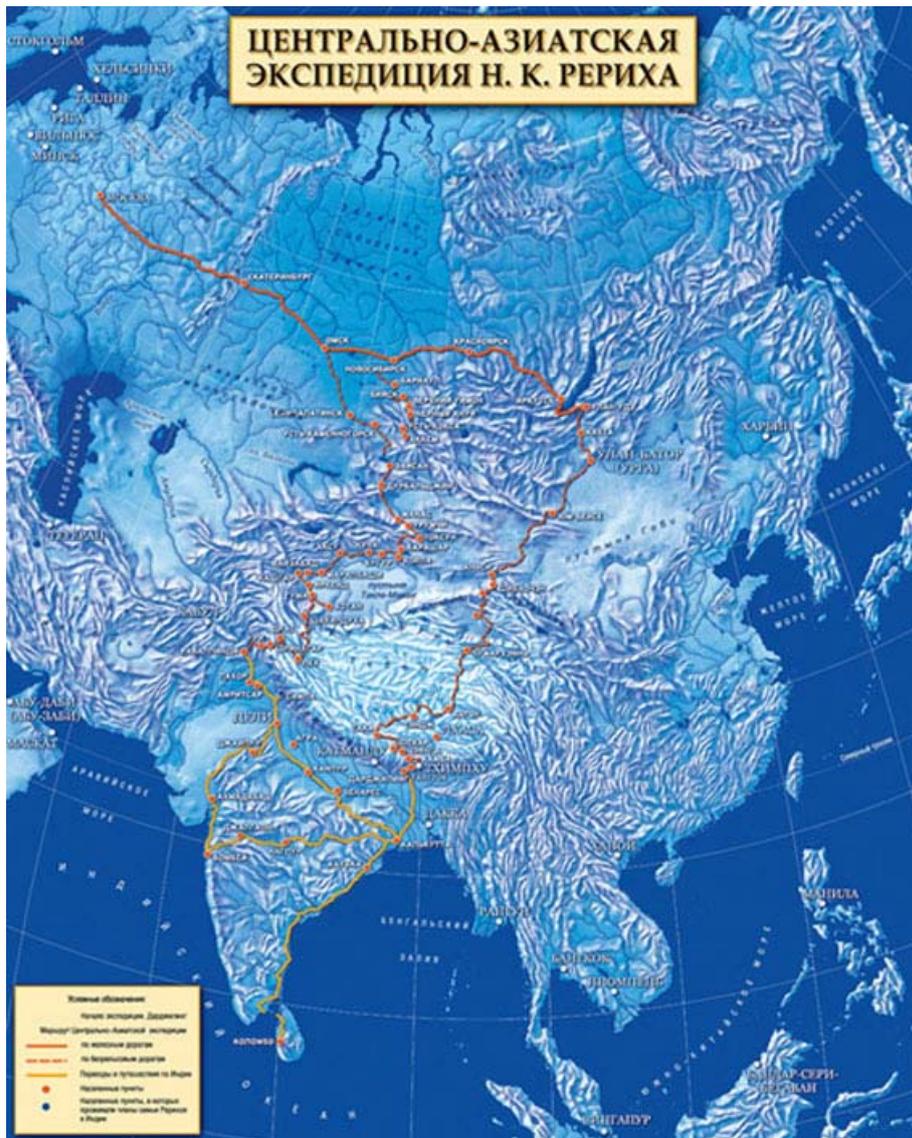


Figure 6. Final decoration of map is the «The Travelling Map of the N. K. Roerich's Expedition to Central Asia»

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Support letter for travel award to Irina Yu. Golodnikova

Dear colleagues,

The post-graduate student, Irina Golodnikova, was graduated from Moscow State University for Geodesy and Cartography with best diploma note in June 2008. Her specialization was “cartography” (map compilation and design). She was a brilliant student in reality.

Her diploma was devoted to a new map compilation of Roerich’s expeditions in Central Asia taking into account a new technology and design possibilities. In summer she continued to work on this map content presentation. That is why her paper represented to ICC 24 became more informative and expressive.

In autumn 2008 she has excellently taken all obligatory exams for post-graduate education and was accepted as post-graduate student at the same University. The next theme of her scientific efforts will be “Planetary Cartography”, namely mapping of Jupiter Galilean satellites and in the first line it will be Io map.

She is very active in her field and it seems to do her investigation with great interest.

I hope my support will help her because it is very important for young scientists to visit international professional meetings.

Best wishes,

Kira Shingareva, prof., chair of Planetary Cartography Commission

## Personal & professional details and information

Irina Yu. Golodnikova

I was born in Moscow in 1985. In 1993 I entered in secondary school and finished it in 2003. Then I entered the Moscow State University for Geodesy and Cartography (the Faculty of Cartography) in 2003, graduated it with best note (5) in 2008.

I have interested in Map Design, Computer Graphic. I have participated in 2 International Conferences: Cartography and GIS in Bulgaria (Jan.2008) and (Intercarto 14) in China (June,2008) and have represented two papers there (both in English) as author:

1. Artistic preparation of the cartographic faculty students. Course “The Fundamentals of drawing, painting and composition”
2. The first version of Map design for the Travelling map in Central Asia.

Now I'm a post-graduate student.

My supervisor is professor of our University, prof. dr. of sci. Kira B. Shingareva.