

## THE GLOBE OF RUSSIAN GEOGRAPHICAL RESEARCHES AND EARTH DISCOVERY

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The Globe of Russian geographical exploration and discoveries of the Earth " contributes significantly to education, training and promotion of research by Russian scientists, researchers and members of the Russian Geographical Society in geographical knowledge of the Earth. The theme of geographical research and journeys is very popular among the population. It is particularly interesting for the younger generation. For example, the translated Royal Geographical Society's Atlas of Geographica Discoveries (UK), released in 1998 was quickly sold out in Russia. This is the evidence of enormous popularity of such publications among the population.

In addition, the globe is not only a popular science publication for a wide range of Russian and foreign users, but also a genuine scientific publication, prepared in the best academic traditions, based on modern software products. The Globe contains all the major geographic research and discoveries, performed by Russian pioneers, scientists and explorers. In many ways it highlights the activities and the contribution of Russian explorers to the geographical knowledge of the world. For the first time a series of research routes were mapped with defined details, based on archival documents. The publication of the globe will bring to light a lot of new archival documents (handwritten maps, drawings and other artifacts), never previously published. This reinforces the attractiveness of the work for readers and the significance among the scientists.

«The globe of Russian geographical researches and Earth discovery» is developed at Institute of geography of Russian Academy of Sciences together with scientists-geographers, cartographers and historians from other academic institutes, universities, Russian geographical society, Russian archives, museums and libraries. The virtual globe is developed in the form of the complex illustrated cartographical product devoted stories of geographical discovery, made the Russian researchers for all period of existence of the Russian statehood, since the first geographical information which have become known still in Ancient Russia, and finishing results of regular purposeful geographical researches of a land and ocean up to our days. The globe reflects not only history of geographical studying of Russian territory in different stages of its existence, but also the contribution of the Russian researchers and pioneers to world process of accumulation geographical knowledge of everything, at times even very far corners of globe. In it forwarding activity Russian Academy of Sciences, Russian geographical society and other domestic organizations and departments on studying of Russia and the whole world is in detail shined.

At the heart of the development of The Globy of Russian geographical exploration and discovery of the Earth" is the use of different materials and results of multiple studies and work - geographical, cartographical, historical, art (painting), literature, and many other different in content and form documents. The advantages of the Globe are completeness, accuracy, modernity and reliability of its content - depending on the quality of the involved in the compilation sources. Therefore a particular important was the focus of the work on the collection, analysis, evaluation and selection of different sources. This is a responsible and very time-consuming part of work on the project. In compiling of the maps and texts to them mainly primary sources (archival documents and stock) - Reports of expeditions, diaries of travel, route maps and descriptions compiled by the pioneers, both published and unpublished were used. The second most important source of information is scientific publications (monographs, maps, atlases), dedicated to this or any other expeditions, trekking, travel, embassies. A lot of materials are cumulated on the history of geography and cartography, research and discoveries of the Earth by Russian scientist. The work involved "The historical atlas of geographical discovery and research" published in 1959, intended for students as a teaching tool in studying the history and cartography. Unfortunately, as shown by detailed analysis, this atlas contains several inaccuracies and outright errors. Some assistance in the selection of illustrative material, provided an other fundamental work The Atlas of Geographical Discoveries in Siberia and in North-Western America, XVII-XVIII Centuries." Edited by A.V. Efimov (1964), which placed the drawings and maps of explorers, made during travels, and the maps combined with archaeographic notes and lists of place names contained in the maps.

The concept of "The Globe of Russian geographical exploration and discovery of the Earth" was developed by director and responsible executor of the project based on lessons of experience creating similar or related topics and content of the scientific background of geographical atlases and in accordance

with the objectives of the project, as well as the latest research in the history of geography and cartography and the latest scientific and technological advances of cartography, computer science and multimedia.

The concept provides a chronological order of disclosure of the thematic content of the globe (IX-XVI centuries.; XVII in.; XVIII century., The first half of the XIX century.), And within each chronological group of subject-chronological or spatial and chronological distribution of material. Subject-chronological principle involves the presentation of material on specific topics - military campaigns, the embassy, voyages, etc., in chronological order. In accordance to the spatial-chronological the materials are grouped by location - the European North, Siberia and the Arctic, etc., in chronological order. Such placement of material in the Globe provides the most compact, complete and logically build historical outline of Russian geographical exploration and discovery of the Earth.

A uniform sign system was created for all of the maps - routes of expeditions, hiking and traveling. With the help of GIS software MapInfo and ArcGis the maps were compiled on standard cartographic basis, based on the copyright of original maps. Background of most maps is the terrain depicted a colorful dial with washing. Map-making is followed by its printing and transmission to editing.

To preserve the unity of all new maps and texts, their quality and direction of all efforts on implementing a single common channel were developed general guidelines to the authors, which contained the contents of the structure of explanatory texts, the rules of transfer of place names, dates, citing, especially the content of maps, etc. n.

Explanatory text to maps clarify and supplement the content, to provide guidance for the authors on involving primary and other sources.

Place names are resulted in that form what has been accepted on the end of the period displayed on the screen. The names appropriated by pioneers and researchers are in a special way allocated. Also in the globe for convenience of using the index of place names in which also their modern forms also are resulted is placed.

Methods of the image of geographical opening and researches in the new globe in the majority are same: by a color background it is shown or political division into the end of the period displayed on a map, or a lay of land (in "the muffled" tones). Use of this or that background is defined by the subject maintenance map embassies, scientific expeditions, voyages etc. routes are displayed by way of signs on movement (an arrow, a line) with use of various paints. Areas of detailed researches are if necessary given by way of areas with use of various shadings and contours.

The globe of Russian geographical researches and Earth discovery is developed only in the electronic environment in the form of a virtual interactive product the virtual globe.

Globe is a model of the Earth, made in the form of a sphere. Modern means of three-dimensional simulation can be used to create a virtual spheroidal model. Spheroid is a 3D figure that would take the body, if it is only influenced by the forces of mutual attraction of its particles and the centrifugal force of rotation. The simplest of the spheroids is an ellipsoid with a small contraction along the polar axis.

The mathematical model of sphere is put in its basis with a cartographical grid through  $10^\circ$  and parameters of reference Krasovsky. The model of sphere and system of its management are developed by means of language ActionScript 3. Routes of travelers and expeditions are presented on the globe in the form of animation images (2, 2,5 and 3-dimensional animation) which shots are united in the virtual globe by means of program Flash.

Defining the parameters of the globe, further identified tools to create it. Work on the development of an ellipsoid and controls was held in Adobe (Macromedia) Flash. For the creating of a three-dimensional object (globe) Flash 3D-library was used. To create a set of map layers that are displayed on the globe, shortcomings of virtual globes were taken into account. For example, in most modern systems globe mapping information is limited to a demonstration of satellite images, border states and subjects, as well as the layer of the road network.

In this regard, it has been tasked to fill the content of the globe by various thematic maps relevant historical themes, to give the most complete picture of the geographic features of those times. The globe presents itself as a trial globe-atlas.

The new Globe will fill a niche in terms of promoting scientific knowledge and geographical research, committed by Russian scientists, researchers, pioneers. It will raise the role and importance of the Russian Geographical Society foreducational and training purposes, in the eco-geographical education of the younger generation and all interested readers.

Future plans include the creation of a network version of the globe for the web. World Internet users will have the opportunity to learn about the immense contribution of Russia's scientist to the Earth's study, their

involvement in the accumulation of geographical knowledge. Internet users will be fascinated by the story of the heroic aspirations of the Russian explorers and navigators, who penetrated into the unknown corners of the world, showing incredible courage and stamina.

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