Expedition of Ivan Isleniev to Yakutsk and a handwritten map of the Lena River compiled in the mid-XVIII century

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Abstract. The article discusses the course and results of the astronomical expedition headed by I.I. Islenyev. Using archival materials, an attempt to localize the Astronomical Observatory built in Yakutsk in 1768 was made. New information on the handwritten map of the Lena River compiled in the mid-XVIII century was provided. Analysis of the toponymic map load was carried out and assumptions about its application for compiling generalized maps of Yakutia at the end of the XVIII century were made.

1. Introduction

Astronomical expeditions of the second half of the XVIII century were a basis for a broader study of the northeast of Russia, including the territory of Yakutsk region. On May 23, 1769, a rare astronomical event was expected - the passage of Venus through the solar disk. To observe this phenomenon, it was decided to send astronomical expeditions to different cities of the Russian Empire – Petersburg, Kola, Ponoy, Umba, Orenburg, Orsk, Guriev, Yakutsk. S. Ya. Rumovskiy, A. Malle and L. Pikte went for observations to Kola, Ponoy and Umba, respectively. V.L. Kraft went to Orenburg, G.M. Lovits went to Guriev, and H. Eiler – to Orsk. Yakutsk was the most distant place of observation. The leader of this (the most difficult one) expedition was Ivan Ivanovich Islenyev. Fedor Cherny was his assistant podsturman. Later, they both became associates of the Academy of Sciences. The expedition had to conduct astronomical and meteorological observations in the city and collect materials on “natural history”. The course and results of the expedition, and activities of Ivan Islenyev were documented in letters, journals, and reports deposited in the Archives of the Academy of Sciences. The astronomical materials of the expedition were partly published in Russian and in Latin, German and French for informing the European academic community [1]. For historical studies, Grekov, Shibanov, Shirina, Postnikov and others [2–5] addressed the analysis of the expedition. However, not all details of the expedition are known. The article aims to identify where and under what conditions astronomical-geodesic observations were made, what cartographic works were performed and how their results were used in the subsequent works of the Academy of Sciences.

2. Research methods

The comparative historical method was used. We compared a handwritten map of the Lena River compiled by I. Islenyev with later maps of the XVIII century which depict the territory of Yakutia. The
maps were compiled in 1776 and 1792. In addition, the documents in the Archive of the Russian Academy of Sciences allow for localization of the Yakutsk observatory built for astronomical observations.

It is known that the expedition left St. Petersburg on February 11, 1768. Rumovsky provided them with instructions on astronomy, methods for collecting and preserving rare Siberian animals”, tools, instruments and books. The route of the expedition passed through Moscow, Kazan, Tobolsk, Krasnoyarsk, Irkutsk, Kachug, Verkhokhenskiy stockaded town, Ust-Kut, Kirenskiy stockaded town, Vitimskiy stockaded town, Olekminskiy stockaded town. They arrived in Yakutsk on June 8, 1768.

In accordance with the “Mandate ...”, an observatory was built in the place where full-scale instrumental astronomical observations were carried out.

The documents say about the location of the Observatory: “The Observatory is located in Yakutsk near the Bogorodskaya Cathedral Church at a distance of 380 fathoms” [6].

The Bogorodskaya Cathedral Church was located at the entrance to Yakutsk along Irkutsk highway. The wooden Church was built in 1760. The location of the Observatory can be calculated from this Church. The church existed until 1922 (it was dismantled during the siege of the city). In 1773 (after the observations were completed), at the expense of the merchant D. Barabanov, to the south of the wooden church, the Yakutsk Bogorodskaya stone church was built. Both churches had rich church plates [7].

![Figure 1](estimated_location_of_the_observatory.png)

**Figure 1. Estimated location of the Observatory on a modern map of Yakutsk**

This place gained a historical and spiritual significance - the stone church was restored, the worship was resumed; in 2010, the Yakut Theological Seminary and the Spiritual and Educational Center n.a. St. Innocent (Veniaminov) were created there.

This is the Pledged part of the city located on the shore of Teploe Lake. In this part, there are manor buildings built in the XIX - beginning of the XX centuries.

In the Observatory, Islenyev was conducting observations from August 12, 1768 to June 11, 1769. The “Journal of astronomical observations contains information about instruments, methods, scope and conditions of observations. In August, the observations were carried out for 11 days (on 12, 13, 14, 15, 16, 17, 25, 26, 27, 28, 29 August; 20 two-hour observations); in the remaining days, observations were not conducted due to cloudiness and rain [8].

An important result was the high-precision identification of the latitude and longitude of Yakutsk. For the first time, the latitude and longitude were determined - 62 degrees. 01 min. 50 sec. nl; .8 hours 29 min 35 sec on eclipses of the satellites of Jupiter. In March 1989, the Yakut airborne geodetic plant installed a memorial plaque to memorize this event on the initiative of Gennady Vasilyevich Bocharov, director of the Yakutsk aero-geodesic enterprise from 1980 to 2005.

The measurement data obtained by I. Islenyev were included in the catalog of coordinates compiled by Rumovsky. It became a basis for changing maps compiled by the Geographical Department of the Academy of Sciences.
In addition, the expedition collected information on the flora and fauna of the region, fossil animals in the Lena basin. They collected ethnographic folklore materials about the local population. A description of Yakutsk was compiled, and meteorological observations were made [3, 4].

Reports of the astronomical expedition were partially published, but much of them are stored as manuscripts which were studied in the XX century.

![Figure 2. A plaque in memory of the first accurate evaluations of the coordinates of the city of Yakutsk. Photo by O.A. Lazebnik, 2018.](image)

3. **Handwritten Map of the Lena River**

Information about the Lena River obtained during the expedition is of particular interest. In the XVIII century, the mapping of rivers and lakes was intensively developing in Russia. In 1736, a special instruction was created at the Petersburg Academy of Sciences that regulated the range of issues related to the characterization of the studied river and its mapping [9].

The Archives of the Russian Academy of Sciences (St. Petersburg) stores documents on the map compiled by Islenyev "Explanation about the Lena River map. Irkutsk, Yeniseisk, Ilimsk, Kirensk, Olekminsk, Yakutsk were used as a basis. The Lena River flows from Kachug to the mouth of Dubrovka. Using a compass and measures according to the rules of navigational maps, lands are marked on both banks of the river” (From portfolio XXXIX No 28, number 32; From portfolio XLIX No 48; From Portfolio XXXXIV No. 63 of May 23 of 1782, From Ivan Islenyev” [10]. Thus, the surviving documents indicate that Islenyev compiled a map of the Lena River from the Kachug village to the mouth of the Dubrovka River using old cartographic materials and indicated which maps in particular he used, and from the mouth of the Dubrovka River to the city of Yakutsk, Islenyev made a map using only his own observations.

The map was not attached to the Explanation; its location was not established. Our studies of handwritten cartographic materials carried out in the manuscripts department of the Library of the Russian Academy of Sciences allow us to state that the “The Lena River flow map from Dubrovka to Verkholensk” and the Lena River flow map from Vitim prison to Yakutsk” were compiled by I. I. Islenyev.

In terms of geography, the maps are detailed; they show tributaries, islands, residential places, relief elements, types of banks, river channel nature.

The Lena River map from Vitim to Yakutsk shows 36 tributaries, ostrogs, winter huts, stations, 23 villages, islands, relief elements, “high peaked cliffs (famous Lena Pillars which are the main attraction of Yakutia (Fig. 1)). I. Islenev used the materials collected by S.U. Remezov.
In the XVIII century, the Lena River, the largest water artery of Eastern Siberia, was surveyed. Islenyev surveyed the river from the mouth of the Dubrovka river to Yakutsk; the survey of the river from Yakutsk to the estuary was made in 1739-1742 during the Second Kamchatka Expedition.

Soon after all the necessary observations were made in Yakutsk, Isleniev received an order to conduct geographical observations in Western Siberia. In 1769-1771, he was already shooting the Irtysh River.

Figure 3. Map of the flow of the Lena River from Vitim prison to Yakutsk”. Fragment. [11]

4. Using data from the map of the Lena River collected by I. Islenyev
The study of map toponyms makes it possible to use the map for compiling maps of Irkutsk province. On the “General map of Irkutsk province of 1776 which shows Irkutsk, Yakutsk, Uda provinces” (the scale is about 1: 8,400,000), there are the same names of tributaries and settlements. However, their number is 15 which indicates the generalization of the map. The Goose Mountains were marked. In the area of the Lena Pillars, small unsteady mounds were shown [12].

On the Russian Atlas of 1792 (“The Map of the Western Part of Irkutsk Province”), there are few names from the Islenyev’s map - only four signatures of the Lena tributaries - Olekma, Talb, Botoma, Blue, and "Vitim", "Olekminsk", and "Yakutsk” [13].

Thus, the handwritten map of the Lena River compiled by Islenyev was not used by the Academy of Sciences to create maps of northeastern Russia in 1770-1800. Analysis of the toponymic dynamics of the average flow of the Lena River showed the relative static nature of hydronyms.

5. Conclusion
An assumed location of the Astronomical Observatory built in Yakutsk in 1768 was established. Assumptions about handwritten maps stored in the BRAN manuscript fund were made. The maps show the Lena River from the headwater to Yakutsk. The analysis of the toponymic dynamics of the average
flow of the Lena River showing the static nature of hydronyms was carried out. The ignorance of data obtained by I. Islenyev when creating maps of northeastern Russia by the Academy of Sciences of 1770–1800 was revealed.

Maps of the Lena River will become part of the electronic collection of cartographic images of Yakutia in the XVII - early XX centuries.

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