The military geographical institute contribution in the Galicia mapping

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SUMMARY

The main institution for Austro-Hungarian empire’s geodetic surveys and mapping in 1840-1918 – the Military Geographical Institute foundation and activity history and its contribution to Galicia mapping is highlighted. The Institute provided geodetic data and relevant topographic information to region. After moving from Milan to Vienna the Institute performed a Second military (Franciscan) Austro-Hungarian empire’s survey (1806-1869), which data was used for Galicia and Bukovina detailed topographic map in scale of 1:28 800 on 458 sheets compiling. As a result of Third military survey (1869-1887) the Military Geographical Institute publishes a Special topographic map scaled 1:75 000 that completely covered the Galicia territory. A number of overview topographic maps were created based on these maps. An Institute legacy has multi-sheet Lviv topographic plans. The Institute contribution to Galicia thematic mapping development is considered, in particular “Galicia geological atlas” scaled 1:75 000 and numbers of road maps publishing. It’s noted that many MGI employees were involved into geodetic and cartographic work in Galicia. Among the numerous surveyors, topographers and cartographers, the leaders and organizers of such work especially highlighted.
Introduction

The Military Geographical Institute, as the main topographic, geodetic and cartographic institution of the Austro-Hungarian monarchy, played a significant role in mapping large areas of the Austrian state, including the crown land of Galicia and Vladimirij. The institute established the country’s territory systematic topographic surveys, providing for the state needs, primarily the military department, in up-to-date topographic, geodetic and cartographic information. Austrian topographic maps were commonly considered in the XIX-early XX century as ones of the best in Europe, have repeatedly been awarded prizes at international exhibitions. The institute stimulated the geodetic measurements development, topographic surveys and cartographic production, introduced the latest technologies of lithography and engraving, successfully provided new technologies and approaches to work. The Military Geographical Institute provided normative-legal and normative-technical support for the branch, published textbooks, instructions, scientific literature development, and took care of the specialists training. Viennese surveyors and cartographers worked throughout the empire and far beyond.

Method and Theory

The history of Austrian cartography is closely connected with the institutions that performed topographic, geodetic and cartographic works and without which the production of quality cartographic products would be impossible. Cartography in the early XVIII century began to develop rapidly in the Austrian Empire thanks to the French military school. At the end of 1717 the first military engineering academy was founded in Vienna, where geodetic and cartographic disciplines were taught.

From 1764 to 1918, state cartography in Austria was in the military department. Initially, this was taken care by the military in the Austrian General Quartermaster's Office, which carried out the First Josephine Survey in 1763-1785. The topographic survey lasted a long time and covered almost the entire empire territory. Usually the maps and plans customers were the monarchs or the army, and the main expenses were paid by the state. This was understandable, as interest in the maps was the most among the administration, administrative and military authorities, and the cost of quality maps was significant. The Military Geographical Institute arose from an institution that was established in northern Italy under Napoleon. At the time of the annexation of Northern Italy by the Habsburgs to Austria in 1818, the institute was performing a topographic survey of the Adriatic Sea’s coast, the principalities of Parma, Modena and Lucca.

Franz I the Emperor of the Austrian Empire transformed the Milan Geographical Institute into the Imperial Royal Military Geographical Institute. Prior to this transformation, the Milan Institute was also involved in triangulation measurements and all of Italy maps creation. Until the topographic surveys completion, the newly created Imperial Institute remains in Italy. In 1839, by order of Emperor Ferdinand I, the institute was moved to Vienna and merged with the Topographic and Lithographic Institution of the General Quartermaster's Staff, established in 1806 (Szajnocha, 1883).

After moving institute to Vienna, a triangulation computing bureau, the technical office of the General Quartermaster's Headquarter, and the staff of military cartographers were added. The institute consisted of five groups: astronomical and geodetic group, cartographic group, topographic group, technical group, management group. The staff consisted of senior officials, civil servants and technical support services. Officials were divided into technical, operational and assigned to the appropriate groups. The technical support staff consisted of factory foremen and technical assistants. Workers in detachment brigades, regardless of their base unit, had the following positions: sergeant - corporal - ranker. Officers wore the uniform of artillery camp. Neither technical nor factory officials wore uniforms. The Kaiser's Royal Institute of Military Geography was subordinated to the Austrian Army’s Chief of the General Headquarter until 1913, then directly to the Ministry of War (Imperial Royal Military Geographical Institute) K.K. Militargeographisches Institut (MGI). The documents on the organization indicated the scope of activities and main tasks of the institute.
In 1889, the name of the KK the Military Geographical Institute (k.k. Militärgeographisches Institut) was changed to the Kaiser and Royal Military Geographical Institute (k.u.k. Militärgeographisches Institut) that is, the letter "u" was added. Thus, the name recorded the fact of the Austria and Hungary unification into a single Austro — Hungarian monarchy in 1867.

The area of responsibility of MGI included the all Austro — Hungarian monarchy, with an area of about 677,000 km² (after the loss of Upper Italy and the conquest of Bosnia and Herzegovina), an area that covered all landforms of Central Europe — from the steppes of Galicia to the highlands of the Alps. MGI solved the problem of "measuring the shape of the Earth", so as to technically create maps at a high geodetic level.

The activity of the institute was entrusted with the preservation of the principle of the integrity of the state, the inviolability of borders. Its task was to collect topographic material, to perform astronomical and geodetic measurements, to conduct military surveys, which topographic results were used for scientific and administrative purposes. The obtained results were the basis for the preparation and publication of monopoly’s maps. Also the records of all changes which occurred on a surface of a relief, construction of new communications and regulation of a hydrographic network was kept (Szajnocha, 1883; Sossa, Paduka, 2003).

The institute has always used the latest achievements in the field of geodesy, astronomy, topography, cartography, printing in its work. MGI was also a leader in maps publishing. Technical developments in lithography and engraving were constantly improved and carefully followed. Galvanoplastics was introduced at MGI in 1846, which made it possible to produce large editions of high-quality cartographic publications before the introduction of photomechanical engraving printing in 1869. Since 1876, lithographic presses have been used, and aluminium presswork plates later. In 1873, the production of new maps was changed from engraving on copper plates to heliogravure, the results were presented at the World's Fair in Vienna in 1873. Improvements in printing technology and their use at MGI promoted the widespread use of cartographic products.

There was a press department of the Military Geographical Institute since 1871. At the request of the Austrian Empire Ministry of War, MGI published two of its own journals: Die astronomisch-geodätischen Arbeiten des K. und K. Militärgeographischen Institutes in Wien (1871-1898)/Astronomical and Geodetic Works of the Military Geographical Institute in Vienna and Mittheilungen des kais. königl. Militär-Geographischen Institutes (1881-1914)/Journal of the Military Geographical Institute. They regularly published articles on innovations in topographic, geodetic and cartographic works. MGI defined in the Austrian Empire (since 1867 - in the Austro-Hungarian monarchy) the state technical policy in the area of geodesy, topography and cartography and at the same time performed the main topographic, geodetic and cartographic works for the main consumer of spatial data - the military department. This circumstance determines, first of all, the importance of the institute for mapping Galicia. It is known that in the Austrian Empire in 1806-1869 the Second Military (Franciscan) topographic surveying was made, which the Military Geographical Institute was joined in 1840. According to results, a Franciscan military topographic map of Galicia and
Bukovina in the scale of 1:28,800 on 458 sheets was compiled in handwritten form. The map with the most detailed geographical basis at that time was creating for a long time, but the main amount of map sheets of Galicia was drawn in 1862-1863 (Sossa, Musienko, 2018). Based on the materials of the Second Survey, the General Map of Galicia and Bukovina at a scale of 1: 288,000 was published (11 sheets, 1868).

MGI gained global recognition mostly through the high-level publications of numerous multi-sheet maps of the Austrian Empire and Europe under the direction of Josef Ritter von Sched (Joseph Ritter von Scheda,1815-1888), the institute's director of cartographic work (General Map of the Austrian Empire at 1: 576,000 (20 sheets, 1856); General map of Central Europe scale 1: 576 000 (47 sheets, 1856-1873); General map of Europe scale 1: 2 592 000 (25 sheets, 1845-1847,); Map of the Austro-Hungarian monarchy scale 1: 1,000,000 (4 sheets, 1874).

On the basis of the updated triangulation network, the Military Geographical Institute performs the Third Military Topographic Survey (Franciscan-Josephine) on the entire territory of Austria-Hungary in 1869-1887. According to the surveys materials of scale 1:25 000 in 1873-1889, a one-color Special Map of scale 1:75 000 was published on 752 sheets, which completely covered the territory of Galicia (Sossa, Padiuka, 2003). Since 1885, the special map began to be updated, so that by the beginning of the First World War, the second updated two-color issue of the map was published (Sossa, Padiuka, Ohorodnyk 2012).The materials of the Third Austro-Hungarian Survey were used to create the next MGI cartographic masterpiece - the General Map of Central Europe at a scale of 1: 200,000 (282 sheets, 1887-1915), as well as a new Overview Map of Central Europe at a scale of 1: 750,000 (1899-1915). Based on its own topographic surveys, the Institute compiles and publishes topographic multi-sheet plans of Lviv. For the economic needs of the city in 1844 a plan of Lviv with its suburbs was published («Lemberg mit seinem Vorstädtten im Jahre 1844»).

Thanks to a highly qualified team of cartographers, modern technologies for compiling and preparing maps for publication, high-quality polygraphic reproduction of cartographic products, the Military Geographical Institute has significant achievements in thematic mapping of Galicia. It should also be noted that topographic maps created by the institute often served as a basis for compiling diverse thematic maps.

A number of thematic cartographic works complex in content and filling are prepared for publication and printed here. Thus a significant event in the geological mapping of Western lands was the publication in the MGI "Geological Atlas of Galicia" scale 1:75 000. Geological maps of the atlas are based on nomenclature sheets topographic Special map scale 1:75 000. Maps were combined into groups and published as a separate notebooks with text and tables. The authors of the maps were scientists from Krakow and Lviv. Another direction of thematic mapping of the institute, especially in the second half of the nineteenth century, was the road maps creation. Among these publications we will call "Road map of the Kingdom of Galicia and Vladimir as of 1865.” scale 1: 432 000 on 3 sheets (1867) and "Road Map of Galicia and Bukovina" scale 1: 288 000 on 11 sheets (1868).

Many MGI employees were involved into geodetic and cartographic work in Galicia. Among the numerous surveyors, topographers and cartographers, we especially highlight the leaders and organizers of such work. Along with the above-mentioned major-general J.R. von Sched the following persons can be noted:

- major-general Marieni Jacob (Marieni Jakob, 1783–1867), took part in trigonometric and topographic labor in Galicia; was director of triangulation from 1824-1859 and worked on instructions for trigonometric research;
- major-general Mirbach von Rheinfeld Karl (Myrbach von Rheinfeld Karl, 1784-1844), head of mapping in Galicia, director of the astronomical and trigonometric survey of Austria 1829-35;
- colonel Rousseau von Happencourt Leopold Ritter (Rousseau von Happencourt Leopold Ritter, 1796-1878), was involved in the creation of maps of Galicia (Regale, 1955).
• major-general Dr. Robert Daudlebsky von Sternek (Robert Daublebsky von Sterneck, 1839-1910), headed the astronomical department and astronomical observatory. In August 1892 he performed the first gravimetric measurements in Galicia and Transcarpathia along the line of high-precision leveling Lviv-Nyredgaz, and in August 1899 he took part in measuring the geodetic base of Khodachkiv-Nastasiv near Ternopil and its reference to the triangulation points of the 1-st class (Drbal, Kotsab, 2005).

Conclusions

The Military Geographical Institute was the main institution in the Austrian Empire (since 1867 - in the Austro-Hungarian Monarchy) to provide the military department and the state with geodetic data and topographic maps. Due to the activities of the Institute of Galicia, which was part of the crown land, the Kingdom of Galicia and Vladimir, like other lands of the empire, was covered by topographic maps of various scales. According to the results of the Second Military (Franciscan) Survey (1806-1869), a topographic map of Galicia and Bukovina was drawn up at a scale of 1:28,800 on 458 sheets. The entire territory of Galicia was covered by a Special Topographic Map at a scale of 1:75,000, created as a result of the Third Military Survey (1869-1887). Based on these maps, the institute has created a number of overview topographic maps of the Austrian Empire and Europe. The activity of the Military Geographical Institute was significant for the thematic mapping of Galicia. The institute created a fundamental "Geological Atlas of Galicia" on a scale of 1:75 000.

References


