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**HISTORY OF DEVELOPMENT  
OF THE CONVENTIONAL SIGNS «OLD MAPS»  
(XVIII – the early XX centuries)**

Consideration of cartographic materials as historical evidence on the history of Kazakhstan XVIII – early XX centuries relies primarily on a comprehensive source study analysis, which is impossible without knowledge of the conventional symbols of the «old maps» of the period. The conventional signs of cartographic materials of the XVIII – early XX centuries have their own history of development and improvement. Cartographic signs include all types of signatures. The set of conventional signs and explanations to the map is called a map legend. In order to effectively source the analysis of cartographic material, it is necessary to know all the symbols, the number of which was large and varied for each specific period of cartographic development. At the same time, quite often on the maps of a given period in the fields of maps, conventional symbols were not placed or there were no explanations of their meanings. This article provides the researchers of the «old maps» with comprehensive knowledge of the conventional signs of cartographic materials of the XVIII – early XX centuries without knowledge of which a qualified interpretation of sources of this type is impossible and this proves its relevance.

**Key words:** interdisciplinary research, new time, conditional symbols of «old maps», «legend».

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**«Ескі карталар» шартты белгілерінің даму тарихы  
(XVIII – XX ғасырдың басы)**

Картографиялық материалдарды XVIII – XX ғасырдың басындағы Қазақстан тарихының тарихи деректері ретінде қарастыру бірінші кезекте кешенді көздерден осы кезеңнің «ескі карталарының» дәстүрлі символдарын білмей жүргізілмейтін зерттеуге сүйенеді. XVIII – XX ғасырдың басындағы картографиялық материалдардың шартты белгілері өздерінің даму және жетілу тарихы бар. Картографиялық шартты белгілерге барлық қолтаңбаларды жатқызады. Шартты белгілердің жиынтығы және картаға түсіндірілуі карталардың аңызы деп аталады. Картографиялық материалдарды тиімді талдау үшін, картографиялық дамудың әрбір нақты кезеңі үшін алуан және әртүрлі болатын барлық белгілерді білу қажет. Сонымен қатар, көптеген жағдайларда осы кезең карталарының бүктеуінде шартты белгілер орналастырылмай қалады немесе олардың мағыналары туралы түсініктеме жоқ. Осы мақалада «ескі карталар» зерттеушілеріне XVIII – XX ғасырдың басындағы картографиялық материалдарының шартты белгілері жан-жақты білімдерін береді, ол білімсіз осы типтегі дереккөздерді білікті талдау жүргізу мүмкін емес және осымен оның өзектілігі түсіндіріледі.

**Түйін сөздер:** пәнаралық талдау, жаңа дәуір, «ескі карталар» шартты белгілері, «аңыз».

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### **История развития условных знаков «старых карт» (XVIII – начало XX вв.)**

Рассмотрение картографических материалов как исторических свидетельств по истории Казахстана XVIII – начала XX вв. опирается прежде всего на всесторонний источниковедческий анализ, который невозможен без знания условных знаков «старых карт» данного периода. Условные знаки картографических материалов XVIII – начала XX вв. имеют свою историю развития и совершенствования. К картографическим условным знакам относят все виды подписей. Совокупность условных знаков и пояснений к карте называется легендой карты. В целях эффективного источникового анализа картографического материала необходимо знать все условные знаки, количество которых было велико и разнообразно для каждого конкретного периода развития картографии. При этом довольно часто на полях карт данного периода условные знаки не помещались или отсутствовали объяснения их значений. Данная статья предоставляет исследователям «старых карт» всесторонние знания по условным знакам картографических материалов XVIII – начала XX вв., без знания которых невозможна квалифицированная интерпретация источников такого типа и этим доказывается её актуальность.

**Ключевые слова:** междисциплинарное исследование, новое время, условные знаки «старые карты», «легенда».

#### **Introduction**

The cartographic study of the Kazakh steppes is mainly related to the interest of the Russian Empire in the colonial conquest of the territory of Kazakhstan and, as a consequence, the increased demand for accurate and timely information about the terrain features. Historical and historiographic analysis of the «old maps» is impossible without knowledge of the conventional signs of the new time, the number of which was very significant and varied for each specific period of the development of cartography. The evolution of the conventional signs of cartographic materials was influenced by the improvement of the technical equipment of the army of the Russian Empire.

The beginning of the introduction of conventional symbols by the researchers of historical cartography is connected with the military department of the Russian Empire and is counted from 1797 – from the moment of the creation of the imperial map Depot, on the basis of which the Military Topographical Depot, the main cartographic office of Russia in the first half of the XIX century (Kusov, 2003: 63).

This was the beginning of the organization of the military topographic service in Russia and made a significant contribution to the study of the lands of Kazakhstan and the development of conventional signs of cartographic material.

Further improvement of the conventional symbols of the «old maps» was obtained in the framework of military topographic surveys, which

is well traced under various archival documents, regulations, decrees, instructions and maps issued by the military department during this period. By the work of the military department «tied» and relied on them all the shooting work of other departments. All survey and scientific expeditions used military maps. (Bagrov, 1914:1-4).

#### **Methods**

The methodological basis of the study was the principle of interdisciplinarity, which involves the interaction of various methods.

The cartographic method is used as the main research method, which allows us to trace the improvement of conventional symbols and cartographic methods aimed at obtaining information on the qualitative and quantitative characteristics of the maps, and studying the dynamics of historical events of their interconnections.

One of the effective methods of studying the conventional symbols of the «old maps» is the method of comparison of cartographic works, which allows comparing different-time maps and analyzing the evolutionary change of conventional symbols and their explanations. The general geographic method contributes to the objective analysis and evaluation of the conventional signs of the physiographic data of cartographic materials of the new time, allows localizing certain historical events and tracing the geography of the development of historical phenomena. All of the above methods were used in combination.

## Discussion

The history of the development of conventional signs of cartographic materials of the period of the XVIII – beginning of the XX century was generally covered in the studies of pre-revolutionary, Soviet, Russian and foreign authors involved in the study of cartographic history. However, the issues of the history of development and improvement of conventional symbols on the history of Kazakhstan in the XVIII – early XX century were not considered in them. The study of the history of the development of the «legend» of cartographic materials of the new time is necessary, as it contributes to the successful source study analysis of cartographic material on the history of Kazakhstan of the 18th – early 20th centuries.

Pre-revolutionary studies on the development of symbols of cartographic materials are very valuable today, including the book of the teacher of the Chuguev infantry and cadet school I. Zybin (1897), who analyzed the influence of map parameters on the choice of conventional symbols: «The type and size of conventional symbols are most influenced by the scale value of the plan or map. In general, the smaller the scale, the greater the need for large-scale signs. Therefore, the plans were dominated by contour and large-scale signs on the maps. In addition to scale, the choice of conventional symbols is influenced by: A) the purpose of the plan, indicating which items on it should be applied with more detail. B) accuracy of shooting, as with more accurate work with contours they put on the plan such objects that, with lower accuracy, are depicted with large-scale marks. B) method of issuing a plan (map), i.e. whether it will be monochromatic or painted» (Zybin, 1897: 27).

In the unofficial edition of the captain of the corps of military topographers V.N. Andrianova made one of the first attempts to define conventional signs, theoretical research and classification of conventional signs, which were used in cartography in the early XX century. The author noted: «All designations that depict military topographic plans and maps are called conventional signs. Their general character is such that they must give the impression of the terrain itself, and therefore those objects that are of great importance are depicted by sharper lines. According to the method of transferring local objects on maps, symbols are divided into two groups. The items that are depicted with the exact preservation of their actual outlines, such as the lines of the coast, the contours of forests, swamps, meadows and others, and which are called

contour conventional signs, belong to one. The other group includes objects that have an approximate or other value, but so small that with a corresponding large-scale reduction of them they could not be depicted on paper, such objects are designated by special signs called large-scale conventional signs (bridges, roads, etc. )» (Andrianov, 1905:11).

In Soviet historical scholarship, studies of source studies and the methodology of cartographic material, species peculiarities prevailed, but in their research the history of the development of conventional signs was highlighted. In this regard, the greatest interest is the work of such authors: N.V. Vinogradov (1941), L.S. Garaevskaya (1955), O.M. Medushevskaya (1957), N.M. Volkov (1961), K.A. Salishchev (1982), A.V. Postnikov (1985), etc.

In the monograph «Maps and Atlases» N.V. Vinogradov (1941) draws attention to the peculiarities of drawing conventional symbols on the map: «For elements of the natural (sea, lake, river, forest, etc.) and cultural (villages, roads, artificial structures, etc.) landscapes occupying a certain area of the earth's surface, in principle, you should always put their outer border on the map, inside which you draw any icons (for example, circles to indicate a forest or background colors are used)» (Vinogradov, 1941: 30).

In the textbook «Cartography» LS Garayevsky (1955) paid attention to the measures taken in the early twentieth century. on the creation of uniformity of conventional symbols: « A large number of conventional symbols led to the need to develop standard conventional symbols. The International Conference, held in London in November 1909, adopted the basic rules on the International Millionth Maps. The final installations were adopted in 1913 at the second international conference. The conference developed the «Basic Provisions on the International Million Map », where a certain design of the map was adopted, including the table of symbols» (Garaevskaya, 1955: 36).

Soviet and Russian historian, source scientist and theorist of science O.M. Medushevskaya in the textbook «Cartographic Sources of the XVII-XVIII Centuries» (1957) did not directly address the problems relating to conventional symbols. However, the facts cited in it make it possible to clarify the place and role of conventional symbols in the 18th century cartography system: «For the dating of authentic handwritten maps, the character of symbols can be of great help. Inscriptions and legend to the map are important in determining the author, the time and place of creation» (Medushevskaya, 1957: 25).

Soviet researcher N.M. Volkov (1961) in the book «Drawing and Editing Maps» noted the features of contour conventional symbols: «Contour symbols (signs) are used to depict such objects, which occupy a certain area on the ground, appear on the map scale with their planned contours-contours and serve to characterize the internal content of each such contour. They can be icons, designed in any order and located in a particular system, or have the form of hatching or color fill (fill), filling the entire contour. Outline icons often have a drawing that resembles the object they display to some degree or another (overgrown reeds, woods, etc.)» (Volkov, 1961: 20).

Soviet geographer-cartographer K.A. Salishchev (1982) attempted to summarize the extensive theoretical material on the development of symbols and their functional purpose: «Collections of conventional symbols perform broader functions on maps. They show combinations and interrelations of objects, form a spatial image of phenomena, allow to establish patterns of their placement and thus give new knowledge in excess of the amount of information contained in individual map signs. In addition, groupings of signs open space for the spatial characteristics of the state, differentiation and temporal change of phenomena» (Salishchev, 1982: 20).

The Soviet and Russian historian of geography and cartography A.V. Postnikov studied the issues of conventional signs more thoroughly than other authors. He particularly covered the history of the development of conventional symbols, assessed the values of the «legend of old maps» in the source analysis of cartographic materials of the new time: « With the complication of the classification of objects and phenomena being mapped, the number of signs naturally grew, and their semantic meaning deepened and changed. In the late XVIII – early XIX century. in Russia, conventional signs in the land and military departments are standardized, and their use is approved by law. As the economy develops, new historical realities emerge that need to be displayed on maps. There is a need to revise and add the tables of conventional symbols, which leads to their periodic reprinting. Unified designations of different years are known for hydrographic, forest, land-surveying, military topographical, and many other types of maps. Knowledge of all symbols used on maps in different periods is absolutely necessary to establish the date of creation of the corresponding cartographic works» (Postnikov, 1985: 20).

Interesting facts, including those directly related to the state of development of conventional signs of

cartographic materials in the XIX century given in the review of the Russian researcher S.Yu. Rychkova (Rychkov, 2017).

Thus, all the above works, as a rule, are significant in their contribution to the study of historical cartography. However, from the point of view of studying the conventional signs of cartographic materials on the history of Kazakhstan in the XVIII – early XX centuries. they are just a collection of disparate information, sometimes local generalizations, that do not give a complete and logical idea of the place and role of the «legend» in the source analysis of cartographic materials of the era under study.

### **Results. The history of the development of conventional signs of cartographic materials of the new time.**

Symbols of cartographic materials provide an opportunity to see military history plots in a different graphic dimension. They serve as the language of maps, with the help of which they designate different types of objects, their location, shapes, sizes, qualitative and quantitative characteristics that developed and improved simultaneously with the development of cartography. Historically, conventional signs on maps developed from perspective drawings of various objects of the terrain: mountains, rivers, forests, roads, settlements. Gradually, the drawings lost their external similarity with the depicted objects and became more and more arbitrary and abstract (Paromov, 2010:48).

Cartographic symbols include all types of signatures. Signatures on the cards have a special place. They enrich the content of the map and perform various functions. Symbols and explanations to the map or the «legend» of the map are the basis for reading and analyzing the content of cartographic materials. In the «legend» are required: exhaustive, ie inclusion of all signs used on the map; consistency in the grouping, placement and subordination of characters (for example, by individual elements of the content in the order of their value); unconditional clarity and, if possible, brevity of texts explaining the meaning of signs. A well-constructed «legend» reveals the contents of the map – the list of elements, classifications and indicators used for each element, as well as the degree of their generalization (Salishchev, 1990:45).

Cartographic materials of the 18th century had their own specific features. They were more detailed than the cartographic sources of the earlier period, they were expanded, contained comments



and explanations to the image. On the maps of the XVIII century, were shown: settlements, rivers, lakes, oceans and seas, bays while symbols are used relatively little, mainly for the depiction of the relief, sometimes vegetation. For clarity, or to give the map an elegant look, drawing and coloring are used. One of the first tables of conventional signs was attached to the instructions for surveyors by the head of the Orenburg expedition (1734-1737) IK. Kirilov in 1732 (RGADA F. 248. D. 1428: 184).

By the middle of the eighteenth century, in the compilation of general geographic maps, about fifty icons were used, specialized in the elements of the geographical situation. For the most part, signs were a simple collection of icons that had no logical connections. The introduction of common signs, most of them similar to the symbolism of Western European maps, brought Russian cartography to the European level. Including opened new opportunities for the inclusion of Russian cartographic materials in the European and world atlases (Sotnikova, 1990:14).

For example, the atlas «Russian consisting of nineteen maps representing the All-Russian Empire with border lands» is one of the first cartographic works where the legend symbol table was used.

Most often, the map legend was placed in the margins of the map, in free spaces within its frame, sometimes placed in a separate table on a sheet, as in this case. The structure of the atlas included the map «The flow of the Irtysh rivers, the Enisei with their peaks, and with them also between them lying places», which shows the «Steppe of the Cossack horde.» The cartographic language of the atlas maps is very rich and includes 46 symbols, of which 18 refer to settlements. There are no road signs in the table, but a number of maps show both large roads and smaller traditional routes in the marginal areas (Karta, 1745:15).

In the second half of the XVIII century. The «legend» of the cards becomes fairly uniform, however, the number of conventional symbols has grown (Postnikov, 1989:57).

Further development of conventional signs associated with the formation in the 60s. XVIII century departmental mapping, which initiated the emergence and wide distribution of thematic maps, and the needs of military service. The departmental regulation led to the development of a system of conventional signs in various spheres of state activity. From the first decade of the XIX century systems of conventional signs of general geographic and military maps develop independently, separate

conventional signs are created. In the further development of conventional signs of cartographic materials, a tendency towards systematic development has emerged, which developed in close connection with cartography served by the sciences (mathematics, astronomy, geodesy, socio-economic sciences, etc.). At the same time, the enrichment of symbolism went both in an extensive and intensive way: along with the appearance of completely new icons, variants and modifications of existing icons and methods of imaging were developed. In addition, not only the meaning of the sign, but also the «behavior» of the icon has acquired a certain load – its distribution over the depicted area (Sotnikova, 1990: 9-13).

The unification of conventional signs is observed in two ways: «In addition to combining objects into groups according to the form of conventional signs, they are also united by the color with which these symbols are printed on the map» (Volkov, 1961:21).

This technique allows you to select at one glance a particular group of objects and thus facilitates reading the map. The choice of colors while often associated with the natural colors of objects. So the objects of hydrography assign a blue color, green vegetation, etc. The use of different colors allows you to build the content of the card as if in two plans: what is interesting and important on the map and what should catch the eye is printed on the map with bright colors, and what is less important and what is considered only when studying the map in depth is printed more pale colors. In 1757, the book of D.P. Tsitsianov «A brief mathematical explanation of land surveying,» which became the official instruction in the XVIII century. for the preparation of maps. The book made recommendations on the use of different colors in the design of maps and plans. In the 1760-1770 a textbook is being prepared in the Landowner gentry Cadet Corps (by BA Steinhel), which used 228 characters to display various natural, economic, and military objects. This manual presented a table of conventional symbols called «Drawing of various parts depicted on topographic maps and military plans», where samples of a cartographic image were presented, representing various combinations of conventional signs and an explanation of them (Postnikov, 1989: 57-160).

The new version of the legend table is prepared in 1794, where, along with the normalized signs, the signs referring to the relief, which was depicted by the method of oblique illumination, i.e. using shadow strokes (RGVIA F. 846. D.17862).

Symbols placed in them with small variations were used on topographic maps until the early 1820s.

In 1821, the «Rules for labeling maps and plans ...» developed by Major General A.I. Khatov. The «Rules» emphasized the need to identify different variants of the names of villages and tracts, and these names were required to be written one under the other – «at the top is the ordinary name and more used by the residents of that region, and at the bottom the name is not so well-known, and separate the names with a thin line». All inscriptions, except for the names of rivers, streams, navigable canals, roads and sea straits, were ordered to be located parallel to the upper frame of maps. In case of impossibility to arrange the inscription parallel to the upper frame or parallel, it was allowed to «give the inscriptions some indirect direction, if only it were convenient to read it». The names of the straits, rivers, canals and roads required to be located along them (Postnikov, 1985:117).

On June 6, 1822, developed by Major General A.I. Khatov and Lieutenant General KF Tolya's uniform «Symbols for use on topographic, geographical and flat maps and military plans ...» (RGVIA RF. F. 417. D. 223), which besides the graphic representation of various objects on maps extensive explanations, and were designed to ensure uniformity in the design and execution of cartographic materials and steel the main document that controlled the filming and mapping works until the middle of the XIX century. The document «Symbols ...» remained unchanged signs of the well, cemeteries, signs of roads, orchards and parks, ferries, underwater and surface stones, and some others.

It should be noted that the conventional signs of 1822, especially in their combination, created an impression of the terrain from a bird's-eye view, which was greatly facilitated by the obligatory shading of the contours of settlements, river banks and even individual furrows on arable land with conditional illumination from the north-west («The light is always relied upon from the left hand, in the upper corner of the frame») (Postnikov, 1985:120).

On May 21, 1822, the «Instructions for the compilation of the route map», developed by K.I. Tenner, was approved. For example, consider the colors used for coloring conventional symbols according to the instructions of 1822: a) «carmine, (red dye from carmine acid); gummigut (yellow or yellow-red color); b) azure (one of the shades of blue, the color of azurite mineral and dye is azure, the color of the sky on a clear day; yellow ocher (from light yellow to brown-yellow and dark yellow; brick or burnt ocher; c) green grass (from a mixture of azure with chrome yellow); umber (brown dye made from iron ocher); bistre (dark brown soot paint);

Chinese black ink; other colors, such as: cinnabar, indigo, minium, blue, etc. are used more to cover and signify uniforms of troops « (RGVIA F. 422. Op. 1. D. 275: 120).

«Rules for guidance in drawing and inscribing topographic plans» (1831) became not only the main educational tool on cartography, but also the main instruction on the design and compilation of topographic maps. In the «Rules ...», the vegetation symbols are significantly expanded compared with the previous instructions. In 1834, in addition to the current governing documents, «Signs for displaying on maps of troops, fortresses, highways, military roads, waterways and various military land institutions» were approved, intended primarily for military maps that operated until 1917 without any significant changes (Postnikov, 1989:132-134,171).

### Conclusion

Thus, a significant impact on the evolution of conventional symbols of cartographic materials on the history of Kazakhstan of the 18th – early 20th centuries. improved the technical equipment of the tsarist army and increased its offensive activity on the outskirts of the Russian Empire and, as a result, increased demand for accurate and timely information about the terrain. The unification of conditional documents was based on the principle of cartographic generalization, i.e. selection and synthesis of objects depicted on the map, highlighting of their main typical features and characteristics. In this regard, the general geographic map is updated with all the new conventional signs, first of all, according to the elements of the geographical situation, which is strategically and tactically important. By the middle of the XVIII century, about fifty icons were used in compiling general geographic maps.

In our opinion, the further development of the conventional symbols of the cartographic symbolism of Russian maps is closely connected with the formation in the 60s. XVIII century. departmental mapping, which initiated the emergence and wide distribution of thematic maps. At the same time, the symbolism of general geographical maps, which have since been prepared exclusively within the framework of the military department, continued to develop. In this regard, the general geographic map is being updated with new informational characteristics, primarily on the elements of the geographical situation, which is strategically and tactically important, and these indicators are becoming more formalized. At the same time, there is a rebounding from the general

geographical map (special maps specialized in military subjects (operational, dislocation, etc.). From the first decade of the XIX century systems of conventional geographic and military maps develop independently (separate conventional symbols are issued). In general, there is an increase in the volume of cartographic documents, as well as an increase in abstractness and formalization of the image. This circumstance stimulates the improvement of conventional signs and their number. Memorization of symbols and reading the map is facilitated by the fact that similar symbols are assigned to groups of related objects. For example, railways of various types on topographic maps have a conventional sign that distinguishes only in details; the same can be said about borders, roads, settlements, etc.

A large number of conventional symbols led to the need to develop standard conventional symbols. One of the events of this kind was initiated by the International Geographical Congresses (1909 and 1912), which established the program and conventional symbols of the so-called International Millionth Map. However, the complete uniformity of conventional signs was not achieved.

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