

**The dissertation on the topic “Stone tools of the Saryarka people in the Bronze Age (in the Atasu and Taldysai microdistricts)” was prepared by Yerzhanova Albina Ergeshbaevna for the degree of Doctor of Philosophy in the specialty 6D020800-Archaeology**

## **ABSTRACT**

### **General description of the thesis.**

The dissertation is aimed at determining the function of stone tools, as well as the scope of their use in the economy and production, collected because of many years of archaeological research at the Bronze Age settlements of Saryarka, such as Taldysai, Atasu, Myrzhyk, Ak-Mustafa, Akmaya.

### **Relevance of the topic.**

Stone tools are a valuable source for studying some problems of the population of the region in the Bronze Age, characterizing the level of material culture, cultural and trade and economic relations. The dissertation analyzed 1500 pieces of tools from the settlement of Taldysai, located on the territory of the Zhezkazgan mining and metallurgical center, 300 pieces from the settlement of Atasu, 213 pieces from the settlement of Myrzhyk, from the settlement of Akmustafa 21 pieces 43 pieces from the settlement of Akmaya, which are located on the territory of Northern Betpakdala. The materials collected over many years are in the funds of various museums of the country, as well as in the archives of the Institute of Archeology named after A.Kh. Margulan. In the dissertation, we pay special attention to the morphology, typology and traceology of stone tools.

**The object of the study** are stone tools obtained because of the work of the Central Kazakhstan archaeological expedition in the settlements of Atasu, Myrzhyk, Akmustafa, Akmaya in 1975-1985 and 2018-2020, the bulk of the material comes from the settlement of ancient miners Taldysai, which has been studied since 1994.

**Subject of study.** Stone tools from the settlement of Taldysai located on the territory of the Zhezkazgan-Ulytau metallurgical center and from the settlements of Atasu, Myrzhyk, Akmaya, Akmustafa, materials from which are in the collections of the National Museum.

**Aims and tasks.** The study of stone tools to determine their place and role in the system of the most ancient economic systems of the population of the Atasu and Taldysai microdistricts using the methods of trace analysis. To achieve this goal, the following tasks are defined:

- Analysis and determination of the factors that influenced the adaptation of the Andronovo tribes to the natural and ecological environment in the Bronze Age;
- The study of minerals used for the manufacture of tools in order to determine the sources of raw materials;
- The history of the study of settlements and ore places of the Atasu and Taldysai microdistricts with the study of the features of the topographical landscape situation of their location;

- Form the theoretical and methodological foundations for the study of stone tools;
- Trace analysis of stone tools from the above settlements;
- Determination and systematization of macro and micro traces on the surface of stone tools, comparison of similar objects to clarify functional features;
- Determination of changes in functions during the use of scrapers and hoes during their use in production;
- Analysis of some aspects of the development of technology for the production of tools and their distribution;
- Classification of tools as an indicator of the level of development in the field of socio-economic, historical, and cultural processes;
- Compilation of a trace Russian-Kazakh terminological dictionary.

**Level of study of the topic.** Many materials on stone tools have been collected, which are introduced into scientific circulation in the form of articles, but the analysis carried out in these works remains at the level of description and definition of raw materials.

Stone tools from the settlements of the Bronze Age of Saryarka were not considered in the context of morphological and traceological features. Modern methods of study are widely used in archaeological science, one of these methods is traceological analysis, the use of which makes it possible to obtain new knowledge.

The main material of the thesis is stone tools originating from the settlement of ancient metallurgists Taldysai, which is part of the Ulytau-Zhezkazgan metallurgical center, which has been studied since 1994. At the Atasu settlement, an area of 3688 m<sup>2</sup> was explored, as a result, a mass of materials was collected among which we analyzed 300 stone tools, at the settlement of Myrzhyk an area of 584 m<sup>2</sup> was explored we processed 213 stone tools, during excavations at the Akmustafa settlement, 21 stone tools were found at the site of dwelling No. 15. At the Akmay settlement, archaeological excavations were carried out in two areas; as a result, 43 tools were recorded. The materials shown above from the settlements of Atasu and the Taldysai microdistrict were studied at the level of description and characteristics of their forms, their tracing analysis made it possible to obtain new knowledge about the system of ancient production and the economy.

In the presented work, the tools are analyzed using the methods of traceology, the results of which made it possible to gain new knowledge about the functional features of stone tools and their role in the production system and the economy.

**Source base of the dissertation** consists of stone tools obtained from the settlements of Atasu, Myrzhyk, Akmustafa, Akmay, Taldysai, investigated in the Central Kazakhstan archaeological expedition.

**Geographic scope** covers Atasu and Taldysai microdistricts of Saryarka, where the settlements of ancient metallurgists Taldysai, Atasu, Myrzhyk, Akmustafa and Akmay are located.

**The chronological framework of the dissertation:** II - I millennium BC.

**Methods and Methodology.** During the study, methods of description, systematization and typology, comparative analysis, which are basic, as well as accepted methods in archeology, were applied. At the same time, the main method in the study of tools is traceological analysis, which is conducted using macro-micro photography, the binocular method in the context of studying the developmental features and the nature of their improvement. To identify and determine the specific features of traces of wear and tear, the method of experimental analysis was used. During the study of stone tools, a stereo microscope MS 2 Zoom – TD 2 equipped with a micro camera and a UCMOC 5 mp eyepiece was used, a Canon EOS 600D digital camera was used to obtain macro images of the surface of stone tools, and Helicon focus was used to process the images.

**The novelty of the dissertation work:**

- The climatic conditions of Atasu and the Taldysai microdistrict were moderately cool, which affected the development of production and the economy of the population in the Bronze Age;
- On the basis of modern research on archaeological mineralogy, it was found out that local centers of mineral resources were used for the production of tools;
- Topo-landscape features of the settlements from which stone tools originate are revealed, as well as the work of researchers on this subject is analyzed;
- Theoretical and methodological foundations for the application of this analysis have been formed for the traceological study of stone tools;
- The functional features of stone tools from the settlements of Taldysai, Atasu, Myrzhyk, Akmustafa and Akmay, which are in the funds of the Central Museum, the Institute of Archeology named after A.Kh. Margulan, Historical, Cultural and Natural Museum-Reserve "Ulytau";
- Using the methods of microanalysis, macro, and micro features of traces of wear and tear were revealed, which are described and systematized. Traces of grinding and other traces were found on the microreliefs of the working surfaces of the tools. A traceological group of reference tools was formed because of a comparative analysis in the context of studying the system of economy and production of the population in the Paleometal era;
- Assumptions about the rough form of making retouches and flakes in the Atasu period were proved. The forms of hoes used in mining and land cultivation are determined. Hoes for ore production usually have an oval working part, and tools with a sharpened blade of the working side were used for cultivating the land;
- Technological features in the manufacture of tools by craftsmen from two microdistricts were determined;
- the tribes who lived in the Bronze Age in the settlements of Taldysai, Atasu, Myrzhyk and Akmustafa, Akmay, it was established that the metallurgical industry occupied a leading position, and it was concluded that animal husbandry, agriculture and crafts belonged to an auxiliary economy;
- The Kazakh equivalents of the names of instruments and terms in the science of traceology have been identified and a dictionary has been compiled.

**The main conclusions proposed for the defense:**

- During the research, criteria were identified for the influence of a favorable natural and climatic state of the environment on the progressive development of the production system and economy;

- The location of the settlements is rich in many rocks and is a good area for mining. However, in tool art, it can be concluded that on the Bronze Age settlements, the ancient miners were well versed in the knowledge of making durable hammers, hoes, pickles, polishes, and scrapers from rocks commonly found in the area: granite, sandstone, diorite and diabase, quartzite;

- Studying the works of researchers of the settlements of Atasu and Taldysai microdistricts, paying special attention to the layers of origin of certain tools, the main tools of labor that were widely used in the Nura and Atasu stages of the Bronze Age were identified;

- An effective methodology for the study of stone tools has been developed, including the methods of morphology, typology, conceptuality, traceology;

- As a result of the traceological study of stone tools found at the settlements of Taldysai, Atasu, Myrzhyk, Akmustafa and Akmaya, it was found that some of the tools used in the work, although morphologically similar in their functional purpose, belong to another group of tools. A comparative analysis of morphology, technology, and mineralogy with the materials of Bronze Age settlements in other regions of Kazakhstan and Russia has been conducted. As a result, it turned out that some types of tools are unique to the local population;

- Macro- and micro-signs of traces of use are preserved in stone tools used in the economic activities of the ancient inhabitants of the Bronze Age, their appearance and location depend on the properties of the material being processed and the operations performed with the tool. Functional groups of tools are directly related to certain objects of economy or production in settlements;

- The classical type of scrapers made of quartz and jasper rocks of the Eneolithic era found in the settlements was preserved in the Nura time, and in the Atasu time, the form of scrapers from rock flakes in a rough form. In the Bronze Age, it was proved that in mining and metallurgy there were types of hoes with two grooves for attaching to a wooden handle, they are distinguished by an oval working surface of the blades, in agriculture - a type of hoe with a sharp edge beveled in one direction, with two or one groove for fastening to a wooden handle;

- For the Atasu and Taldysai microdistricts, the most numerous and diverse group of tools used in metallurgy and metalworking of the Nura and Atasu periods. Examination of the instruments showed that they were made by local craftsmen;

- The intensive development of metallurgy, animal husbandry, agriculture, and crafts in the Bronze Age at the settlements of Taldysai, Atasu, Myrzhyk, Akmustafa and Akmay is confirmed by the results of studying stone tools;

Russian-Kazakh dictionary is presented.

**The practical significance of the dissertation.** The results of the research can be used for writing and theoretical development of the problems of ancient history, archeology, and ethnology of Kazakhstan, for the development of special courses in higher educational institutions, for the systematization and analysis of archaeological material, as well as for the formation of museum expositions.

**Approbation of the results of the dissertation.** The main results of the work were tested in 2 monographs, a book-album, 16 scientific articles. During the period of study in doctoral studies, prepared and published: in the journals Scopus - 1, recommended by the Committee for Quality Assurance in the Sphere of Science Education - 4, tested in conference proceedings - 3.

**The structure of the dissertation:** The dissertation consists of an introduction, four chapters, a conclusion, references and a list of abbreviations and applications.