ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE

ISSN: 2692-5206, Impact Factor: 12,23
American Academic publishers, volume 05, issue 09,2025

Journal: https://www.academicpublishers.org/journals/index.php/ijai

THE EMERGENCE OF THE MINING AND METALLURGICAL INDUSTRY IN UZBEKISTAN

Ziyayev Husan Niyaz ugli
Doctoral Student of Samarkand State University
ziyayevhusan@gmail.com
Rashidov Sunnatillo Rashid ugli
Doctoral Student of Samarkand State University
sunnatillorashidov050@gmail.com

ПОЯВЛЕНИЕ ГОРНОДОБЫВАЮЩЕЙ И МЕТАЛЛУРГИЧЕСКОЙ ПРОМЫШЛЕННОСТИ В УЗБЕКИСТАНЕ

Зияев Хусан Ниязович
Докторант Самаркандского государственного университета
ziyayevhusan@gmail.com
Рашидов Суннатилло Рашидович
Докторант Самаркандского государственного университета
sunnatillorashidov050@gmail.com

Abstract: This article discusses the emergence of the mining and metallurgical industry in the territory of our country and the information about it found in written and archaeological sources. The first stages of mining production in Uzbekistan began as early as ancient times. Many historians, while describing the life of the Mavarannahr region, have paid special attention to metals and the field of metallurgy.
Keywords: Avesta, metallurgy, primitive mining, copper, tin, silver, Uchtut, Qarnab, gold.

Аннотация: В данной статье рассматривается возникновение горно-металлургической отрасли на территории нашей страны и сведения об этом, приведённые в письменных и археологических источниках. На территории Узбекистана первые этапы горнодобывающего производства начались ещё в древние времена.
Ключевые слова: Авесто, металлургия, первобытное горное дело, медь, олово, серебро, Учтут, Карнаб, золото.

According to specialists, humanity's acquaintance with various ores and rocks, their use, and even their extraction began as early as the Stone Age[1]. The ancient ancestors who lived on the territory of Uzbekistan gradually mastered the physical properties of different stones and rocks and started using them as tools in their daily lives. In this way, the foundations of primitive mining in the Stone Age were laid.

Today, many sites belonging to the ancient Stone Age – the Paleolithic – in Central Asia, particularly in Uzbekistan, have been studied from a historical and archaeological perspective. Numerous stone tools, hunters' weapons, and other artifacts discovered at sites such as Selungur in the Fergana Valley, Kulbulok in the Tashkent region, Teshiktosh in the Surkhan region, and many other Paleolithic sites indicate that a distinctive stone industry had already developed in Central Asia during the Paleolithic period. This process was closely connected

[1] Ўзбекистон тарихи. А.Сагдуллаев ва Б.Эшовлар тахрири остида.1-қисм.Тошкент., «Университет».1997.

ORIGINAL ARTICLE
INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE
ISSN: 2692-5206, Impact Factor: 12,23
American Academic publishers, volume 05, issue 09,2025
Journal: https://www.academicpublishers.org/journals/index.php/ijai

with the lifestyle and economy of primitive people. In particular, the stones used for making tools had to be durable, while at the same time easy to work with.

Current historical-archaeological research, as well as geological studies, show that the main flint deposits in the territory of Uzbekistan are found in the south of the Kyzylkum desert, at the Chaqmoqtepa site in the northern part of the Nurata Mountains, at Altin Mountain in Karakalpakstan, and in other places[2].

In the 1950s and 1960s, large flint mines and stone-processing workshops dating back to the Stone Age were discovered near Karmana, in Uchtut and Ijand. Written sources from the Middle Ages, in particular from the 12th century, mention that flint was extracted from the Chuponota hill in Samarkand, while 19th-century sources report the existence of a special type of flint in the Zarafshan Mountains south of Samarkand. It should be noted that many flint deposits in Uzbekistan and neighboring regions were used not only in the Stone Age but also up until relatively recent times. For example, it is known that high-quality flint extracted from Chaqmoqtepa supplied the local population and neighboring regions, particularly the city of Bukhara, with fire-starting material as late as the 19th century, that is, until the introduction of matches.

Until recently, many specialists believed that the people of Central Asia's Neolithic period brought flint from the Ural Mountains. This assumption was based on the fact that large flint deposits from the Paleolithic and Mesolithic periods were rarely encountered in Uzbekistan, while Neolithic stone tools were made from a type of flint similar to that found in the Urals. However, recent geological studies have shown that the low mountain ranges of the Kyzylkum Desert are a natural extension of the Ural Mountains, and due to geochemical processes that took place during certain geological periods, similar minerals are found there.

In the works of Eastern historians, while describing events that took place in the cities of Mawarannahr, interesting information about metals is also presented. The Arab historian al-Tabari, in his detailed account of the Arab campaigns in Central Asia, reports the following: "After the Arabs under Qutayba captured the city of Paykent in Bukhara in 706, they took as spoils a large number of gold and silver vessels that had been melted down into metal. Such a great amount of booty had never before been seized in Khurasan."

He further writes: "After capturing Samarkand in 712, Qutayba ordered all the wealth of the city's temples to be collected. According to his orders, idols were stolen, temples were burned, and even the used nails were melted down again to collect 50,000 miskals of gold." According to al-Tabari, the weapons, tools, and gold belts seized from the Chach and Fergana troops, who had come to aid besieged Samarkand but were defeated, filled the warehouses of Paykent to overflowing[3].

Detailed information about the mineral resources of Mawarannahr, that is, present-day Uzbekistan, is provided in 9th–12th century Arabic sources, especially in the works of 10th-century geographers. When describing the countries of Mawarannahr, they specifically mention the reserves of mineral resources and the centers of extraction.

According to the writings of Eastern geographers of the 9th–10th centuries, the greatest wealth in metallurgy belonged to Central Asia. The Caliph, describing this region, placed special emphasis on the mineral riches of the Mawarannahr mountains stretching from Wakhan to Chach, from there to Ilak, and as far as the borders of the Kyrgyz state.

[2] Абu Тохигхоja. Самагиуа. Туplam "Meroc". –Т., 1991. – p 20
[3] Тарихи ат - Табарий. Тошкент. 1987, pp - 118 - 136

ORIGINAL ARTICLE
INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE
ISSN: 2692-5206, Impact Factor: 12,23
American Academic publishers, volume 05, issue 09,2025
Journal: https://www.academicpublishers.org/journals/index.php/ijai

Speaking of Shosh and Ilak, they particularly highlight Ilak's gold and silver mines and its mint. Ibn Hawqal also emphasized that this area was rich in capital, circulating thanks to minted coins, and that similar mints also existed in Bukhara and Samarkand.

Regarding Fergana, he mentions gold and silver mines around Nekad and Akhsikent; in Sogd, deposits of resin, asbestos, gold, silver, turquoise, yellow copper, and tin; and in the mountains of Upper Nasaf and Isfara, a black stone that burned like coal.

The history of metals did not escape the attention of Eastern scholars. In particular, the great scholar Abu Rayhan al-Biruni devoted a large part of his work *Mineralogy* to metals. In it, he described the technologies of extracting ores of gold, silver, mercury, iron, copper, and tin, as well as alloys, including the technology of producing bronze[4].

The active study of mineral deposits, and occasional reporting on ancient mines, began after the conquest of Turkestan by Tsarist Russia. The region's nature, mineral resources, and raw material base began to be examined comprehensively and recorded in geographical reports.

As a result of research conducted by scholars and industrial specialists in specific areas of the region, information about ancient mines of the Akhangaran valley, for example, can be found in the works of V. V. Bartold. Some ancient mines of this valley are also mentioned in the works of mining engineer V. N. Tomilin and archaeologist I. A. Kastan.

The large Kansai deposit was studied by mining engineer V. N. Weber. The first major comprehensive work on the subject also belongs to V. N. Weber.[5]

He (V. N. Weber) summarized the results of studies of Turkestan's mines, supplemented them with additional information, and compiled data about ancient mining sites. The work was written in 1913 and updated in 1917. "Even a simple enumeration of the ancient mining sites testifies to the vast amount of work carried out by ancient metallurgists," wrote V. N. Weber.

The 1920s marked a qualitatively new stage in the study of mining and metallurgy history. At that time, the permanent Tajik-Pamir geological expedition began working in the tributaries of the Tien Shan Mountains. Around the same period, P. P. Ivanov published his work "The History of Mining in Central Asia". Unfortunately, this work was based solely on written sources, without considering the results of geological and archaeological research, and without analytical study. As a result, it was full of chronological, political, and economic errors.

Geologists who began investigating ancient mining sites, during the exploration and evaluation of deposits, tried to reconstruct the structure of the mine sections, determine the scale of ancient work carried out there, and assess the remaining reserves in detail.

From the 1950s onward, archaeological studies of the economies and urbanization history of the major historical and cultural regions of Uzbekistan (and Central Asia in general) intensified. The study of ancient mining sites, as one of the factors influencing historical processes, became a primary concern for archaeologists.

It is known that flint deposits from the Stone Age are located in the southern Fergana Mountains and in the territory of Navoi region, in Uchtut and Ijand. Among these, the most famous is the Uchtut flint mine, discovered between 1956 and 1960 by archaeologists M. R. Qosimov, Kh. Mukhammadov, and T. M. Mirsoatov. Between 1966 and 1973, a team of historian-archaeologists led by academician Ya. G. G'ulomov conducted scientific research at this site.

---

[4] Абу Райхан ал-Беруни. Собрание сведений для познания драгоценностей (Минералогия) //Пер.Беленицкого.Д.,1963. – pp 214-240,518

[5] Вебер В Н. Отчет о осмотре некаторых месторождений в Туркистане //Известния геологического комитета.1915,т XXXIY,вып №7. Pp - 409-414

ORIGINAL ARTICLE
INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE
ISSN: 2692-5206, Impact Factor: 12,23
American Academic publishers, volume 05, issue 09,2025
Journal: https://www.academicpublishers.org/journals/index.php/ijai

Research has shown that flint extraction at the Uchtut site began as early as the Lower Paleolithic period. Large quantities of flint were also extracted there during the Mousterian (Middle Paleolithic) and Upper Paleolithic periods. According to archaeologists, in the Paleolithic, flint at Uchtut was taken only from surface layers, but by the late Mesolithic and Neolithic periods, ancient miners were forced to dig shafts several meters deep to extract it.

The discovery of remarkable examples of primitive art and sculpture by scholars near the Uchtut mine and at the foot of the Koratov mountains also attests to the fact that mining had already been mastered in these areas by our ancestors in the earliest periods of history.

In Northern Sogd, in the area where the Kyzylkum desert meets the oasis, low mountains stretch near the city of Navoi. Here, in a place called Sarmishsoy, magnificent petroglyphs have been preserved on the steep slate surfaces of rocky cliffs. These images belong to different periods and depict both imaginary and real scenes, as well as historical aspects of daily life. The Navoi historian and local researcher B. S. Shalotonin studied them for many years, recording more than 3,000 images, and published his findings under the title Shadows on the Rock.

Several thousand years ago, the area of Northern Sogd, where farming and herding lands overlapped, was inhabited by the tribes of the Andronovo culture, and at the beginning of the first millennium BCE, by the Saka tribes. This region was one of the oldest centers of copper and gold mining, and it was here that the first metals were obtained. The ancient process of metallurgy flourished here, and "with the help of the gods of fire and the sun," hard substances were transformed into other materials that endowed humans with tools of labor, means of farming, weapons for defense, and instruments to seize the wealth of their enemies. These images may well depict miners, since in the vicinity of Sarmishsoy and further north there were deposits of polymetals, precious stones, and flint. These provided the raw material for making and casting tools that created farming culture. Among them are the ancient Uchtut flint mines and Karnab tin deposits, which had been used since the Bronze Age, as well as the copper mines of Kuktov, Ovminzatov, and Bukantov, which during the Copper and Bronze Ages became major centers of mining in Sogd, Khorezm, and the Southern Aral region[6].

In 1958, in Uchtut, a primitive settlement and a workshop for making stone tools belonging to the Middle Paleolithic period were discovered. Research has revealed that ancient miners used special tools made from animal horns, the shoulder blade of an eagle, sandstone, and wood to extract flint. The mined flint was separated from the rocks and divided into several pieces with the help of sandstone. It is known that damp flint becomes soft, making it relatively easier to process and to make various labor and hunting tools from it. The flint extracted in Uchtut was reprocessed in a primitive workshop near the mine, and weapons and tools were made.

On the surface of the Uchtut workshop, 844 stone tools were found lying in the open, 26 of which are considered complete tools, consisting of polished and spear-shaped tools. Up to now, 35 types of tools made of stone and animal horns have been found in the Uchtut flint mine. Based on this, it can be concluded that ancient people used the mine for a long time as a source of raw material.

The numerous flint fragments and various semi-processed stone tools found on the mountain slopes and around the ancient settlement indicate traces of the labor activity of ancient miners and toolmakers.

As a result of the research, it was determined that there are more than one hundred shafts belonging to the Neolithic period in the Uchtut stone mine. Twenty-six of them have been studied by specialists. Flint mines and shafts belonging to the Neolithic period are also found in

[6] Кабиров А.Сармишсойнинг қоятошларидаги расмлар. Тошкент: «Фан», 1976.17-б; Хўжаназаров М Памятники наскального искусства Центральной Азии.Алматы,2004, - р 109.

ORIGINAL ARTICLE
INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE
ISSN: 2692-5206, Impact Factor: 12,23
American Academic publishers, volume 05, issue 09,2025
Journal: https://www.academicpublishers.org/journals/index.php/ijai

the Alay and Chatkal mountains. Based on this, it can be concluded that already in the Neolithic period, mining production in Uzbekistan and neighboring territories had entered a new stage[7].

Not only in Uzbekistan, but even in Eurasia, the Uchtut mine, which was the largest primitive mining industry, for many thousands of years supplied humans with a wonderful industrial material—flint—which was used instead of metal. Thus, the discovery of Stone Age shafts in Uchtut, ancient miners' settlements and workshops, as well as various artifacts found in primitive mining sites, indicates that as early as 5–7 thousand years ago, mining production in Central Asia was already quite developed.

In 1959, not far from Uchtut, near the village of Ijand, the famous scientist A.P. Okladnikov discovered an ancient workshop where various labor tools were made from local flint. This workshop was also contemporaneous with the Uchtut mine and was found to have functioned for tens of thousands of years[8].

In general, the Uchtut-Ijand flint mine and workshops supplied many regions of Uzbekistan and Central Asia with flint raw material for thousands of years.

Starting from the Neolithic period, a new direction appeared in ancient mining production. This was connected with humanity's mastering of a new raw material—"soft soil"—from which various vessels were made. The study of the properties of this raw material and the beginning of its use for making products led to the discovery of new mines in areas of Uzbekistan where "soft soil" was present.

According to specialists, beginning from the Neolithic period, and possibly even earlier, primitive people also began to use various rare stones. Their appearance and properties attracted attention, and gradually they began to be used as ornaments and amulets. This, in turn, encouraged the search for different rare and colored stones and contributed to the development of mining production.

In general, it has been established that in the Neolithic period about 20 different raw materials and products were extracted from the mines of Central Asia. Among them were salt, flint, jasper, quartz, quartzite, mineral pigments, clay used in pottery, rare stones, colored stones, stones used in construction, and others[9].

In general, the Uchtut-Ijand flint mine and workshops supplied many regions of Uzbekistan and Central Asia with flint raw material for thousands of years.

Starting from the Neolithic period, a new direction appeared in ancient mining production. This was connected with humanity's mastering of a new raw material—"soft soil"—from which various vessels were made. The study of the properties of this raw material and the beginning of its use for making products led to the discovery of new mines in areas of Uzbekistan where "soft soil" was present.

According to specialists, beginning from the Neolithic period, and possibly even earlier, primitive people also began to use various rare stones. Their appearance and properties attracted attention, and gradually they began to be used as ornaments and amulets. This, in turn, encouraged the search for different rare and colored stones and contributed to the development of mining production.

[7] Berdiqulov Mirolim Tugalvoyevich Rashidov Sunnatillo Rashid ogli. "To'da-1 neolithic site stone tools". Zenodo, 29 ноябрь 2024 г.,https://doi.org/10.5281/zenodo.14246544

[8] Темиров Ғ.Т., Одинаева З.Б. Қадимги давр кончилиги ва металлургияси «Янги аср авлоди» нашр.-Тошкен. 2008. Р 14.

[9] Исломов О.И. Из истории геологических знаний в Средней Азии. –Т., 1976. С.24. Сагдуллаев А.С.Қадимги Ўрта Осиё тарихи.Тошкент.: Университет,2004,21-бет; Авдусин Д.А. Основы археология.М.,1989. – р 100.

ORIGINAL ARTICLE
INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE
ISSN: 2692-5206, Impact Factor: 12,23
American Academic publishers, volume 05, issue 09,2025
Journal: https://www.academicpublishers.org/journals/index.php/ijai

In general, it has been established that in the Neolithic period about 20 different raw materials and products were extracted from the mines of Central Asia. Among them were salt, flint, jasper, quartz, quartzite, mineral pigments, clay used in pottery, rare stones, colored stones, stones used in construction, and others[10].

The transition to the Copper Age led to a further rise of the productive forces. Although copper tools were much more advanced compared to stone tools, copper was not widely used for making durable and heavy tools (especially work tools).

Based on the artifacts found in the monuments of the Copper and Bronze Ages, we can conclude that copper was mainly used for making ornaments, weapons, and household items.

As a conclusion from the ideas mentioned above, it should be noted that humanity's acquaintance with various ores and rocks, their use, and even their extraction began as early as the Stone Age. Our primitive ancestors gradually mastered the physical properties of different stones and rocks and began to use them in their daily life as work tools.

The list of used literatures

1. 1. Abu Toxirxoja. Samaria. Tuplam "Meros". – T., 1991.
2. 2. Abu Rayhan al-Beruni. Collection of information for the knowledge of jewelry (Mineralogy) // Translated by Belenitsky. D., 1963.
3. 3. Avesta. Selected hymns. Translated from the Avesta and commentary by I.M. Steblin-Kamensky. Dushanbe., 1990.
4. 4. Weber V. N. Report on the inspection of some deposits in Turkestan // Bulletin of the Geological Committee. 1915, Vol. XXXIV, Issue No. 7.
5. 5. Islomov O.I. From the history of geological knowledge in Central Asia. – T., 1976. P. 24. Sagdullaev A.S. The History of the Rock Art of Uzbekistan. Tashkent: University, 2004.
6. 6. Kabirov A. The History of Rock Art of Central Asia. Tashkent: Fan, 1976, 17-б; Khuzhanazarov M. Rock Art Monuments of Central Asia. Almaty, 2004.
7. 7. Lordkipanidze L.N. History of the Geological Study of Uzbekistan in the System of Asian Civilization. Tashkent, 2001.
8. 8. The History of the Rock Art of Uzbekistan. Tashkent, 1987.
9. 9. Temirov G.T., Odinaeva Z.B. The History of the Rock Art of Uzbekistan in the System of Asian Civilization. Tashkent. 2008.
10. 10. Uzbekiston tarikhi. A.Sagdullaev and B.Eshovlar takhriri ostida.1-qism.Toshkent., "University".1997.
11. 11. Ziyayev, H. . (2025). MINING AND METALLURGICAL INDUSTRY IN ANTIQUITY AND THE MIDDLE AGES IN WRITTEN SOURCES. International Journal of Artificial Intelligence, 1(5), 236–239.
12. 12. Berdiqulov, Mirolim Tugalvoyevich, Rashidov, Sunnatillo, Rashid ogli. "To'da-1 neolithic site stone tools". Zenodo, November 29, 2024, https://doi.org/10.5281/zenodo.14246544.

[10] Массон М.Е. К истории горного дела. Р - 8.