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## COPPER PRODUCTION IN MAJDANPEK IN SIXTIES AND SEVENTIES OF THE 16<sup>TH</sup> CENTURY

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### Abstract

*In this paper the practice of mine Majdanpek during sixties and seventies of the XVI century has been investigated with an accent on copper production. The attention has been also given to various subjects from considering copper treatment and use to forbidden activities connected to copper illegal production and trade with Persia.*

**Keywords:** *Ottoman Empire; XVI century; Majdanpek; Copper*

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### 1. Introduction

There are not so many facts about copper mines on the central Balkan in the Middle Ages and Ottoman period. In the medieval Serbian state copper production was secondary in the lead-zinc mines where silver was the main product. This was primarily related to mines Brskovo and Rudnik. There has been only one evidence about their annual production, which showed that in Brskovo during 1333-1334, 65-70 tons of copper were produced [1].

At the time of the Ottoman rule establishment, mine Brskovo stopped working, while copper production was continued in Rudnik. It is known that middle twenties of the sixteenth century people from Dubrovnik often purveyed copper, but available data can not indicate overall copper production [2].

In the Ottoman period secondary copper manufacturing existed in Bosnia and Macedonia, in mines Fojnica, Kreshevo and Kratovo. In Bosnian mines production lasted relatively short. In Fojnica, state income

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from copper was registered only in cadaster inventory from 1540, and in Kreshevo from 1570 and 1604 [3]. The amounts of tenth indicated a small production – about ten tons in Fojnica and from a few hundred kilograms to one ton in Kreshevo. Copper manufacturing in Kratovo lasted much longer, but the published data do not indicate that it was a case of large quantities [4].

From presented facts, it can be concluded that production of copper in the European provinces of the Ottoman Empire was not developed until the second half of 16<sup>th</sup> century when Majdanpek and several smaller mines in the region were opened.

The Ottoman government, on the contrary, hadn't been short in supply in this strategically important metal, thanks to extremely rich deposits of copper mine in Kure (Küre-i mamure), which was located in the Kastamon province in northern Anatolia. In order to obtain indication of the size and importance of the mine and due to the possibility of data comparison, in this paper data are listed from 1530. when the summary inventories were made in almost all of the Ottoman Empire provinces. Annual income from the mine Kure, without local taxes and fees, was even 2.255.381 Turkish akches [5]. It was more of the mining income then the largest Balkan silver mines as Trepcha (747.847 akches), Kratovo (500.000 akches) and Novo Brdo.

The development of copper mining in the European provinces of the Ottoman Empire had begun with opening of mine Čelusnica in Berkovac kaza in 1553, while special swing had begun with early workings in Majdanpek at the end of the decade [6].

About production of copper in Majdanpek there have been numerous data covering a

period longer than two centuries. Most of them came from the annual calculations of mines, in which were numbered the amounts of ore and pure copper, prices, information about the lessees and mine administration members, income from taxes, fees and other. Annual accounts are very rare and usually unrelated, which complicates successful analysis. Due to that, it is very important to have some periods of time and a dozen connected billings (1564-1574 and 1703-1714) [7]. Particularly interesting have been the accounts from the sixties and seventies of the 16<sup>th</sup> century, as witnessed by mine production in the early working period, the first renters and the opening of new mine, which we are determined to write this article [8].

In the first years of copper exploitation in mine Majdanpek, copper content in ore was very high, which can be explained only by frequent findings of native copper [9]. Majdanpek had become known by the abundance of ore and had been issued in the three-year lease for 220.000 akches on August 1st, 1564. However, the first purchaser had financial difficulties and it probably caused that, in the accounting year, mine had worked only ten months [10]. It is important to emphasize that the production (Chart 1), related to 1564/65. (43 tons of copper) was not objective and the approximate level of annual production should have been around 50 tons [11]. The next accounting year, production was doubled but that was not enough to continue the lease and a new tenant had taken the mine for 250.000 akches after bidding.

Except 1565/66, mentioned above, in the next five years the copper production was quite evenly and varied from 49,5 to 63,9

tons of copper [12]. In that period 52,8 tons were obtained.

From the accounting 1567/68 year, Majdanpek holder united leasing of the mine with the lease of mines and mint in Kučajna, and a three-year lease was 1.300.000 akches [14]. Neither the new leasehold terms, however, had not improved business. Due to production stagnation in mine Majdanpek and the fall in Kučajna, the Ottoman government from August 1st 1569, had given the leadership over united leasing to certain Husein, the mining specialist from the imperial silahdar military corpus. Husein expertise and Ottoman government measures, primarily acquiring new lease income, contributed that next year the new holders lease for 1.500.000 akches, and then as a bidder appeared Jewish stock company, which has taken renter obligations for even 2.200.000 akches [13].

New management invested money in the existing plant and research works. There followed the opening of new mine in Majdanpek, probably in the spring of 1572, which led to the very growth of production. In less than three years, the total quantity of ore the production increased more than 8 times. It is notable that the ore curve (Fig.1) registers a bigger growth than the copper curve. The reason for that is not the impoverishment of the ore, but the fact that the part of it remained unused. The graph shows those quantities in the production year in the brackets and marked with minus sign, while in the next account, as carried-over quantities, they are marked with a plus sign. Creation of the ore reserves started already in 1570/71 when out of 307 produced tons, some 114 remained unused (37%). Following year, out of 114 remaining tons and 643 newly produced tons, only 150 tons

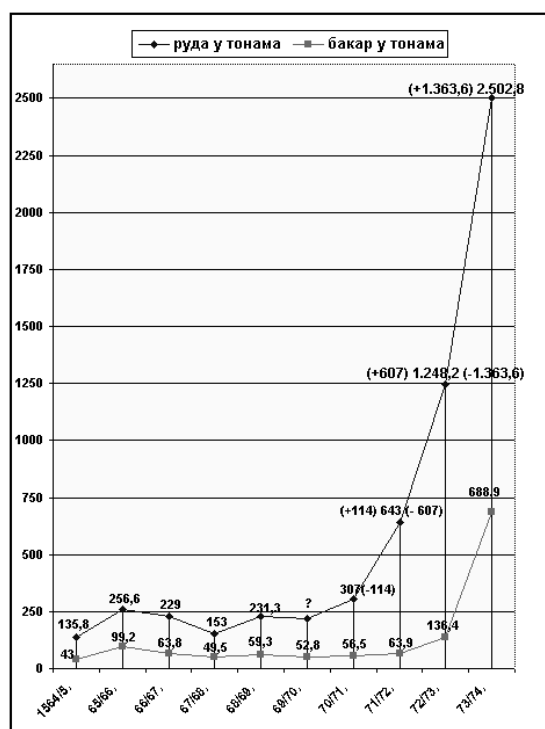


Fig. 1. Amounts of excavated ore and produced copper in Majdanpek in period 1564-1574.

were delivered to the smeltery, while whole 607 tons (80,2%) remained in the warehouses. Only in 1572/73 greater quantities of ore were processed (518,6) which resulted in a larger copper production, but even then some 1.363,6 tons of ore were left as a reserve. The changes were noted only by the end of the accounting year 1573/74. In the summary report for that year, some 200 tons of copper production was registered, but in a more detailed report which we discovered later, among the last accounted items, it was mentioned that all the reserves of some 2.883,4t ore were melted into 488,8 tons of copper during the last two months of the renewed lease. [14]

These data indicate that copper with the metal content in the ore of about 5%.

On the data basis from the Figure 2. it can be concluded that in the Ottoman Empire

price of copper was not determined, as was the case with silver and gold. It was dependent on the mine production, exploitation cost and market demands. It was obvious that in Majdanpek great impact on the price of copper had the opening of new mine. Its price, from then, had noted a sudden drop, which, in addition to higher production, could contribute to cheaper exploitation in the open-pit mining.

Production of copper mines in Majdanpek grew and after a period that was included in graphs. About the mine progress in the next few years testified the mine lease from 1578. From August 1st of the mentioned year, Majdanpek was rented separately from the mines and mint in Kučajna, and the amount of 1.300.000 akches was for more than five times higher in comparison to the last independent lease (250.000) from 1566. year. That contributed to existing mines development and opening new ones, and lease expansion to minor copper mines in the surrounding area. Majdanpek continued development in the coming decades by opening two more mines in the same place, which resulted with much higher production than those from the sixties and seventies of

the 16<sup>th</sup> century.

Production data listed in this paper have been related to copper that was produced in the furnace under supervision of civil servants and mine government. The copper was recognized by its embedded mark. It was a sign of legal production and that the owner settled up all obligations towards the state. Copper without the appropriate sign was confiscated, while a person who possessed it was strictly punished. When the mine Majdanpek trademark was broken in 1576, mine manager immediately informed the government and suspended distribution of copper, till the new trademark had come from Istanbul [15].

Of all the metals copper had the widest application in the everyday life of the Ottoman Empire inhabitants. Copper was used for producing: kettles, table bowls, casseroles, basins, pots and other vessels. It was used in the trades for making molds, in foundry for casting cannons, and in mints for minting copper coins - mangirs.

From copper were also made special boilers for boiling salt. They were shallow, and of about 1,5 meters in diameter. They were widely used in the Gornja and Donja

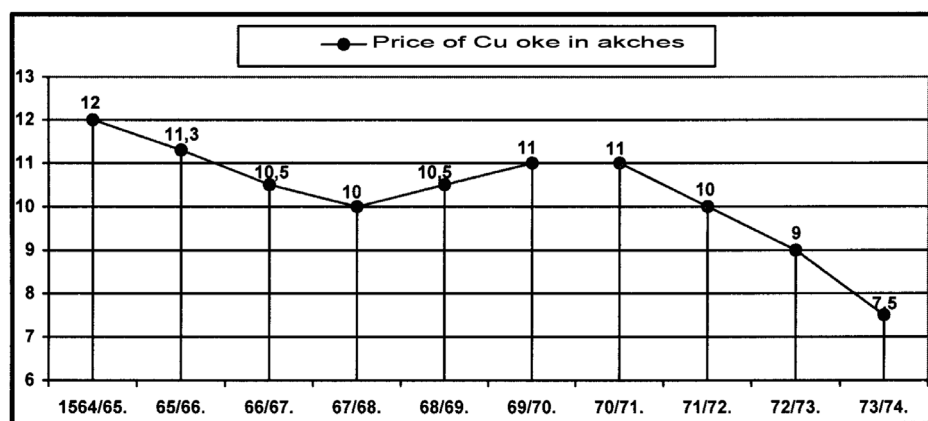


Fig. 2. Copper prices in Majdanpek from 1564 to 1574.

Tuzla and other saltworks which had got salt water sources [16]. However, the largest objects made from copper were the giant cauldrons for saltpeter leaching, which was one of the main gunpowder ingredient. The development of new saltpeter deposits, or expanding production in existing, required making tens of large boilers, where state participation was needed. Ottoman authorities had given great importance to this work, especially in time of war. In the work on the saltpeter production, it was said that boilers had been carried to the production place, but there was no data about their size, weight or material which they were made of. Therefore, we have dedicated more attention on two government's regulations, which were related to the above topic, and were issued at the preparation time for the Siget conquest in 1566. Since the authorities in Istanbul had been informed that beylerbey of Budim, Arslan-Pasha, managed to ensure only 9 of 50 needed saltpeter boilers, the emergency measures were taken for production of 41 more boilers. To Smederevo *sancakbeg, kadi* and to Belgrade *nazir*, on April 19<sup>th</sup> the order for buying 150 kantars (8.466,5 kg) of Majdanpek copper were sent, which had to be carried to Belgrade using teams, and transported to Budim by river boats. It was a great expense, because the market value of copper quantity amounted 72.600 akches. This amount, as well as money for travel costs, had been provided from the incomes in Smederevo *Sancak*.

Ottoman government had also decided to send from Belgrade to Budim coppersmiths' leader Pehlivan with 40 braziers and necessary tools. For their gathering and journey preparation Belgrade *kadi* had been

in charge, who had to send to the capital the list of braziers present at the inspection. The cost of their travel and per diem were beared by Budim beylerbey.

Average amount of copper used for the saltpeter boiler was 206.5 kg, which testified to the extremely large boiler size and its volume. The approximate amount of money spent for one boiler could be determined, by adding copper price which was 1771 akches, to other material prices, transport costs and braziers per diem, which in total was more than 2.000 akches. Based on the archive, it can also be concluded that, because of their size, the boilers for saltpeter weren't produced in coppersmith cities, but they were made in saltpetre mines by coppersmith masters.

Obviously that the number of boilers (41) corresponded to the number of coppersmiths (40 + commander), which means that each brazier was responsible for making a single boiler and that, consequently resulted with a relatively long production process.

The involvement of coppersmiths from Belgrade *kaza* area on the work, points out that their guild was known far outside the boundaries of Smederevo *Sancak*. Large coppersmiths' guild was in Majdanpek, but its members weren't heard of only by their mastery, but also by accusations that they usually used illegally produced copper, which had no trademark [17].

Smugglers in Majdanpek easily came to a rich copper ore, which abundance was also outside of the mine area, and relatively simple metallurgical process was on their serve. That illegally produced copper was sold to braziers by significantly lower prices, and they, immediately upon receipt, had transformed it into kettle and other objects, destroying the evidences of its origin. This

phenomenon in the middle of the seventies spreaded so much that Belgrade *kadi*, who, at the time, held office of *mufetish* - inspector of royal property custody inspector, had suggested the government to prohibit work of Majdanpek braziers. However, Ottoman authorities had not decided to such severe measure, because only in this way illegal production could be bounded, but not permanently eradicated. In addition, the state would had been left from the income that was collected from the local coppersmith activities [18].

Copper, like silver, gold, lead and iron was on the list of strategically important products, whose export from Ottoman Empire was forbidden. Unlike gold and silver which had supplied mints and Empire treasury, lead, iron and copper could have been purchased in free sale. Lead and iron, however, were not fit for smuggling, because the profit could have been achieved only throughout the export of large quantities, so copper only was worth the risk smugglers had been exposing themselves.

Import of copper was periodically authorized to Ottoman vassals, like Dubrovnik, Wallachia, Moldova and Transylvania, for their internal needs. However, imported copper had often been resaled, ending in foreign markets from Apenine Peninsula to Persia. The biggest problem was the large copper outflow over the eastern border. Its price was significantly higher in Persia, and despite the permanent prohibition of customs, a large number of local traders focused on smuggling. They were selling oriental goods on the Ottoman markets, and with earned money they bought copper, produced in mine Kure. Offering significantly higher prices than standard, they came over large amounts of copper, and

some of them succeeded to obtain silver. In response to smugglers action, Porta increased border control in the twenties of the XVI century. Persons who were found copper and silver bars were threatened to captivity on the galleys, as the utmost punishment for this offense. These measures had significantly reduced the smuggling, but the persian traders had continued with exporting copper through buying various copper vessels, which were then in the land resold on kilo. In this way they had not violated the law and even motivated the Ottoman craftsmen production. However, due to three wars, the Ottoman Empire fought against the Persian, in the period from 1533. to 1555, such kind of trade was prohibited too, because the copper was used for making cannons. Only at the end of 1559. Ottoman government had allowed persian merchants to export 2-3 copper casseroles and small vessels for their own needs [19].

In the following years the border control to the east had been reduced, and was even approved certain amount of copper for sale. Good relations with Persia, primarily affected in opening new copper mines in the European part of the Empire. That political atmosphere again encouraged the smuggling of copper from mine Kure, which had been often documented in official papers from the sixties of the sixteenth century [20]. Most contraband stunt took place in 1568. year, when the 400-500 persian traders came to mine Kure and purchased large quantities of copper. Persians had been collaborators of the Ottoman civil servants, because they were just able to buy copper directly from mines and then, from the north central Anadolia, went to Persian border. Since then, copper was sold only to those craftsmen who had the confirmation from authorized *kadi* in

stated quantities [21].

Copper smuggling had been such a lucrative job that on Persian market often ended even copper produced in Majdanpek. This was witnessed by appeal of Istanbul craftsmen, which, due to high quality, were regularly supplied by copper from Majdanpek. Their representatives complained in 1568. to the Port that they were lack in raw materials, because some traders in the capital purchased the copper and sold it in Persia. During mid-eighties the smuggling took big swing, which was stated on the Istanbul braziers to Port that copper, which "they had been supplied with from Kučajna and Majdanpek from the ancient time came, no longer came". Therefore, on September 12th in 1585, the Kučajna *kadi* was sent the order, which required, as soon as possible, the renewal of copper delivery, and there had been highlighted his responsibility if copper would had been sold out of Empire borders [22]. That threat had special significance, because in the course of a bloody war against Persia (1578-1590), and the sale of military strategic and important raw materials had been flat betrayal. Data about flows of smuggled copper during the war can be acquired from one Ottoman government spies report from Moldova, which had been made in the same year. In that Ottoman liege vassal Principality copper was usually delivered legally, but was rarely used for that purpose, but via circumlocutional roads, north of the Black Sea, exported to Persia [23].

In a document from March 1576. had not been specified who had complained to the government, but it was only recorded warning to Belgrade *kadi*, who was the inspector of the royal income inspectorate. Since Majdanpek had been under his

jurisdiction, he had been indicted for unobservancy, because the *spies* signals had indicated the increase in copper quantity that ended in the smugglers hands that year too [24].

Mine Majdanpek successfully worked till its desolation during Vienna war in 1688. and in 1690. Because copper production had strategic importance, the mine was restored quickly [25], but the amount of produced copper hardly achieved 70 tons, that only after the putting new state government, before Austro-Turkish War started (1716-1718) and the significant investment the copper production was considerably increased. Majdanpek was restored in 1739, after a period of Habsburg rule in Northern Serbia, and worked until the end of the 18<sup>th</sup> century, but there were a lot of production problems in that period, and Majdanpek hadn't been included among the largest Ottoman mines.

The best way to acquire images of Majdanpek production in the Ottoman period is comparison between the production in mines during the second half of the nineteenth and first decades of the twentieth century. From 1855. to 1922. the mine hadn't been working only in 1915. For 67 years 266.350 tons of copper ore were excavated, from which were produced 8.640 tons of copper. On an annual basis it was 3.975,4 tons of ore and 126,3 tons of copper, with the average content of copper in the ore of 3,18%. [26]

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