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ŞAFARS IN MEDIEVAL SERBIAN AND OTTOMAN MINING**

Abstract: The paper deals with *şafars* – supervisors responsible for the operation of mines, smelters and charcoal and wood supply operations. Analysing numerous unpublished Ottoman archival sources on mining and metallurgy, as well as on farming the imperial revenues, the emergence of *şafars* is shown from the time when they were temporarily engaged and poorly paid by the owners of *çahs* and smelters, to the time when they became civil servants and permanent members of mining administrations. The paper presents all types of *şafars*, their number and duties in Balkan mines, as well as in large mints and salt mines. Special attention is paid to the entrepreneurial role of *şafars* in buying shares in mines and smelters and farming the imperial revenue. A part of the paper concerns Serbian mining and smelting experts, who were opening and restoring mines in Anatolia, establishing in them the supervisory services of *şafars*.

Keywords: mine, smeltery, consumables, *şafariye*, leases, Skopje mining superintendence.

Анстракт: Рад се бави шафарима надзорницима задуженим за рад рудника, топионица и послова опскрбе ђумуром и дрветом. Анализирајући бројне необјављене османске архивске изворе о рударству и металургији, као и закупима царских прихода, приказана је генеза шафара од времена када су их власници цехова и топионица привремено упошљавали и слабо плаћали, до времена када су постали државни службеници и стални чланови рударских управа. У раду су приказане све врсте шафара, њихова бројност и дужност у балканским рудницима, као и у великим ковницама новца и соланама. Посебна пажња посвећена је предузетничкој улози шафара, од власничких удела у рудницима и топионицама до закупа царских прихода. Део рада односи се на српске рударске и топионичарске стручњаке, који су отварали и обнављали руднике у Анадолији, успостављајући у њима надзорничке службе шафара.

Кључне речи: рудник, топионица, потрошни материјали, шафарија, закуп, Скопско рударско надзорништво.

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The term *şafar* was used in Tyrol as early as the 12th century, and was brought to Serbia by Saxon miners. It originates from the Old German word *Schaffer*, equivalent to the modern term *Schaffner*, meaning a manager, supervisor.¹ *Şafars* were supervisors in charge of mines, smelters and the supply of consumables, who over time gained an important role in mining administrations and imperial revenue leases. Despite their obvious importance, *şafars* have not been a topic of separate works, while monographs on Ottoman mining mention them only in the context of a general overview of mining occupations. Due to scarce sources and a radical change in status, authors were not able to communicate even basic information about them.² This, as well as the abundance of information about *şafars* from various Ottoman archival series and collections, were the motive for writing this paper.

In the Law on Mines of Despot Stefan Lazarević, as well as in the earliest Ottoman translations of Serbian mining laws, *şafars* are not mentioned, while other representatives of administrative-supervisory services, the *urbarars* and the *hutmans*, are mentioned in numerous legal articles.³ In the mines of the Serbian medieval state, the service of *şafars* certainly existed, as otherwise that Saxon institution could not have survived until the establishment of Ottoman rule. This can also be seen from Lukarević's book of debts, in which, in the 1430s, in Novo Brdo and the surrounding area, one *urbarars*, nine *hutmans*, and seven *şafars* are recorded as debtors.⁴

¹ Joseph von Sperges, *Tyrolische Bergwerksgeschichte, mit alten Urkunden, und einem Anhang, worinn des Bergwerk zu Schwarzib beschrieben wird*, Vienne 1765, 263; Josef Jungmann, *Slovník česko-německý*, Díl IV., S–U, Vydání první, Praha 1838, 41.

² Robert Anhegger, *Beitraege zur Geschichte des Bergbaus im Osmanischen Reich I, Europaeische Türkei*, Bd. 1, 2, Istanbul 1943–1944, Zürich – New York 1945, 264; Nicoară Beldiceanu, *Les Actes des premiers sultans conservés dans les manuscrits turcs de la Bibliothèque nationale à Paris I–II*, Paris – La Haye 1960–1964, 112; Fehim Spaho, “Turski rudarski zakoni”, *Glasnik Zemaljskog muzeja Bosne i Hercegovine* 1–2 (1913) 133–150; 151–194; Skender Rizaj, *Rudarstvo Kosova i susednih krajeva od XV do XVII veka*, Priština 1968, 212–122; Владислав Скарић, *Старо рударско право и техника у Србији и Босни*, Београд 1939, 17–18; Ахмед Шериф, *Рударство во Македонија во време на османлиското владеење*, Скопје 2001, 58–60.

³ Никола Радојчић, *Закон о рудницима деспота Стефана Лазаревића*, Београд 1962; Биљана Марковић, „Закон о рудницима деспота Стефана Лазаревића“, *Споменик СХХVI*, Одељење друштвених наука 24 (1985) 1–64; Сима Ђирковић, *Латинички препис Рударског законика деспота Стефана Лазаревића*, Београд 2005; N. Beldiceanu, *Les Actes* II, 243–254; S. Rizaj, *Rudarstvo Kosova*, 209–214; Ahmed Akgündüz, *Osmanlı kanunnâmeleri ve hukukî tahlilleri* II, *Vâyezid devri kanunnâmeleri*, Istanbul 1990, 546–551; Андреја Катанчевић, “Институт урбарара у средњовековној Србији”, *Баштина* 51 (2000) 263–279; idem, “Хутмани средњовековног рударског права”, *Анали Правног факултета у Београду* 70/2 (2022) 497–510.

⁴ Михаило Динић, *За историју рударства у средњовековној Србији и Босни* II, Београд 1962 83–84.

Şafars were not mentioned in the above mining laws because their work duties, choice and method of financing were not permanently defined. The specific mining legislation also contributed to this, due to which their status differed from one mine to another. In the early period of Ottoman rule, the situation in mines was not changed, and neither was the position of şafars. Ottoman mining laws from the second half of the 15th century are an important testimony of that time. They are highly specific as they consist of the reports of expert commissions sent to around fifteen most important mines in the European part of the Ottoman Empire. Upon arrival in a mining centre, a mining expert and a *kadı* recorded detailed data on the method of production, the most important articles of law, customs, as well as local specificities, including the status of şafars. The report indicates that şafars who supervised the operation of the mine were originally entitled to a share in the ore. In the Sidrekapsi mine, they received a large leather sack of ore from each shaft every week, which was used to bring the ore to the surface, while in Plana and Zaplana they received an annual share of the ore. As this changed in time, the daily wages of three or four *akçes* were paid to miners in these mines. In Belasica, mining şafars who supervised exploration pits received only two *akçes*, and when ore was found in them, they were paid in kind. In the Jarkovac mine, the previous payment in ore was prohibited, and a mining şafar was paid 30 *akçes* per week. In some mines, mining şafars were paid by *çahs* owners, and in some by state revenue lessees, which caused jurisdiction-related disputes. Smeltery şafars were always paid by the owners of smelteries, but unevenly – for example, in Trepça they received 37 *akçes* per week (more than five *akçes* per day), while in Belasica the daily wage was only two *akçes*.⁵

The status of şafars was regulated differently in the Kratovo mine. In that large mine, the mining legislation was worked out in most detail, and there were also some duties and customs that were only applied there. Among them were two customary duties related to administrative and supervisory services in the mine, which were called the *urbarariye* and *şafariye* or *şafarlık*. The *urbarariye* was a tax for measuring ore fields, of which two-thirds went to the state and one-third to the *urbarars*. State revenue from the *urbarariye* was leased, as evidenced by lease and debt books from the last decades of the 15th and the first decades of the 16th century.⁶

⁵ N. Beldiceanu, *Les Actes* II, 184, 200, 206, 228; S. Rizaj, *Rudarstvo Kosova*, 223, 228, 234; A. Akgündüz, *Osmanlı kanunnâmeleri ve hukukî tahlilleri, Osmanlı hukukuna giriş ve Fatih devri kanunnâmeleri* I, İstanbul 1990, 519; A. Akgündüz, *Osmanlı kanunnâmeleri* II, 362, 535, 562, 566.

⁶ Kâmil Kepeci Tasnifi [=KK] 2411, s. 54.

According to the mining law for Kratovo from 1488, *şafariye* was collected by first separating a tenth from the manufactured ore for the state, then a ninth for the owners of trenches, and then a fifteenth for blacksmiths, and the thirtieth part of the remaining ore would constitute *şafariye*.⁷ It was intended to finance the necessary number of *şafars* in charge of overseeing mines and smelteries, as well as supply and transport operations, which significantly improved Kratovo's operations.

The lease books and books of debts of lessees in Rumelia and the Sanjak of Kyustendil, show that *şafariye* existed in Kratovo before. It was not only collected during the 1470s, but judging by its name – it was a customary *şafariye* (*âdet-i şafariye*) – it is clear that it was a tax existing for a long time.⁸ The original *şafariye*, calculated to ensure three-year daily wages for six to eight *şafars* and lessees' profit of 10% to 15%, probably amounted to 30,000 to 35,000 *akçes*. When in 1478 a certain Skender took over the lease of *şafariye* from Strahinja for 40,000 *akçes*, new rich deposits of ore were discovered in Kratovo and enormous expansion of production began, thanks to which the amount of *şafariye* increased eightfold by 1494.⁹ The share that belonged to *şafars* was slightly increased, due to the engagement of two or three more *şafars*, and the duty became the subject of competition among numerous business people. Some of them, expecting quick profit, offered unrealistic amounts and went bankrupt.¹⁰ In the late 15th century and the first decades of the 16th century, manufacturing in Kratovo declined, leading to a fall in the value of *şafariye*.¹¹ Although *şafariye* provided permanent financing for *şafars*, tying its amount to a share in the ore clearly proved to be an unstable solution, which may be the reason why it was not applied in other mines.

Differences in the position of *şafars* in Balkan mines were also visible in the first decades of the 16th century. Only after the great crisis of Ottoman mining and the mining reforms of Sultan Suleiman the Magnificent (1520–1566) in 1536, the position of *şafars* was permanently established and was

⁷ N. Beldiceanu, *Les Actes* II, 193; S. Rizaj, *Rudarstvo Kosova*, 244; A. Akgündüz, *Osmanlı kanunnâmeleri* II, 445.

⁸ Başbakanlık Osmanlı Arşivi [=BOA], Maliyeden Müdevver Defterleri Tasnifi [=MAD] d. 149, s. 34–35; MAD 176, s. 382; BOA, Kamil Kepeci Tasnifi d. 2411, s. 54.

⁹ MAD. d. 176, s. 382. The lease of Skender's son Haji Ahmed from 1481 equalled 101,400 *akçes*, the lease of Peja, the son of Staniša, from 1491 was 283,920 *akçes*, and the lease of Petrija's son Marko from 1494 equalled 324,480 *akçes*. MAD. d. 149, s. 34–35.

¹⁰ Around a half of all *şafariye* lessees ended their leases with debt. Some of them were paid off by warrantors, while three ended up in an Istanbul dungeon. Đurko, the son of Todor, was soon released, Vuja, the son of Ivaniš, was imprisoned for more than 15 years, while Bojč'in died in prison. A certain Haji Ahmed had other debts as well, so he was hanged. MAD. d. 149, s. 34–35.

¹¹ *Ibidem*.

valid for all mines in the Empire. *Şafars* became civil servants, whose daily wages were paid from state revenues generated by mine leases, so they became personally interested in the betterment of mines and smelteries. Together with the *emîn* and scribes, they constituted the administration of the mine with clearly defined duties, which will be discussed in more detail later, when we will shed light on particular types of *şafars*.

The *şafar* in charge of supervising the underground works was called the *jol şafar* (German *Jol*) – according to the bottom of the ditch connected to the shaft. *Jol şafars* were most often in charge of one mine, but depending on the size, they could also serve two smaller ones, or a part of one large mine. It was a mine in its basic sense, i.e. a large ore deposit, with numerous *çahs*, of which each had one, often two, and sometimes three shafts with ramified underground exploitation. Each such mine had its own established mining district, and when a new ore deposit was discovered outside it, a separate mine was formed at that place, also with established boundaries. In this way, four, five and even six mines operated in the largest mining centres, among which the one that was opened the first was often called *Stari* (Old – *Atik*). The following mines operated in Novo Brdo: *Stari*, *Veliki* (Large – *Büzürg*), *Glama*, *Plavica* and *Kosovica*.¹²

Janjevo is a good example of the engagement of *jol şafars* in a large mining centre, where five mines operated in the second half of the 16th century. In the Janjevo mine, the first that was opened and the largest in terms of the volume of operations, two *jol şafars* were employed, in the *Glava* mine one, while for the two smaller mines *Kazan* and *Novi Ceh* another one – the fourth *jol şafar*, was in charge.¹³ A *jol şafar* is not mentioned in relation to the smallest mine of *Slavinje*, but only the mine scribe, who most likely performed both duties, which was often the case with mines of that size.¹⁴

¹² BOA, Maden Mukâta'ası Kalemi Defterleri [=D.MMK.] d. 22700, s.10–13; D.MMK. d. 22705, s. 13. In *Majdanpek*, the largest copper mine in the European part of the Ottoman Empire, the following mines operated: *Stari*, *Šuplja Glava*, *Surekanlik* and *Karaoglan*. Срђан Катић, *Рудник Мајданпек XVI–XVIII век, Османски документи о руднику Мајданпек*, Мајданпек 2009, 150–161.

¹³ D.MMK. d. 22704, s. 11–15. It happened rarely that one *jol şafar* served two mines from the neighbouring mining centres; such example existed in the case of *Kavala* and *Pravište*. D.MMK. d. 22698, s. 2.

¹⁴ D.MMK. d. 22704, s. 8. In *Žežna*, the positions and responsibilities of *jol şafars* changed depending on the production in mines. Three or four *jol şafars* were reported in five mines: *Žežna*, *Crnac*, *Leskova Glava*, *Lipovo* and *Orahovo*. Bâb-ı Defteri, Başmuhâsebe Kalemi Defteri

In Sidrekapsi, in by far the largest mine of Kestenje, in the first half of the 16th century, two *jol şafars* were employed, and three decades later – four, which was also the largest number of *jol şafars* recorded in a single mine.¹⁵

A *jol şafar* was in charge of overseeing the work of around ten *çahs* with scaled ore fields. He visited the shafts in *çahs* every working day, in order to determine the regularity of workers' arrivals, their engagement at digging sites and their performance. He recorded all changes in the work log, based on which he and the mine scribe compiled weekly reports for the Saturday assembly, at which the mines were inspected in the presence of the mine management, the *kadı*, *çahs* owners and all those engaged. He was also obliged to immediately inform the mine manager – the *emîn* and the *kadı* – of all extraordinary changes in the mine.¹⁶

Jol şafars also supervised the deployment of workers, who came in shifts from the village of the mine's *hâss*. The residents of those tax-privileged villages were mostly producers of charcoal (*kömürçüs*), while other villages sent one day labourer per every 15 households to work in the mine. *Jol şafars* could transfer those workers from one *çah* to another, as well as bring new diggers to vacant positions.¹⁷ They had much less influence on miners in a business relationship with *çah* owners, who could work for a share in ownership or a part of the ore, or be paid according to the contracted number of mined fathoms. They could probably be only warned or reported about in case of gross misconduct.

The so-called *şafars* of lagums – horizontal trenches, used to drain water from the shaft, also belonged among mining *şafars*. Lagum *şafars* are mentioned in documents much less often than *jol şafars*, primarily in large and old mines with a highly ramified underground structure, such as Novo Brdo and Žežna.¹⁸

Mining *jol şafars* also supervised test excavations in shafts in which ore had not yet been found, and they were called *pavun* or *paun* (German *bau*). In the kanun-name of the Jarkovac mine near Novo Brdo, from the end of reign of Sultan Bayezid II (1481–1512), it is stated that per every ten shafts in which ore had not yet been found, one *şafar* was designated to supervise the work day and night. In the case of neglecting work or abandoning the shaft, the *şafar* informed the *emîn*, who invited the owners to continue the work, and if they did

[=DBŞM.] d. 94; Срђан Катић, “Закупи рудника и хасова Жежне из 1585/6. и 1591/2. године”, *Мешовита грађа (Miscellanea)* 34 (2013) 97–98.

¹⁵ D.MMK. d. 22692, s. 3; BOA, İbnülemin Tasnifi, Maden [=IE.MDN.] 1/10, s. 4.

¹⁶ Владислав Скарић, *Старо рударско право и техника у Србији и Босни*, 16–18. F. Spaһo, *Turski rudarski zakoni*, 37.

¹⁷ BOA, Bâb-ı Defteri Evâmîr-i Mâlîye Kalemî Defter Tasnifi [=D.EVM] d. 26278, s.154.

¹⁸ MAD. d. 21960, s. 14; D.MMK. d. 22705, s. 13.

not do so, the shaft was given to new owners.¹⁹ Among the members of mining administrations, special paun *şafars* are also mentioned in the Sidrekapsi mine.²⁰

Mining *şafars* were also responsible for mining ore from river sediments after heavy rainfall. The ore extracted in this way was separately sorted and sold, and was named *potok* (*stream*) after the place of mining. Potok *şafars* were also in charge of supervising ore washing in *plakaonice* (*plakaniçe*), which were called *potok* in the law for Novo Brdo from 1488. This is also indicated by the above Jarkovac kanun-name, according to which all extracted ore had to be washed under the *şafars*' supervision. In the second half of the eighties and the early nineties of the 16th century, as many as three potok *şafars* were engaged in Novo Brdo, one of whom was in charge of the Plavica stream.²¹

Christians were often *jol şafars*, while among Muslims they were most often converts, or descendants of converts, who came from the local community.²²

The daily wages of *jol şafars* were most often five, and less often four *akçes*. This was less compared to the daily wages of the *hutmans*, *çah* supervisors, who received six or seven *akçes*.²³ Although *jol şafars* and the *hutmans* were supervisors of miners and mining operations, their responsibilities did not overlap. As already stated, *jol şafars* were part of the mining administration, while the *hutmans* were elected and paid by the share owners of *çah*. *Jol şafars* were accountable to the *emîn* and the *kadı*, and the *hutmans* to their employers, and they were also obliged to inform the *emîn* about changes in ownership and business relations in the *çah*. First of all, the *jol şafar* had to ensure that in all four shifts in the mine the digging positions were filled with workers and that all of them met the working standards, while the *hutmans* took care of the ownership shares in the *çah*, contractual obligations of employers and miners, all repairs in the *çah*, except those under the jurisdiction of blacksmiths, and he also represented the *çah* in disputes with other ownership groups regarding demarcation, ventilation, water drainage etc.

The *jol şafar* and the *hutmans* had to cooperate in solving various problems. When, for instance, owners were not able to pay diggers or to compensate the amount by pledging ownership shares, the *hutmans* and the *şafar* reached for the mined ore to settle the debt and ensure the continuation of

¹⁹ N. Beldiceanu, *Les Actes* II, 270; S. Rizaj, *Rudarstvo Kosova*, 215–216; A. Akgündüz, *Osmanlı kanunnâmeleri* II, 561–563.

²⁰ D.MMK. d. 22692, s. 3.

²¹ D.MMK. d. 22700, s.10–13; D.MMK. d. 22705, s. 13.

²² D.BŞM. d. 61; D.BŞM. d. 79; D.BŞM. d. 94; D.MMK. d. 22704.

²³ BOA, Bab-1 Defteri Baş Mukataa Kalemi [=D.BMK.] ÜSM. I (13), s. 2–6.

production.²⁴ The law also stipulated that the *hutmans* and *şafars* should jointly solve problems apparently unrelated to their activities. When the owners of canals for water supply to *plakaoniçe* neglected them, all *çah* that used them had to participate in the repair, paying four *akçes* per *plakaonica* per week for this service. The repairs were carried out under the supervision of *jol şafars* and the *hutmans*, who later paid for the costs of the canal restoration with the free use of *plakaonice*.²⁵

After washing, sorting and weighing, the ore was sold to the owners of smelters. This is when smeltery *şafars* became responsible, by recording the quantities of purchased ore. When necessary, sulphide ores were first roasted (*roşt* from the German *rost*) – in order to remove unnecessary and toxic ingredients. Only in the mines of Žežna and Novo Brdo in the late 16th century are *şafars* in charge of roasting mentioned.²⁶ At the end of that process, the ore was measured again in the presence of *roşt şafars* and the scribe, and transferred to smelters.

Smelters consisted of a mill wheel driven by the power of water and a building in which its shaft as transmission enabled the inflation of the smeltery bellows. In Saxon smelters, there were usually 12 bellows, two for each of the six furnaces, in which they fanned the fire to the temperature needed to smelt the ore.²⁷ In order to create a smeltery, three conditions had to be fulfilled: the existence of a strong water flow throughout the year, the proximity of places where charcoal could be made, and the possibility of building a road. When opening a mine, the same importance was assigned to these conditions as to the solidity of the terrain and the quality of the ore.²⁸

In the Middle Ages, the Serbian name *kolo* was used for smelters in Balkan mines. It was a synonym for a wheel, while the German word *hütte* referred to the smeltery building. In the Ottoman mining terminology, the smeltery was also called after the wheel, but instead of the Serbian word, the Persian word *çarh* was used, after which smeltery *şafars* were also called *çarh şafars*.

²⁴ F. Spaho, *Turski rudarski zakoni*, 58–59.

²⁵ Ownership of the water supply canal was lost only when it was neglected to such an extent that a branch of one arşin grew out of it. F. Spaho, *Turski rudarski zakoni*, 59.

²⁶ D.MMK. d. 22705, s. 19, 50.

²⁷ G. Agricola, *De Re Metalica*, Translated from the first Latin edition of 1556 by Herbert Clark Hoover and Lou Henry Hoover, New York 1950, 355. According to Agricola, it rarely happened that there were more than six furnaces in the smeltery, and more often there were fewer.

²⁸ MAD. d. 21960, s. 139–142.

Smelteries were often built in deserted areas, so settlements of smelters arose around them. Around twenty villages sprang up in the vicinity of Novo Brdo, containing the word *kolo* in their name, such as Hajново *kolo*, Stanimirovo *kolo*, Rajkovo *kolo*, Nikšino *kolo*, Brajkovo *kolo*, Crkveno *kolo*, Kalojanovo *kolo*, Evrenosovo *kolo* and others.²⁹

As the number and arrangement of smelteries are very rarely mentioned in sources, historiography did not deal with this topic. In the Rudnik mine, opened by the Saxons back in the late 13th century, smelteries were located in two areas near Rudnik and Majdan, as evidenced by numerous slag deposits.³⁰ In 1516, in the vicinity of Rudnik, near the village of Jarmarovac (present-day Jarmenovci) on the upper flow of the Jasenica river and its tributaries, 15 smelteries were recorded, 13 of which were in use, and there was one more in the village of Ravne.³¹ The second group of smelteries was located on the Krasojevačka and Majdanska rivers, near the Grasovac (Majdan) mine. In the village of Gornji Grasovac (Krasojevci) there were four smelteries, three of which were in use³² and near the village of Kolarica, named after the wheel, there were three more.³³ At that time, *şafar* Pava from the village of Jarmarovac was in charge of supervising all mine smelteries, and in later sources only one *çarh şafar* was recorded among the Rudnik *şafars*.³⁴

The number of smelteries and the number of *çarh şafars* are also stated for the neighbouring mines of Plana and Zaplana, which constituted one mining area and were always stated together in mining laws and leases. According to the census of the Sanjak of Kruševac from 1516, there were 13 smelteries in Plana, 14 in Zaplana, 13 in the settlement of the former Brzeće mine, five in the village of Duboka, and one in the village of Ravniste.³⁵ According to the mining law for the Plana and Zaplana mines, published a quarter of a century earlier, in each of those mines, as well as in Brzeće, one *çarh şafar* was employed.³⁶

²⁹ Т. Катић, „Топионице – језгра нових насеља у рударским областима Вучитрнског санџака“, *Историјски часопис* 73 (2024) 123–144.

³⁰ Владислав Симић, “Рударска прошлост рудничке планине у Шумадији” I–IV, *Рударски гласник* 1 (1971) II.

³¹ BOA, Tapu Tahrir defterleri [=TT] d. 1007, s. 51, 53.

³² А. Аличић translated the *çarh* as *samokovi*, reading the name of the village as Gornji Grabovac, assuming that it was Grabovac near Кнић. Ахмед Аличић, *Турски катастарски пописи неких подручја западне Србије XV и XVI век I*, Чачак 1984, 289.

³³ TT. d. 1007, s. 52–53. In the mid-16th century, the village of Kolarica was renamed into Donji Krasojevac, TT. d. 316, s. 48.

³⁴ D.BŞM. d. 94; D.MMK. d. 22705, s. 13, 16; TT. d. 1007, s. 51; MAD 21959, s. 30.

³⁵ TT. 55, s. 1–3.

³⁶ N. Beldiceanu read the former mine of Brzeće as Zirnič, which was taken from him by S. Rizaj and later A. Akgündüz. N. Beldiceanu, *Les Actes* II, 206; S. Rizaj, *Rudarstvo Kosova*, 228; A. Akgündüz, *Osmanlı kanunnâmeleri* II, 341.

Probably over 100 smelteries operated in the vicinity of the largest mines such as Sidrekapsi. According to Pierre Belon, a French naturalist who visited Sidrekapsi in 1547, the ore from that mine was smelted in 500–600 furnaces.³⁷ This is close to the mentioned number of smelteries, whose number could only be higher in the following period.

At the time of Belon's arrival, the *çarhs* of Sidrekapsi were concentrated in the areas of: Pijavica, Dunav, Koporište, Lizažde and Braskovica, and one *çarh şafar* was in charge of each of them.³⁸ In the following decades, two more smelting areas, Orašnica and Pavlovo, are mentioned in the vicinity of Sidrekapsi. All the mentioned names, as well as the vast majority of other local toponyms, were of South Slavic origin.³⁹

The above examples show that one *çarh şafar* was in charge of supervising 15 to 20 smelteries. One *çarh şafar* could supervise the operation of smelteries in two, even three smaller smelting areas. For instance, in smaller mines such as Grebna near Kratovo or Kozja Glava and Lištje on Kopaonik, due to the limited scope of work, the *çarh şafar* also performed the duty of the mine scribe.⁴⁰ There were also examples of the unification of the duties of the *çarh şafar* and the *şafar* in charge of supplying the mine, which will be discussed in more detail hereinafter.

In the early period of the Ottoman rule, *çarh şafars* gave permissions to the owners of smelteries to smelt ore and build refineries, making them a schedule for ore smelting. They supervised the smelting process, particularly the final stage, in which silver was removed from the furnace, weighed and sent to the mint. A kanun from the end of reign of Sultan Bayezid II (1481–1512) states that the lessee of state revenues did not decide on the engagement and dismissals of *çarh şafars*, which means that they were still elected and paid by the owners of smelteries, to whom they were at their service.⁴¹

After the Ottoman mining crisis during the twenties and the first half of the thirties of the 16th century, Sultan Suleiman the Magnificent (1520–1566) introduced a series of reform measures in 1536, among which was the codification of Saxon legislation. The Sultan's confidential emissaries pointed out a series of omissions in the organisation of work of mines and smelteries. In particular, they highlighted the status of *çarh şafars*, who, as the only ones

³⁷ Pierre Belon, *Les observations de plusieurs singularitez et choses memorables trouvées en Grèce, Asie, Judée, Egypte, Arabie et autres pays étrangers*, Paris 1555.

³⁸ D.MMK. d. 22692, s. 3.

³⁹ D.MMK. d. 22698, s. 10–12; IE. MDN, 1/10, s. 4.

⁴⁰ MAD. d. 654, s. 206; MAD. d. 21960, s. 154.

⁴¹ N. Beldiceanu, *Les Actes* II, 270; S. Rizaj, *Rudarstvo Kosova*, 216; A. Akgündüz, *Osmanlı kanunnâmeleri* II, 562–563.

responsible for melting silver, abused that authority, and even produced silver intended for smuggling in distant smelteries. Investigators were obviously surprised by the negligence and the failure to act and “put an end to this excessive deficiency”, as they stated.⁴²

It was therefore decided that in the future the permission to build a refinery and smelt ore would be obtained from the *emîn* in the presence of the scribe and the *şafar*, and that the smelting process, in addition to the *şafar*, would be monitored by the *emîn* or his representative, the mine scribe and the mint lessee. The *emîn* measured the obtained silver, which was then taken to the court in tied leather bags, sealed with the seals of the *şafar* and the scribe. There, silver was measured again, and all data were recorded in the *sicil* and a special defter.⁴³

As already stated, after the mining reforms of Sultan Suleiman the Magnificent, *şafars* became civil servants, who were paid with money from the lease of the ruler’s revenues in mines. Thus, they became part of the mining administration, which they formed together with the *emîn* and scribes. From the mid-16th century, it happened increasingly frequently in mining administrations organised in such way, only to become commonplace later, that lessees, during the lease, performed some of the mentioned administrative duties. In time, the lessee’s warrantors also gained an important role, so in the future, the selection of administration members increasingly depended on them.

Çarh şafars had the best insight into the production of silver and lead, so the lessees most often chose to perform that service, while less often opting for the services of the *emîn* or chief scribe of the mine. In mines that had more than one smelting area, lessees always chose the one with the largest number of smelteries. Thus, in the Kučajna mine, opened in the mid-16th century, lessees with the service of *çarh şafars* first chose smelteries near Rakova Bara, then those near Melnica, while showing no interest in smaller groups of smelteries near Crvenica, Slatina and Vrelo.⁴⁴

In the last decades of the 16th century, in almost all silver mines in the Skopje mining superintendence (*nezaret*), among which were the largest ones in the Empire, such as Novo Brdo, Janjevo, Trepča, Žežna, Belasica, Zagrađe, Zaplana and others, lessees were *çarh şafars*.⁴⁵ In copper mines, lessees more often opted for the services of the *emîn* and chief scribe, so of around fifteen

⁴² F. Spaho, *Turski rudarski zakoni*, 36 [170].

⁴³ Ibidem. B. Скарић, *Старо рударско право и техника у Србији и Босни*, 18.

⁴⁴ D.BŞM. d. 61; MAD. d. 654, s. 273, 275–277. In the newly formed urban settlement of the Kučajna mine, one of the first urban *mahalles* bore the name of *şafar* Mihajlo. TT. 316, s.108.

⁴⁵ D.MMK. d. 22705.

lessees of Majdanpek from the second half of the 16th century, only two Jewish lessees were *çarh şafars*.⁴⁶

It happened that the lessee with the service of a *çarh şafar* also leased the neighbouring mine or mines or leases of other state revenues. For instance, in the 1590s, the *şafar* of the Kremkovica mine near Sofia, leased the revenues of the Kremkovica mine, the mining *hâsses* and the mint in Sofia.⁴⁷ There were very rare cases when distant *mukâta'as* were unified in the same lease. The most striking such example were the leases of the Čemerno mine in the south of the Smederevo Sanjak with the Avala and Rudište mines near Belgrade or the Morović *hâss* north of Valjevo.⁴⁸

Smelting and mining experts and miners from central Balkan mines were sent to Anatolia, in order to open new mines, or enhance the work of the existing ones. There they applied mining laws, technology, business organisation and terminology from their homeland. That is how *şafar* services became common in Anatolian mines. In the early 1570s, dozens of miners and smelters of all profiles went from Novo Brdo and Kratovo to the İnegöl silver mine near Bursa.⁴⁹ Among them was Sava, who served for years as a *sahib-i ayâr* in İnegöl, i.e. an appraiser of the purity of silver and gold, receiving a daily wage of ten *akçes*.⁵⁰ In 1578, Sava became the lessee of the İnegöl mine, taking a three-year lease for one million *akçes*, under the condition of performing the service of the *çarh şafar*.⁵¹

Sava's example is very important as it also shows that being a *çarh şafar* was not a profession, but a time-limited service that could be performed by various experts from the smelting industry.

Members of all three confessions, the majority of whom were Muslims, performed the tasks of *çarh şafars*. The daily wages of *çarh şafars* were five or six *akçes*,⁵² with the exception of *çarh şafars* who were mine lessees and whose income were usually significantly higher. Thus, in the late 16th and early 17th century, the daily wage of lessee *çarh şafars* in Kremkovica was five *akçes*, while

⁴⁶ С. Катић, *Османски документи*, 28–86; D.BŞM. d. 67, s. 9–10; IE., Maliye, 27/2633, s. 10.

⁴⁷ D.ММК, d. 22705, II, s. 12.

⁴⁸ Срђан Катић, “Рударство Чемерна и Троглава (16–17. век)”, *Наша прошлост* 16 (2015) 15–16.

⁴⁹ KK. d. 67, s. 242a, 567a.

⁵⁰ BOA, Bursa Mukâtaası Kalem Defterleri [=D.BRM.] d. 24252, s. 7.

⁵¹ Ibidem, 2. BOA, Muhimme Defteri 41, s. 173. One of Sava's two warrantors was Andrijaš, the *emîn* of the İnegöl mine.

⁵² In the annual reports of the Kučajna mine from the sixties and seventies of the 16th century, the daily wages of *çarh şafars* were mentioned 37 times – 20 times a daily wage of six *akçes*, 14 times a daily wage of five *akçes* and, which is very rare, three times a daily wage of four *akçes*. D.BŞM. d. 00.

in Novo Brdo, Janjevo, Žežna, Belasica, Zaplana and Plana it was ten *akçes*, in Trepča 13, and in Zagrađe near Priština 15 *akçes*. The differences in daily wages reflected different lease agreements regarding the increase of the lease amount, the merging or splitting of the *mukâta 'as*, the warranty amount etc.⁵³

The largest part of the labour force, including *şafars*, was engaged outside mines and smelteries – they were preparing and transporting fuel and other consumables. Huge amounts of wood were needed for the operation of a single mine. Pits and trenches were supported with beams and planks, and auxiliary structures were built. Most of the wood was used to make charcoal, which was used in all stages of ore smelting and metal processing. Wood was used as fuel during the roasting of sulphide ores (*roşt*) and in the smelting process as an addition to charcoal. Fire clay was also needed for the operation of smelteries and was used to coat furnaces and make various types of moulds.⁵⁴

Officers responsible for overseeing these activities were constantly on the move. In early spring, before the beginning of the growing season, they often went to very remote and inaccessible places to supervise the cutting of wood. After the processing and drying period, they followed the work of a large number of *kömürhâne*, of which there were hundreds in forests around large mines. The produced charcoal was packed in large sacks, with two making up horse load.⁵⁵ In the medieval Serbian state, the use of horses for the supply of mines with consumables and for putting mining plants in operation was called *konjuh*, as evidenced by the eponymous toponyms near the mines of Brskovo, Janjevo, Kratovo, Olovo and others. Even in the Ottoman period, entire load was carried by pack horses, and since *şafars* also performed their service on horseback, they were called horsemen *şafars*. In the mines of the central and western Balkans, the Persian word *sivârî* was most often used for this type of *şafars*,⁵⁶ and more rarely the Turkish word *atlu*.⁵⁷ In the mines in

⁵³ D.MMK. 22705; С. Катић, *Закупи рудника и хасова Жежне*, 95.

⁵⁴ Срђан Катић, “Потрошни материјали у османском рударству и металургији“, *Историјски часопис* 58 (2009) 197–207.

⁵⁵ *Ibidem*.

⁵⁶ D.BŞM. d. 61, s. 1–88; D.BŞM. d. 94, s 2–8; D.MMK. d. 22694, s. 12–16; D.MMK. d. 27000, s. 10–13; D.MMK. d. 22704, s. 1–23; D.MMK. d. 22705.

⁵⁷ MAD. d. 6148. The presence of the form of this word depended on the use in the field, but also on the origin and education of the scribe. For instance, it happened that the scribe in the same document used both forms on one page, and on the next page, for the previously mentioned *şafars*, he used only the Persian name. D.MMK. d. 22700, s. 12–1).

the territory of today's Greece, in the nezaret of Sidrekapsī and the nezaret of Kavala and Pravište, *şafars* in charge of these activities were called charcoal *şafars* – *şafars-i engişt*.⁵⁸

Horsemen *şafars* in silver mines, regardless of size, usually made up a half of the total number of engaged *şafars*. The Sidrekapsī and Novo Brdo mines were an exception. In Sidrekapsī, a mine with large production, numerous mines and smelting areas, mining and smelting *şafars* had the priority, so in the 1540s, of a total of 17 *şafars*, only six were horsemen. Three decades later, there were still six horsemen *şafars* in service, although a total of 19 *şafars* were recorded at the time, the largest number of *şafars* in a single mine ever.⁵⁹ The situation in Novo Brdo was quite different. After long-lasting exploitation, the ore was mined at great depths, so many shafts were abandoned due to considerable costs. Novo Brdo, however, still owned large workers' *hâsses*, whose population, under the supervision of horsemen *şafars*, continued to make charcoal, which was sold to the surrounding mines. In 1588, a total of 15 *şafars* worked in Novo Brdo, of which nine were horsemen, and in 1596, one more horseman *şafar* was engaged, so in total they were 16 *şafars*.⁶⁰

While in large silver mines there were usually around six horsemen *şafars*, in medium-sized mines there were around three, and in small ones one. A horseman *şafar* was most often in charge of one mine or one area that belonged to the mine's *hâss*. Depending on the scope of work, they could also supervise the activities related to two smaller mines or areas, and rarely more. In 1583, the largest number of responsibilities was taken over by a horseman *şafar*, who undertook to supply as many as four smaller mines under the lease of the Žežna mine.⁶¹

Horsemen *şafars* with multiple duties most often performed tasks within a single mining region, and when this was not the case, those were neighbouring mining areas. It very rarely happened that due to the insufficient volume of work, the *şafar* in charge of supply also took over a part of duties of the *jol* or *çarh şafar*. In the mentioned lease of Žežna, in addition to two independent horsemen *şafars* and two independent *jol şafars*, there was also a *şafar* who combined the services of the horseman *şafar* of the Crnac (Çrniçe) mine and the *jol şafar* of the Žežna mine.⁶² This unification of services occurred due to the crisis in the Žežna mine. When the crisis was overcome and silver

⁵⁸ D.MMK. d. 22692, s. 2–3; D.MMK. d. 22698, s. 1, 12; D.MMK. d. 22705, s. 62.

⁵⁹ D.MMK. d. 22698, s. 10–12; IE. MDN, 1/10, s. 4.

⁶⁰ D.MMK. d. 27000, s. 10–13; D.MMK. d. 27005, s. 49–50.

⁶¹ D.BŞM. d. 94, s. 1.

⁶² Ibidem, s. 1–3.

production was restored to its earlier levels, 12 *şafars* were re-engaged in the mine, six of whom were horsemen *şafars* and three *jol şafars*.⁶³

In the late 16th century, in the joint lease of the superintendence – the *nezaret* of Serres and the *nezarets* of Kavala and Pravište, two *şafars* were mentioned who, in addition to the procurement of charcoal, were also in charge of supervising smelteries. One served in the smelteries of the Sengil mine, and the other in the Kavala and Pravište smelteries.⁶⁴

In large iron mines such as Samokov and Vlasina, one or two *şafars* were in charge of delivering charcoal.⁶⁵ In copper mines, however, due to the relatively easy solubility of copper ore, there was a significantly smaller need for this fuel. This is also the reason why horsemen *şafars* were not regular members of mining administrations even in the largest copper mines such as Majdanpek.⁶⁶

Mine lessees very rarely chose to perform the service of horsemen *şafars*, and only in iron mines. Thus, in the 1590s, in the Vlasina iron mine, a lessee took a six-year lease, on the condition to be a horseman *şafar*.⁶⁷

Horsemen *şafars* were also employed outside mines. In the largest mints in Sidrekapsi and Novo Brdo, one horseman *şafar* was employed each. In Sidrekapsi he was called the charcoal *şafar*, and in Novo Brdo both names were used.⁶⁸ In a document from 1590, the *şafar* in the mint in Novo Brdo was recorded as the *şafar* for charcoal and fire clay (*şafars-i engişt ve hakister*), which determined their scope of work even more precisely.⁶⁹

Horsemen *şafars* played a particularly important role in Gornja and Donja Tuzla salt mines. The production in these salt mines was based on boiling water from salty springs. Huge amounts of wood were needed to stoke up fire in a large number of wide, shallow pans day and night, so in Ottoman documents those salt mines were called wood salt mines (*memlahâ-i çob*).⁷⁰

Two horsemen *şafars* were engaged to supply the salt mines with wood, one for Gornja and the other for Donja Tuzla. They visited the villages that were assigned to the salt mines as a *hâss* and organised the cutting and delivery of wood. In the salt mines in Tuzla, in addition to the name horseman *şafar*,

⁶³ D.MMK. d. 22705, s. 19.

⁶⁴ D.MMK. d. 22705, s. 62.

⁶⁵ MAD. d. 654, s. 56–57, 208–209.

⁶⁶ С. Катић, *Рудник Мајданпек*, 20–86.

⁶⁷ MAD. d. 5581, s. 92.

⁶⁸ D.MMK. d. 22694, s. 1; D.MMK. d. 22698, s. 12; MAD 654.

⁶⁹ D.MMK. d. 22705, s. 13.

⁷⁰ Ahmed Handžić, *Tuzla i njena okolina u XVI vijeku*, Sarajevo 1975, 232; A. Akgündüz, *Osmanlı kanunnâmeleri II*, 119.

the name wood *şafar* (*şafars-i hîme*) was also used for the same profession.⁷¹ The fact that lessees often chose to perform this particular duty also testifies to the importance of horsemen *şafars* for the operation of Tuzla salt mines. From the list of members of the administration of the *mukâta'a* of Rumelia, it can be seen that in the second half of the sixties and during the seventies of the 16th century, four consecutive leases of Tuzla salt mines were held by *şafars*.⁷² The lease book contains more information about the third of them, in which it is recorded that on 16 February 1572 Nikola, the son of Luka and Pasko, the son of Jorge, took over the three-year lease of the salt mines. In that lease, Nikola was the *şafar* for the wood of Gornja Tuzla, and Pasko for the wood of Donja Tuzla.⁷³

In addition to *şafars* in charge of supplying one or two areas, there was a *şafar* who served all the mines belonging to the Skopje mining superintendence. It was a special “iron tool” *şafar*, who in the last decades of the 16th century was on the payroll of mines and the mint in Novo Brdo.⁷⁴ He ordered tools in the Gvostanica iron mine, which in medieval Serbian and Ottoman sources is also called Gvočanica, Gvozčanica and Gvoščanica. That mine was famous for iron with the natural properties of steel, from which local blacksmiths made extremely high-quality mining tools.⁷⁵ *Şafars* supplied around fifteen mines with those tools, among which Novo Brdo, Janjevo, Trepča and Žežna were among the largest in the Empire.⁷⁶ The daily wages of horsemen *şafars* usually amounted to five *akçes*, and this service was almost exclusively performed by Muslims.

Within the profession, *şafars* had administrative and supervisory bodies. In the largest mines such as Novo Brdo, Kratovo and Janjevo, with a large number of *şafars*, there was a duty of the chief *şafar* (*ser şafarân*). Chosen for this service were highly skilled persons who had rich experience and were

⁷¹ A. Handžić, *Tuzla i njena okolina*, 228; in the registers, scribes used to call the same person during the same service as a horseman *şafar* and a wood (*çob*) *şafar*, which clearly proves that they were performing the same duty for which two different names were used.

⁷² MAD. d. 654 s. 195, 242.

⁷³ D.BŞM. d. 67, s. 2.

⁷⁴ D.MMK. d. 22694, s. 2.

⁷⁵ Ibidem; Срђан *Katić* и Татјана *Katić*, “Насеља и становништво Гокчанице у средњем и раном новом веку”, *Гласник Етнографског института САНУ LXV/2* (2020) 403–419.

⁷⁶ D.MMK. d. 22694, s. 2.

familiar with all phases of mining and smelting production, as well as supply operations. For instance, in 1589, in the Novo Brdo mine, the chief *şafar* with a daily wage of ten *akçes* was in charge of the work of 15 *şafars*.⁷⁷

In the Skopje mining superintendence there was a special supervisor, who controlled the work of all *jol* and *çarh şafars*. According to data from 1585, the supervisor of *şafars* oversaw their work in the mines of Janjevo, Novo Brdo, Trepča, Belasica, Priština (Zagrade), Zaplana, Žežna, Železnik (Ćiprovci) and Medna (Vraca). The supervisor's daily wage was 20 *akçes*, and at that time it was paid from the income of the Janjevo mine.⁷⁸

After three years, and perhaps at the end of the lease, the payment of the supervisor of *şafars* was transferred to the jurisdiction of another mine from the Skopje mining superintendence. In 1595, the Žežna mine was in charge of this. In the meantime, probably due to the number and distance of the mines, which were located in as many as four sanjaks (Vučitrn, Kruševac, Prizren and Sofia), two *şafars* supervisors were engaged for the same daily wage of 20 *akçes* – one received 14 *akçes*, and the other, probably his assistant, six *akçes*.⁷⁹

The appointment of the *şafar* supervisor was proposed by the chief supervisor – the *nazır* of the Skopje mining superintendence and the *kadı müfetiş* – inspector.⁸⁰ The supervision did not apply to horsemen *şafars*. The reason is that the duties of *jol* and *çarh şafars* required much greater expertise and responsibility. Therefore, the supervisor was obliged to evaluate the ability and performance of each of these *şafars*, which had an impact on their appointment to a new position.

It is also possible that the office of a *şafar* supervisor was created because, during the second half of the 16th century, the choice of *şafars* increasingly depended on the amount of warranty they could offer in a new lease, which meant that their expertise was not always at the forefront. Problems with uncollectible lease arrears resulted in the situation when large warranties were demanded from potential lessees and their partners. In the lease agreement, the warrantor's name, the amount of the warranty and the

⁷⁷ Ibidem. d. 22705, s. 13. Over time, due to inflation or differences in the lease agreement, its amount increased, so in 1602, the daily wage of the chief *şafar* in Kratovo was 13 *akçes*, and a few years later in Novo Brdo 15 *akçes*. Ali Emiri Tasnifi [=AE], SAMD I, 7/606/2; IE., Darbhane, 1/3.

⁷⁸ D.MMK. d. 22704, s. 9.

⁷⁹ On 4 March 1595, Pir Mehmed, the son of Hamid, replaced Christian Lazar in the position of the supervisor of *şafars* with a daily wage of 14 *akçes*. Two days earlier, Pir Ali was appointed in place of Hasan as the supervisor of *şafars* with a daily wage of six *akçes*. D.MMK. d. 22705, s. 43.

⁸⁰ D.MMK. d. 22704 s. 9; D.MMK. d. 22705, s. 43.

service, whose obtainment they conditioned, were recorded. *Şafars*' warrantees usually ranged between 10,000 to 20,000 *akçes*.⁸¹ Thus, warrantors assumed joint responsibility for a potential business failure, while at the same time receiving the desired services and a share in profit. On the other hand, even in the case of leases that were not expressly based on a warranty, lessees often defined the choice of *şafars* as a condition.⁸²

Even much earlier, *şafars* invested money in various activities, as evidenced by the data from the first half of the 15th century, recorded in Lukarević's book of debts. In the mining centres there were numerous business opportunities, which *şafars* took advantage of, including even those that were considered to be forbidden to them. In a kanun from the end of reign of Sultan Bayezid II (1481–1512) it is stated that *şafars* were forbidden to become share owners in *çahs*, which is uncritically stated in historiography as a blanket ban.⁸³ However, it did not refer to everyone, but only to the *çahs* in the mine where *şafars* performed their service. This is also confirmed by data from the second half of the 15th century from the census of share owners of 58 exploration *çahs*. Among them were a dozen *şafars*, who owned two, three or four ownership shares out of a total of 64.⁸⁴ Among the owners there were certainly also many of those who used to perform the service of *şafars*.

An in-depth analysis of the role of *şafars* in Ottoman mining in the later period, starting from the 20s and 30s of the 17th century, is almost impossible. At that time, mining production was already on a sharp decline, and the administration seemed to have stopped dealing with mining personnel. In the mine annual reports, in the part where data about the members of the mining administration and their daily wages used to be recorded, the daily wages of religious officials of local mosques and masjids were recorded, and only the total amount intended for the members of the mining administration was stated.⁸⁵ At the time, lessees were increasingly becoming *nazırs*, prominent courtiers, military commanders and local magnates, who were not interested in performing the service of *şafars*. Since then, the number of *şafars* was declining, as well as their participation in entrepreneurial activities.

⁸¹ D.MMK. d. 22700, s. 8; D.MMK. d. 22705, s. 50.

⁸² This did not only happen in large mines with numerous *şafars* but also in smaller ones. Thus, for example, in 1546, two lessees of the Kozja Glava and Lištje mines and their workers' *hâss* took over the services of the *emîn* and the scribe, and, in addition to the amount of their daily wages, they also requested to propose the *jol şafar* themselves. MAD. d. 21959, s. 78–79.

⁸³ N. Beldiceanu, *Les Actes* II, 112; S. Rizaj, *Rударство Kosova*, 121; A. Шериф, *Рударство во Македонија*, 59.

⁸⁴ Topkapı Sarayı Arşivi d. 5337/1.

⁸⁵ TS. d. 6877/1; MAD. d. 15214.

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Срђан Катић

ШАФАРИ У СРЕДЊОВЕКОВНОМ СРПСКОМ И ОСМАНСКОМ РУДАРСТВУ

Резиме

Термин шафар донели су у српске руднике саски рудари. Он потиче од старонемачке речи *Schaffer* и значи управник, надзорник. Шафари нису били тема посебних радова, а у монографијама о рударству њихова улога није објашњена. У српској средњовековној држави и раном периоду османске власти радне обавезе шафара, њихов избор и начин финансирања нису били трајно утврђени и разликовали су се од рудника до рудника. Из тог периода ипак се могу извући одређени закључци о шафарима, а то је да су им послодавци најчешће били власници цехова и топионица, да се временом уместо у руди исплаћивани у новцу, као и да је први покушај решавања њиховог статуса учињен у руднику Кратово, увођењем посебне дажбине шафарије. Тек после рударских реформи султана Сулејмана Величанственог 1536. године сви шафари постали су чланови рударских управа и заједно с емином и писарима и исплаћивани су новцем од закупа државних прихода у рудницима.

Постојале су три основне врсте шафара, који су надзирали рад рудника, топионица и опскрбе потрошним материјалима. Шафар задужен за надзор подземних радова називан је жолски по жолу (од нем. *Jol*), дну штолне. У највећим рударским средиштима било је по четири, пет, па и шест одвојених рудника. Жолски шафари су најчешће били задужени за један такав рудник, али су у зависности од величине могли да опслужују и два мања, или део једног великог рудника. Као посебне врсте рудничких шафара који се помињу само у ретким рудницима били су шафари истражних радова - пауна, хоризонталних поткопа – штолни и испиралишта руде - плакаоница. Шафари топионица називани су по воденим колима колски шафари или персијски чарх шафари. Они су били задужени за надзор 15 до 20 топионица. У највећим рударским регијама попут Сидрекапсе било је пет шафара задужених за пет топионичарских области. Шафари опскрбе називани су и шафари коњаници, а у Грчкој шафари ћумура. Они су били најбројнији и обично су чинили половину укупног броја шафара. Поред рудника и топионица опскрбљивали су и највеће ковнице новца, као и тузланске солане.

Закупци царских прихода у рудницима сребра најчешће су бирали да током закупа обављају службу шафара чархова, а ређе емина или главног писара, док је то у рудницима бакра било супротно. Закупци рудника гвожђа и сланих извора у Горњој и Доњој Тузли најчешће су били шафари коњаници, због велике потребе за ђумуром и дрветом. Временом су службе шафара све више преузимали и закупнички јемци, што је све више доводило у питање њихову стручност.

То је вероватно и довело до стварања службе главног шафара у највећим рудницима, као и службе надзорника шафара у Скопском рударском назорништву, задуженом за петнастак рудника у санџацима Вучитрн, Крушевац, Софија и Призрен. У том надзорништву постојао је и посебан шафар гвозденог алата, који је набављао у руднику Гошчаница, чије је гвожђе имало природна својства челика и њиме снабдевао све руднике у надзорништву.

Службу шафара српски рудари пренели су у Анадолију. Један од њих био је топионичарски стручњак Сава, који је почетком седамдесетих година 16. века с десетинама рудара из Новог Брда и Кратова учествовао у отварању рудника сребра Инегол код Бурсе. Сава је годинама у Инеголу био проценитељ чистоће сребра и злата, а 1578. године постао закупцац рудника Инегол, обављајући управо службу шафара чархова.

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