

# UN MILENIU ȘI JUMĂTATE DE MINERIT AURIFER LA ROȘIA MONTANĂ A MILLENIUM AND A HALF OF GOLD MINING GOLD IN ROȘIA MONTANĂ

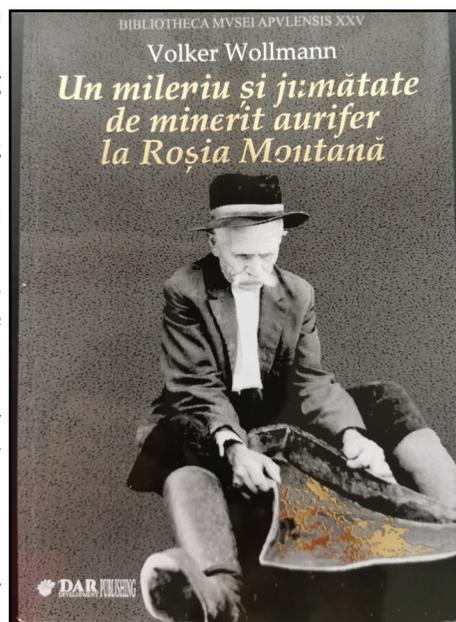
Volker Wollmann, DAR Development Publishing, BIBLIOTHECA MVSEI APVLENSIS XXV,  
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The book is dedicated to the long-term mining activity in the Roșia Montană gold site, the best known in the history of the extractive industry in Romania, both due to the evolution of mining technology over a millennium and a half, and the steps taken in recent years to stop initiating a project to resume mining, a project proposed by a Canadian company that could have destroyed a local resource as precious as gold, surface cultural heritage and underground.

The presentation of a mining site so important from a historical, cultural, architectural and technical point of view, whose multiple valences recommended it to be inscribed on the tentative list of UNESCO heritage and still awaiting the final decision, could not have been better analyzed than by the famous historian Volker Wollmann. He has dedicated a large part of his professional activity contributing to the transmission of a rich volume of information about the elements of industrial heritage on the Romanian territory. Coming from a family of Saxon intellectuals, professor and researcher Volker Wollmann has been deeply attached to history since adolescence, his main research concerns being related to the civilization of Roman Dacia and the history of technology, especially mining (Ardevan, 2012).

The book is structured in 14 chapters and is organized in a logical structure, the author presenting the evolution of the Roșia Montană gold site from its beginnings, which debuts from the period when Dacia was part of the Roman Empire, until 1918.

The profile of the researcher focused on explaining the details of the name of the locality, which became known since Roman times as "Alburnus Maior", justifies the presentation of a history of research that has been carried out over time, starting from the first historical sources, waxed tablets, found by locals in several galleries, dating from the Roman period; the most numerous batch of tablets was discovered in 1855 at the Cătălina-Monulești mine. These tablets, which are considered unique due to the excellent degree of conservation they had at the time of their discovery, provide important details about the economic aspects of mining in Roșia Montană. The tablets are considered extremely valuable texts of Romanian civil law, providing information on sale-purchase contracts, services (salaried work), loan with interest, association agreements, records of expenses and prices, etc. Considered primary documentary sources, invaluable for deepening the knowledge related to the extractive activity in Roman Dacia, the waxed tablets were the basis of several scientific papers belonging to various Romanian and foreign authors: Ioan Baltariu, Tudor Dumitru, Hans-Chirstoph Noeske, Pólay Elemér, etc. On the territory of



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Roșia Montana were discovered other inscriptions preserved on lithic material, or other isolated inscriptions. The number of archaeological discoveries increased after 2000, following the request of the Canadian company S. C. Roșia Montană Gold Corporation S.A. to initiate extensive research (archaeological excavations with a rescue character) to assess the archaeological potential in Roșia Montană, a measure imposed by national legislation, as a prelude to the granting of a gold mining license in this area. Archaeological research was carried out by a team of French researchers, led by Béatrice Cauuet. The results of the researches undertaken on very large areas, highlighted the antiquity of gold mining in Roșia Montană, since the Roman period, by dating made with C-14, highlighting the trapezoidal shape of underground galleries in the Roman period, made similarly to other other gold mining from other parts of Europe (Las Medulas site, Spain) (Merciu et al., 2015).

The author mentions the existence of archival funds kept at various County Services of the National Archives of Romania that contain relevant documents for the reconstitution of the mining activity in Roșia Montană starting with the first half of the 18th century. From this moment until the First World War, no special archival funds were created for the mining activity, but important sources of documentation are represented by the mineralogical-geological works.

In the next chapter, Volker Wollmann presents the archeological testimonies that attest the continuity of the population and the practice of the mining activity in Roșia Montană, as well as in the adjacent area including after the Aurelian retreat in the following centuries until the conquest of Transylvania by the Hungarian royalty. After the Aurelian retreat, the local population continued to practice the extraction and processing of metals in the Apuseni Mountains (gold, iron, copper), fact proved by the takeover and transmission of technical terms, but especially by toponyms and hydronyms that refer to the existence of gold in this area. The exploitation of precious metals will regain its importance and scope after the assimilation of the Slavs by the native population, starting with the 8th century (e.g. formerly called Ampelum, Zlatna is a word derived from the Bulgarian language meaning gold). The native population, called "băieși" – workers in a (gold)mine, practiced mining on a small scale, exploiting the mines abandoned by the Romans, until the conquest of Transylvania by the Kingdom of Hungary, which was determined by the resources of salt, gold and silver in this area.

The third chapter, entitled "The period of the establishment of the Kingdom of Hungary", presents the conditions of exploitation of precious metals in Transylvania in the new political context that determined the colonization of German miners in the area. The kings of Hungary imposed the conditions of gold exploitation that took place both in the former mines created by the Romans and on the lands of the native population or of the settlers who were put in possession of land within the province (gold mining from river alluviums was practiced, using "șteampuri" – mills made of wood for grinding gold). The lands on which precious metals were discovered remained the property of the owners, provided that 2/3 of the production obtained was handed over to the royal treasury. The gold production made in the Apuseni Mountains had to be exchanged at the Royal Treasury, at the official price set by the king, respectively at the Treasury of Sibiu. Most of the time, the king leased the Treasury to wealthy townspeople, with a certain social status, as a rule, to the mayors of Sibiu. During the Angevin dynasty, some mining towns in the Gold-bearing Quadrilateral of Transylvania also received mining privileges (e.g. Baia de Arieș, Abrud). The result of these measures was the interest of feudal owners in the development of precious metal mining, and landowners initiated a real campaign to exploit subsoil resources. Over time, there is a greater penetration of urban capital in mining activities in the Apuseni Mountains (e.g. mining operations in Baia de Criș are undertaken by the Saxon Count Petrus Haller, the Jude Nicolae Lazăr, and the merchant from Brasov, Johannes Benkner). There is also an increase in foreign capital that has penetrated the mining, especially in the exploitation of salt in Transylvania, of some very influential

families in Europe.

Chapter four presents the situation of mining in Roșia Montană and its surroundings during the Principality, marked by the entry under the rule of the House of Habsburg. A new mining legislation is proposed in successive phases: in 1550 King Ferdinand I (King of Hungary) began the reorganization of mining by drafting laws (e.g. the sale and export of gold and silver were forbidden); In 1573, Emperor Maximilian II developed a new mining regime based on the Austrian mining law, without taking into account the customary law of the local mining population in the Apuseni Mountains: the privilege of exploiting precious metals was conditioned by the obligation to hand over the eighth part of production to the state. The Treasury income of the tax from gold extraction increased significantly, especially since the mining technique was perfected, but also as a result of a more intense exploitation. On the other hand, the value of the precious metal was increasing. A substantial contribution to the development of mining technology was also made by the local population who had a long tradition and experience, managing to ingeniously perfect the gold mining craft. From the beginning of the 17th century, several documents have been preserved, from which it appears that there were numerous mills on the Roșia and Corna Valleys: ex. at the foot of the Cărnic Mountains (located on the territory of Roșia Montană) there are 77 mills.

In Chapter 5, the author presents details about the techniques that revolutionized mining in Transylvania in the seventeenth and eighteenth centuries. Thus it is presented the evolution of metal or salt mining techniques is presented: from hydraulically operated wheels, which set in motion the arrows of the mills that ground gold and iron, the exploitation in the form of a bell used as a technique for detaching salt blocks, horse-operated winch, a rudimentary installation used to pulling out salt and metals to the surface, up to elements of the industrial revolution: in Zlatna there was a steam machine for processing metals, the first in our country (1839); simple techniques for draining infiltrated water from underground exploitation areas were also used, techniques also utilized in the mines from Roșia Montană. In the Apuseni Mountains, traditional mining techniques were practiced until the 19th century by the local population (the "băieși"/miners). In Roșia Montană, were used wooden carriages with wheels, initially also made of wood, later made of metal, in the middle of the 18th century, in order to bring the exploited gold to the surface. This type of wagon, called "râznă", was used until the nationalization, in 1948. In antiquity, gold was taken out in wooden troughs (elongated wooden vessels) carried on the shoulder. The ore crushing tools provided the operation prior to the washing process. The mills, originating from the Apuseni Mountains, which were operated by the hydraulic force, had several batteries provided with 6, 9 and then even more arrows that shattered the gold. At the bottom, the arrows were provided with clogs, initially made of hard stone, later of steel.

In the next chapter, the author analyzes the evolution of mining activity in Roșia Montană in the 18th century under the influence of Austrian mercantilism. Starting with the second half of the 17th century, mining did not progress, amid an economic downturn felt in Transylvania after the death of Prince Gabriel Bethlen. Efforts to recover Transylvanian mining were undertaken by Emperor Leopold I: i.e. the re-establishment of the treasury in Alba Iulia, in 1701, which had been out of use for many years, the bringing of specialists from Lower Hungary, the Gold Exchange Office was moved to Abrud, the establishment and sending to Transylvania of commissions to investigate in detail the subsoil resources. These measures favored the reorganization of Transylvanian mining as early as the first decades of the 18th century, when the Vienna Court made it a political-economic program. Beginning in 1699, a chamber commission headed by the prefect of mines of Upper Hungary, Baron Ludwig Albert Thavonat, was sent to Transylvania, accompanied by several specialists. The results obtained by the members of this commission were represented by: drawing up a map of the mining regions, researching the composition of

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the ores and the administration of the fiscal goods. From the 18th century onwards, mining exploitations were named after the monarchs during whom they were opened. Over time, in order to increase its income, the tax authorities took measures to encourage mining: due to the lack of water during the dry summers that slowed production due to the malfunction of the mills, measures were taken to restore artificial lakes and build new ones; the purpose was that the villagers who had mills in the valley, encouraged to have water, would build other mills, and would pay an annual fee of one or two gold florins for the use of this energy; in this way, the state would recover its expenses and gold production would increase.

During the reign of Empress Maria Theresa, measures were taken to revive the institution of the Treasury, which also had implications for the Treasury of Transylvania. Measures were taken to stimulate mining activity: repairing the collecting lakes and opening a new mine in Cârnic Mountain (from Roșia Montană), increasing the volume of gold exchange, re-exploiting the old mines. To remedy the lack of qualified staff, 9 specialists from Upper Hungary were brought in to train the few local specialists. The authorities were concentrated in Zlatna: the mining court, the mercury store, the mining inspectorate and the Central Exchange Office.

In the next 2 chapters are presented by the author two important galleries from Roșia Montană: the main galleries "Holy Trinity" and "Orlea". Mining has been practiced in the Cârnic Massif since the Roman period. This massif has been described by several authors, the oldest representations dating back to the 18th century in the book of the Jesuit monk, Joannes Fridvaldsky, which locates exactly the perimeter in which the mining operations of Roșia Montană were extended. At the same time, the mineralogist Fridvaldsky offers some relevant details about the mills from Roșia Montană. The "Holy Trinity" gallery was excavated by order of Empress Maria Theresa, who set out to continue the policy of Leopold I and Charles IV to encourage mining in Transylvania. It allocated the sum of 5,000 florins for the opening of a main gallery in 1746, at an elevation of + 798m, having a vital function for other works opened in this massif. Being a main gallery (called "Erb-Stollen"), it also served to collect infiltration water from a larger area. A mining map for the construction of aeration well is dated July 1748. As a very hard sedimentary rock was identified during the excavations, gunpowder, mentioned for the first time, was used to continue the excavations in the gallery. Due to the large amount of gunpowder, the air was almost unbreathable, so ventilation pipes were made. For the processing of extracted gold, 2 mills were built in 1755: one with 9 arrows, under the Orlea lake and another with 6 arrows, just below the landfills of the "Holy Trinity" gallery, which were driven by the water collected in this gallery, supplemented with water that he was to be brought from the Dosului Valley, where the arrangement of a new one had begun.

The "Orlea" gallery represents the main gallery from the homonymous massif, which started to be excavated in 1782, being provided with a ventilation shaft. The Orlea massif was very famous due to the large number of gold veins. Due to the fact that on the last section of the Orlea gallery several profitable veins to be exploited were identified, it was reinforced with massive masonry in the vault. In addition to the ventilation shaft, two ventilation ducts made of wood were arranged, provided on the surface with huge funnels for capturing the air needed in the gallery, especially for heat, for lighting, considering that at that time they were still used open lamps. Because the excavation of the Orlea Gallery, which in some parts was made of hard rock, required the use of a large amount of gunpowder, a new powder storage tower had already been designed in 1786. A report from 1783 shows that at Gura Roșiei (located near the Orlea gallery) there were 33 high-performance mills. By the end of 1789, the Orlea gallery had reached a length of 855 m, which required the arrangement of a new aeration shaft of 31.5 m vertical depth, intended for the evacuation of ore, which is why it was also called the main extraction well. From the legend of a mining map from 1792, it appears that the Orlea gallery had a length of 1260 m. So far, 75

mills have been built and it was necessary to widen the road on which they were built, because it was necessary to transport larger quantities of ore extracted from the underground using ox carts instead of horse transport that could make only one transport per day.

In the 10th chapter, the author analyzes the development of mining in Roșia Montană between 1850-1867, when the problem of practicing, for the first time, a surface mining arose and there were proposals made for a more efficient transportation (creation of a railway to transporting gold extracted from the Orlea massif) and a preparation plant. In 1851, a water supply canal was built in Abruzel (a tributary of the Roșia River), and also a dam was built at the point of discharge into Abruzel. A preparation plant was also built in Gura Roșia in 1851, consisting of metal parts ordered at the Reșița plant. The preparation plant was put into operation in 1852. The need to build the plant was determined by the fact that the 5 collecting lakes, which supplied water for hydraulic energy for mining in Roșia Montană, did not have enough capacity to provide a full amount of water needed for the mills for a year. The plant had a hall with crushers, built so that the ore could tip over through the roof, from some specially arranged ramps, directly to the crushing batteries. For grinding the gold, the plant was equipped with 90 wooden arrows, each weighing 70 kg, grouped in 5 batteries with 15 arrows each, driven by hydraulic force (7 hydraulic wheels). The plant also had 60 amalgamation mills, grouped by 12 in front of each battery, 4 pyramidal decanting tanks, etc.

The narrow railway was built on a length of about 3200 m, on the left bank of the Roșia Valley, between the Orlea gallery and Aprăbuș, being also provided the arrangement of a ore storage place at Aprăbuș. A wagon weighed 275 kg.

In the next chapter, the author presents the architectural evolution of the most important surface constructions of the main mining galleries in Roșia Montană, created with the construction of the Orlea gallery: aeration shafts, extraction wells, powder tower, blacksmith workshop administrative buildings (mine direction, topographic office). The author also refers to the houses of the mining engineers, the foremen, built near the galleries.

In the 19th century and the beginning of the 20th century, the mining activity at Roșia Montană experienced intensification. At the same time, the town is visited by scientific personalities who evaluate the gold resources: mineralogist and professor Gustav Tschermak, who conducted a study calling Roșia Montană "The focus (center) of the gold industry in Transylvania"; the famous geologist Gerhard vom Rath who undertakes in 1873 or 1874 a visit to Transylvania in order to know the "mineralogical oddities" from Roșia Montană and Săcărâmb; the geologist Cornelius Doelter y Cisterich undertakes a geological study of the Ore Mountains after the discovery of gold veins. Quite rare is the information related to the technical aspects related to gold mining during this period, various foreign geologists publishing specialized articles in specialized journals in Europe.

In the penultimate chapter, the author makes a description of the social and cultural objectives of Roșia Montană: the concern for the health of the population is noticed, which determined the establishment of dispensaries by the fiscal montanistic forums; the elementary school was built in the 18th century from massive masonry, it can still be seen in the central part of Roșia Montană; a mining school also operated with the support of the Budapest Ministry of Finance. The multiethnic character specific to the mining settlements due to the periodic colonization with populations specialized in mining extraction and processing techniques explains the presence on the territory of Roșia Montană of several churches: Unitarian, Greek-Catholic, Roman-Catholic and Orthodox.

The last chapter is dedicated to the presentation of the Abrud-Roșia Montană pisetal fund, which was established in 1790 and operated under the Abrud Gold Exchange Office. Initially, the fund was used to remunerate the licensed doctor, the midwives and provide pensions for widows and orphans. The

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money left in this fund had to be invested in mining, in order to obtain higher incomes, from which to help the poor miners, unable to work, or for medicines. In exceptional cases, money was also borrowed from this fund for other purposes of public interest, for example, in 1824 the amount of 200 florins for the maintenance of the road leading from Abrud to Zlatna.

At the end of the book, Volker Wollmann dedicates the last pages to introduce Franz (František) Pošepny, the author of the geological-mining map for Roșia Montană (1866-1868).

The book written by the historian Volker Wollmann is the result of preoccupations about the history of mining in the Apuseni Mountains, which materialized in his doctoral thesis, preoccupations that he continued over time, the author paying special attention to mining in the site Roșia Montană gold site, for whom he consulted many documentary sources, including some foreign authors, as well as numerous archival funds kept at various County Services of the National Archives of Romania.

The book on mining in the Roșia Montană mining site reflects an evolution over a millennium and a half and includes significant details about the history and technological evolution of mining in one of the most important industrial sites in the country. At the same time, the historian Volker Wollmann brings to the fore social and cultural aspects that have been associated with the practice of mining in Roșia Montană. Last but not least, the historian describes the hard life of the local miners (băieși) who had a significant contribution to the development of the mining activity and of the socio-cultural life of Roșia Montană.

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