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ABOUT SALT EXPLOITATION FROM OCNA MUREŞ SALINE - ROMANIA

Prof. Phd. NICOLAE LUDUŞAN, assoc.prof. PhD. MONICA ANGELA BARA
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ABSTRACT: *Salt exploitation at Ocna Mureş has been done since antiquity. The Dacians and then the Romans, exploited the salt here without interruption. In the Middle Ages salt was exploited and then transported by carts to Portus (near Alba Iulia), then to the Mureş River, to the center of Europe. Exploitation continued in the modern age when, with raw salt, an important branch of the chemical industry, the chlorosodium industry, has developed.*

Keywords: *salt; exploitation; transport; Mureş river; medieval mines;*

In Transylvania, exploiting salt goes back to the Dacian-Roman period, in towns with old traditions in the field, such as the exploitations from Turda, Ocna Mureş and Ocna Sibiului.

The town of Ocna Mureş, known since the oldest times, is located on the left bank of the Mureş river, at 265 m altitude, being surrounded by the Banţa Hill, with steep slopes near Mureş on which several fortified settlements have been built along the centuries. The documentary attestation of the town appears in 1202, under the name of "the Vyuuar villa" (Doc. Rom. C., a I 21), being united with the settlement of Uioara de Sus.

The whole area is placed on a gigantic mass of salt, respectively a diapiric structure, that lies on an area between the Banţa Hill and the bank of the Mureş river (fig.1) [1, 2].

The upper side of the structure pierces the upper formations in an area situated at less than 500 m from the civic centre of the town, where the first galleries were dug and where the Dacians discovered salt 2000 years ago. Before the area between the Carpathians was occupied by the Roman army, in the neighbourhood of the town of Ocna Mureş, the Dacians created the "Marisiodava" location, mainly inhabited by the miners who were exploiting the deposits situated dozens of metres below the ground.

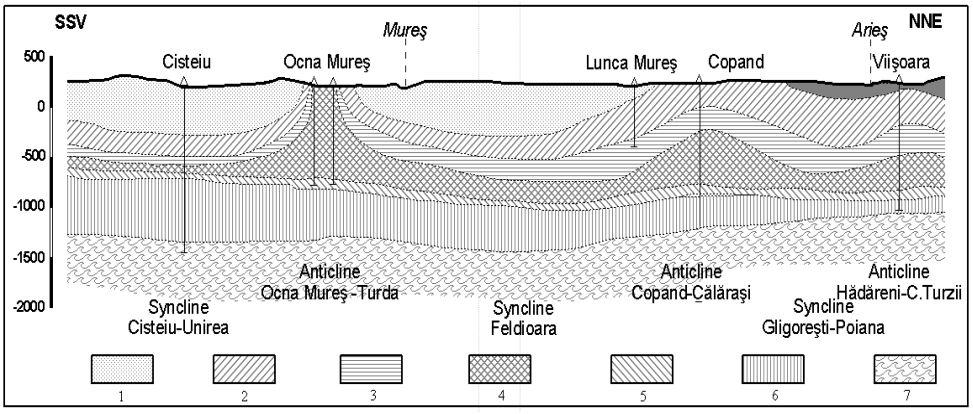

Fig. 1. Geological section through the salt structure Ocna Mureş - Turda
1-Sarmatian, 2-Buglovian, 3-Higher Badenian, 4-Lower Badenian (the horizon of the salt), 5-Burdigalian - Helvetian, 6-Eocene - Oligocene, 7- crystalline foundation (according to: Stoica, Gherasie, 1981)

During the Roman administration, the town was known under the name of "Salinae", being one of the most important exploitations of salt in Dacia. The miners, that used to be slaves and freed Roman slaves, were extracting salt from underground galleries, in rooms that were 15-30 meters long, 8 meters wide and 15 meters deep. The special importance of salt for the Romans is emphasized in the history of the words "*salariu*" and "*solda*" from the bag in which the Roman soldiers put the salt, which constituted good payment for their services, called "*salinarium-salarium*."

Salt exploitation continued in the Middle Ages as well, in the same rhythm and, apparently, with the same technologies. According to some historians' hypotheses, medieval exploitations, that were more developed than the ancient ones, were opened near the Roman ones, using a part of the old work.

A special role in developing salt exploitation was played by the Mureş river which, for a long period of time, constituted an important way of communication and transport. The written and unwritten proof show the fact that ever since ancient times and up to the modern period, rafting has been practised. The transported materials varied, but most of the kept notes refer to the transport of salt.

The first writings referring to sailing on Mureş go back to the period of the Roman times. Thus, in an inscription from Apulum, a "*Collegium nautorum*" is mentioned, an association of the shipmen on Mureş, and a "*genius nautorum*" is represented on a bas-relief. These artefacts show the fact that rafting, and probably with the help of small ships as well, played an important part during the Roman administration in Dacia. After the Romans' withdrawal, there were no more references on this topic for a while, which did not mean that rafting was not practised anymore.

Starting with the nineteenth century, mentions of rafting on the Mureş river can be found in different documents. Thus, the "Annales Fuldenses" mentioned that at the end of the ninth and the beginning of the tenth century, salt was exported from Transylvania to Moldavia; there were even tax collectors and guardians whose mission was to collect tax for the boats that were transporting this kind of salt on the Mureş river. "Anonymus's Chronicle" and "St. Gerard's Legend" also mention the existence of guardians and tax collectors in the early eleventh century, employed by king Achtum to collect taxes from the raft men that were coming from Transylvania on the Mureş heading for the Tisza river, for the Hungarian kingdom. A document from 1075, issued by the king Geza I, mentions for the first time the salt tax collecting from Turda, located on the Arieş and Mureş rivers [3].

In the following centuries, references to salt transportation on the Mureş multiply. References are also made to certain privileges or rights that came from exploiting, storing (in the so called "salt rooms") and transporting salt. Besides the notes from the official documents, references to the given topic can also be found in the notes of foreign chroniclers or travellers who walked these lands. Thus, Nicolaus Olahus (1493-1568) in "Hungaria", chapter 19, wrote: the salt which is dug and cut in Transylvania is usually transported by raft on the two rivers, Mureş and Someş up to the Tisza and there it is distributed and given for sale in all Hungary. David Frolich (1595-1648), in "Medulla Geograpihae Practicae", chapter 10, also mentions that: in Transylvania there are three rivers that can be sailed on: the Criş, the Mureş and the Olt.

But the most important story related to exploiting and transporting salt is due to Hans Dernschwam "De Hradeczin" (1494-1568), Hans Alber's cashier, Fugger's Factory manager in Buda. Sent by the houses of Fugger and Turzo, the managers of the salt mines exploitation, to evaluate the state of the salt mines, he also refers in his report to the transport of salt on the Mureş river.

Speaking about the carriers, he wrote that they *"… loaded the salt and carried it on to a village called Decea, they took it to the bank of the river and unloaded it there… In Decea, a big storage room should be built, in which salt could be deposited so that it cannot be stolen or ruined by rain. As salt often had to stay there for a long time, until the river was flooded by the rains in the spring and the snow melted down; that is why this storage room is necessary. Salt is not shipped abroad in autumn as waters do rise. In Turda, rafts for transporting salt are built; there are big and small rafts, having the same shape as the extremely large rafts. Then they are transported on the Arieş until they get to Decea, on the Mureş river ... Those that have rafts and earn their living with their help are called 'celeristi'… After Easter, when the river's waters begin to rise, the rafts are loaded in Decea, leave Transylvania and go to the other areas"* [3].

In the eighteenth century, more subsidiary or transit warehouses are mentioned, among which the one from Mirăslău as well. References to this warehouse are also present in the notes about the 1784 rebellion, when, the baron Seeberg, from the warehouses of Mirăslău, enlisted the inhabitants of Decea and the raft men of Mirăslău in the future border regiments.

For a long time after the Roman period, especially in the Middle Ages, the town of Partoş, today a neighborhood of Alba Iulia city, played an important role in the transport of salt by rafts on the Mureş river until the place where it flows into the Tisza, transport that dates back to the pre-Hungarian period. Partoş is mentioned in the documents written in Latin letters under the name of *"Portus,"* from which the name of Partoş derived or under different names such as : "villa Salis" (the salt village), "Salzdorf" (the salt village), "Salgafen" (the salt harbour). In the time of the Habsburg domination, the chronicles show that Partoş was the most important subsidiary for depositing and transit of the salt, from where it was transported by raft and by the ferry pulled by horses to the great cities downstream the mines and even up to Budapest. The raft men dealing with salt transportation were called 'heiuşi', which many inhabitants of the Alba Iulia have as family names.

The transport of salt by raft on the Mureş river stopped in 1871, when the railroad Teiuş- Războieni was put to use, which absorbed the whole salt transport.

The intensive exploitation of salt led in time to an instability of the ground, thus affecting the area. The ceilings of the exploitation rooms fell. The first time the stability of the underground was affected was in 1791, when the Roman and the medieval mines, that were situated under Ocna Mureş, were flooded by the Mureş river. In the same year, the exploitations were resumed, new hall-shaped galleries being opened, and Ocna Mureş became the most important salt exploitation in Transylvania of the eighteenth-nineteenth centuries.

The water that came from floods dissolved in time the salt layer and in 1913, the first landslides occurred. During World War II, the main street, that was actually the civic centre of the town, sank as the ceiling of the medieval mines Ferdinand, Iosef and Stefania collapsed. A similar phenomenon was registered in 1972, when the last houses on the mentioned street collapsed into the salty water, buildings that had once hosted a pharmacy and a bookshop.

Despite all these inconveniences, the exploitation of the deposit in the mining system continued until the late twentieth century. In 1952, the method of salt extracting using drills was introduced for the first time in the world, through the salt pipes method, a procedure protecting the upper side of the deposit and, at the same time, the stability of the ground.

The studies and the measurements that were systematically taken emphasize the fact that the ground layer is not perfectly stabile and that the land on which the buildings

were constructed has the tendency to subside by 2 mm/year, but this does not mean that there is no immediate danger for the town to sink. In the 1970's, there were some infiltrations in the gallery walls, and breaking a wall let the water get in and flood a gallery completely. Despite the fact that the water from the mines is deep enough, the waters that flood the water table make the salt layer thinner, weakening the ground strength.

The solution for saving the town would be to build some drenching canals on the Banţa Hill in order to avoid the water circulation into the water table and the flooded mines.

Despite all these, every time it rains heavily, the salt layer gets a little thinner and the resistance of the ceiling of the halls on which Ocna Mureş was built decreases, the danger becoming greater by the year.

In order to avoid a ground collapse, the company Salina, which exploits the salt deposits, builds clay backfills on the banks of the salted lakes in order to stop erosion. Nevertheless, in the case of heavy rain or an earthquake similar to the one on October 3, 1880, that started in the Gâmbuţ-Ozd area, with a seismic intensity of almost seven degrees, a good part of the town of Ocna Mureş could become a lacustrian town in just a few minutes.

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