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OVERVIEW OF SALT DEPOSITS IN POLAND

Abstract

It is a well-known fact that the basis for the existence of mines are minerals (i.e. deposits thereof). Within the present-day borders of Poland, salt deposits are related to two areas. Both are designated by the occurrence of evaporates belonging to epochs distant in time: Zechstein and Miocene.

Rock salt of the Miocene epoch occurs in a belt of parallel latitude designated by the border of thrusting over of the Carpathian flysch formations. In these areas, tectonic enrichment of the evaporates took place as a result of scraping them from an area with a width of several dozen kilometres. Tectonic accumulation of salt resulted in emergence of deposits with utility characteristics in several places. Bochnia and Wieliczka are the oldest centres where salt mines were built. The deposits were examined gradually, starting from the Middle Ages, in the course of their exploitation. Such long period of production activity also includes present day utilisation of water from the Wieliczka Salt Mine performed in the saltworks nearby.

Production of evaporated salt in the area of Lesser Poland adjoining the Carpathian Mountains constitutes a separate thread in the history of economy. The presence of active salt springs in this area in the middle Neolithic period changed the mode of life of nomadic groups of people. From hunters and gatherers, they transformed into settled producers of evaporated salt. Activity in this area of economy continued to develop until the Middle Ages, when deposits of rock salt were discovered. Since that moment, salt evaporation has been combined with mining activities. Salt brine extracted from the mine provided material for the saltworks operating on the surface; exploitation of rock salt was performed in parallel. Such a state of affairs continued until 1724. At the beginning of the 19th century, attempts were made to reintroduce the production of evaporated salt, yet it was eventually reinstated in 1913 after opening of saltworks near the Kinga Shaft. Therefore, it may be stated that a salt-making centre has existed here for several centuries which, in a certain period, was extended onto a mine. Nowadays, apart from ongoing securing work and control of the

state of the mining pits, the basic activity of the salt mines in Wieliczka and Bochnia is limited to the tourist, recreational, entertainment and spa offer. The long production history of the salt deposits is today testified by salt evaporation, initiated already in the Neolithic Age. One may venture saying that after the industrial activity has ceased, a certain return to the sources took place: unfortunately, not the salt spring sources, as they ceased to be active a long time ago. In Wieliczka, the resources are provided by salty waters of the mine and in Łapczyca near Bochnia (SALCO company), rich brine is procured from boreholes. Therefore, today only these two centres make references to the distant salt evaporation traditions.

A thorough picture of the genesis of sub-Carpathian salt deposits and the operation of both mines with respect to historical, cultural, technical and natural issues is contained in the display and publication offers and presented during events organised by the Cracow Saltworks Museum Wieliczka. The institution tries to be a centre collecting information about the history of the salt mining industry in Poland, with special attention given to the oldest salt mines in Bochnia and in Wieliczka. The rank of both facilities is confirmed by the entry in the UNESCO World Heritage List: on 23 June 2013 both mines were entered in the list as the Cracow Saltworks along with the Saltworks Castle (the Salt Mine in Wieliczka was entered in the list on 9 September 1978).

Bearing in mind such finale of the story, it is worth appreciating the causal factor of nature examined and described by geologists. It was included in numerous studies investigating the genesis of Miocene salt deposits. Examination of the geological structure of deposits and, subsequently, relating their genesis to regional processes, forms a separate part of history. It may start with practical mining activities which, already in the 17th century, found their expression in maps illustrating the situation of mining pits (Marcin German, William Hondius). Conclusions about the form of the deposit may be drawn from them. Questions about its genesis were probably asked earlier. Systematic geological studies commenced in the 19th century focused more on the Wieliczka deposit (Ludwik Emanuel Hrdina, Jan Nepomucen Hrdina, Julian Niedźwiedzki and others). In the course of time, the structure of the deposit was connected to the regional scale of geological processes. Among an incomplete list of researchers discovering the secrets of the Miocene salt, it is necessary to mention the names of Antoni Gaweł, Józef Poborski, Kamila Skoczylas-Ciszewska and Aleksander Garlicki. The work of geologists led to the examination of subsequent deposits. The knowledge gathered during these studies offers a beautiful illustration for the determining relation between geological processes and the mining history of the region.

Contemporary stages of exploitation of Miocene salt are designated by the presence of deposits in Barycz, Łężkowice and Siedlec-Moszczenica. However, all of the mining centres related to them ended their operation before the end of the 20th century. Deposits documented in Rybnik and Wojnicz constitute some type of a reserve from this period.

Today, their future is unknown, yet a description of their structure also constitutes an important supplement for the knowledge about the formation of Miocene salt series in the area of thrusting over of the Carpathian flysch and outside of it.

There is a series of archaeologically documented production sites of evaporated salt dating back to the middle Neolithic period. They occur in the vicinity of later salt mines. Other centres with the tradition of salt evaporation are hidden behind the name of spa resorts: Iwonicz Zdrój, Rabka Zdrój, Busko Zdrój, and these that aspire to such role, making references to the salt-working past, e.g. Sól, Sołonka, Dębieńsko, Dębowiec and Zabłocie.

The Zechstein evaporates are related to mining centres located on the deposits discovered in the 19th century. At that time, Inowrocław appeared on the map of salt mining and slightly later Wapno. Both centres already have historical significance, nowadays modestly reminded by the artefacts (e.g. geological specimens) and by descriptive and photographic documents in greater numbers. It is also necessary to mention much older traditions of producing salt from salt springs located on the surface. In Kujawy, such activity already took place in the ancient times; traces of a graduation tower from the beginnings of our era were discovered in the area of present-day Inowrocław.

In post-war economy, salt from the Zechstein deposits started to play a growing role. New deposits were documented and subsequently exploited in diapir structures, e.g. in Kłodawa, Góra, Mogilno and Rogóźno, Damasławek, Lubień and Łanięta. The exploited deposits are documented in higher categories, yet the basic data about the structure, such as the cap-rock, the salt table, the form of diapir, its size, resources and types of salt were determined for all. This also refers to bedded deposits in the region of Łaba and Sieroszowice–Kaźmierz.

As it turned out, numerous Zechstein salt deposits are fit for the construction of cavern storage facilities for liquid and gas hydrocarbons. Work in this direction was commenced in 1975 in the diapir deposit "Lubień Kujawski" and stopped in 1981. The first utility storage was established in post-exploitation voids (open pit exploration via leaching) of the "Góra" mine. Subsequent ones were established in "Mogilno" and "Mechelinki" deposits (the last storage facility in 1916). As can be seen from the examples presented above, the history of salt mining includes another aspect of application of salt deposits. It has to be emphasised that each decision on the possibility of opening a storage facility is related not only to the documentation of the salt deposit as such, but it also requires examination of its structure, properties of the rocks and geological structure of the neighbouring area.

The history of two locations is related to salt evaporation: in Kołobrzeg, it is slightly overshadowed by health resort functions and in Ciechocinek, one of the graduation towers continues to function in cooperation with saltworks. In both cities, salt tradition is to be connected to the presence of Zechstein formation of evaporates.