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SALT TREATMENT AS AN IMPULSE FOR INDUSTRIAL TOWNS' FUNCTION CHANGE

LECZNICTWO Z WYKORZYSTANIEM SOLI JAKO IMPULS DO ZMIANY FUNKCJI MIAST PRZEMYSŁOWYCH

Abstract

The article discusses the healing properties of salt and its application in various methods of spa curative treatment. The discussion serves as the background for presenting the origins of Polish and foreign spa resorts which are now able to function due to making use of post-industrial salt making facilities – mine working pits and brine graduation towers. Special emphasis has been laid on the character and consequences of the transformations of salt making towns, where industrial salt production has given way to spa treatment activities.

Keywords: salt making industry, spa curative activities, brine boiling, salt mining, town development

Streszczenie

W artykule omówiono lecznicze właściwości soli i jej zastosowanie w różnych metodach lecznictwa uzdrowiskowego. Na tym tle przedstawiono genezę polskich i zagranicznych uzdrowisk, które współcześnie funkcjonują, wykorzystując poprzemysłowe obiekty związane z pozyskiwaniem soli – wyrobiska górnicze w kopalniach oraz tężnie solankowe. Szczególną uwagę zwrócono na charakter i skutki przeobrażeń miast solnych, w których działalność produkcyjna ustąpiła pola lecznictwu uzdrowiskowemu.

Słowa kluczowe: *przemysł solny, lecznictwo uzdrowiskowe, warzelnictwo, górnictwo solne, rozwój miast*

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1. Introduction

Salt production on an industrial scale is considered to be one of the oldest branches of human economic activity. As early as the Neolithic period (approx. 10,000 – 3,000 BC) primitive communities that had abandoned the nomadic lifestyle in favour of organized settlements were seeking natural sources of salt – the substance that was indispensable for survival and further civilizational development[1]. Throughout the centuries, people mastered various methods of salt production depending on the accessibility of the raw material deposits, climate conditions and the stage of technological progress. These techniques not only made possible a systematic increase in production necessary to satisfy the constantly growing demand for salt, but also considerably influenced the growth and transformations of salt towns, where production was taking place.

Until the 19th century, salt had been considered primarily as an economic commodity – it was used first of all to preserve food, and in many other industries, as a simple chemical compound – sodium chloride. Among other things, salt was also commonly used in everyday life – in the kitchen and in the household[2]. Due to salt's specific properties, the range of its applications has always been, and still is, rather extensive, yet one fundamental factor that was of key importance for salt producing towns in the last two centuries was salt's beneficial influence on human health.

2. Biological function of salt and its healing properties

In the past, when the nature of salt had not yet been scientifically examined, the substance was attributed with divine and magical properties. Salt was considered a substance that had influence over human health and mood, also affecting fertility and sexuality. It was already known that sodium chloride (NaCl) – customarily called salt – played an important biological role and was indispensable for life. At present, salt is often labeled as 'white death', and its excessive consumption poses a serious health hazard. There is no doubt, however, that sodium chloride occurring in the form of ions – sodium cation (Na^+) and chloride anion (Cl^-) – is necessary for survival and proper functioning of a human organism as well as all animal species. The presence of salt is a condition for most living processes to run properly – it is responsible for water balance, regulates blood pressure and pH, participates in controlling the functioning of the nervous system and the digestive and muscular systems. Prolonged salt deficiency in a human organism causes serious diseases and may even lead to death.

Regardless of its biological function, salt supplied to the organism in certain amounts has healing properties which help to overcome certain diseases and ailments. Moreover, it

[1] M. Kurlansky writes extensively on the significance of salt in the history of humanity as well as on the origins of industrial production of salt in the publication *Dzieje soli*, Książka i Wiedza, Warszawa 2004.

[2] Detailed discussion of various properties of salt and possibilities of its use resulting from them is to be found in the following publications: Stobiński J., Stobiński W., *Sól soli nierówna*, Państwowe Zakłady Wydawnictw Szkolnych, Warszawa 1965; Gutorski K., *Sól*, Krajowa Agencja Wydawnicza, Warszawa 1978 and Moersth C., *Sól. 1001 praktycznych zastosowań*, K.E. LIBER, Warszawa 2008.

positively influences the human psyche and emotional sphere, which is emphasized by some researchers[3]. Salt's usefulness in medicine results from its specific features. A strongly salted environment stops numerous pathogenic microorganisms from multiplying or even destroys them completely; it especially refers to bacteria, fungi and dust mites[4]. Initially, this property was mostly used in the kitchen where salt was used for preserving food products that went off easily. At present, salt is commonly used as a natural healing agent. Its deathly effect on microorganisms promotes overcoming colds and upper respiratory tract infections, allergies and chronic skin diseases. Moreover, salt also has an application in post-injury rehabilitation and the recovery of the osteoarticular and muscular systems as well as in rheumatism treatment. It also alleviates muscle and joint pains and the discomfort connected with insect bites.

3. Salt applications in curative and body care treatments

As early as in antiquity, salt constituted an important ingredient of many medicaments used for the treatment of the majority of diseases. It was of a more symbolic character and usually did not produce the desired therapeutic results. The research into the curing properties of salt initiated in the 5th century BC by a Greek philosopher – Hippocrates, a pioneer of "salt" medicine. The scientific work in this field was carried on by Paracelsus (Phillippus Aureolus Theophrastus Bombastus von Hohenheim), a naturalist and doctor living at the turn of the 15th and 16th centuries, considered one of the most important representatives of modern medicine[5]. A real breakthrough in using salt for curative treatment only took place at the beginning of the 19th century, at the time of common application of various methods of spa treatment, developed by *inter alia* Sebastian Kneipp and Vincent Priessnitz, especially in the field of balneology[6]. At present, salt – understood as sodium chloride in various forms, finds application mostly in two methods of spa treatment – balneotherapy[7] and halotherapy[8].

Application of salt in balneotherapy comprises various medical treatments[9], including:

– brine baths, in solutions of sodium chloride but also other mineral salts – chlorides, sulphides, sulphates, bromides and iodides;
– inhalations with spray created by suspension of salt solution in water, the so-called "aerosol therapy".

Brine baths and inhalations may be applied both in artificial and natural settings. Most spa treatment centres have appropriate technical infrastructure in the form of pools and

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[3] G. Adams writes on the subject of salt's healing properties and the possibilities of its application in medical and body care treatments in Adams G., *Lecznicze właściwości soli,* KIRKE, Wrocław 2005.

[4] See: Witomski P., *Wartość grzybobójcza chlorku sodu*, Studia i Materiały do Dziejów Żup Solnych w Polsce, vol. XXVI, (ed.) Jodłowski A., Museum of Kraków Salt Mines, Wieliczka 2009, 295-304.

[5] Adams D.G., *op. cit.*, 18-19.

[6] *Ibidem*, 67-70.

[7] From Latin *balneo* = bath and Greek *therapeia* = treatment.

[8] From Greek *hals* = salt.

[9] Ponikowska I., *Przegląd balneologicznych metod leczniczych*, Medycyna rodzinna, issue 3/2004, 117-118.

inhalatoriums (Ill. 1). Curative baths may also be taken in natural salt water reservoirs, especially in inland lakes, such as the Dead Sea in the Middle East or Lake Baskunchak in central Asia. Inhalation treatments may also be administered in natural scenery – most often in the direct vicinity of brine graduation towers, which constitute indispensable elements of spa resort parks in numerous European health resorts (Ill. 2).

Ill. 1. A brine bathing pool in a natural treatment centre in the German spa resort Bad Salzdetfurth (photo by the author)

Ill. 2. Salt spray inhalation in a brine graduation tower in the area of the spa resort park in Konstancin-Jeziorna (photo by the author)

The other of the aforementioned methods of salt's curative application, halotherapy, makes use of the specific properties of the microclimate created in closed facilities whose surfaces are lined with the natural salt rock – halite[10]. Healing agents present in such spaces include:

- presence of dry salt spray in high concentration;
- stable atmospheric conditions – temperature, humidity and pressure;
- air saturated with ions of various elements, including micro- and ultra-elements;
- absence of pathogenic microorganisms or allergens, as well as gaseous and dust impurities in the air;
- isolation from harmful external stimuli, such as noise, vibrations or radiation.

The person who blazed the trail for halotherapy was Feliks Boczkowski – a salinary doctor working at the beginning of the 19th century in the Wieliczka salt mine[11]. Examining underground miners, he realised that the underground pit's specific microclimate has a beneficial influence on the human organism. This conclusion encouraged Boczkowski to use

[10] Chervinskaya A., *Haloterapia w mikroklimacie komory solnej jako metoda medycyny rekonwalescencyjnej*, Balneologia Polska, vol. XLIX, No. 2 (108/2007), Medi Press, 142-144.

[11] *Ibidem*, 142.

brine baths as a curative treatment, which in consequence led to the opening of a balneology centre in Wieliczka[12].

Feliks Boczkowski's work was continued in the first half of the 20th century by his successor doctor Mieczysław Skulimowski[13]. In 1958, he successfully created the first underground spa directly in the salt mine worked pits – this event opened a whole new direction of using salt in curative treatment.

At present, halotherapy may be administered in two ways:

– in underground sanatoriums placed in post-excavation pits in the area of inactive salt mines;
– in salt chambers installed above ground or inside some facilities especially for the needs of curative treatment.

Initially, halotherapeutic treatments were offered only by spas functioning underground, sometimes also called "speleo health resorts". Undoubtedly, an advantage of halotherapy administered in underground worked pits is the microclimate created in a natural way, mainly due to the free flow of air around the exposed salt rock. Owing to this, the atmosphere inside the pit is not only saturated with salt spray but also contains ions of trace elements, indispensable for life.

Another healing agent present in the spaces situated at considerable depth is the permanently heightened atmospheric pressure, which positively influences the functioning of blood and respiratory systems as well as stimulating an increase in general stamina and immune system efficiency[14]. It should also be mentioned that, apart from its beneficial influence on human health, going down a mine into a worked pit is for most people, a strong psychic and emotional experience.

Due to the fact that the aforementioned sanatoriums are situated underground, halotherapy is often called "subterraneotherapy", which means "treatment by staying in underground spaces". Nevertheless, it has to be explained that this term has a broader meaning and refers to the operation of all sanatoriums using pro-health properties of underground climates, e.g. in radon inhalatoriums, where the healing agent is not salt but a radioactive noble gas.

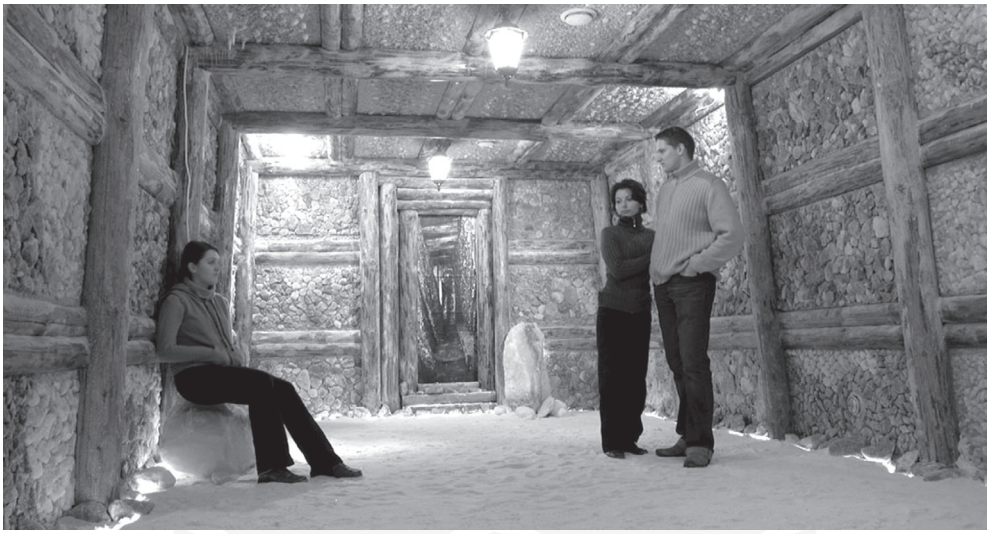
For obvious reasons, it is not possible to offer underground halotherapy in all spa resorts. At present, the curative method uses more and more common artificially constructed chambers also called salt caverns or caves (Ill. 3).

The interiors of these facilities most often reflect the austere character of worked pits in salt mines, yet contrary to underground sanatoriums, a stay in a salt chamber is always of static character and has the form of sessions of a fixed time duration.

[12] Boczkowski published his research results and described his treatment method in Wieliczka Brine Bath Centre in the publication *O Wieliczce pod względem historyi naturalnej, dziejów i kąpieli*, W. Pisz, Bochnia 1843.

[13] M.D. Schmidt-Pospuła writes on Mieczysław Skulimowski's role in developing the halotherapy method and treatments administered in the underground sanatorium in the Wieliczka salt mine area in *Mieczysław Skulimowski – prekursor podziemnego leczenia sanatoryjnego w Wieliczce*, Studia i Materiały do Dziejów Żup Solnych w Polsce, vol. XXI, (ed.) Jodłowski A., Museum of Kraków Salt Mines, Wieliczka 2001, 273-278.

[14] See: Olechnowicz-Bobrowska B., Wojkowski J., *Bioklimat komór sanatoryjnych w kopalniach soli Bochni i Wieliczki*, Acta Agrophysica, Year 2004, issue 3(2); Kmiecik M., *Subterraneoterapia w Kopalni Soli „Wieliczka". Part I*, Balneologia Polska, Year 2006, issue 1, 68-70; also Kmiecik M., *Subterraneoterapia w Kopalni Soli "Wieliczka". Niecodzienność metody i miejsca. Part II*, Balneologia Polska, Year 2007, vol. XLIX, issue 1, 64-67.



Ill. 3. Interior of a prototypical salt chamber manufactured in Bochnia for the needs of halotherapy offered in spa resorts which do not have the possibility of using salt mine underground worked pits (photo by P. Konieczny)

The main difference between underground spas and salt caverns lies in the origin of the healing microclimate. In salt mines, it is created spontaneously, in a free and natural way, while the pro-health agents inside salt chambers are artificially generated with the use of specialised equipment, and they are controlled automatically. In particular, devices called "halogenerators" are used for creating a suitable atmosphere, which produce and spray dry salt aerosol in the interior[15]. Due to the analogy between salt chambers and natural geological formations (caverns and caves), halotherapy is also sometimes called "speleotherapy". In recent years, salt caves have become easily accessible. They are offered not only in spa resorts, but also in numerous holiday resorts, biological regeneration centres and even in hotels.

Application of salt in curative treatments is not limited to spa activities. Salt and its derivatives are also used as home remedies, e.g. to treat bacterial infections of the upper respiratory tract by applying a saturated salt solution rinse. Salt products are also used in various body care and relaxation treatments, most frequently in the form of baths and compresses.

4. Industrial salt production and the spa function

The tradition of producing salt on an industrial scale goes back a few thousands of years. Throughout the millennia, humans have mastered a few completely different methods of salt production using various sources of the raw material available in nature. Of all the methods,

[15] Chervinskaya A., *op. cit.*, 143.

two are important for the development of spa treatments: pan brine boiling and underground mining.

The pan brine boiling is the oldest method of salt production used in many regions of the world as early as the 6th millennium BC[16]. The essence of this technique was the "boiling", i.e. obtaining crystal salt by evaporating a salt solution – salty waters coming from natural surface reservoirs (seas, salt rivers and lakes) or springs flowing out into the surface. The process of brine boiling took place over open fire, where vessels filled with brine were placed – initially they were ceramic and metal pots, and later flat-bottom rectangular vats with a large base area – the "pans". Salt production in brine boiling plants was in general of a large scale, but the basic factor limiting the production capacity of such establishments was the insufficient supply of fuel for the ranges. In many places, the natural brine was of a relatively low concentration – only a few percent, which made the whole process much more energy-consuming. The problem of insufficient fuel supply was finally solved only in the middle of the 18th century, when brine graduation towers were used for the first time in salt making. It is believed, quite wrongly, that those objects were built to accommodate the needs of spa treatment, yet in fact, the primary and exclusive function of brine graduation towers was to concentrate brine tapped from natural springs and used in pan brine boiling plants for salt production.

Although the brine graduation tower principle of operation is relatively simple, the structures are of complex design and monumental character (Ill. 4). Brine preparation for the salt making process takes place in several stages. Salt water tapped from a natural spring is pumped to the top of a wooden structure and distributed by an elongated trough. The brine flows through small holes in the bottom of the trough and soaks through the dense piles of twigs stacked in heaps that are a few metres high, sometimes even more than ten metres. The brine undergoes the process of dispersion, i.e. breaking into very small droplets, greatly multiplying its active evaporation surface. The appropriately shaped structure of the graduation tower enforces air movement, which promotes intensive evaporation of the weak salt solution and thus concentrates it systematically. Additionally, free flow through the pile of twigs helps to purify the brine, as unwanted mineral compounds precipitate from it – mostly particles of clay, gypsum and other salts. The brine that has soaked through the column is collected in containers placed at the bottom of the structure and subsequently pumped up again, obtaining in several cycles a concentration reaching even 20%. The concentrated brine water is then sent to the pan brine boiling plant and subjected to thermal treatment.

A natural phenomenon that accompanies the operation of a graduation tower is the presence of salt aerosol mist and a considerable increase of air humidity in its environs, both of which have been considered important healing agents. For this reason – regardless of their industrial function – brine graduation towers erected in salt producing towns contributed to the creation of balneology spa resorts offering inhalation treatments and brine water baths. Starting from the middle of the 19th century, spa facilities and spa resort parks started to spring up around brine boiling plants, and their focal points have always been the characteristic graduation tower structures. Such places are *inter alia* Ciechocinek and Inowrocław[17] in Poland, and also

[16] S. Ciszewski writes on the subject of pan brine boiling history and the application of this method in various part of the world in *Sól*, [in:] *Studia etnologiczne*, Polskie Biuro Etnologiczne, Warszawa.

[17] Aleksandrowicz J., *Inowrocław i okolice*, PTTK, Inowrocław 1973.

Ill. 4. Brine graduation tower in Ciechocinek built in the 20s of the 19th century for the needs of the local pan brine boiling plant (photo by the author)

Ill. 5. The structure of the historic-value brine graduation tower in the area of the spa resort park in Inowrocław *is this right?* (photo by the author)

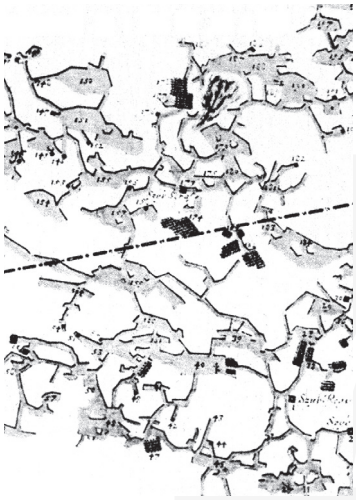
German spa towns of Bad Reichenhall[18] and Bad Salzdetfurth[19]. The degree of graduation tower usefulness for the purposes of spa treatment is confirmed by the fact that nowadays, such facilities are installed in spa resorts which have never been involved in industrial salt production in brine boiling plants, *inter alia* in Konstancin-Jeziorna.

The other method of industrial salt production, apart from pan brine boiling, which has contributed to the development of spa treatment, is underground mining. Mining salt deposits in Europe was started as early as between the 8th and 5th century BC by the Celts, who opened a mine pit in the vicinity of an Alpine town of Hallstatt in the area of present-day Austria. The beginnings of salt mining in Poland are dated back at the 13th century, when the mines in Wieliczka and Bochnia were opened. In most of the historic mining centres, salt was mined incessantly for many centuries, the result of which was that the mines have taken the form of extensive, multi-layered underground structures composed of spaces characterised by various shapes and sizes – spacious chambers and narrow corridor working pits (Ill. 6).

[18] *Salz aus Bayern*, Salzbergwerk Berchtesgaden, Saline Bad Reichenhall, Bad Reichenhaller Salz Handelsgesellschaft, Munich.

[19] Heinemann E., *Bad Salzdetfurth*, Gerstenberg Verlag, Hildesheim, 1980; and Mundel R., *Bad Salzdetfurth. Saltzstadt mit Tradition*, Alan Sutton, Erfurt 1999.

The spatial layout and the size of a mine depend first of all on the time of commencement and the duration of the excavation as well as on the geological structure of the salt deposit and the whole geological formation. The extensive networks of underground working pits are equipped with ventilation shafts, thus enforcing air circulation under the ground. At the same time, due to the high mechanical durability of rock salt, the parts of working pits drilled in the pure deposit do not require application of any supports in the form of continuous lining (Ill. 7). Owing to this fact, the air flowing through the excavation spaces becomes saturated with dry salt solution and ions of other elements thus acquiring its healing properties.

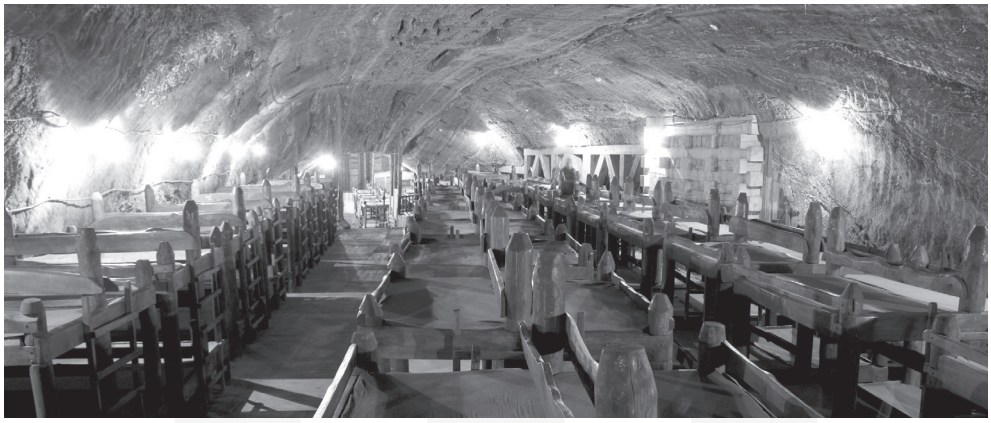


Ill. 6. Organic layout of the mining working pits in the Wieliczka salt mine – fragment of a 17th century plan

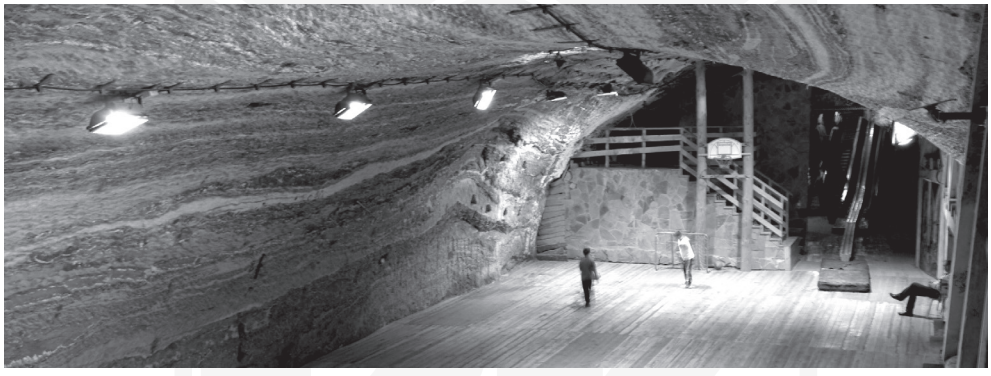
Ill. 7. Bare (i.e. with no lining) corridor working pit drilled in the rock salt deposit "Kazimierzów" within the area of the KGHM mine "Polkowice-Sieroszowice" (photo by the author)

The specific microclimate of salt working pits, combined with their visual, natural, scientific and historic values, has laid the foundations for the present use of salt mines for spa treatment purposes, but also for functions related to sport, recreation, entertainment, tourism, religious cult, museum exhibitions, culture, art, education and science (Ill. 8). Apart from the aforementioned Wieliczka, spa treatment activities are also carried out in the salt mine in Bochnia, and abroad – Solotvino and Artemovsk (Ukraine), Soligorsk (Bielarus), Berchtesgaden (Germany), Salzebad-Salzeman (Austria), Berezniki (Russia), Siget (Romania), Nakhichevan (Azerbaijan)[20]. Underground spas are mostly located within vast post-excavation chambers, where it is possible to have not only a sanatorium with the necessary infrastructure, but also some accompanying functions, e.g. gastronomic facilities, sports courts and facilities, multi-purpose halls, music and theatre scenes etc. (Ill. 9).

[20] Chervinskaya A., *op. cit.*, 142.



Ill. 8. Underground sanatorium installed within "Ważyn" Chamber in the Bochnia salt mine (photo by the author)



Ill. 9. Team sports court at the sanatorium operating in the Bochnia Salt Mine – one of the elements of the underground infrastructure serving both the spa patients and tourists visiting the mine (photo by the author)

5. Spa curative activities as an alternative for salt industry

Numerous examples of towns both in Poland and in other European countries show that industrial facilities used in salt production, especially brine graduation towers and working pits in salt mines constitute the foundations for innovative methods of spa treatment using the healing properties of salt. In the history of those towns, there are discernible critical periods when the industrial function (brine boiling or underground salt mining) was overshadowed and even completely replaced by spa curative activities.

The process of functional transformation was different for brine boiling and salt mining towns. In the case of places where salt was produced with the use of the traditional pan evaporating method, the turning point in their development usually occurred in the middle

of the 19th century, when there was a dynamic increase in the number of spa resorts all over Europe resulting from the new fashion of 'going to the waters to take the cure', as it was called at that time. Using brines of varied chemical compositions and healing properties in balneotherapy breathed a new life into brine boiling centres, where salt waters had thus far been used exclusively for the purpose of salt production. The period of founding new spa resorts coincided with the time of erecting brine graduation towers at pan brine boiling plants – objects which, apart from their industrial function, became an important element of curative treatment.

Introducing the spa function considerably affected the dynamics of the salt making industry development and the scale of salt production in salt making towns. In many places, like in the German spa town Bad Salzdetfurth, spa activities were gradually replacing the town's traditional function becoming its primary field of development in the 2nd half of the 19th century. Salt production was finally abandoned there in 1948, the pan brine boiling plant was shut down completely, but the water intake points and brine graduation towers were preserved for the use in spa treatment. Other salt making towns, e.g. Ciechocinek, managed to maintain salt production and they still continue to do so. The scale of this production is small and it mostly caters for the needs of the spa patients and tourists – pan evaporated salt is used for the manufacture of souvenirs, cosmetics, body care products and also as the traditional condiment. Modern salt production in salt making spa towns is based on the vacuum evaporation process, which has replaced the less effective pan evaporation method. Regardless of the present state of the salt making industry, the transformation of function that has taken place in salt making towns, i.e. reduction or discontinuation of industrial activity in favour of developing the spa function, has been usually of evolutionary character.

The diagram illustrating the changes in the levels of industrial and spa function development in salt making towns in characteristic time periods as well as mutual interdependencies between these functions is presented below (Ill. 10).

The functional transformation of mining towns has different origins to brine boiling centres. Its foundations lay in the present-day decline of the underground salt mining industry, which can be observed both in Poland and in other European countries. The reasons of the rock salts mining industry crisis are of a complex nature. The reasons for reducing mining excavation in underground mines are most often the decrease of extraction profitability connected with the rising costs of maintaining production, salt deposit exhaustion, mining disasters or a real danger of such disasters occurring, as well as competition from modern methods of salt production, first of all vacuum salt evaporation, borehole mining and mine water desalination[21].

A distinct decrease in production powers as well as in the demand for salt extracted with the use of the so-called 'dry method' (by working the salt deposit in underground working pits) was the direct cause of the closing down of numerous salt mines in the whole of Europe, *inter alia* in Germany, Poland and The Ukraine. The process of closing down a mine is equivalent to the definite discontinuation of its industrial activity, which for the majority of salt mining towns means losing the familiar grounds for functioning, economic stagnation or recession as well as the need to seek new impulses for continuing growth. An important chance in this respect is the post-industrial use of defunct mines for contemporary purposes – especially the ones oriented towards spa activities based on the specific microclimate of mine working pits.

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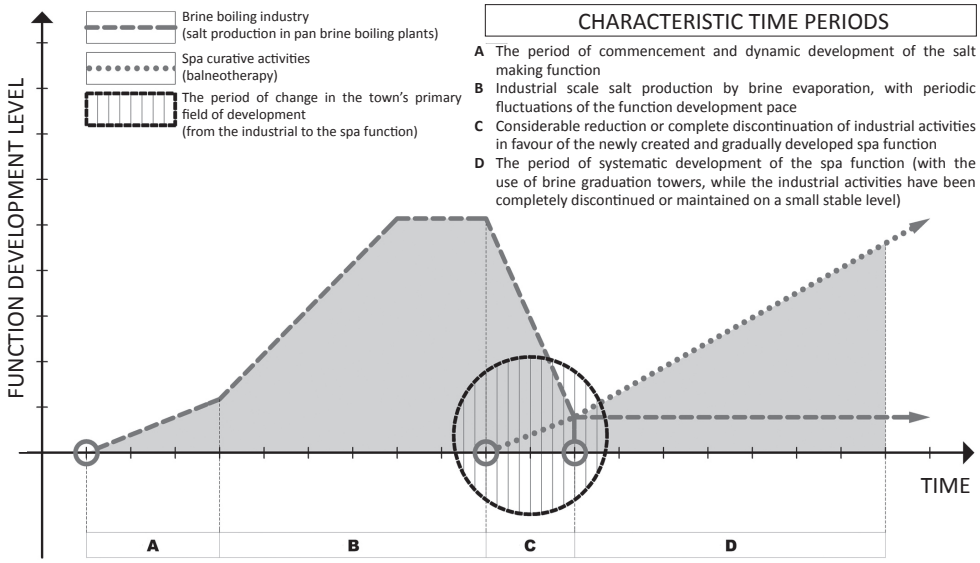
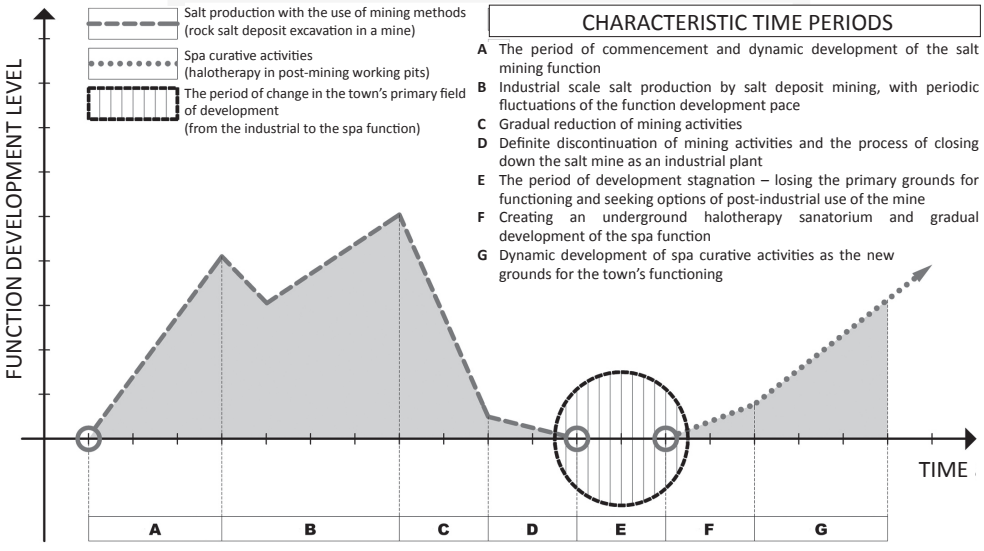
[21] Hwałek S., *Górnictwo soli kamiennych i potasowych*, Śląsk, Katowice 1971.



Ill. 10. Salt making towns – the levels of industrial and spa function development in different time periods (prepared by the author)



Ill. 11. Salt mining towns – function transformation in characteristic periods of time (prepared by the author)

Building an underground sanatorium is a costly and technologically difficult enterprise, it also requires adaptation and the maintenance of a considerable part of mining infrastructure – transportation and ventilation shafts, installations and facilities, and also the continuous monitoring of the geological processes taking place in the working pits and the whole surrounding geological formation. In spite of objective difficulties, there are underground sanatoriums which are successfully carrying out their curative activities in many European mining centres, now better known as spa resorts.

The figure below illustrates the contemporary transformation of salt mining towns' functions, taking into account the characteristic periods (Ill. 11).

An important element of transforming defunct salt mines for the needs of the curative function is the possibility to renovate and adapt the post-industrial areas and facilities situated above ground, including the historic complexes of development and characteristic engineering structures. An example of such action is the adaption of the lift machinery room, *Sutoris,* in the Bochnia salt mine for the purpose of a recreational, hotel and gastronomic facility, while the transportation function of the lift shaft itself has been retained.

6. Conclusions

Specific properties of salt have made it suitable for numerous applications in various spheres of human life and activity. Sodium chloride's healing properties are the grounds for using this compound in medicine and various methods of spa treatment – balneotherapy and halotherapy. The examples of Polish and foreign towns discussed in this article prove that many spa resorts functioning at present are operating thanks to the elements traditionally associated with industrial salt production – brine graduation towers and working pits in defunct mines.

Renovation and functional adaptation of these facilities for the needs of spa treatment activities seems extremely important in the present-day development of salt towns in their post-industrial period. The spa function, considered as an innovative direction of development, may peacefully replace the production activities, which are losing their dominating status, and at the same time, it may promote preservation and proper display of the existing industrial heritage. It is especially important in the case of salt mining centres, where, apart from underground working pits, there still exist many different post-mining elements above ground. It must also be emphasized that given the present civilization development and the discernible trend to return to natural curative treatment methods, modern spa curative treatment is gaining prominence and has become economically profitable, which speaks for the need to stimulate the development of this function.

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