

Study on the Cultural Value of the World Heritage of Salt Industry*

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Abstract—The world's three major salt world heritage projects are Poland's Wieliczka and Bochnia Royal Salt Mine, France's Ark-Sennan Royal Saltwork and Austria's Salzkammergut Cultural Landscape. This paper combines the three salt world heritage projects with the United Nations World Heritage Assessment Standards to analyze the authenticity and irreplaceability of the cultural values of the three projects. On the registration criteria, the three major salt industry heritages were mainly selected through the cultural heritage Article iv; from the geographical perspective, the three projects are located in Europe. The salt industry heritage has a large number of cultural relics in other states, especially in China. It needs to be systematically and intensively integrated with the international standards, making the salt industry heritage an important part of the world heritage and displaying unique salt culture values.

Keywords—Salt Industry World Heritage; Wieliczka and Bochnia Royal Salt Mine; Ark-Sennan Royal Saltwork; Hallstatt-Darsteint Salzammergut Cultural Landscape; organic evolution landscape; associated landscape

I. INTRODUCTION

The salt industry heritage belongs to the mining heritage, and the mining heritage belongs to the industrial heritage category. The study of the salt industry heritage can be started from the industrial heritage. According to the Nizhny Tajir Industrial Heritage Charter, industrial heritage is "an industrial cultural heritage with historical, technical, social, architectural or scientific value", including "building complexes and machines, workshops and factories, mines, and processing and refining sites, stores and warehouses, sites for energy generation, transportation and use, transportation and all its foundations, and sites for related industrial social activities (such as residence, religion or education)" [1]. It can be seen that mining heritage is an integral part of industrial heritage. In the World Heritage List, the Wieliczka Salt Mine in Poland was nominated for the first batch of world cultural heritage in 1978, which shows the status of the salt industry heritage in the industrial heritage.

So far, the domestic research results on salt have focused on the archaeological aspects of salt industry. Li Shuicheng

[2] [3] [4] [5] conducted archaeological studies on Hainan Danzhou Eman Yanding Village, Laizhou Bay Area, Lubei-Jiaodong salt industry area and other areas, and found many relevant facts about the salt industry. The rich salt resources and long history of salt production from the eastern Chongqing to the Three Gorges Area have an important impact on the development of local economic culture. He believed that salt industry archaeology is the basis of other research in the salt industry and provides important clues to other research related to the salt industry. In terms of the relationship between the salt industry and the economy, Li Xiaobo [6] analyzed the relationship between the salt industry and its economy in the Three Gorges Area. In terms of salt industry resources and cultural influence, Cheng Longgang [7] [8] found that salt and Ba Culture have a close relationship in the investigation of salt resources in the Three Gorges Area. He also pointed out that salt is an important cohesive factor in the formation of ancient Chinese culture; salt is an extremely important driving factor for the development of ancient Chinese culture; the salt resources of the Three Gorges Areas is an important cause of the demise of the Ba Culture. Lin Wenxun [9] believed that although a village has changed from a village dominated by salt industry to a village dominated by mountain agriculture, it should also take a new tourist road of salt well village culture. Regarding the relationship between salt industry heritage and tourism, Li Xiaobo [10] believes that the tourism development of ancient salt industry sites should be cultural interpretation of the heritage site; museums should show the protection of heritage sites and tourism education functions; it is necessary to develop scientific thematic tourism, reflecting the essence of industrial heritage; and it is also necessary to work with companies to combine the brand image of existing products with sales. Chen Qian and Wang Quankang [11] after studying the ancient salt industry culture of Bayu, believed that the development of the tourism value of the ancient salt cultural heritage can promote the sustainable development of the Bayu economy, improve the image of the regional city and promote the flourishing development of cultural tourism of the Bayu region, achieving a win-win situation for the protection and development of the Bayu salt industry. After studying the development of sea salt cultural tourism in Weifang, Zhang Junyang and Yin Yingmei [12] thought that in the process of studying sea salt culture, people should pay attention to the interaction between sea salt cultural tourism and fishery folk tourism. Liu Yanqun [13] believed that in the development

*Fund: This article is the research achievement of the 2019 Guangdong Mechanical & Electrical Polytechnic College-level Teaching and Research Project — "Cultural Value Research of Salt Industry World Heritage". Fund No.: YJYB2019-32

of salt tourism resources, special attention should be paid to correctly handling the relationship between the construction and development of cities and towns and the protection of salt culture tourism resources. Regarding the development and protection of salt industry sites in China, Cheng Longgang [14] believed that for the protection and utilization of salt cultural heritage in Zigong City, it is clear that not only it's necessary to maintain the salt cultural resources but also the salt cultural heritage of Zigong City should be utilized. People can develop salt culture heritage by focusing on building salt cultural heritage tourism projects and using modern information technology. Wu Huayu, Zhang Xue, and Que Weimin [15] believed that the maintenance of the salt industry in Zigong City should go beyond the existing point distribution and develop into a "point driving line, line making up surface" situation to build a city salt heritage resource system, build a combination of static protection and dynamic protection, closed protection and development protection, and use text annotation, picture exhibition, physical display, physical experience and other ways to build museums, conservation areas, theme parks or blocks, building the whole city into a living museum of salt industry heritage. Some scholars also have some analysis of the temporal and spatial distribution of China's mining heritage from the perspective of cultural relics protection units, and believe that mineral resources should be effectively protected [16]. Some scholars have studied the protection of Japanese mining heritage in neighboring countries and noted that the method of the protection of the mining heritage in Japan is: from the perspective of recycling, to highlight the new functions of the abandoned mining heritage by the design of reuse, and thus to obtain the funds and meanings of preservation and reservation; from the preservation of unique

areas landscape and historical perspectives to explore the challenges of mining heritage protection; through the local movements launched by the lower levels to promote, realize and even lead the protection and reuse of heritage operations. [17] [18] In terms of the declaration and protection of world heritage and China's mining heritage, some scholars believe that the world's mining heritage has been extremely severely imbalanced in terms of its scope, time distribution and characteristics. Under the background of the "global strategy", China should strengthen the study of theory and realize the framework of its own heritage discourse. When applying for world heritage, people should base themselves on the current state of Chinese heritage, consciously lean towards the mining heritage, and contribute to the construction of a balanced, representative and credible world heritage list while complementing the gaps in the world's mining heritage. [19] [20].

The above research covers the review of the salt industry, the development, research and protection of specific salt industry sites in China, the review of mining heritage, the discussion of mining heritage, world heritage and tourism development research, and even the protection of Japanese mining heritage. However, there has been no in-depth study on the declared world heritage sites of salt industry: why they can be included in the world heritage list, what value they have, and which conditions they meet. Therefore, the author believes that in-depth study of the world heritage of the salt industry from the perspective of world heritage, understanding the international trend of the world heritage of salt industry, can better guide the world heritage declaration of China's many salt industry heritages, so as to better protect the heritage of China's salt industry.

outstanding universal value. Salt industry heritage is a category of cultural heritage that is short-listed according to cultural heritage standards.

Statistics show that in the three salt world heritage sites, the three heritage inclusion criteria cover the Article iv item; and the Article i, ii, and iii items become the additional inclusion criteria for one heritage (33.3%). Compared with the selection criteria of the world cultural heritage, it can be known that the adoption rate of the Article iv standard is the highest, reaching 100%. It can be seen that the value of the world heritage of the salt industry is mainly reflected in the scientific and historical value, emphasizing the status of a period in history, while the construction, town and other factors are the manifestations of the technological progress and influence of the salt industry (see "Table I").

II. EVALUATION CRITERIA AND CONTENTS OF THE WORLD'S THREE MAJOR SALT INDUSTRY WORLD HERITAGE SITES

At present, there is no special world heritage list of salt industry at home and abroad, but the world heritage of salt industry is included in the industrial heritage. To date, in the World Heritage List published by UNESCO, the projects related to "salt" have been consulted, and there are only three world heritage sites in the industrial heritage. They are: Poland's Wieliczka and Bochnia Royal Salt Mines, declared world cultural heritage sites in 1978/2013; France's Ark-Sennan Royal Saltwork, the production of boiling salt (From the Great Saltworks of Salins-les-Bains to the Royal Saltworks of Arc-et-Senans, the production of open-pan salt) was named world cultural heritage in 1982/2009; Austria's Hallstatt-Dartstein Salzkammergut Cultural Landscape was awarded the title of world cultural heritage in 1997 [21]. The article takes these three salt world heritages as the research scope, in order to provide reference for the identification, development and protection of China's salt industry heritage.

According to the provisions of the Operational Guidelines for the Implementation of the World Heritage Convention, projects nominated as cultural heritage must fully comply with one or more of the six international standards and then the item can be confirmed to have

TABLE I. SALT INDUSTRY WORLD HERITAGE STANDARDS AND THEIR EVALUATION CONTENT

Evaluation standard	Poland: Wieliczka and the Bochnia Royal Salt Mine	France: Royal Salt Field in Ark-Senan, production of boiling salt	Austria: Hallstatt-Dartstein Salzkammergut Cultural Landscape
(i) <i>It represents a genius masterpiece created by mankind</i>		According to the report, the design of the Sainan Royal Salt Field is aimed at the workplace and is the largest building group in terms of scale. This salt field is the first example of a factory that combines the functions of a palace and a religious building. It is a rare and far-sighted building. This salt field is an idealized city, imagined and designed by Claude-Nicholas Ledu. It is an unfinished Utopia building that has an extremely important impact on future buildings.	
(ii) <i>It can have a significant impact on the development of architectural art, monumental art, town planning or landscape design within a certain period of time or within a certain cultural region of the world</i>		The report pointed out that the Sainan Royal Salt Field witnessed a cultural revolution in Europe at the end of the 18th century: the birth of the industrial revolution. This salt mine is not only a perfect example of the entire European philosophical trend during the Enlightenment, but also a design model for industrial buildings half a century later.	
(iii) <i>It can provide a unique or at least special testimony to a lost civilization or cultural tradition</i>			According to the report, humans have lived in the valley between the mountains for more than 3,000 years. The exploitation and processing of salt embodies the importance of natural resources to people and animals. It is the salt industry that has given this region prosperity and retained its uniqueness. This small town is a testimony of human activities in an uncontrollable natural environment, reflecting a complex connection with nature.
(iv) <i>It can serve as an outstanding example of a building or group of buildings or landscapes, showing one (or several) important stages in the history of human beings;</i>	According to the report, the Wieliczka and the Bochnia Royal Salt Mine shows the development of mineral technology from the 13th to the 20th century in European history. The gallery, basement layout and decoration methods reflect the social and religious traditions of the miners; the use of tools, machinery and the establishment of salt mines, witnessed the social technology system designed for the mining of rock salt. [22]	According to the report, the Great Saltworks of Salins-les-Bains and the Royal Salt Field in Ark-Senan have invented some outstanding techniques from the distant Middle Ages to the 20th century. They extracted underground salt water from salt extraction and production, and accelerated the evaporation of salt water with fire. [23]	According to the report, the Hallstatt-Dartstein Salzkammergut alpine region is a typical mountainous area with beautiful scenery and high scientific value. This mountain area proves the basic economic activities of the early human beings. The cultural landscape of the region has undergone 2,500 years of continuous development, and its history has been linked to the salt industry economy from the beginning. Salt mining determines all aspects of the village and provides a basis for architecture and art. Salt production in the small town of Hallstatt can date back to the Bronze Age. [24]

III. THREE MAJOR SALT WORLD HERITAGE SITES

Cultural landscape is composed in a specific period of time, and it is a complex of natural and human factors of a certain area. It changes constantly with the key role of human activities [25], and it is a variety of human activity characteristics added to the natural landscape [26]. Landscape change is the interaction between nature and culture in the environment, in order to change its use and spatial structure, so as to better adapt to the social needs of development, and then lead to cultural landscape changes [27]. Landscape change is the core content of geography

research. For a city, not only should people pay attention to the cultural value of individual buildings or blocks, but also establish a complete historical profile of "possession in succession" [28].

The United Nations World Cultural Landscape Heritage further expands the basic concepts of geography and proposes patterns of organically evolved landscape and associative cultural landscape. The former emphasizes sudden, gradual and persistent evolutionary steps and the latter highlights the cultural relevance of evolution and its close relationship with nature [29].

The United Nations evaluation materials of the three major salt world heritage sites also reflect the theory of cultural landscape and landscape change in geography, and also show the organically evolved landscape and associative cultural landscape.

A. Poland: "Wieliczka and the Bochnia Royal Salt Mine"

1) *Introduction to salt mines:* The Wieliczka Salt Mine is located in the surrounding area of Krakow, Poland. The salt mine was developed in the 13th century and is one of the oldest salt mines in Europe. This world heritage includes Wieliczka and the Bochnia Royal Salt Mine and the Wieliczka Salt Mine Castle. The Wieliczka and Bochnia Royal Salt Mine show the progress of European mining technology from the 13th to the 20th century in various historical stages. Both mines have hundreds of kilometers of galleries, underground churches and statues carved in salt mines. This salt mine was managed and operated by the Wieliczka Salt Mine Castle and has been rebuilt many times since the Middle Ages.

2) *Cultural landscape and landscape changes of salt mines*

a) *Organically evolved landscape:* The Wieliczka and Bochnia Royal Salt Mine are located in southern Poland, which belong to the same geological rock salt deposit. The mine consists of three parts: the Wieliczka Salt Mine, the Bochnia Salt Mine and the Wieliczka Salt Mine Castle. Salt mines retain their integrity in mining, technology, art, as well as in historical evidence of rock salt in southern Poland. The salt of the Wieliczka Salt Mine Castle, was historically managed and sold by the Prince and the King of Poland. They are geographically close and have been working continuously from the 13th century to the end of the 20th century, becoming one of the earliest and most important industrial production sites in Europe.

b) *Associative cultural landscape:* After the salt mine was used up, its function began to change. The entire salt mine was rebuilt into churches, workshops, museums, and entertainment halls, which preserved the original working scenes of the salt lake, prayer halls and workers. There are many sculptures and decorations in it, all carved out of salt. Among them, the famous work is Da Vinci's The Last Supper.

The Wieliczka Salt Mine and the Bochnia Salt Mine are protected by law. They were awarded the "National Certified Historical Sites" in 1976 and 1981 respectively, and were named historical monuments by presidential decree in 1994 and 2000. The Wieliczka Salt Mine Castle was certified by the state in 1988 as a historical monument. Ancient book protection is the responsibility of the administrator's office to protect historical sites. The implementation of mining laws and regulations is the responsibility of the Krakow Mining Authority. The independent management system of each salt mines and the function preservation and management of each salt mine are also satisfactory. The management department fully considered the mining factors and, after making overall arrangements, abandoned some of the scrolls and left only

the most representative, historical and traditional scrolls. In order to ensure that the three parties can work together, a department for the detection and coordination of two salt mines and a salt field castle has been recently established to coordinate and protect the structure and function of the entire salt industry heritage [30].

B. France: "The Production of Boiling Salt from the Great Saltworks of Salins-Les-Bains to the Royal Saltworks of Arc-Et-Senans, Where Salt Is Produced Through Open-air Tanning Ponds"

1) *Introduction to the salt field:* The Royal Salt Field in Ark-Senan is located in the area around Besancon and was founded in 1775 during the reign of Louis XVI. This is the first major achievement in industrial construction and reflects the idea of enlightenment and progress. The salt mine was built by Claude-Nicholas Dulle. The huge semi-circular building is a class-like building structure, is an idealized Utopia city. The Great Saltworks of Salins-les-Bains is an open salt manufacturing field. Its salt production history has been at least 1200 years until the end of 1962.

2) *Cultural landscape and landscape changes in the salt field*

a) *Organically evolved landscape:* The Great Saltworks of Salins-les-Bains and the Royal Saltworks of Arc-et-Senans show the great excavation technology of the deep underground salt source and the application of the fire evaporating salt water. The seawater is transported by wooden pipes to the Royal Saltworks of Arc-et-Senans and it is processed there. Those wooden pipes are marked with scales. This wooden pipe, which is completely exposed to the sun, is about 21 kilometers long and the salt water is naturally evaporated in the pipe. The salt water is then transported along the pipeline to the Royal Saltworks of Arc-et-Senans, where it is contained in large containers such as large basins, buckets, etc., and heated again to form "salt".

b) *Associative cultural landscape:* The town and surrounding areas have retained their integrity. Almost all of the walls of the salt field were demolished, leaving only the gates, breaking the separation between the saltworks and the city. Modern buildings are built in museums and casinos, respecting the authenticity of archaeological remains and old buildings.

The mine management system is very adequate. In order to maintain its authenticity, a systematic management system is developed, which is also a strong guarantee for the implementation of the management plan [31].

C. Austria: "Halstatt-Dartstein Salzkammergut Cultural Landscape" United Nations Evaluation Materials

1) *Introduction to the salt capital:* The town of Hallstatt is located in the Salzkammergut region of Austria, on the lakeside of Lake Hallstatt, at an altitude of 511 metres. There have been human activities since prehistoric times. Humans began mining salt mines here in 2000 BC. From that time until the mid-20th century, this resource has been

the foundation of the prosperity of the region. Hallstatt's "Hall" may have originated from the "salt" of the ancient Celtic, and the villages named after by the surrounding salt mines. In the history, the place has become rich due to salt production, so it is also known as "the most beautiful town in the world" or "the oldest salt capital in the world".

2) *Cultural landscape and landscape changes in salt capital:*

a) *Organically evolved landscape:* Beginning with the medieval Bronze Age (before 2000 BC), when natural brine in seawater were collected and evaporated, the region began systematic salt production. Salt underground mining began in the late Bronze Age (8th century BC), and archaeology shows that the region already has a prosperous, highly organized Iron Age society. Since then, the region has had extensive trade relations with many regions, which is called "Hallstatt Culture" in Europe. Salt mining continued in the Roman era and recovered in the 14th century. Since the 16th century, the mine has been directly controlled and managed by the Austrian royal family. Mining requires large amounts of wood to evaporate the salt extracted from the mountain forests.

b) *Associative cultural landscape:* The town became a small town described by writers and painters in the 19th century. These writers include novelist St. Whitt, theatrical poet Franz Gripazer, and the most representative painter of the Bid College. There are many hotels and salt water baths in the town, and its natural forces have played a vital role in human history, affecting local farmers and miners for thousands of years.

National and provincial protection schemes have entered into force, and regional planning has been well established. The scope of protection encompasses monuments and buildings, new buildings, wood, water, groundwater and other aspects of nature, including specific projects, larger areas, caves and arable land.

In recent years, people have become increasingly aware of the traditional value of urban heritage. Residents and managers in the area carry out daily management of the town. This program is guided by the national and provincial heritage protection office. The fund is provided by the Austrian Federal State, and the provincial funds are also available in Steiermark, Salzburg and Upper Austria. [32]

In 1992, the 16th annual meeting of the UNESCO World Heritage Committee in the United States proposed the basic concept of cultural landscape. Since then, the world heritage has been divided into: natural heritage, cultural heritage, natural and cultural heritage and cultural landscape heritage. For example, New Zealand's Tongariro National Park, China's West Lake Cultural Landscape, and China's Red River Hani Terraces have all been rated as cultural landscapes. After 1992, industrial and agricultural heritages were mostly rated as cultural landscape heritages.

IV. CHINA'S SALT INDUSTRY HERITAGE COPING STRATEGIES AGAINST THE BACKGROUND OF GLOBAL STRATEGY

There are few world heritages in the international salt industry. Therefore, a detailed understanding of UNESCO's comments and descriptions on the world heritage of the three major salt industries is of great significance for studying the application of the salt industry in China, and people can also better learn from the experience of these successful applications to apply to the application of the salt industry heritage in China.

The world heritage of the salt industry is concentrated in space, all of which are concentrated in the European region. A total of three countries have salt industry heritages, namely Poland, France and Austria. It has very big difference on the total amount of world heritage in each country. As of July 2017, the top three in world heritage projects are China (52), Italy (52), and Spain (45), but none of them has a world heritage in the salt industry. In 2017, China became the country with the largest number of world heritage projects, and there are many salt heritage sites within its territory, but the world heritage of the salt industry is still blank.

The author found through research that the salt industry in China can be roughly divided into the following five categories:

A. *The Salt Industry Archaeological Site — the Ancient Gene of Salt*

Taking the Laizhou Bay area as an example, helmet-shaped vessels were discovered in the archaeology of this region. The ruins of these vessels were the salt-making workshops of the Shang and Zhou Dynasties, indicating that the area began to make salt from the Shang and Zhou dynasties and formed villages [33]. Moreover, the Fengmen Village in Dongkou County, Zhejiang Province discovered traces of salt stoves, halogen pits, housing sites and stalls, water diversion and tide storage facilities, and unearthed hundreds of various salt-making pottery tools, reflecting the prosperity of the salt industry at that time [34]. These archaeological discoveries reflect the close connection between early salt and human settlements.

B. *Salt Production Traces — the Geographical Veins of Salt*

Taking the eastern Chongqing region as an example, Wuxi Daning Natural Salt Spring, Zhongxian Tujing, Kaixian Wentang Well, and Yunyang White Rabbit Well, the geological structure and geomorphology of the area are peculiar, and its natural salt springs flow from the foothills on both sides of the Yangtze River basin and spread throughout the region, making it one of the earliest areas to use salt springs [35]. Therefore, the eastern Chongqing region is centered on salt wells and the salt industry is economically developed.

C. Ancient Salt Roads — the Transportationsalt Meridians of Salt

Taking the ancient Sichuan salt road as an example, the surrounding areas have left a variety of salt industry cultural heritage with a large amount of time and space span. In terms of material form, it involves inscriptions, salt roads, passes, wharfs, ancient towns, salt stalls, guild halls, and architectures, etc.; in terms of non-material forms, there are ship songs, poems, food culture and salt songs associated with salt transport activities [36].

D. Salt Industry Towns — the Collectors of Salt

Salt towns embody the salt economy and society related to salt. For example, the salt industry economy developed in Yunnan Nuodenggu Salt Village has nurtured the highly developed Nuo Deng culture. The western Yunnan region is remote, but there are many Jinshi, Juren, and Xiucan in history, which is very unique. Nuo Deng is the cultural center of western Yunnan in ancient times. The salt industry has brought rich life to people here and allowed them to pursue cultural development. People who are located in the mountains have always maintained cultural communication and exchanges with the outside world, standing at a higher historical development starting point and making the residents here build magnificent and ethnically-style Bai residential buildings. [37] Not only this place, there is a stone niche beside the salt field beside the entrance of Hainan Danzhou Eman Yanding Village, where the statue of the salt god is placed. It is a rare relic related to the worship of the salt god in Hainan [38].

E. Salt Industry Architecture — the Art of Salt Industry

The remains of the salt merchants and the salt merchants culture are complementary. For example, the Yangzhou salt merchants' residential areas, private gardens, guild halls, palaces and government offices, temples, temples, sites and inscriptions, ancestral halls, etc., [39] all sites show the architectural art related to salt culture.

V. CONCLUSION

The salt industry is a special department in China. It has become an indispensable daily food in the lives of people. It provides an inexhaustible source of income for the officials of the past and is also the source of interest for salt merchants. The production and circulation of Chinese salt has a long history [40]. From the analysis of the three major salt world heritages, it can be seen that each heritage meets the criteria of Article iv, which can serve as an outstanding example of an architectural or architectural complex or landscape, showing one (or several) important stage in the history of the entry class. In the future process of application for the list of world heritage in China, attention should be paid to the Article iv standard and it is necessary to focus on how the region is combined with the world heritage Article iv standard so as to innovate other standards on this basis.

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