Heritage of Mercury

Almadén Idrija

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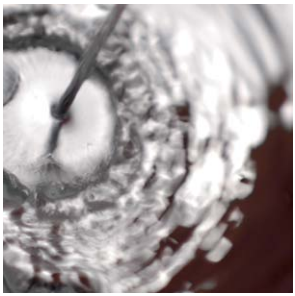


Almadén Idrija

Based on the nomination for inscription
on the World Heritage List
Heritage of Mercury. Almadén and Idrija
(Spain, Slovenia), submitted to the UNESCO
World Heritage Centre in January 2011.

May 2012

CIP

A HERITAGE OF MERCURY

Understanding the importance of heritage to society from different points of view, as well as the expansion of its significance in all directions, has led to another important concept: the idea of cooperation between different communities and stakeholders. With this in mind, a new approach to heritage has been introduced – the idea of a series of assets, which means that some sites, monuments or other types of heritage can be understood and recognised not only because of their particular significance, but also because of their mutual relationship as representatives of the same type of heritage or as complementary sites in their role through history.

This is the case of Almadén and Idrija, two mining sites that not only had important roles in history, but are still satisfying various needs of the community. They are still helping to create a culture based not only on respect for the past, but also on solving problems.

The communities of Idrija and Almadén, aware of the importance of their heritage, decided to prepare a serial nomination to the World Heritage List in order to underline the importance of sites, their significance in history, and their aim to continue working together.

Now that mercury exploitation in the European Union belongs to the past, the studies carried out by different specialists over the course of many years have revealed the need to disseminate the value of and protect the heritage resulting from historic mercury mining in the world's largest natural deposits from where this liquid metal has been obtained as an important part of the memory of mankind.

Rich cinnabar ore.

They have been individual mining sites in the vast geographical area where mercury was an essential driving force of economic development and the promotion of reciprocal cultural influences at an intercontinental level. Only put together do they explain the whole story of the heritage of mercury.

There are many similarities between the two mining complexes: the way in which the population responded to the difficult living conditions of mercury production, and especially the amazing technical and scientific response to various challenges. Jointly they form a set of assets constituting "twins" which represent the complex and inter-complementary mercury mining methods

and related industrial and technical development from the period of the Roman Empire to the initial years of the 21th century. It also offers a complete panorama of the different uses and utilities of mercury throughout history.

The mining sites of Almadén and Idrija have produced a great part of the mercury existing on a world scale, representing in a comparative way the highest level of production obtained from mines of this kind. They are the most eminent representatives of the meaning and transcendence of mercury mining and related technology and industry in the world.

Drops of mercury.

From the standpoint of civil engineering, both mining sites have been the paradigm of mercury mines throughout history thanks to the technical and construction systems used and the historical meaning and transcendence of the phenomenon that arose from the introduction of the mercury-based metal refining system in America in 1555.

Both mines complemented one another in sending mercury around the world, mainly to America, which gave path to outstanding economic, social and cultural changes on this continent and in Europe, as well as in the development of science and technology, as witnessed in the exchange of know-how and equipment. The legacy of the historical heritage at these locations comprises a variety of common and inter-complementary assets that demonstrate how closely interlinked these sites have been as a result of their outstanding interactive historical function. Both sites made use of and have retained unique collections of material expressions of all the processes, methods, techniques and physical components ever employed in the production of mercury throughout history.

The mines at Almadén and Idrija also represent exceptional examples of human interaction with the environment, which has now become vulnerable due to the closure of the mines following the implementation of a restrictive policy with regard to mercury. At the same time, they demonstrate how mining activities gave rise to particular cultural expressions and developed specific intangible and unique characteristics whose main value is the conservation of the spirit of the site as manifested by the community's commitment to its history.

The mercury obtained by the Spanish territories in America came from the largest mine in the world, located in Almadén, Spain. When mercury became scarce due to the impossibility of extracting the needed quantities

because of fire, or if the human capacity employed was exceeded, it was purchased from Idrija, the second largest mine in the world. After being received from both sources of supply, it was adequately controlled and prepared for sending to the Viceroyalty of New Spain. Mercury from Almadén and Idrija was occasionally also sent to Peru, which became necessary from the 17th century onwards.

In general terms, it was not possible to refine Mexican silver by smelting, as the ore was either not rich enough or was unsuitable for this system, so mining depended completely on mercury. Without mercury, no silver could be produced and without silver, the whole driving force of the colonial economy would have grinded to a halt.

As is well known, economic and environmental issues marked the beginning of the mercury crisis during the 1970's. The restrictive environmental measures adopted by the European Union with respect to this metal, together with the diminished profitability of the mines and the prevailing market conditions in 2006, spelled the end of mining activities at Almadén and Idrija, and the emergence of issues having to do with waste treatment, pollution, and diseases linked to the history of mercury.

In Almadén, mercury exploitation and production lasted for over 2000 years, in Idrija for 500 years. From the estimated 759,000 tons of mercury consumed throughout human history, one third is from Almadén and one eighth is from Idrija. At the Idrija Mine, mining activities were stopped in 1994 and mercury production in 1995. At the Almadén Mine, mining activities were stopped in 2001, but mercury production continued until 2003. Environmental pollution caused by ore extraction and mercury production began to be systematically investigated in the 1970's. Since then, mercury concentrations in air, water, soil, plants, animals and humans have been observed and monitored. The findings of numerous research studies conducted in the past 40 years have resulted in a number of measures implemented by both mines within the recently established Technological National Centre of Mercury Decontamination in Almadén and the Information and Research Centre for Mercury in Idrija.

Brief Description of Almadén and its Assets

Almadén is located in the province of Ciudad Real, Spain.

The territory of the mines at Almadén features components of varying types and sizes, including geological, geographical and geomorphological aspects, landscapes, paths, the mines, other engineering works, and the historic town centre of Almadén.

The mines at Almadén are made up of a system of tunnels and shafts from different eras, ranging from ancient times to the modern day. There are

also ore processing and metal working areas, administrative buildings and warehouses, along with structures and installations from different periods in history.

The area proposed for inclusion in the World Heritage List comprises the following assets:

- The Mine at Almadén together with all components corresponding to the mine itself, the tunnels and shafts, the ore and metal processing areas, workshops, dumps, and the administrative and social buildings. This area has assets of great value, including underground components, all of which are of high historic value, as they are the main witnesses to the mine's evolution over the centuries.
- Probably the most spectacular of the underground assets is the Baritel and malacate (winch) of San Andrés, installed towards the beginning of the 18th century and used to bring out ore through the San Andrés shaft. The Baritel is an opening cut into the rock and lined with rubblework, measuring 903.6 m², roofed over with a brick and stone vault to provide housing for the whim installed for the extraction of ore from the Mina del Castillo. It is impressive for its shape and volume thanks to the size of the cupola and the brickwork on its walls.

Almadén, Spain. The town seen from the mine.

Baritel of San Andrés, Almadén.

- As part of the external historic mining and metal working assets, mention should be made of the Bustamante Furnaces (1720), where mercury was produced from the extracted mineral.

Bustamante Furnaces, Almadén.

- Forming part of the palisades are two ancient gates, the old *Puerta*

de Carros (17th century) and the *Puerta de Carlos IV* (1795), which marked the beginning of the road to Seville along which the mercury produced at the Almadén mines was sent on its way to America.

Puerta de Carlos IV, Almadén.

- Almadén's historic town centre contains several monuments of high value, as well as domestic constructions of historic and typological value. It is located on an area forming part of the mine itself, so it obviously constitutes an important, inseparable part of the mine. Some tunnels even extend outside the historic town centre.
- One of the most important buildings in the historic town centre, both in terms of historic value and architectural features, is the Mining Academy building dating from 1785, which is indeed a palace for engineers.
- Some high-value components outside the historic town centre are the archaeological remains of the Royal Forced Labour Gaol (1754), the Saint Raphael Royal Miners' Hospital (1773), and the Bullring (1757).
- The Saint Raphael Royal Miners' Hospital is one of the most outstanding 18th century civil buildings in Almadén. It was constructed to provide medical assistance to mine workers.

Mining Academy, Almadén.

Museum in the Saint Raphael Royal Miners' Hospital building, Almadén.

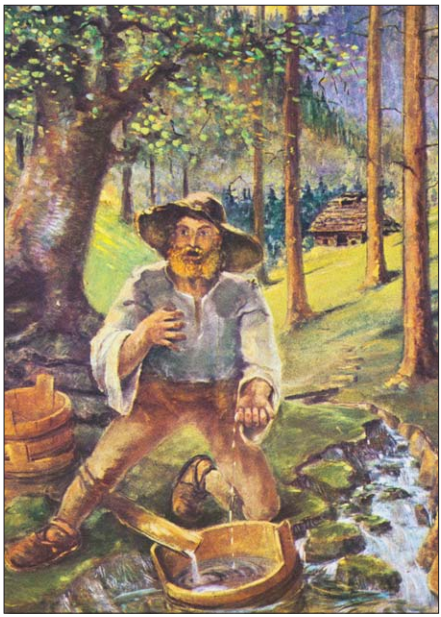
– The Bullring, built between 1755 and 1757, is the second oldest bullring in Spain and has a hexagonally shaped ground plan. The Bullring also provided 24 houses. The purpose of its construction was to generate, through the use of the bullring and the rental of accommodation to seasonal workers, the finances needed to operate the Saint Raphael Royal Miners' Hospital.

The bullring, Almadén.

Brief Description of Idrija and its Assets

The Idrija region is positioned at the crossroads of two mighty mountain chains – the Dinaric mountain range and the Alps. This is what gives the area its main natural features.

Ore mining in Idrija began after native mercury was discovered in 1490. Centuries of exploitation have resulted in mine tunnels spanning 700 kilometres and reaching 420 metres below the surface.



A tubmaker finds mercury, Idrija.

The town of Idrija has kept a lifeline to the mine, resulting in a number of buildings in its old town that are closely linked to mining and have been preserved to this day. These include Gewerkenegg Castle, built as the mine's administrative building and mercury depot – now a museum; the first Slov-

Idrija is located in a deep basin and surrounded by hills.

enian secondary school for natural sciences; a number of miners' houses; churches; squares, and other buildings of interest.

The area surrounding the town and the mine is covered by woodland, which extends upwards to high-lying plateaus and used to represent an important resource for the mine's development (wood for smelting, supports for the tunnels). The streams flowing into the Idrijca River and the Idrijca itself acted as important sources of energy for the mine, both for propelling water wheels and for floating timber (klavže water barriers).

The area nominated for inscription as a world heritage site encompasses:

- The area of the mine: ore deposit, shafts, tunnels, entrances, administrative and other buildings, smelting plant, water pumps, machinery and equipment;

Ore-transporting tower above Joseph's Shaft, Idrija.

Main level in the underground Mine Museum, Idrija.

- The roads in Idrija that linked the mine and ore-processing facilities with the warehouse and the starting point of the trade route;
- The starting points of various trade routes that were used to transport mercury from Idrija in various periods;
- The old town of Idrija, with its mining history as manifested by its buildings, including: the Miner's Theatre, warehouse, Town Hall, old town square, Secondary School for Natural Sciences, Gewerkenegg Castle, miners' houses, etc.;
- The water barriers (klavže) located on the Idrijca River and the Belca and Kanomljica streams in the nearby forests;
- The area surrounding the mine and the town serving as a buffer zone.

The Idrija Mercury Mine: the part of the mine that is open to visitors manifests the various methods used over the cen-

turies to extract mercury ore, as well as methods of constructing wood supports and the engineering feats, hoist technology, and groundwater pumping systems. Other features include a number of natural and technical attractions unique to this special mine, as well as the presence of mercury in native form. This 300-metre tunnel, named Anthony's Main Road, was used by miners for nearly half a millennium to enter and exit the mine. The Chapel at the end of the tunnel was erected in the late 18th century.

Main galleries with the underground Chapel of the Holy Trinity still open to the public, Idrija.

The Smelting Plant: The smelting of ore developed over a period of five centuries from a basic coal-fired heap burning system in the 16th century to modern rotary furnaces that were installed in the 1960's and operated continuously until 1995. The entire area is fenced off to protect the building heritage, and basic restoration works have been carried out on the crushing and smelting equipment.

Čermak-Špirek reverberatory furnace, Idrija 2002.

The Kamšt water pumps: to ensure normal operation, the groundwater had to be continuously pumped from the shaft. The Kamšt water pump built in Idrija and still preserved dates back to 1790. It was used to pump water from the mine until 1948. The device features a massive wooden wheel with a diameter of 13.6 metres, and is one of the largest preserved systems of its kind in the world.

The wooden water wheel of the Idrija Kamšt water pump.

Gewerkenegg Castle: was built in 1533 to house the administration of the mercury mine and as a secure storage facility (warehouse) for precious metals and cinnabar.

Gewerkenegg Castle, Idrija.

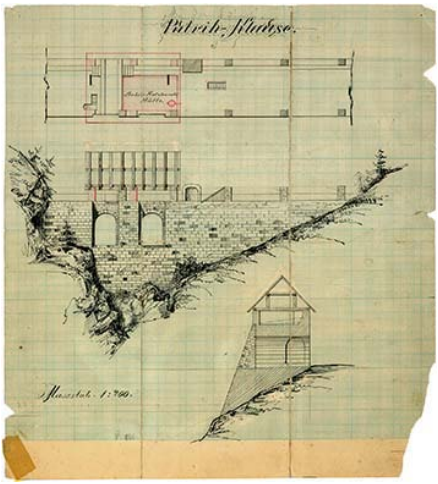
The Mine's warehouse: a large, single-storey building that was later used as a granary to store wheat, was built in the old town centre of Idrija in 1764.

Mine's warehouse and Idrija mine's theatre.

The Idrija Miner's Theatre: built in 1769, testifies to the rich and diverse cultural heritage of Idrija, which includes theatre production.

The klavže water barriers: were built in the narrow channels of streams that converge and then flow through Idrija to serve an important purpose - the floating of timber for the needs of the Idrija Mercury Mine. Due to the bounded conditions that had to be considered in their construction, their buffer zone is so small that it is not taken into account as a separate feature. The area of the property encompasses only the space filled by water trapped behind the barrier.

The Putrih's klavže water barrier on Belca creek, Idrija.



Plan of Putrih's klavže, mid.19th century, Idrija.

Values in Almadén and Idrija

They are the key elements articulating a process lasting for over three centuries and linking several parts of the world. This process made a significant contribution to the shaping of cultures on both sides of the Atlantic. This cultural fertilization was bilateral, as there were exchanges in both directions, thus adding value to all of them as part of the historic process mentioned above.

These exchanges were mainly scientific, technical and technological, and they provide evidence, among other significant moments in history, of the development of the Industrial Revolution in Latin America.

With respect to their uniqueness, the mines at Almadén and Idrija are the world's most important natural deposits of their kind, as well as the most significant accumulations of technology in the production of mercury in the history of humankind. This is evident from the production volume achieved – the greatest in history – and also from the material evidence that has been maintained there in an exceptional degree.

On the other hand, it can be said that, regardless of their uniqueness, Almadén and Idrija are the world's most representative example of historic mining sites producing mercury, as these sites made use and retained material expressions of all the processes, methods, techniques and physical components ever used in the production of mercury.

These sites served as the main points during the centuries of mining for mercury. Their trading activities, know-how, financial resources, and culture joined nations and influenced many changes and developments on a global scale.

The components of this series provide a lesson in the evolution, over the centuries, of the scientific, technological and technical methods and procedures directly linked to the production, use and distribution of mercury. At the same time, they demonstrate how mining activities gave rise to particular cultural expressions and determined specific intangible and unique characteristics whose main value is the conservation of the spirit of the site as manifested by the community's commitment to its history.

They are unique examples of man's relationship with his surroundings over the centuries. The very mining process, itself a predatory activity, developed a kind of stratification through history that we can now view today as a catalogue of variants and alternatives of this relationship with the environment. But at the same time, the functional relation between the towns and mines clearly shows the physical integration of the two.

Almadén and Idrija are both characterized by a high degree of integrity and authenticity, derived in part from their communities' awareness of their great significance, from their roots and a sense of ownership, as evidenced by the quality of the handling of this heritage, which is based on a commitment to culture.

REASONS FOR NOMINATION

Mercury, the messenger of the Roman gods, has influenced the name of the element mercury.

Idrija and Almadén decided to join forces in their nominations to the World Heritage List, based on their importance as the principal sites providing evidence of their mercury heritage. The reasons to be sure of their outstanding universal value as a series of assets are:

Almadén and Idrija are outstanding with respect to the importance of an event that transformed the world both economically and culturally. They are also outstanding for their functional specificity and exceptionality in production, all of this being linked to the diversity, authenticity and integrity of their material heritage and the permanence and transcendence of their cultural values.

Both components are characterized by a high degree of integrity and authenticity.

The effects of cultural exchange are evident in the historic vestiges and the many components that they comprise, as well as with regard to the culture of mining. The historic functionality serving a specific and well-determined goal created an identity of its own. When history transformed the relationships between the components of the original historic phenomenon, the product resulting from the dynamics of mercury, that is to say, the cultural heritage generated by this phenomenon, kept it in place up to the present day. Equally important is the fact that all of the culture created around and by the production of mercury, instead of disappearing, continued to consolidate its existence and gave rise to numerous scientific methods, technical procedures and immaterial culture.

The mines have evolved over time, in line with the production processes carried out at each individual site. Nonetheless, due to the characteristics of mining operations, one can clearly understand how the techniques have

evolved since the 16th century. The construction techniques used in architecture have evolved, but nowadays, recent restoration works on historical and artistic buildings have been carried out with the clear intention of recovering old construction techniques and completely understanding the substantial value of the use of these traditional construction systems in order to conserve the memory of the inhabitants and for practical reasons based on sustainability.

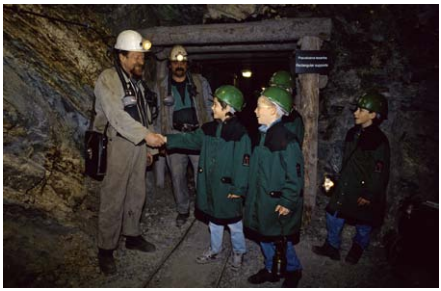
The mining deposit itself is a means for Almadén's and Idrija's cultural development; hence the mines and the settlements have an absolutely organic relationship with the environment. Thanks to their authenticity and the expression of their integrity, it is possible to understand the history of a mining activity pursued over many centuries.

Hammer and chisel – symbol of the miner's profession.

Despite the fact that the history of the sites is awash with terrible events of sad memory, a considerable feeling of belonging has been generated over the centuries that is closely linked to work in the mines and has been transmitted through the generations.

LOOKING TO THE FUTURE

The historic function of Almadén and Idrija has ceased to exist due to international decisions with regard to mercury. Nonetheless, the steps taken for the recovery of their heritage have made it possible for that function, originally productive, to be transformed into an educational and scientific function based on the original function as the starting point.



Young visitors in Anthony's Main Road, Idrija.

As there has been a cultural continuity with regard to the impact of the original function, the settlements, historically dependent on the mines, now have enough vitality or are in the process of recovering it for the most part, on the basis of the community's identifying with historic processes such as mining culture, as well as all of the scientific and educational development derived from the latter.

Thanks to management plans, as well as the high degree of commitment by the citizenry, both sites will not suffer from the so-called "pressure of development".

This degree of awareness with respect to conservation can already be verified thanks to the extraordinary work carried out for the interpretation centers and the display of items in museums, as well as the archive documentation prepared by both sites. Moreover, the extraordinary archive documentation corresponding to the history of both Almadén and Idrija bears testimony to the authenticity of the sites.

It must be outlined that the management coordination of both sites, based on the establishment of scientific and educational cooperation, is substantially aimed towards guaranteeing the continuity of mercury culture.

Both mining sites will continue serving history, not by means of mercury production, but instead by conducting research aimed at mitigating damage and fostering the development of their inherent scientific culture so that new generations may come to know what has been given to mankind through mercury heritage and what can still be expected from it.

Mine Information Centre, Almadén.

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