

OPENING HOURS

mism

1 OCTOBER - 31 MARCH:

Tuesday - Saturday:
10 am - 2 pm and 4 pm - 7 pm

Sundays and Bank Holidays:
10 am - 2 pm and 4.30 pm - 7.30 pm

1 APRIL - 30 SEPTEMBER:

Tuesday - Saturday:
10 am - 2 pm and 5 pm - 8 pm

Sundays and Bank Holidays:
10 am - 2 pm and 4.30 pm - 7.30 pm

CLOSED:

1-2 Januari and Mondays except: (25 July, 15 August, 31 October, 5 and 26 December.)



Junta de Castilla y León

Consejería de Cultura y Turismo
Fundación Siglo para las Artes de Castilla y León



Museo de la **Siderurgia** y la **Minería** de **Castilla y León**

Plaza de San Blas, 1 24810 Sabero (León) Teléfono: 987 71 83 57

www.museosm.com

Sabero

the history of a utopia

The Forge of Saint Blas was made into a museum by the Board of Castilla and Leon in order to pay homage to a group of men and women, who had made possible the establishment of Spain's first steel industry in 1846. Characters like Miguel Iglesias Botias, Santiago Alonso Cordero and Casiano de Prado y Valle believed that it was possible to bring the technical advances and infrastructures that were being developed at the time in countries like Belgium and France, to Spain.

A result of this effort was the construction of a complex steel industry with coal blast furnaces, which was an event of great importance at that time due to the use of the latest technology, in particular, due to the neo-gothic architecture of the steel rolling warehouse.

The situation in Spain at the time did not appear to promise a good ending for the project: The reign of Isabel II was an era troubled with conspiracies, changes of government, military uprisings, street fighting and, last but not least, the wars in Africa and the Pacific depleted the public funds. An economy based in the primary sector and with little presence of active and entrepreneurial bourgeoisie, the lack of internal demand and of Spanish capital for this kind of industry, along with the lack of rail infrastructure which raised the production costs, forced the closure of the Forge of Saint Blas in 1866.

Since then and until 1991, the economy of the valley was based on mining, this activity and its memory is collected in the museum, along with the uses and customs of the people of the valley, who have known how to maintain a fruitful and continuous dialog with their natural environment throughout time.



Museum

services

>>Accessibility

You can access the rooms and facilities of the museum with wheelchairs and strollers.

>>Cloakroom

Free. Backpacks (of all sizes), umbrellas, packages, bags and purses larger than 28 x 36 cm, or any large object, should be left in the cloakroom.

>>Animals

Animals are not allowed to enter, with the exception of guide dogs.

>>Rules of access

Photographs can be taken in the rooms only with hand held cameras. The use of flash or tripods is not allowed. The reproduction, distribution or sale of photographs without the museums permission is forbidden. Smoking is not allowed inside the museum, nor is entry with food or drinks.

>>Guided tours

Groups of more than 5 people.
On the hour.
Free activity.

>>Transportation

Alsa.: www.alsa.es
Feve.: www.feve.es



Museum

the pharmacy

>>Linked from the first moment to the forge

Dr. Fructuoso Martínez Rojo, born in Boñar in 1827 and a member of a dynasty of pharmacists, was the founder of the Sabero pharmacy. He opened the establishment in Sabero between the years of 1857 and 1859, and at the same time proceeded to buy a building in the neighbourhood of Rebedul, in which he cultivated a botanical garden or a garden of medicinal plants for use in the pharmacy.

The location of the pharmacy within the steel mining complex was an important step forward in the concept of social attention to the working class, as the new forms of production brought about frequent accidents and work injuries, fractures and wounds as well as serious problems of poisoning and pulmonary affectations. The pharmacist applied his healing treatments using the medicine which was prepared in the same pharmacy, and up until the first half of the last century, they could be presented in three groups: natural drugs (quinine), the so-called medicinal multi-drugs (magna antidote) all of which were prepared by the chemist himself, and the first medicines manufactured known as pharmaceutical specialities, among which we can find the popular Selz salt. The pharmacy's services linked from the very first moment to the Forge installation, has remained uninterrupted until this day. From 1930 onward its activity of public attention was increased by the inauguration of the Izaguirre Hospital.



Museum

the neo-gothic warehouse of the forge of Saint Blas

During the first decades of the 16th century, until 1830, in European countries like France, Germany or Belgium great steel installations were built. They were very innovative as they embodied a new urban industrial concept. These huge installations were based on a specific architecture for industrial production. This is an urban form conceived in order to offer all sorts of services, both for workers and for managers (hospitals, pharmacies, homes, abundant food and a place of work). This steel rolling and forging warehouse is the only remaining example in Spain of an industrial installation from this era. This enhances its architectural and historical value, as it was the first forge in Spain to use blast furnaces fed with coal (coke) and to also bring that great machinery that was revolutionising the steel industry in Europe at the time. The factory is built of stone and brick, with a great open central warehouse completely clear of columns, the roof is supported by a succession of diaphragm arches. It has a basilica type floor with 3 naves; the central nave is higher and wider. The side naves are closed with a semicircular dome which is 5 metres in height and they communicate with the central nave through pointed arches. Each nave is stretched in the east to form sheds; the northern area held the forges and the south some hearth furnaces. Each nave opened to the outside through a semicircular arch which formed a splendid gallery. The construction of this warehouse was started in 1846 by the initiative of the Palencian - Leonese Mining Society. The building held the first steam engines of the province, just like the great machines imported from Great Britain: cylinder and rolling trains, steam hammer and shear.





Museum

the valley of Sabero in the past

>>From the rural community to the gates of an industrial society.

In this section we will cover from the beginning, the whole historical process of the valley and its people. Who, from the first settlers in their Celtic forts advanced in time and through social ways of life, from the subsistence of a rural community, to the strong emergence of the steel and mining industry in the first decades of the 19th Century.

>>From Prehistory to the Romanization.

Although the references, both material and documentary, about the first occupations in the valley are very scarce, the confirmation of the presence of man in these high valleys of Leon is very clear. The settlements of Celtic forts that have been identified in the valley along with the Vadinian gravestones found reaffirm the presence of settlement in this area, already from the 5th Century B.C. to the 4th Century A.D. It was possibly the contact with the Roman world that influenced almost unchangeably, the close relationship that existed between man and his natural environment which enabled their subsistence.

>>The formation of medieval towns.

The stable occupation of space by people or individuals united by blood ties, bonds of service or beliefs, is the seed of the primitive village communities. Within these rural societies the ways of life remain unchanged, the commercial relationships and transactions are done in the closed environment of the valley's community. The presence of the artisans along with the farmers meant that the important balance was maintained which was necessary for subsistence.

>>Daily life in a rural setting.

The emergence of the church within the rural communities with the presence of the parish generated some forms of coexistence between the official religion and the ancestral practices and beliefs that had been maintained throughout the centuries. Education was a privilege of the oligarchy; the masses very rarely attended school.



Museum

the mining basin of Sabero

This area is dedicated to explain to visitors the origins and the importance of the mining sector in Castilla and Leon. The current museum area that is dedicated to mining is just an introduction to the subject, as a second part of the museum is currently being finished, which is entirely dedicated to mining.

In order to introduce the visitor to the complex world of mining, the Mine of the Sabero Basin has been used as a reference, as it was the first basin in the community to be exploited and one of the first that suffered the consequences of a conversion. The fact that the museum resides in this territory and that all of the basins share common characteristics allows us to extrapolate its history and characteristics to the rest.

A large scale model that represents to scale 50 km² of the basin, interactively explains all of the processes lived in this territory during a period of 160 years, from the first exploitations in the year 1830 up until the end of the mine in the year 1991.

The Basic aspects of mining work: the start-up, the transport and the lighting, are explained using audio-visual materials and a complete collection of tools, which show how these tasks have evolved over time.

Along with technical knowledge the museum gives great importance to its sociological aspect, to all of those circumstances that surround the creation of a mining colony, how a territory can be changed when its resources are exploited on a great scale, how an entire social fabric, human, architectural comes out of nowhere....

Like this, through explicative panels and photographs, we go through the life of the miner and his environment, the role of the managers and technicians, the creation of a predominant social class, the evolution of the miners housing, etc.





Museum

the furnace puddling process and the wrought iron or soft iron

>>The process of puddling in a reverberatory furnace

The puddling or the refining of metal was a process that consisted of the heating of a reverberatory oven and at high temperatures the ingots of steel melted to eliminate part of its carbon component and the slag that had been introduced during the casting process. In these puddling furnaces the metal did not come into direct contact with the coke carbon, instead it received the heat reflected on the walls of the furnace in order to avoid the addition of impurities. Once the ingots were completely melted the puddling or the arm movement began, stirring the liquid with a spit so that, when the slag was mixed with the metal, it was eliminated through oxidisation.

>>The wrought iron or soft iron

The ingots of melted steel obtained from the blast furnace were transformed into soft steel, also called wrought iron, reducing its content of carbon and eliminating at the same time by oxidisation a great part of its impurities such as sulphur, phosphorous, manganese and silicon. This process, which was mainly done through puddling in the reverberatory furnaces, was completed by submitting the "billets" of steel obtained to the percussion of the steam hammer, eliminating in this way the slag that had been mixed with the steel during the initial fusion.



The steam hammer



Puddling furnaces



Museum

blast furnaces and the forge of Saint Blas



>>The constitution of the Palencian - Leonese Mining Society

References exist that indicate that in the decade of 1830 some mining activity was done by a British company in the valley of Sabero, and a few years later, between 1841 and 1847, the installation of the first blast furnaces in the Spanish church took place, near the shrine of Saint Blas. "By 1841 the palencian Miguel Iglesias Botias was awarded three coal mines (Sabero 1, 2 and 5) and formed the Palencian Mining Society, its objective would be the exploitation of the coal mines and the manufacturing of steel from the minerals of the "Imponderable" mine. In 1845, with insufficient capital, it was extended, while changing its name to the Palencian - Leonese Mines.

At the same time, Santiago Alonso Cordero a capitalist from Madrid and his friend Casiano de Prado, an important figure of Spanish culture from the 19th century, participated in the society. The Palencian Mining Society started its works around 1841 with an initial mining of coal. In 1847 it started to make steel in a coal blast furnace, and in 1860 a second was inaugurated, its production was consistent and was maintained until the definitive closure of the factory of Saint Blas in 1862. The stoppage of the furnaces also meant the practical abandonment of the steel and coal mines, whose period of major activity was during the decade of 1850 to 1860 (Quirós, 1971).

Museum

the raw materials

The operation of a coal blast furnace for the production of iron began by loading it from the top (gutter or loader) in alternating layers of "... a wagon of coal, a wagon of iron ore and a wagon of flux... with additions of metal slag...". The whole of this burden fell regularly into the belly of the furnace and the combustion of the coke took place in the mouth of the jets; this reached a maximum temperature of 2,000° C, above which caused the reduction of the steel oxides and the steel was liquefied, it also got rid of its impurities due to the limestone flux and being the most dense was deposited at the bottom of the crucible. From there, once the casting hole was uncovered the melted steel came out through the grooves and onto the floor of the plaza. The impurities, the ash and the rest of the additional products being lighter in weight remained floating on top of the melted steel forming the slag or casting.

>>The characteristics of Iron Ore

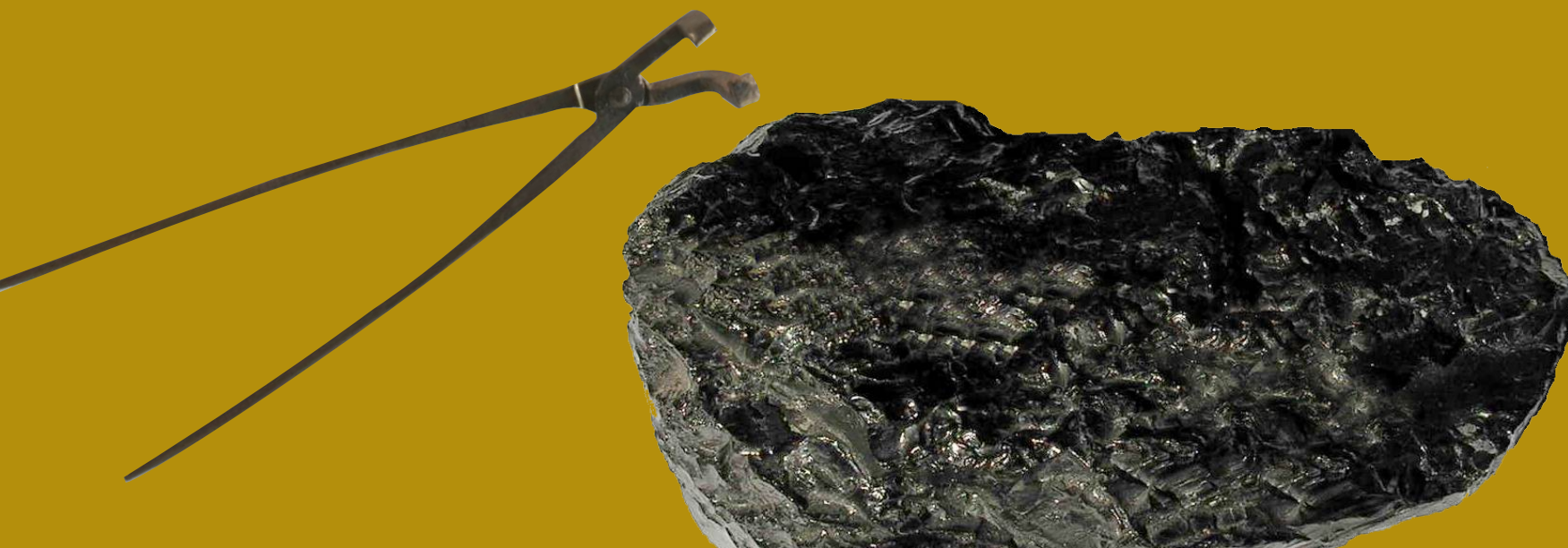
Iron ore is abundant in these basins. It is scattered everywhere in carbonate form and also in that of hydroxide, which in some places forms rich and abundant mines. There is also iron sandstone in extraordinary abundance, and limestone as well, therefore these already contain the flux... (Industry and material interests magazine, 1847)

>>From coal to coke

Coke is a fuel obtained from the distillation of coal, heating it to very high temperatures in closed furnaces. It is therefore a product of the thermal decomposition of bituminous coal in the absence of air. When the coal is heated it releases gases and the coke carbon is what remains. It is a hard and porous material with a carbon composition of between 85 and 90%.

>>The characteristics of flux (limestone flux)

Limestone flux or basic flux made up of impure calcium carbonate and contains, at least, between 50 and 56% of calcium oxide. It is used in the obtaining of iron when the raw mineral to be melted is acidic, freeing it of its impurities during the final process.



Museum

the coke blast furnace

The procedure for obtaining coke carbon was done in closed furnaces, usually arranged in a battery. The coal was introduced and was heated to high temperatures during a long period of time (on the premises of the Forge the process lasted between 25 and 30 hours), provoking the thermal decomposition of the bituminous coal in the absence of air. The resulting carbon only contains a small fraction of volatile materials and it is a light and porous fuel, which was ideal for the manufacture of iron and steel. As its combustion does not produce smoke and is less contaminating, it was also used for heating. On the 14th of March in 1846 the first foundation stone was placed, for the first blast furnace of the Forge of Saint Blas. This construction, of refractory brick, was made up of two truncated cone bodies joined at the base. Their dimensions where of, 16 meters in height, 2.24 meters in diameter at the loader, 4.5 meters at the widest part of the belly and 37 centimetres at the crucible. The great novelty that this tall furnace brought with it, was that it worked continuously and it was the use of coke carbon that accelerated the obtaining of great quantities of steel. During the stages of maximum activity it had the capacity to produce more than nine tonnes a day.

<<Technology and production>>

>>Technology and production of the forge

The cast that came out of the crucible of the blast furnace, once cooled, was divided into blocks or ingots and was worked on in the nave of the Forge, known also as the forging and rolling workshop. Inside the foundry or the forge the block was decarburized in the puddling furnaces or it was reheated to be submitted to the percussion of the steam hammer. This forging hammer was driven by steam, which expanded within a cylinder provoking a cyclical percussion movement of the mallet that beat, crushed and purified the "ball" or mass of steel over the anvil. This operation created breads or thick bars of steel, called "billets", which after the last reheat were transferred finally to the rolling trains. The steam hammer in this forging and rolling workshop in 1847 was of English construction; it had a force of 10cv and a mallet of 1,300 k, whose falling distance could be regulated between two meters and some centimetres.

>>Technology and the production of sheets

The thick bar of steel that came out of the steam hammer was reheated once or twice to make it more ductile and manageable, and it was passed under pressure in the rolling trains between rollers or cylinders which turned at the same velocity and in opposite directions, transforming in this way the softened iron bar into circles, squares, rails, wheels, plates and all kinds of profiles.

>>Technology and the foundry production.

Cast iron or the separated iron that came out of the bottom of the crucible of the blast furnace was poured into the prepared grooves that were in the floor of the plaza, situated at the very foot of the mouth of the furnace. This casting, once cooled, was separated into equal blocks called ingots, which were once again melted in the cups located between the two blast furnaces. Finally, the melted steel was emptied into moulds in order to create the desired melted piece. Currently there are very few references about the production of the Saint Blas factory; it is known that from one oven 2,185 tonnes of cast iron were obtained in the year of 1851, and 1,044 in the year of 1859.