

INDUSTRIAL & TECHNICAL HERITAGE MUSEUMS IN EUROPE

**A personal selection of 160 European museums about
industrial and technical heritage and culture**

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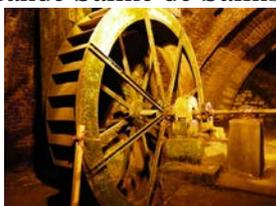
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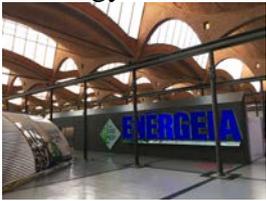
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INTRODUCTION

The industrial and the technical heritage include three main categories: the first category includes buildings, transport infrastructures and engineering works -the category of immovable remnants-; the second category includes industrial equipment, scientific instruments, products, archives, etc. -movable remnants-; a third category is the immaterial heritage, including technical skills and workers' culture.

Museums present items from all three categories, mentioned above, often with a main focus on the two last ones. There is an important and evident reason for that: in many cases it is simply not possible to keep machinery and tools on the original sites of production. This means that the presentation of technological and industrial objects in a museum, mostly out of the original location and original context of these items, implicates an optimal contextualisation and an intelligent interpretation. This is not an easy task and it is the purpose of 'good practice museology'!

As a consequence of the delocation of industrial and / or technical objects (far from their original production context), presented in classical, often stereotypical showcase-museums, it's no wonder that, since the 1970s, numerous attempts were made to create site-museums, integrating the collection in a more or less original and authentic environment in or related to former production areas.

The 1970's and 1980's were the time of new museological formulas, of ecomuseums and the creation of decentralised "network-museums". But because of changing mentalities and social attitudes (less involvement of local population in ecomuseums, difficulty to find enough volunteer managers, etc.), or because of too expensive management (in some of the new network-museums and institutions), a lot these younger museums were reduced in surface, re-structured or, in the worst cases, they were forced to close their doors for the public, selling their collections or offering them to other museums or cultural colleagues-institutions...

The last purpose is an important research topic not further developed in the actual publication, conceived as a guide, presenting a wide range of industrial and technical heritage museums from all over Europe.

The main criterium of the selection was the presentation of a diverse choice of all kinds of museums in European countries, showing a scientifically, a technical or an industrial collection (or a combination of items from these categories). The selected museums have a different scale, from impressive so-called national museums, or regional museums, to more modest, local museums.

The museums were selected from the majority of the European countries, and the selection covers quite every branch or thematic issue of industrial and scientific heritage. The selection not only focuses on museums presenting objects reflecting different industrial production branches, but stresses also on transport history, technology, further also on technical heritage and scientific heritage. The last category of museums presents the heritage of the scientific research within specific universities (academic heritage) or heritage of research activities by private foundations, associations and by enterprises.

In total, 160 museums were selected, but the description of several of these museums was completed with “tips for visitors” with additional information about one or more museum nearby. Also, the different branch museums of so called ‘networkmuseums’ were mentioned. Including these complementary museums, the quantity of presented museums in this guide is about 200 museums.

The comments and texts are concise and concrete. Only essential information is provided. In each case, the website of the museum will present more and additional information about the collections, the new developments and practical information about the collections, comporary events, opening times, entrance prices, etc.

We hope that this guidebook will be an interesting tool for further discovery of these and other museums on site. The author and publisher of course welcomes all our readers’ comments, eventual corrections and further suggestions, useful for a possible new edition.

Patrick Viaene, 15th of February 201

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AUSTRIA

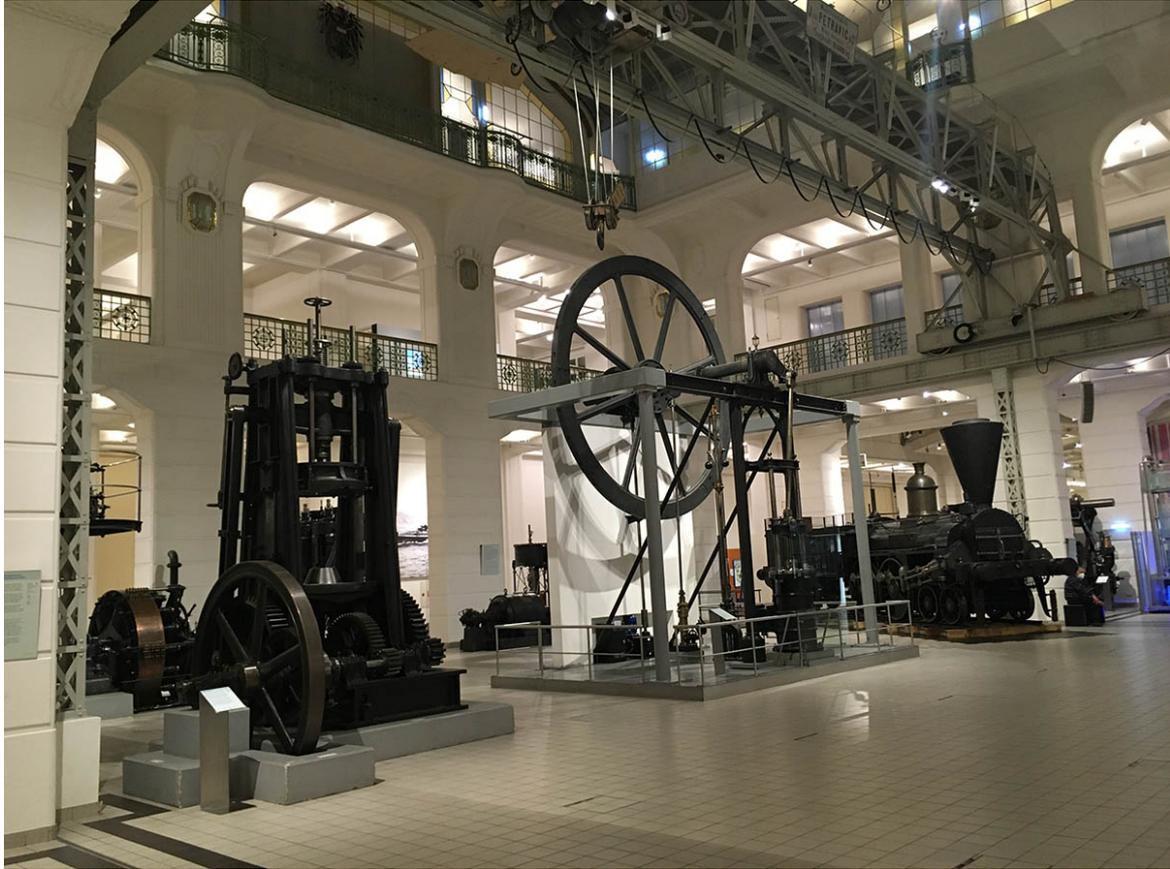
1

Technisches Museum Wien (Vienna Technical Museum)

Mariahilfer Strasse 212, 1140 Wien (Vienna), Austria

Tel.: 43-1-89 998-0

www.technischesmuseum.at



On 20 June 1909 Emperor Franz Joseph laid the foundation stone for the Technisches Museum Wien (Vienna Technical Museum).

During the 1990's the museum was refurbished and renovated in order to face the new millennium, where technology and science still are two of the main forces driving our society. At the interface between past and future the Technisches Museum Vienna invites visitors to discover, experience and reflect on different fields of technology and its history, catering to all ages of interests. Permanent exhibitions include the sections nature and knowledge, 'locomotive adventure', heavy industry, energy, everyday life, media worlds, but also old less expected items such as historical musical instruments.

Historical exhibits, many of them unique, are showcased in their cultural context, with fun ways and methods of transferring knowledge making it literally possible to get to grips with technology. The Vienna Technical Museum is a nice example of a great classical technology museum constantly striving to evolve further.

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2

Österreichisches Papiermuseum (Austrian Museum of Papermaking)

Museumsplatz 1, 4662 Steyrermühl, Austria

Tel.: 43.7613 3951

<http://www.papiermuseum.at>

The Austrian Museum of Papermaking is housed in historical workshops of the Paper Factory Steyrermühl, active from 1890 to 1988. The setting of the buildings along the Traun River is remarkable and romantic. The museum (over 4000 square meter) illustrates not only the technical aspects of paper production and printing but informs also about the social history of the work and lives of former workers, the link between industry and environment.

The Austrian Museum of Papermaking was founded by the town-authorities of Laakirchen in 1993. In 1997, after four years of intensive restoration works the first section of the museum was opened to the public, presenting the restored paper machines 4 and 5 and a lot of other equipment for industrial and manual paper production. In 2000 the section "printing shop" was opened and three years later an activity centre (with spaces for cultural meetings, seminars and other educational events) in the so called "Old Factory" (Alte Fabrik ALFA).

In 2008 the presentation of the collections and different museums sections was renewed on the occasion of the "Landesaustellung Salzkammergut". Also in 2008 the 19th century power station "Kraftwerk Gschröf" (delivering a part of the energy for the demonstration of certain museum machines) was opened the doors for visitors as well as a section about Fire brigades. The Austrian Museum of Papermaking is a good example of a lively and dynamic institution, sponsored by public and private funds.

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3

Museum Arbeitswelt Steyr (Museum of the Industrial World)

Wehrgrabengasse 7, 4400 Steyr, Austria

<http://www.museum-steyr.at>

The Museum of the Industrial World Steyr is not a classical museum but an international conference and events (Internationales Veranstaltungszentrum - IVZ), housed in a remarkable mid-19th century industrial site, presenting temporary and semi-permanent exhibitions about past and present of economy, industrial production, globalisation of work, historical topics as "From Boom to Civil War" (Steyr in the period 1914 to 1934) and other presentations..

Not far from the museum site, installed in a so called "Luftschutzbunker" (a World War II bunker against air raids), the section "Stollen der Erinnerung", devoted to war industries and presenting the industrial and military heritage of the Second World War.

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Museum Alte Textilfabrik Weitra (Old Textile Factory Museum Weitra)

In der Brühl 13, 3970 Weitra, Austria

Tel.: 43 2856 2998

www.members.aon.at/textilmuseum

www.bergfex.at

The “Old Textile Factory Weitra” is one of the most important remnants of the “Waldviertler textile region”. The weaving workshops were installed in the local section of the “Modenwarenfabrik Hackl & Söhne” (Factory of Fashion articles Hackl & Sons), founded in Vienna in 1843. The Old Textile Factory site Weitra includes also an ensemble of workers houses and an old watermill, used in the 16th and 17th century as hammer work, from 1689 to 1866 as paper factory and later on as textile workshop. Since 1990, the Weitra museum presents permanent and temporary exhibitions about carpet making, furniture textiles and all aspects of weaving.

The museum is supported by the project “ARGE Waldvierter Textilstrasse”, who manages two other textile museums nearby, **Lebendes Textilmuseum Gross-Siegharts** (Museumsgasse 2, 3812 Gross-Siegharts) and **Erster Waldviertel Webereimuseum** (Moritz Schadekgasse 4, 3830 Waldhofen an der Thaya).

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Montanhistorisches Museumensemble Vordernberg (Historical mining Museumensemble Vordernberg)

Radwerk IV, Peter-Tunnerstrasse 2, 8794 Vordernberg, Austria

Tel.: 43 664 734 91 994

www.radwerk-vordernberg.at

This museum ensemble offers different ways to discover the old production of iron and in the Vordernberg area. The museum includes the site “Radwerk IV” (blast furnace museum), “Radwerk III” (including the so called “Gebläsehaus” with a steam engine of 1873 and other technical equipment for the transformation of iron).

At a ten minutes walk distance from Radwerk IV is the so called “Lehrfrischhütte”, a rare blacksmith ensemble, dating from 1842. The “Montanhistorisches Museumensemble Vordernberg” is an excellent starting point for the discovery of other old industrial sites in the surroundings.

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BELGIUM

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EMABB - Ecomuseum en Archief van de Boomse Baksteen (Ecomuseum and Archive of the Boom Brickworks)

Noeveren 67, 2850 Boom, Belgium

Tel.: 32 3 888 15 58

www.emabb.be



EMABB is the only Ecomuseum project in Flanders until now. It is an outstanding example of a dynamic, private non-profit organisation working on the legacy of brickworks in de Rupel-region, an association mainly supported by volunteers. Since the late 1970's this group of cultural and social workers struggled for the conservation of the last 19th century brickworks in Noeveren, a neighbourhood of the town of Boom. Until 1960, the region of Boom, situated along the River Rupel, was one of the most productive areas of the entire world. But due to foreign concurrence the brickworks stopped their activities, followed by massive destruction of the old industrial installations...

In 1986 the entirely conserved old brickwork site Frateur was listed by the Flemish government as historical monument and restored from 1997 onwards. Meanwhile, parts of the historical building of the Lauwers brickworks, situated nearby the Frateur site, were bought by EMABB, developing intensive educational activities and developing a new kind of social and heritage tourism. EMABB obtained different distinctions for their excellent and pioneering work, for example the Dunhill Award (1985). Nevertheless, the financial support by the local and regional authorities remained very limited due to a lack of interest and several budget restrictions.

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La Fonderie – Musée bruxellois de l'Industrie et du Travail (Brussels Museum of Industry and Labour)

Rue Ransfort / Ransfortstraat 27, 1080 Brussels, Belgium

Tel.: 32.2.410.99.50

www.lafonderie.be



La Fonderie, a non-profitable organisation has been studying the economic and social history of the Brussels region for thirty years. Situated nearby the Canal Brussels – Charleroi, on the site of the disaffected foundry “La Compagnie des Bronzes”, active until 1979, La Fonderie offers a unique look at the industrial history and actuality, with the view to promoting its industrial heritage. There are many aspects to La Fonderie’s work: a magazine (Les Cahiers de La Fonderie, published since 1986), the organisation of temporary exhibitions, of guided visits and other educational activities, the collection and presentation of machinery, tools and other artefacts used in Brussels industries, saving archives of old enterprises from destruction, elaborating oral history projects, etc.

La Fonderie equally houses a documentation centre open to the public. In 2014, a permanent trilingual museum presentation was opened for the public in the oldest part of the surviving buildings, restored in 2001. This exhibition illustrates four key industrial sectors that have created or transformed products made in Brussels: the metal industry, even more important considering that La Fonderie settled on the site of the former “Compagnie des Bronzes”; wood, which is essential for the construction and development of the city; textile manufacturing, historically one of the first and most important sectors in Brussels; and finally, the food sector that nourished a growing population. Far from being a static museum about the past, La Fonderie doesn’t aim to compete with the major museums of Brussels. As a museum on a human scale, La Fonderie wants to make industrial history and heritage relevant for the visitors, especially for visitors of the multiethnic neighbourhoods by a closer contact and interactivity.

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Le Bois du Cazier

Rue du Cazier 80, 6001 Marcinelle (Charleroi), Belgium

Tel.: 32.71.88.08.56

www.leboisducazier.be

www.charleroi-museum.org



Le Bois du Cazier is a coalmine in Marcinelle (to the south of Charleroi), listed as historical monument in 1990 and since 2012 listed as a UNESCO World Heritage Site. The coalmine is tragically known for the accident of 8th August 1956: as a result of a human error, 262 men (including 136 Italians) lost their lives, leaving hundreds of widows and orphans. The “8th August 1956 site” is a visitors centre and memorial, devoted to the memory of this tragedy and other mine catastrophes in the world, to safety at work and to migration phenomena. This section is housed in the colliery extraction machine hall. Nearby, in the landing building (directly behind the former entrance of the tragic shaft) a place of remembrance pays homage to the 262 victims with their names and portraits, accompanied by a sound illustration.

Another section of the museum on site presents a panorama of the industrial history of Wallonia, principally based on the Charleroi region. Three important industrial sectors are presented here: the collieries section, the metallurgy section (including a copper sheet – rolling mill dating from the 19th century, saved from destruction out of a threatened copper rolling mill in Warnant-Anhée) and the regional glass production. Also the chemical industry and the heritage of industrial energy (including steam engines) are presented. Finally, the Glass Museum is housed in a new building of glass and contemporary steel, next to the lamp store.

Imagined especially for young people, the discovery of the Bois du Cazier awakens the senses through the medias used: thematic guided visits, interactive discovery workshops, visit to temporary exhibitions, research in the public documentation centre, the discovering of the pithead, the “terril” (a local name for the slagheap) and the wooded surroundings.

A special attraction on site are workshops and demonstrations with old forging hammers of the “Providence-forges” in Marchienne-au-Pont, integrated in the museum site of the Bois du Cazier. Temporary exhibitions are organised in the former electric power station. A library and documentation centre is open for researchers and all kind of visitors.

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Ecomusée du Bois-du-Luc

Rue Saint Patrice 2b, 7110 Houdeng-Aimeries (La Louvière), Belgium

Tel.: 32.64.28.20.00

www.ecomuseeboisduluc.be



Bois-du-Luc is a part of the town of La Louvière. It is the best preserved mid 19th century miners village of southern Belgium, and is a part of the UNESCO World Heritage Site “Major Mining Sites of Wallonia”. The site of Bois-du-Luc, still inhabited by old miners and younger newcomers, includes the Saint-Emmanuel colliery, workshops and warehouses, situated behind steel guillotine doors, the villa of the director facing four huge housing blocks, a small festival hall and a shop, a church, two schools (for boys and girls), a hospital (now archive centre), a music kiosk at the base of a slag-heap, etc.

Since 1983 visitors have been allowed inside this industrial microcosm, thanks to the “Ecomusée du Bois-du-Luc”. The round tour of the museum entitled “Between Men and Machines” gives a vivid picture of the strict hierarchy at the pit and the close intermeshing of the various working processes. Visitors can experience a typical day of the life of a collier, enter the director’s office, go inside the colliery workshops and watch craftsmen at work, before taking a look in a typical old worker’s house.

Closely to Bois-du-Luc, visitors can discover the four late 19th century hydraulic boats-lifts (ships-elevators) of the historic Canal du Centre, another UNESCO World Heritage Site. Of the eight hydraulic boat-lifts built at the end of the 19th and the beginning of the 20th century, the only ones in the world which still exist in their original working condition are these four lifts on the Canal du Centre (for visit conditions, see <http://voiesdeau.hainaut.be>).

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Industriemuseum Gent (Museum of Industry Ghent)

Minnemeers 9, 9000 Gent, Belgium

Tel.: 32.9.269.42.00

www.miat.gent.be



Ghent has been an important pre-industrial city since the Middle Ages and was the cradle of the first industrial revolution on mainland Europe at the end of the 18th century. From the 1970's much of the evidence of the first and second industrial revolutions were demolished. In 1978 the municipal authorities responded with a commitment to preserve machines and other objects in a first museum, located near the Castle of the Counts (Gravensteen). In 1989 Ghent city council decided to move and present the collection in the former Desmet-Quequier cotton-

spinning factory (in use until 1975). In 2015 the first name of the museum, “MIAT - Museum over Industrie, Arbeid en Textiel” (MIAT - Museum about Industry, Labour and Textile) changed in ‘Museum of Industry (-Ghent)’.

The overview of the industrial society provided by the museum occupies four floors of 1800 m², including the permanent exhibitions “Our Industrial Past” (presenting the famous and unique semi automatic spinning machine ‘Mule Jenny), “World Wide Working” and “Textile Machines in Motion”. Other spaces are occupied by temporary exhibitions, a museum cinema and (outside) a museum garden with a variety of dye plants, used for dyeing textiles naturally during museum workshops.

The Museum of Industry is nowadays the reference museum on industry, labour and textiles and the contact point for tangible and intangible industrial heritage in Flanders. As a museum and knowledge centre, The museum acts as a bridge between the collections of tools, machines, related remnants and the wider (inter)national heritage community. The museum-institution is close to the local people of Ghent, and disposes of an active team of volunteers (textile and printers working groups). Special attention is paid to schools and to technical and vocational training institutes in particular.

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Jenevermuseum (Distillery Museum)

Tel.: 32.11.23.98.60

Witte Nonnenstraat 19, 3500 Hasselt, Belgium

www.jenevermuseum.be



The Jenevermuseum Hasselt is located in the former distillery Stellingwerff – Theunissen, bought by the Hasselt city council in 1979 in order to accommodate a museum. The tour integrates the living and working areas of both these families. From the oxen stable you'll be guided to the bottling facility and the distillation hall. The 19th century distillation system, originally from distillery H. Servais in Géromont-Malmédy and bought by the museum in 1981, is the beating heart of production. After the germination attic, you'll enter the living quarters before finally reaching the barn.

Only a small part of the collection is presented in semi-permanent exhibitions of jenever glasses bottles, jugs, ceramic objects, posters, pictures, placards and labels. The museum-jenever-bar has an extensive selection (130 kinds of jenever from Belgium and the Netherlands) to offer. The court yard is the location for many activities: music, theatre, performance and other events. The entire (late 18th century) distillery location is a protected monument.

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Mijnmuseum Beringen (Mining Museum Beringen)

Koolmijnlaan 201, 3582 Beringen, Belgium

Tel.: 32.11.45.30.25

www.mijnmuseum.be



Coalmines play a major role in the history of Limburg. In Beringen the mining past is still very present: the former mining settlement is almost fully preserved. The surrounding garden suburbs, with a unique Sint-Theodardus church in art deco-style, a Casino, engineers houses, a milk booth, the miners school and –typical for mining regions- a nice interwar period football stadium, have kept much of their charm and uniqueness. The former slag heap has been turned

into walking areas. The Beringen Mine Museum, who started activities in 1986, is situated at the former mine site and is in full development thanks to be-Mine. The museum presents the saga of coalmining in Limburg from the first discovery in 1901 to the last mine closure in 1992. The Mine Museum offers programmes for individual visitors, schools and groups: welcoming film, underground simulation, guided tour through the original mine-buildings (bathroom, lamp room, crew room, pit shaft, etc.).

The Mine Museum is the ideal starting point to visit other interesting sites in coal basin of Limburg.

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C-Mine, Winterslag (Genk)

Address: C-Mine, Evence Coppéelaan 91, 3600 Genk-Winterslag

Tel.: 32.89.65.44.90

www.c-mine.be

One of the most remarkable mine heritage sites in northern Belgium is **C-Mine in Winterslag (Genk)**. C-Mine is a cultural centre, housed in the former Winterslag colliery. The huge front building (former offices) is reused since the late 1990's as restaurants, pubs, cinema and polyvalent event halls. The energy buildings of the mine were restored shortly after 2005. The most important elements of the original machinery (winding machines, air compressors, etc.) remain on site. Actual uses of the former mine building include a congress centre, seminar and event locations (in the former energy-buildings and power hall), a theatre, the regional tourist office board, exhibitions rooms, bars and restaurants, a bicycle renting corner, etc. A special attraction is the underground C-Mine expedition with possibility to climb up the highest mineshaft tower of the region and to enjoy a nice panorama. The former office block and adjoining former dressing hall and shower rooms, an impressive construction facing the street, house different public services and private offices, a multiscreen cinema and additional restaurants and pubs. In the northern part of the mine area, different new buildings and activities enhance the cultural importance of C-Mine as the Genk Design Academy and workshops of craftsmen and artists. Also the surroundings of the mine, including a nice garden village ('tuinwijk van Winterslag') and Vennestraat (a multi-ethnic village street), the other mining heritage of Genk (including the mine of Waterschei and Zwartberg) are interesting complements of a C-Mine – visit.

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Texture – Flax Museum (Texture - Vlasmuseum)

Noordstraat 28, B-8500 Kortrijk, Belgium

Tel.: 0032 56 27 74 70

www.texturekortrijk.be



The history of the Flax museum begins in the 1960s. The flax industry was the most important economic activity in the south of West-Flanders. When this sector experienced a major crisis, the museum founder, Bert Dewilde, realised that this local tale would be lost. He started collecting work tools with enthusiastic volunteers and with the support of companies. In 1982 the National Flax museum opened for the general public. Thanks to many spontaneous gifts to the museum, a second wing about the finished flax products was developed and the 'Lace and Linen Museum', opened in 1998. The Flax museum was renowned for its realistic scenes, its nice collection of lace and its enthusiastic demonstrators.

Under the leadership of Lies Buyse, work has been carried out since 2009 on a thorough re-profiling of the museum and the relocating to a significant location. This location was transferred into a flax distribution centre from 1912 in the centre of Kortrijk. After being closed for two years, the museum reopened its doors in 2014 and was named TEXTURE, adding a new chapter to an already interesting story. In this modern museum building young and old now discover the valuable collections of flax and textiles presented in a totally new concept. Texture is situated next to the river Leie, the main port to the industrial heritage of the area, on walking distance from the centre of Kortrijk. Overleie, the neighbourhood where Texture is located, is currently in full development and a masterplan realizes a number of important works which are interesting for the integration of the museum in its neighbourhood. The actual museum building was constructed in 1912 by the Linen Thread Company but was - when finished - immediately claimed by the German authorities. They used it as a pigeon prison, as these birds were considered to be important messengers during the First World War. The Linen Thread Company could finally in 1918 start with the flax distribution centre

which had a strong reputation among the flax producers. Today the building is one of the most important remains from the flax industry. The company worked with major Irish and Scottish spinners which pushed the prices down due to large group purchases. It is also a symbol for the importance that the international linen sector attached to the crop.

The building was transformed into a modern museum by noArchitecten and Madoc. By using contemporary industrial elements they opted to highlight the industrial past of the building. The top floor with its entirely gold colour is another reference to the Golden River. In addition to the permanent exhibition the building also offers a polyvalent space, a bistro, desks, a studio and a spacious reception.

Texture draws on the collections of two driven collectors. *Bert Dewilde* started in the 1960s with an educative collection of flax tools and built these step by step into a unique collection in Europe. This collection lies at the basis of the Flax museum in Kortrijk (1982) and was later extended with a lace and linen collection. This collection contains a pulling machine and a scutching turbine (design Vansteenkiste 1937) which was included in the list of best museum pieces in Flanders. *Joseph de Bethune*, a descendant from a family of linen traders, started an impressive textile collection. The collection laid the basis for the Broelmuseum (1879) and was primarily filled with damask and lace items. In the collection there are - among other things - the internationally renowned damasks from Kortrijk.

On the heritage database www.erfgoedinzicht.be you can look further into the Texture collection. In this way you can yourself make connections with exciting museum collections from East and West-Flanders.

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Train World

Place Princesse Elisabeth 5, 1030 Schaerbeek (Brussels), Belgium

Tel.: 32 2 224 74 98

<http://www.trainworld.be/en>



Train World is the new Belgian railway museum, opened in 2015 and located in and around Schaerbeek stations, whose plans date from 1887 and 1913, and which have been completely restored. Train World is located on the route of Belgium's very first railway track, between Brussels and Mechelen and the site is still very accessible by rail and other public transports.

Belgium's railway network is the oldest on the European continent and was developed at a furious pace. The new museum illustrates the role of industry and state as investors in this development and the building of locomotives. Train World presents a wide chronological range of trains, starting with Le Belge (the first locomotive to be built in Belgium) or the Land van Waes (the oldest remaining steam engine in Europe) and a spectacular streamlined type 12 steam engine, but tells also the tale of railway men and women, presenting their daily work and life.

Other important themes are the evolution of technology and safety, the transport of workers to and from their workplace (commuting as a typical Belgian phenomenon), goods transport by rail ('from letters to containers'), train travels during holidays, special railway lines (Orient-Express), the use of train by the royal family, the key role of the railways and train timetables in telling the time and synchronising clocks...

Tragical events of railway history are also presented: over 3.000 railway men lost their living during the two world war; not forgetting the 28 convoys with Jews and gypsies, who were transported to concentration camps.

Attention is not only given to the steam age of railways, but also to electric and diesel engines, including the very first electric model MS 35 and the "mini" of the diesels, the so-called Brossel MW 551. Train World presents also a wonderful collection of engineering structures (bridges, viaducts, tunnels, etc).

Not only the scenographic quality of the museum and the remarkable input of the artist François Schuiten, but also the high standard educative approach, present in all sections of Train World attracts visitors of all ages and social background from all over Belgium and abroad.

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BULGARIA

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National Textile Industry Museum

Stoil Voyvoda Square 3, Sliven, Bulgaria

Tel.: 359 44 62 37 49

www.polytechnicmuseum.org

www.textilemuseum.abv.bg

<http://bulgariatravel.org/en/object133>

The National Textile Industry Museum in Sliven is unique and the only museum of this kind in Bulgaria. The museum, a branch of the National Polytechnic Museum, is situated in the yard of the first Bulgarian textile factory. Thematically, the museum is dedicated entirely to the production of textiles from the ancient past until the present day. Special focus is placed on the industrial revolution in Europe. There is a working Jacquard loom displayed at the museum. A

special exhibition is dedicated to crafts related to textile production, such as silk-production, frieze-weaving, rope making, cotton-printing, goat's hair processing and carpet production.

The museum is very attractive with its demonstrations of ancient weaving machines, some of which are nearly 200 years old. The collection include also a 1937 spinning machine, knitting machines and a 1943 Princess Marie Louise mechanical weaving loom manufactured in England especially for the Bulgarian market. A special exhibition can also be seen dedicated to the life and work of Dobri Zhelyazkow (1800-1865), founder of modern industry in Bulgaria.

A complementary visit at the Sliven Regional Historical Museum, situated in the pedestrian district of Sliven, is another attraction for guests interested in local and regional history.

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Interactive Museum of Industry

Ul. Nikolaevska 3, 5300 Gabrovo, Bulgaria

Tel; 359 87 868 33 95

www.imi.gabrovo.bg

The Interactive Museum of Industry is more a visitor and information than a classical museum, but it is informing visitors about the economic past and present of the Gabrovo region.

Also recommended to visit in Gabrovo is the Museum of Education (www.nmogabrovo.com) And the Architectural and Ethnographic Complex Etar (www.etar.org), an outstanding open air museum at the outskirts of the town of Gabrovo.

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Naval Museum Varna

Blvd. Primorski 2, Varna, Bulgaria

Tel.: 359 52. 731.523

<http://www.museummaritime-bg.com/eng/>

The Naval Museum has old roots, starting in 1883 with a first collection of ships and equipment of the Danube fleet in Russe. The "Maritime Museum" in Varna opened in 1923. The purpose was "to explore and present the development of the Bulgarian navigation (...) and to propagate the concept of love for the sea (...)".

In 1955 the old name Maritime Museum changed in Naval Museum and became a branch of the Central Museum of the National Army (today National Museum of Military History), having branches in different Bulgarian towns, as the Aviation Museum – Krumovo near Plovdiv (<http://www.airmuseum-bg.com/eng/>).

Soon the purpose of the museum was enlarged to present the history and heritage of shipping, shipbuilding, ship repair, harbour history, etc. The collections are not limited to indoor presentations: interesting vessels outside include the torpedo-boat "Druzki" and the yacht 'Cor Caroli'.

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CROATIA

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National Technical Museum

Savska cesta 18, 10000 Zagreb, Croatia

Tel.: 385 1 4844 050

www.tehnicki-musej.hr/eng/

The National Technical Museum was founded in 1954 and went in operation on present location in 1963. It is one of the most visited museums of the country, presenting a wide range of machinery and technical equipments. Highlights include the section “The Motive Power of Fire”, with steam engines (including a working vertical piston steam engine) internal combustion motors and machine models. Of particular interest is the section geology and mining (with a 350 m long model mine, built below the museum), objects and documents in relation to the extraction of coal, iron and non-ferrous metals).

Also important is the section traffic vehicles (including the hydro-plane Fizir FNH designed by the Croatian constructor Rudolf Fizir, the popular locomotive Samoborček, and the pocket size submarine Malisan CB-20, a Dubrovnic tram car from 1912 and the motor sled constructed by the Zagreb mechanic Marko Knez). The tram car M 24 (1924) parked at the Zagreb Tram Terminal carries museum visitors around the town on Sundays and during special events.

Other sections are dedicated to fire fighting, with a special emphasis on Croatia, to the development of agriculture, astronautics (with a well-known and popular Planetarium). In 1976, the Demonstration Cabinet of Nikola Tesla has been constructed in the section dedicated to the great personalities of Croatian science and technology. The museum presents a lot of Tesla’s inventions: a rotating magnetic field, high frequency transformers, the wireless transfer of electromagnetic oscillations, a remote-controlled ship, etc.

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Musej Automobila Ferdinand Budicki (Automobile Museum Ferdinand Budicki)

Ulica Kneza Ljudevita Posavskog 48, Zagreb, Croatia

Tel.: 385 99 22.90.161

<http://www.oth-ferdinandbudicki.hr>

The Automobile Museum Ferdinand Budicki, opened in July 2013, is a good example of an important private collection of ‘oldtimers’, presented in the former Pluto factory workshop, a building in modernist style with sheds, providing a lot of daylight in the museum. The museum is named after F. Budicki, the first person who bought a car to Croatia in 1901.

Attractive exhibits include a Ford Model T, numerous old Mercedes and the locally popular classics such as the Zastava Fico, Citroens DS and 2CV, etc. A special section is dedicated to the collection of historic Vespa’s. The museum organizes mechanics workshops, a learning program concerning the restoration of old vehicles, film projections and other events regarding the long history of traffic and car culture in Croatia.

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CZECH REPUBLIC

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National Technical Museum

Kostelni 42, 170 78 Prague 7, Czech Republic

Tel.: 420 220 399 111

www.ntm.cz/en/

The National Technical Museum (NTM) in Prague is one of the most technical and industrial museums of Central and Eastern Europe. The NTM-building on Letná hill, designed by the architect Mila Babska, gradually opened beginning in 1949.

Different branch collections are of great importance: the Museum of Transportation (divided into departments dealing with roads, waterways and aerial transport, with the Railway Museum as special branch of NTM, to be installed in old sheds of the monumental Masaryk Station in Prague), the Electro-technical and Media Museum (or MEM, divided in departments dealing with photography and film technology, printing and writing technology; informatics and acoustics) and the Museum of Industry (composed in five sections: mining and metallurgy, mechanical engineering, chemistry, domestic technology and textile industry, and finally the department of exact sciences).

Another independent component of the NTM is the “Museum of Architecture and Civil Engineering”, created in 2008, presented a unique collection of design, scale models and archives related to architectural and civil engineering activities. Others sections are dedicated to astronomy and measurement of time. From 2003 to 2011 the NTM-building underwent a massive reconstruction, expressly for the purpose of serving as a contemporary technical museum.

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Hornicky skanzen Mayrau (Mayrau Mining Museum)

273 07 Vinarice u Kladno, Kladno, Czech Republic

Tel.: 420 312 604 540 (Tourist Information Kladno)

<http://www.czechtourism.com/t/kladno/>

www.mestokladno.cz

The rise and growth of coal mining and iron production (Poldi Ironworks, NKT-Cables) became a motive power of the industrial revolution in Kladno. The bankrupt of Poldi Kladno Iron and Steel works in 1996-1997 deeply harmed all the region. The Mayrau mine, listed as historical monument, was active as a Kladno coalmine until the mid-1990s. An open-air mining museum was opened here in 1994 with the 120th anniversary of the foundation.

All the buildings of the abandoned shaft look as if the miners had left the site only recently. In addition to a permanent exhibition about mining in the region, the Prague Iron Company and exhibition of mining salvage and rescue services systems, visitors will also find on site an observation tower and a gallery dedicated to industrial art.

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Michal / Petr Cingr Mine – Ostrava Museum of Industry

Cs. Armady 95/413, 715 00 Ostrava-Michalkovice, Czech Republic

Tel.: 420 596 2311 51 (custodian) / 420 7244 00 280 (collection management)

www.dul-michal.cz



The history of Michal mine is connected with the effort of the former Austrian state to support coal mining as precondition for industrial development. One of the oldest shafts was renamed as Michal shaft after a deceased imperial adviser Michael Laier. In 1946 the mine was renamed after a social-democratic deputy of the Austrian Reichstag Peter Cingr. The mine was closed in June 1993 and shortly afterwards, the whole area was overtaken by the Czech Republic's Ministry of Culture who established the Ostrava Museum of Industry there.

The mine remains since its last major reconstruction was finished in 1915 without any substantial change, and it is an outstanding example of mining heritage. On no account the Office of Preservation of Monuments try to reconstruct or embellish anything.

The site can only be visited during (excellent) guided tours, who present the different parts of the mine: the check room, management offices (with original furniture and equipment), the chain cloakroom, the second evidence room ('Zeichenhaus'), the lamp room, the head-gear tower and building, the coal preparation plant, the engine house and compressor hall. "Dul Michal" is one of the best conserved, researched and managed old coalmines of central Europe.

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Landek Park - Anselm Mine Museum

Pod Landekem 64, 725 29 Ostrava-Petřkovic, Czech Republic

Tel.: 420 596 131 803

www.muzeumokd.cz / www.landekpark.cz



Located on the former Anselm Mine (one of the first of the region established at the end of the 18th century) the Mining Museum was opened in the early 1990's. Coal was used in the Ostrava region long before the 18th century. Man was using coal here more than 25.000 years ago. The "Venus of Landek", a small, carved figure of a woman (46 mm long!), probably made the site most famous.

In Landek Park, a unique exhibition of the mining museum highlights the evolution of coal mining in the Ostrava-Karvina region, as well of mining technology and the largest exhibition of rescue equipment in the world. A guided tour includes a view of mining in the original seams with wooden braces, mining machines and belt conveyors. The compressor hall is today used as an unusual concert or conference hall. Outdoor space is also used to hold social events all year round and presents sculptures and metal structures of contemporary artists. The Harenda Miner's Pub presents miners gastronomy and is decorated with all kinds of mining memorabilia.

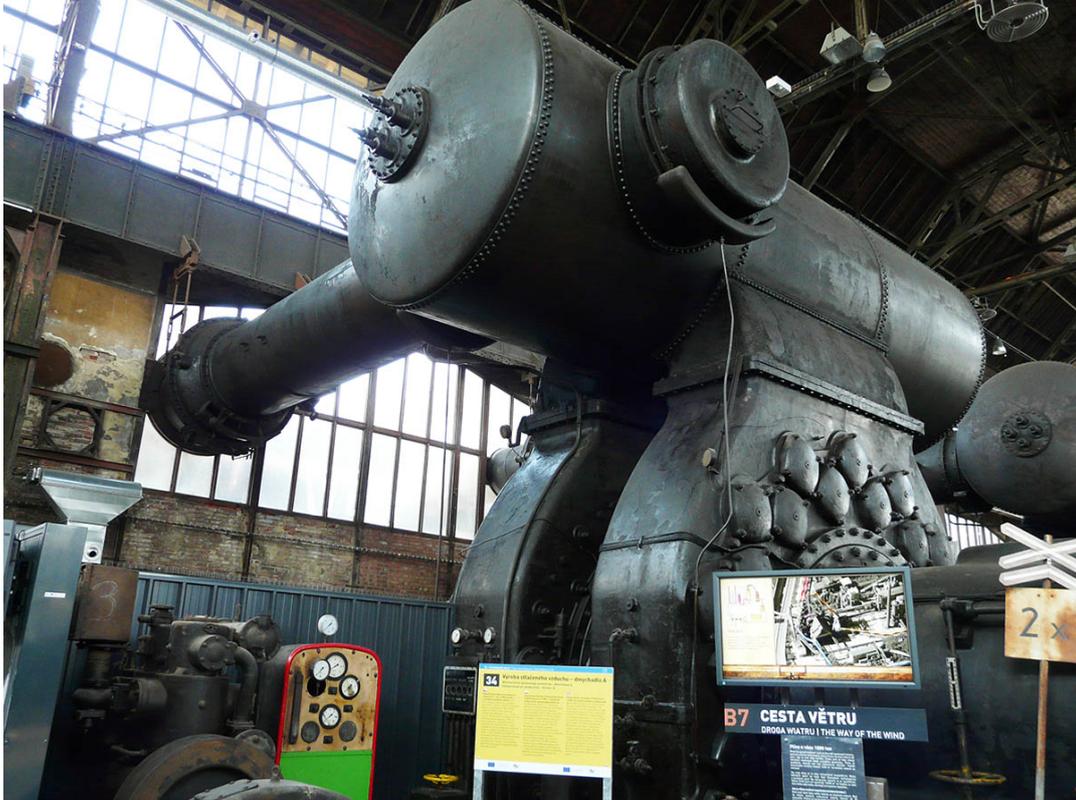
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Vitkovice Iron Works – Lower Area Complex

Ruska 2887/101, 706 02 Ostrava-Vitkovice, Czech Republic

www.vitkovice.cz

www.dolnoblavstvitkovice.cz/56/en/node/2709



The Vitkovice Area takes up almost 300 ha of former industrial land. It forms the typical southern panorama of the town of Ostrava and is also referred to as “Ostrava’s Hradcany” (in honour of Prague’s Hradcany Castle). The blast furnaces, coke-oven batteries and the Hlubina mine of the so-called ‘Lower Area of Vitkovice’ were put out of operation in 1998 after 170 years of continuous operation. In 2002 these huge industrial structures were declared objects of the National Cultural Heritage. A unique industrial piece in the Energy Central Station is a large piston blower, used to supply blast furnaces with compressed air, who remains on site. The TG 178 machine weights 900 tons. The diameter of the flywheel measures 8 meter and the diameters of the piston and piston rod are 3250 and 410 mm, respectively. The cylinder-displacement is 13,87 sq.m., with a stroke of 1700 mm and output of 3800 kW.

In 2008, the Lower Area of Vitkovice was inscribed on the European Cultural Heritage List. The objective of the reactivation project is not only conservation but also the sustainable and useful re-use of the site, who is gradually in transformation into a university and research campus, a cultural park presenting during all seasons of the year cultural events and exhibitions (in the PLATO – Gallery), situated under a large circular auditorium (called GONG), built in a large old gasholder. The old Power Hall (6th Energy Central Station), called U6 nowadays, has been transformed in an interactive industrial and technical museum, entitled “The Small World of Technology”. Visitors find a selected number of inventions that have significantly affected development of industry and technological progress in the Czech lands and in the world.

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Pilsner Urquell Brewery and Museum

U. Prazdroj 7, 30 497 Pilsen, Czech Republic

Tel.: 420 377 062 888

www.prazdrojvisit.cz/en/

The Pilsner Urquell brewery and museum form one of the world's best rated tourist attractions. The brewery museum is located in an original brew house from the 15th and 16th century, introducing the history of the city of Pilsen, the development of trades and guilds, the beginning and development of the beer brewing industry, malting, cooperage, cartage, distribution and consumption. Visitors discover also the late gothic malt hall, the so-called "hvozď", the rolling room and laboratory, a collection of beer bottles, glasses and other collectibles.

From the Welcome Centre in the building of the former cooling 'drains' from 1868, visitors are guided through the different sections of the old and modern brewery. Heritage lovers are impressed by the oldest brewery parts dating from the 19th century and the brew house from the 1930's, producing beer and still using the method introduced on 5 October 1842 by Josef Groll. The original copper kettle of this period survived both world wars and is conserved on site as a relic. A special section presents the ingredients and their historical and cultural context: malt produced from special varieties of Bohemian spring double-row barley, Zatec semi-ripe red hops and special brewer's yeast. The section 'People of Pilsner Urquell' tells the story of human labour and skill that have been handed down in Pilsen from generation to generation. In the historical beer cellars, still in use nowadays, visitors can admire the spillage tubs, learn about fermentation in open wooden vats and about maturing of the beer in oak lager casks.

Directly from the Brewery Museum, visitors can make a tour of the large historical Pilzen underground (with nearly 14 km of corridors), a labyrinth of cellars and corridors at depths of 9 to 12 meters below the historic city centre (see www.plzenskepodzemi.cz).

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Technical Museum Tatra

Zahumenni 637/1, 74221 Koprivnice, Czech Republic

Tel.: 420 556 808 421

www.tatramuseum.cz



The Technical Museum Tatra is a part of the association of “Regional museums of Koprivnici” and presents the history of the cars, with special attention to the Tatra-cars and trucks, produced by the Tatra-factory, still active in the town of Koprivnice. The car-production was preceded by the construction of coaches, sledges and traps, initiated by Ignac Sustala.

The Tatra Museum opened in the actual modern building (5000 square meters) in October 1997. Non-specialists as well as professionals may experience a fascinating reflection of times in which the Koprivnice car factory managed to reach to the top of technical development of motor vehicles. The exhibited cars themselves (the oldest car dates from 1897) but also their parts enable to perceive time-unconventional ideas, which became a true basic principle of local car-designers. The aerodynamic form of some Tatra car models during the period 1935 to about 1975 is admired by design experts world wide. The Technical Museum Tatra presents not only passenger cars but also historical race-cars fire brigade cars, railways and even airplanes.

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DENMARK

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Arbejdermuseet (The Workers' Museum)

Romersgade 22, 1362 Copenhagen, Denmark

Tel.: 45 33 93 25 75

www.arbejdermuseet.dk



The Workers' Museum is located in the Workers' Assembly Building, which was built in 1879 and decorated in the following decades. The glass ceiling in the Banqueting Hall dates back to 1907. Its style is art nouveau and is executed in a German technique known as 'Hinterglas painting'. The building has housed trade union offices, the newspaper Social-Demokraten's office and the later Danish Prime Minister Thorvald Stauning's office. The whole building was restored with great professionalism during the beginning of the 1980's.

The Workers' Museum as founded in 1983 and contained then no one single exhibit, but thirty years later the collection is composed of more than 65.000 exhibits and about 12.000 art works. Visitors can learn here about the life and work of the Sorensen family who moved to Copenhagen in 1885, the experience everyday life of the 1950'ies, they can step into everyday life of working class children in the "Workers' Museum for Children", get a taste of history in the unique 'Café & Beer-hall" (designed in 1892), the only basement pub in Copenhagen.

The Workers' Museum is not only a popular 'society museum' but also an important research centre, conserving and collection archives of industrial companies and of workers' struggle and social life in Copenhagen and Denmark.

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Brede Vaerk - Nationalmuseet (Brede Vaerk – National Museum of Denmark)

I.C. Modewegs Vej 1, 2800 Kongens Lyngby, Denmark
Tel.: 45 41 20 64 58 (Summer) / 45 33 13 44 11 (Winter)
www.bredevaerk.natmus.dk

Industrial aesthetics (Brede old textile factory) and idyllic surroundings (the river valley Molleadalen) come together at Brede Works. In the 19th century this was Denmark's biggest textile factory. Today new technology communicates the story of working life at the cloth mill, the growth of industrial society and the welfare state.

The unique historic plant Brede Works gives to visitors an impression of a tightly-knit industrial community with production buildings, workers' and master-craftsmen's homes, the splendid factory owners villa and a dining house at the park. Each visitor is given an interactive ticket: visitors can choose who they want to experience the cloth mill with: the weaver, the mill girl or the general manager.

Not far from Brede Works is the Danish Open Air Museum (Frilandsmuseet), see:
<http://en.natmus.dk/museums/the-open-air-museum/>
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Danmarks Industrimuseum (Danish Museum of Industry)

Gasvej 17-19, 8700 Horsens, Denmark
Tel.: 45 75 62 07 88
www.industrimuseet.dk

The Danish Museum of Industry was founded in 1977 in the industrial town of Horsens. The old gasworks and electrical power station in the workers' district of this provincial town and the quality of the preserved buildings was the ideal setting for this large society museum.

Permanent exhibitions include the history of industrial tools and machinery, metallurgy, public works, breweries, clothes-making and fashion, transportation, popular bank systems (in the section "Dansk Pengemuseum"), communication and distribution.

Much importance is laid on social and human history during industrialisation, housing and community life.

The museum is well known for excellent educational and pedagogic programs for children of different age. The excellent documentation centre of the Danish Museum of Industry (about industrial past and heritage in Denmark) is attractive for students and professional researchers.

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M/S Maritime Museum of Denmark

Ny Kronborgvej 1, 3000 Helsingør (Elsinore), Denmark

Tel.: 45 49 21 06 85

www.mfs.dk



Following the sloping bridge down to the old dry dock (Dock 1) of Elsinore, situated between Kronborg Castle and the Culture Yard, visitors enter an underground museum, designed by the internationally known architecture company Bjarke Ingels Group (BIG). Until 2012, this museum, established in 1915, was located at Kronborg Castle.

A whole range of exhibitions are telling the story of Denmark as one of the world's leading shipping nations. Via shipping, trade and cultural exchanges, Denmark has always been connected to the rest of the world. This is the history and contemporary life that unfolds at M/S Maritime Museum of Denmark, a state-approved independent institution, primarily funded by Danish Ministry of Culture.

The museum's maritime collections are presented in evocative and dramatic exhibitions, developed in collaboration with the exhibition designers Kossmann.Dejong, with films projected directly onto the inside walls of the building. The recent architecture (2013) is iconic, guiding visitors through a continuous flow of spaces, expending across gently sloping floors before crossing the old dry dock. Important thematic sections explain the challenges of shipping and navigation, the temptation of the ports, the myths of the life of the sailor.

The permanent exhibitions are supplemented by changing, thematic exhibitions and a dynamic education department. The museum's Knowledge Centre includes archives, images and an extensive, specialised maritime library.

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Industrimuseet Frederiks Vaerk (The Frederiks Vaerk Museum)

Torvet 18-20, 3300 Frederiksvaerk, Denmark

Tel.: 45 47 72 06 05

www.indmus.dk



Frederiksvaerk is located in northern Zealand, not far from Roskilde. Compared with most other Danish towns, the history of Frederiksvaerk is young, as the town was planned in the 18th century, with industry in its essence, just as Saltaire, New Lanark of Coalbrookdale in the U.K. Once Frederiksvaerk housed the national armament industry and was the great supplier of military equipment to the Danish Marine and Army.

In the 1720's an agate grinding mill was built at the eastern part of the canal, close to Arreso Lake. In 1751 the French engineer and blacksmith Etienne Peyrebert was summoned to produce cannons from wrought iron, an adventure that left Peyrebert with an enormous debt to the Danish state... and no useful cannons. The real breakthrough was made by general J.F. Classen who created a prosperous industrial society, with a central casting house (the so-called "gjetuset") surrounded by dwellings, secondary workshops and later on by the impressive construction of powder works.

In 1868 the iron manufacturer Anker Hegaard enlarged the industrial installations for the massive production of loco mobiles, steam engines and glazed pots and pans. The first Danish-built steam engine was constructed on this site in 1828 for use at a new copper-rolling works, originally founded by the engineer Th. English.

In 1940, The Danish Steel works was built nearby, on an artificial island in the Roskilde Fjord. Frederiksværk became the only Danish town of true modern heavy industry, producing rolled steel, especially for shipbuilding.

The old industrial town now has a population of 15.000 people and celebrated 250th anniversary in 2006, shortly after the start of the Museum of Industry. Already in 1935 the old military depot building 'Arsenalet' was opened as the town museum. In 1965 the Powder Works, based on gunpowder works from 1758, was closed and transformed into a working museum of gunpowder production. Following a time of crises, the old museum was closed in 2003. A group of experts then outlined a new vision for an industrial museum.

In 2004 state recognition was achieved and the Frederiks Vaerk Museum of Industry was ready to be launched. The actual museum, spread over different old industrial buildings, develops nowadays 'a Museum without Walls', considering the town and the cultural landscape its exhibition room. This concept, related to the concept of the "ecomuseum", targets the youth, local inhabitants and tourists.

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ESTONIA

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Kohtla Kaevendus Park (Kohtla Mining Park)

Jaama 1, Kohtla-Nõmme, 30503 Ida-Viruma, Estonia

Tel.: 372 33 24 017

<http://www.kaevenduspark.ee>

The Kothla oil shade mine was established in 1937 by the British company New Consolidated Gold Fields Ltd. In order to supply the oil industries with oil shade. On 1 April 2001, Kothla mine was closed after 64 years of work. Immediately after the closure, the project for opening a mining park and a museum has started. The mission of the museum foundation is to develop and promote one of the most unique areas in Ida-Virumaa. Since about 13 years, excellent guided underground mine visits (called "Estonian deepest experience"), managed by the Foundation Kothla Mining Park, attract numerous visitors from Estonia and abroad. Meanwhile, a museum in the former office building introduces the history of Estonian energetics in an interactive manner, from the geological formation of mineral wealth and mining till bringing electricity to end-users and the perspectives of oil shade in the future.

A new visitor's centre in the old sorting premises (a part of the mining plant) is under construction nowadays. It was nearly finished in 2014 and will soon offer the opportunity to get to know several unique showpiece and exhibitions both indoor and out, introducing the field of energy, geology and various rocks. Also, a promenade passing the territory of the Mining Park as well as a watchtower with a beautiful view is almost ready to open for visitors. Showpieces include a 50 tons heavy bucket of the biggest European excavator, the dumper BelAZ, loading and slotting machines, boring aggregates, pumps and boilers. Other attractions on site and nearby of the oil shade mine are a variety of sports facilities such as the roller skate park, an open air swimming pond and hiking tracks.

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Kukruse Pölevkivi Muuseum (Kukruse Oil Shade Museum)

Lehe 10 a, Kukruse, 30621 Kohtla-Järvi, Estonia

Tel.: 372 332 1350

<http://www.pkm.ee>

Kohtla-Järve Museum of Oil Shade is an academic museum that was established in 1966. Its visitors have access to a permanent display that reflects the formation of oil shade as a rock, as well as the history of its mining industry and the present value of oil shade.

In 2006, a data base was set up to house a digital representation of the collection (about 27.000 units). Also since 2006, the structure of the museum has been modified to accommodate several other independent units used to organize art exhibitions. One example of this is Kohtla-Järvi White Hall, formerly the city Gallery, presenting exhibitions about the representation of industry and labour in art. Since 2007, the Museum of Oil Shade has been situated in Kukruse village, located along the highway Tallinn – St.Petersburg.

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FINLAND

Forum Marinum Maritime Centre

Linnankatu 72, 20100 Turku, Finland

Tel.: 358.2.267.9511

<http://www.forum-marinum.fi>

The Forum Marinum Maritime Centre is a museum with several exhibitions, both in the main building and on board the museum ships, and a centre for nautical events. The basis exhibition "From Hoy to Ro-Ro, from Gallery to Hovercraft" tells the history of seafaring in South-West Finland and of the Finnish Navy. It includes themes such as the Turku shipping companies, vessel typologies, archipelago culture, peasant shipping, merchant shipping and tourism, but also the history of maritime administration, coast guard and the customs. These exhibitions opened in 2002 and are located in the Kruununmakasiini building, which was built in 1894 as a state granary.

An additional boats collection tells the history of leisure boating. During the summer, the exhibition "The Five Lives of Our National Treasure" is open on the Suomen Joutsen (a three-masted sailing ship built in 1902, used as seamen's school during the period 1960-1988), as well as an exhibition presenting the history of the ship on board of the Sigyn (another three-masted barque, built in Gothenburg in 1887) and a temporary summer exhibition.

The Forum Marinum has a total of over 50 boats, most of which have been built in South-West Finland. Some of the boats are shown to the public in the Linnanpuomi building and in the boathouse in the inner yard. The exhibited boats include an Utö cruiser, to design boats, a kolibri boat, a snipe, a Finn dinghy, two netting boats, a "boyboat", three covered motorboats from the 1930's, an early rowboat and a windscreen boat from the 1960's. Other remarkable

vessels from the collection are the Keihässalmi minelayer (built in Helsinki in 1957), the motor torpedo boat Taisto 3 (used in 1943-1944 in the eastern Gulf of Finland for attacks to Soviet service transports), the S/S Vetäjä V (a steam tugboat built in 1891) and many more. The efforts by support associations and a lot of helping hands of volunteers resulted in the renovation and restoration of the majority of the boat collection.

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Työväenmuseo Werstas (Finnish Labour Museum Werstas)

Väinö Linnan aukio 8, Tampere, Finland

Tel.: 358 10 420 92 20

www.tyovaenmuseo.fi

The Finnish Labour Museum Werstas is based in the historical Finlayson cotton mill area right in the heart of Tampere. The Finlayson mill's roots go back to the year 1820 when a Scotsman called James Finlayson set up an engineering shop on the banks of the Tammerkoski rapids. This engineering shop was soon transformed in a cotton mill and later developed into Finland's first large-scale industrial company. Industrial production came to an end in 1995 and the former industrial premises flourish today as an active cultural and business centre, probably the most outstanding example in Northern Europe of good practice re-use of industrial buildings.

The museum building is the former dye shop of the cotton mill. At Werstas visitors can discover the Textile Industry Museum, the Steam Engine Museum as well as the other exhibitions of the Labour Museum. The exhibitions offer an overview of the history of the industrial area, worker population and civil society from different perspectives: technology and daily life, social history, worker's culture, labour movement, visual arts and the image of labour, etc.

The Textile Industry Museum is located in spinning and weaving workshops of Finlayson factory, the heart of the Finnish textile industry, located on the banks of the Tammerkoski rapids. There are 25 machines on display, hundreds of objects and a wide variety of yarns: wool, linen and cotton pass through their various phases from fibre to fabric. Documents and photographs related to the history of the factories, the worker's movement and the co-operative movement enrich the presentations, as well as about 3000 items produced in Tampere textile sector.

The Sulzer steam engine, taken into use in 1900, produced daily power for the Finlayson mill until 1926 and can still be seen in its original location. After 1926 the engine continued to be used as a backup power source until the mid-1950's. It remains the biggest steam engine ever used in Finland. Its output was 1650 horse power and the flywheel has an impressive diameter of more than eight meters.

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Vapriikki Museum Centre

Alaverstaanraitti 5, Tampere, Finland

Tel.: 358 03 5656 6966

www.tampere.fi/vapriikki

Vapriikki Museum Centre is housed in what used to be the engineering works of Tampella Ltd. on the banks of the Tammerkoski Rapids. The Museum Centre host about a dozen of permanent exhibitions with various themes, including history, technology and natural sciences. Vapriikki is also home of the Natural History Museum of Tampere, the Finnish Hockey Hall of Fame and the Shoe Museum. The Shoe Museum is telling the story of shoes in Finland, illustrating with old machinery the individual stages in manufacture of the industrial shoe, from the design table to the finished product. Other sections are the Doll Museum, more recently also the Postal Museum and the Tampere Mineral Museum.

An important exhibition in Vapriikki is “The Tammerkoski Rapids” with the presentation of the story of Tampere and illustrating how a small village grew into an industrial city. The exhibition “1918” depicts the events that took place in Tampere in the spring of 1918, with the Finnish Civil War between the Red and the White Guards, a short but traumatic period in Finnish history, killing almost 40.000 people in an internal crisis which lasted only four months.

The permanent presentation “Innovations” is focusing on the past and present of local technical know-how. Many well-known technical devices first entered use in Tampere. New additions display the history of the metal industry and engineering works, modern IT research, and medical technology.

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Verla Millmuseum (& Board Museum)

Verlantie 295, 47 850 Verla, Finland

Tel.: 358 2041 52 170

www.verla.fi

Verla Groundwood and Board Mill is a unique, intact industrial complex dating from the early years of the Finnish wood processing industry. Now surprisingly, the ensemble is a UNESCO World Heritage Site. Verla differs from most of the museums, where the items on display have been brought from elsewhere and isolated from their original environment. At Verla the opposite applies: traditions are honoured and nothing has been removed. In the summer of 1964 the mill was shut down, but nowadays the machines, partly in running order, are still there for visitors to admire. Only the mill workers are missing, yet even so they are present in many ways. Most of the documented objects and photographs of Verla mill museum can be seen on www.kantapuu.fi.

The objects and pictures help to present the story of the little mill community called Verla on the border of Jaala and Valkeala. Verla village was a part of the development that was to make the Kymi river valley the leading centre of the Finnish woodprocessing industry.

The mill museum can be visited only by guided tours, who start with a documentary, showing the mill at work in the summer of 1964, shortly before the stop of the industrial activities. The film is followed by a tour in the mill, where you can see, step by step, how the rough spruce logs were converted into the natural Verla board, highly reputed on the market.

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FRANCE

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Centre Historique Minier de Lewarde

Rue d'Erchin, 59287 Lewarde, France

Tel.: 33 03 27 95 82 82

www.chm-lewarde.com



The Mining History Centre (MHC) is located at the heart of the coalfield, at Lewarde in the Nord Département near Douai. It is developed on the old Delloye colliery yard. MHC, created in 1982 at the impetus of the nationalised mining company, opened to the public in 1984. Its aim is to conserve and promote the Nord-Pas de Calais mining culture, so that future generations can learn about three centuries of mining in the area.

The site is made up of three entities: a mining museum, a documentary resources centre (housing the archives of the Nord-Pas de Calais coalfield nationalised mining company, and a scientific and technical energy culture centre explaining the history of coal in the context of the wider history of energy. Gradually, the museum sections covering 8000 m² took their current appearance: the machine building with his glass roof, the galleries and themed exhibitions.

From the early 1990's onwards, several important temporary exhibitions and events were organised, including 'Museums at Night' and the Open Heritage Days.

During the 2000's the Mining History Centre, which had reached saturation point in terms of visitor capacity (yearly 150.000 visitors), was restructured to create 4000 m² of new or renovated buildings.

MHC holds a collection of 15.000 objects relating to the Nord-Pas de Calais coalfield. Three domains are particularly well represented: the history of mining techniques (with a wide range of objects such as digging, lighting and safety equipment, tools, machines, models, education material, etc.), secondly ethnology (with representations of the miner's daily lives, illustrating the rich social network of the mining region) and finally geology (with a significant collection of coal fossils and rock samples discovered during prospections for coal, presented in the exhibition "The Carboniferous: the origin of coal"). Since it was opened to the public in 1984, the MHC has welcomed a very large number of groups: clubs and societies, retired people's club, seminar, works council groups and school groups. The quality of guided tours and educational activities is assured through professional training programmes.

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Conservatoire National des Arts et des Métiers

Rue Saint-Martin 292, 75003 Paris, France

Tel.: 33 1 40 277 330

www.cnam.fr

www.arts-et-metiers.net

Through its remarkable scientific and technical legacy, the Museum of Arts and Crafts retraces the history of technological innovation. The Conservatoire National des Arts et Métiers, one of the worlds the oldest institution in his kind, was founded in 1794 by Henri Grégoire as "a store of new inventions". The museum is still housed in the Saint-Martin-des-Champs priory, where the NCAM was founded and started his activities, shortly after the start of the French Revolution.

The museum is nowadays an important institution of the CNAM. The vocation is to conserve and diffuse heritage that bears witness to evolution of techniques. Renovated profoundly in 2000, the museum displays over 3.000 inventions through seven different collections: scientific instruments, materials, construction, communication, energy, mechanics and transportation. Highlights include the Cabinet of Physics of Jacques Alexandre Charles and the laboratorium of Antoine Laurent de Lavoisier, the clocks collection of Louis Ferdinand Berthoud, weaving loom of Jacques Vaucanson, the telegraph Chappe, the steamcar of Cugnot and the airplane-prototype nr. 3 built by Clément Adler.

Different types of discovery are available: guided tours or demonstrations by a own staff of scientific interpreters, a quick tour focused on the museum's 150 "flagship objects", an unrestricted exploration inspired by reading pedagogical albums, or using an audio-guide tour available in eight languages. Today, two-thirds of the Conservatoire's education programmes fall within the field of management and society. The teaching methods are multidisciplinary and interdisciplinary, in order to better respond to current economic and social issues.

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Corderie Royale / Centre International de la Mer

Rue Jean-Baptiste Audebert, 17300 Rochefort, France

Tel.: 33 5 46 87 01 90

www.corderie-royale.fr

Built in the 17th century, the Royal Rope is the jewel of the Rochefort Maritime Arsenal and Dockyard. Colbert, minister of king Louis XIV ordered the construction of the "Corderie Royale" (architect François Blondel, 1666-1669) to equip hundred of vessels of the French war fleet. The 374 meter long building was constructed on a swampy terrain on the edge of Charente river, with a solid raft made of oak beams grid section. The Royal Rope was in use as rope manufacture until 1867, but other parts of the Arsenal (dry dock, warehouses, powder shop, repair workshops, forge, etc.) continued their activities until 1927. After 1867, the Corderie was used for housing a school for officers and gunsmiths apprentices and the archives of the Navy. The Rope building was partly damaged by fire at the end of the Second World War by German troupes, leaving the city. The Rope building and surrounding were gradually overgrown with vegetation, endangering the unique architecture of the building.

At last, the Corderie was listed as historical monument in the 1960's and restored from 1976 to 1988. In 1985 the International Center of the Sea ("Centre International de la Mer") was opened as an interpretation centre about maritime history and heritage. A permanent exhibition is devoted to the history of the rope, while in the seamanship workshop, demonstration of marine knots highlights the complexity of these techniques. Tools and machines, raw materials (including hemp) and production methods are presented in a pedagogic concern.

The reconstruction of the Hermione, a French war ship of 45 meters long, a frigate built originally in 1779 by the Rochefort arsenal, was an ambitious project launched by the town of Rochefort in 1997. The ship is known to have led the Marquis de Lafayette to the United States in 1780, allowing him to join the American insurgents fighting for their independence. The finished replica was launched on 7 September 2014 and is now sailings on sea travel overseas. For more information: [http://fr.wikipedia.org/wiki/Hermione_\(1779\)](http://fr.wikipedia.org/wiki/Hermione_(1779))

An additional visit to the Musée national de la Marine (www.musee-marine.fr), installed in the former Naval Medicine School (in Rochefort town centre) is an important complement of your discovery of the naval history and heritage of Rochefort.

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Ecomusée Creusot-Montceau

Musée de l'Homme et de l'Industrie (Museum of Man and Industry)

Château Verrerie - Rue du Creusot 71, 71200 Le Creusot-Montceau, France

Tel.: 33 3 85 73 92 00

www.ecomusee-creusot-montceau.fr



Formerly a mining town, the economy of Le Creusot is now dominated by metallurgical companies such as Arcelor-Mital, Schneider Electric and Alstom. Since the 1990's, the town has been developed its tourism potentialities. The Creusot steam hammer, built by Schneider & Co in 1877 (weight: 545 tons) was the most powerful in the world until 1891. In 1981, this industrial landmark was rebuilt on a town square.

The main industrial heritage attraction of Le Creusot is the Museum of Man and Industry or "Ecomusée Creusot-Montceau". It was one of the very first museums to be called a "Ecomuseum" in 1973, a museum with a strong involvement of the local community and who tried to link the cultural and human heritage of the territory with the presentation of indoor collections.

The main site of the museum is housed in the former "Château de la Verrerie"-glassworks and old office building. Highlights are a nice collection of scale models of machinery, artworks with industrial themes, glass and cristal collection, poster about safety in workshops, original 19th century photo-albums of different enterprises. Themes explored during visits include urban growth, history of industrial production, transport, mining history and heritage, metallurgy, glass and ceramics, working class history and industrial directors.

Near of the Chateau de la Verrerie exhibitions, visitors can discover three other sections of the Ecomuseum:

-1. **Briquetterie Ciry-le-Noble** (Route du Canal, s/n, 71420 Ciry-le-Noble) is a nice and complete conserved brickworks along the Creusot canal.

-2. **Musée de la Mine / Puits Sainte-Claude** (Rue du Bois-Clair 34, 71450 Blanzey) is a nice local colliery with exhibition about mining in the Le Creusot-region, the oldest and basic industrial branch to be developed.

-3. **Musée du Canal / Site de la 9e écluse** (Route du Canal, 9e écluse, 71210 Ecuisses) is a small visitor centre near a historic lock on the Le Creusot canal (For more information, see: www.bateau-musee-canal.com)

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Musée du Familistère Godin

Cité du Familistère 263, 02120 Guise, France

Tel.: 33 3 23 61 35 36

www.familistere.com



The Familistère Godin in Guise (Northern France) is a realised utopia, a “social palace”, built from 1856-1859 onwards by the manufacturer of cast-iron stoves Jean-Baptiste André Godin (1817-1888) who improved his workers’ housing, education and recreation, but also the working conditions, trade and supply. He was deeply influenced by the philosophers and

'utopian socialists' Charles Fourier and Victor Considérant, developing his industrial and residential community in Guise and ultimately converted it to a cooperative ownership and management by workers.

Godin developed the Familistère as a self-contained community and built it opposite a large factory and foundry, on either side of the river Oise. Three large buildings, each four stories high, were constructed to house all the workers and their families, having healthy and spacious apartments. Each of these blocks, joined in the corners, equipped with staircases and lavatories, has a large central court covered with a glass roof. Galleries around the courtyard provided access to the apartments on each floor. At the back of the main block was a nursery and opposite the same block was a building containing a theatre, a primary school and various shops and recreation rooms, called "les économats". Products and goods were purchased at wholesale prices and sold with a little mark-up, with working men manning the shops.

In 1880 Godin created the association documents for the Familistère, converting it as he had long intended into a co-operative society, eventually to be owned by the workers. It was called "l'Association coopérative du Capital et du Travail".

Although the foundry was owned by the workers for more than 70 years, it was taken over in 1968 in a purchase by the manufacturer Le Creuset and the cooperative association was dissolved, and the apartments sold by S.A. Godin to a social housing society. The factory, since 1988 owned by the group "Cheminées Philippe", is still producing different kinds of stoves. In 1991 the whole site was listed as a historical monument and restoration works started in 2000. Some of the domestic buildings have been restored for private, adaptive use, other parts as museum, nominated as "European Museum of the Year" in 2015. The restoration of the "économats" was already completed in 2008, with a visitor centre, bookstore, café and exhibition rooms, also present in the restored communal laundry rooms, the former bathroom and swimming pool, where in ancient times water was heated by the factory. The Familistère of Guise is really a unique industrial and social example, documented in an excellent visitors' centre and museum.

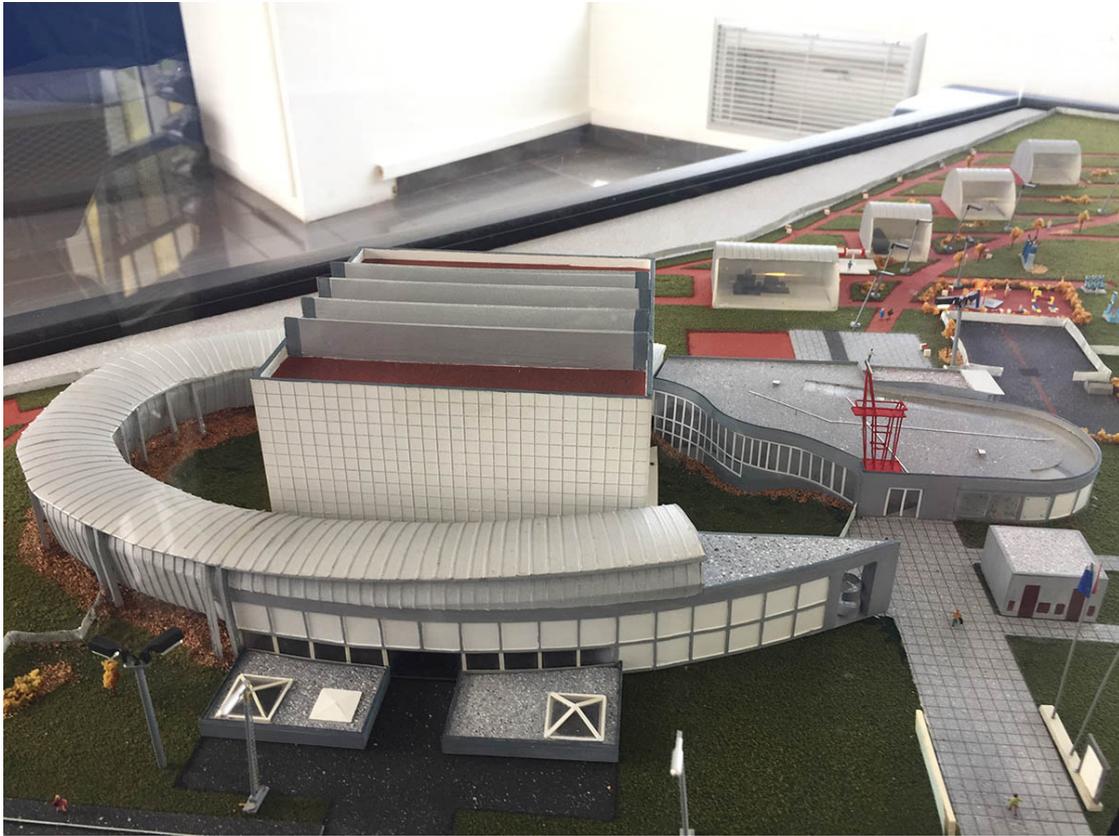
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Musée EDF Electropolis - Mulhouse

Rue du Pâturage 55, 68200 Mulhouse Cedex, France

Tel.: 33 3 89 32 48 50

www.edf.electropolis.mulhouse.museum



The EDF-Electropolis Museum is located in Mulhouse, a European capital of scientific, technical and industrial museums. The museum was created and opened to the public in 1992 in order to save from destruction a Sulzer-BBC compressor, manufactured in 1901 and used to provide power to the DMC establishments (Dolfus, Mieg and Co spinning mills) in Mulhouse up to the first half of the 20th century.

EDF-Electropolis presents electricity from various viewpoints: historical, sociological, technical, economic and cultural. The museum relates the extraordinary human, technological adventure of electricity in an original museography.

The collection, spanning three centuries, starting with the first scientific ventures of electricity in the 17th century, from the industrial revolution to the end of the 19th century, and to the major upheavals of the 20th century. The collections (even if only 10 % of the collection-items is on exhibited) really surprise most of the visitors by their extreme richness: they include everyday objects, posters, scientific equipment and devices, unique documents and archives. An special attraction is the “Jupiter Gallery” where visitors discover the electricity flow in a 80 metre long gallery, from the origin of its production with power plants, through distribution and the domestic use.

Some museums sections present specific period, as “Electricity in the Age of Enlightenment”, “Discovering the invisible” (about Galvani and Volta’s work contributing to the scientific and technological revolution in the 19th century), “The Electricity Fairy and the Financier” (about

the first public appearance of electric light in 1881 during the Paris International Exhibition, and how industrialists learned to produce, transport and distribute with this new energy). “The technological garden” is an outdoor exhibition completing the museum. Visitors can discover turbine generators, circuit breakers, disconnecting switches, rectifiers and a working wind turbine, connected to a computer display. It indicates the amount of electric power produced and the quantity of carbon-dioxide not released into the atmosphere.

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Cité de l'Automobile – National Museum – Schlumpf Collection

Avenue de Colmar 192, BP 1096, 68200 Mulhouse, France (Administration and postal address) /

Rue de l'Épée 15, 68 100 Mulhouse, France (Entrance and parking)

Tel.: 33 3 89 33 23 23

www.citedelautomobile.com

The Cité de l'Automobile is the largest car museum of Europe and showcases more than 400 classic, prestige and racing cars, which trace the history of the automobile. The nucleus of the actual collection is the private collection of Hans and Fritz Schlumpf, who directed several textile mills in Mulhouse and in other French cities. In 1966, work on displaying the collection began. In 1976, the Schlumpf textile factory was in crisis and its employees were on strike. The unions condemned the Schlumpf brothers for “lack of consultation”. The brothers tried to sell their factories, but no offers were sent, they were quit and took refuge in Basel (Switzerland). They would never return to France.

From 1977 to 1979, the Schlumpf Museum was renamed to “Workers Museum” and taken over by the CFDT-union. Finally, in 1980, the French supreme court authorised the sale of the car-collection, purchased in 1981 by the National Automobile Museum Association, who opened the new museum on 10 July 1982. In 1999, Museum operation was entrusted by ‘Fondation Culturespaces’. In 2000, after a considerable renovation and modernisation, Culturespaces opened the renewed car museum. New areas were opened in 2006, including a breathtaking entrance building and new exhibition spaces, designed by Studio Milou Architecture.

The collection is spread throughout several large spaces: the “Motorcar Experience”, the “Motor racing”, the “Motorcar Masterpieces” and the “Bugatti Veyron” areas. Three areas lift the lid on the lives of cars in the collection, issues of conservation and mechanical developments. Special collections include a presentation of mascots (figurines that decorate radiator caps of luxury cars) and the “Jammet collection”, the largest children’s car exhibition in the world.

The Cité de l'Automobile opened recently “The Autodrome”, a new exhibition track, who can seat 4500 people in its stands. It includes an open-air paddock where up to 30 cars can be parked and a clubhouse equipped with a garage to hobby clubs and provide space to work on the vehicles. The Mulhouse Car Museum is the first museum in its kind to create facilities that deliberately make a break with the static image people have of collections in indoor-exhibitions. A great show “On track! 18 emblematic cars tell their history” is performed every weekend in the summer months.

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Cité du Train

Rue Alfred de Glehn 2, 68200 Mulhouse, France

Tel.: 33 3 89 42 83 33

www.citedutrain.com

The idea for a French railway museum goes back to the start of the 20th century when the World Exposition in Paris closed. After the Second World War several sites in Paris were suggested for the location of such a museum, but without results. In 1961, the Société Industrielle de Mulhouse appointed a committee to investigate the possibility of creating a railway museum in Mulhouse. The projects was finally accepted by SNCF in 1969. In the same year the “Association du Musée Français du Chemin de Fer”, the actual owner of the collections, was founded.

From 1971 to 1976, the first locomotives, stationed during the 1950's ad 1960's in a depot in Chalon-sur-Saone were taken to an old roundhouse of a former SNCF depot in Mulhouse-Nord. A first section museum of the new French Railway Museum welcomed its first visitors in 1976. But the size of the growing collection led to the plan in 1982 for building a second section in Mulhouse-Dornach. In 1983, this second museum section was opened and displayed many highlights of the rolling stock, steam and electric locomotives, railcars, passenger carriages, goods wagons, reflecting more than 150 years of rail transport. After the initial success, the number of visitors declined until the closure for renovation works in 2003.

In order to improve the displays, events and services, Culturespaces was selected fort his job in 2004. In March 2005, the new French Railway Museum of Mulhouse became the “Cité du Train”. The display of 100 collection items was redesigned entirely over two exhibition areas: “the Golden Age of Rail” and “the Railway Adventure”, redistributed meanwhile in an chronological exhibition about the railways in France from 1827 to the present day. The actual presentations include three main sections: “The Railway Trail” (with a unique exhibition ‘Railways and Mountains’), “Platforms of History” (including the exhibition “Introducing Steam: How does it work?”) and finally “The Railway Panorama” (an impressive 6000 m² outdoor exhibition).

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Musée du Papier peint

Rue Zuber 28, 68170 Rixheim, France

Tel.: 33 3 89 64 24 56

www.museepapierpeint.org



Since 1797, wallpaper produced in the “Fabrique de Papiers Peints de M.Jean Zuber et Cie”, is a major part of the life in the city of Rixheim (in the Alsace region, nor far of Mulhouse). Today scenic wallpapers are still printed there.

The Museum of wallpaper, inaugurated in 1983, works to continue this long tradition. A dozen of original scenic wallpapers from the beginning of the 19th century are exhibited in the museum. This kind of wallpaper was created to enlarge and to enhance the horizon of everyday life. Landscape wallpapers were specially printed in Rixheim.

The collections from the Zuber company (circa 100.000 items) were completed with thousands of wallpapers acquired since 1983. They give a complete panorama of the history of wallpaper since the dominos of the 18th century to the present creations from everywhere all around the world. All the tools to print wallpapers by hand or by machine until the 1930’s are shown in the museum. The museum has an outstanding specialised bookshop with catalogues of temporary exhibitions, organised in the Rixheim museum and in related institutions.

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Musée Industriel de la Corderie Vallois (Industrial Museum of Ropery Vallois)

Route de Dieppe 185, 76960 Notre-Dame-de-Bondeville (Seine-Maritime), France

Tel.: 33 2 35 74 35 35

www.corderievallois.fr

The history of the ropery 'Corderie Vallois' is closely linked with that of the valley of the Cailly (near of Rouen, Normandy), where cotton mills flourished since the beginning of the 18th century. Typical products at that time were the "siamoises du pays de Caux" (cotton fabrics, reinforced with linnen or silk) and "indienneries" (printed cotton fabrics). During the 19th century, industrial activities continue their development in the Caux valley. The concurrence with much cheaper production methods and low wages in North-African French colonies (Algeria, Morocco) was the main reason of the quick decay of the textile industry in Normandy after the Second World War.

The story of Corderie Vallois itself starts in the 18th century. Originally, a merchant of Rouen, Jean Toussaint, runned on site an old paper mill. In 1819, this water mill was purchased by the dyer Charles-Désiré Fouquet. Shortly afterwards, the mill was transformed and enlarged (by his widow Marie-Rose Fouquet-Cuit) to the building with the actual proportions. In 1825 King Charles X gave the authorisation to transform the paper mill into a cotton mill. New technical equipment is installed, including a giant water wheel (3,9 metre large, with a diameter of 7,30 metre). In 1836 the mill became propriety of Edouard-Henri Rondeaux and produced cotton yarn, later (during the cotton crisis caused by the Civil War in de U.S.) wool yarn. In 1880, a new owner, ropemaker Jules Vallois (1842-1918), transformed the factory for the production of ropes. From 1918 to 1937 the Corderie was managed by Gaston Vallois (son of Jules), facing the big crisis of 1929 and following years by producing a variety of ribbons. Later the Corderie Vallois was taken over by Suzanne Bresch (daughter of a book-keeper of the Corderie) who married the engineer Maurice Mallet. This engineer directed the Corderie Vallois as good as possible, but the very specialised production was not successfull and the number of clients decreased; finally the factory closed the doors in 1978.

The efforts of the last owner and a heritage association resulted in the listing of the building and technical heritage as historical monuments. Finally, in 1989, the Region of Haute-Normandie, owner of the Corderie Vallois, decided to install here an industrial museum, after a very professional restoration campaign. The museum opened on 11 February 1994. The Corderie Vallois, now owned by the Département de la Seine-Maritime, is one of the best preserved industrial sites of the country, conserving all original machinery and the complete archives. The site, situated in a magical green environment, is visited by a lot of tourists from Normandy, from elsewhere in France and abroad.

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Fabrique des Savoirs / Musée d'Elbeuf

Cours Gambetta 7, 76500 Elbeuf , France

Tel.: 33 2 32 96 30 40

www.la-crea.fr/fabrique-des-savoirs-de-la-crea-presentation.html

www.metropole-rouen-normandie.fr/index.php?

The “Fabrique des Savoirs” (Factory of Knowledge) is the cultural and educative heart of the Elbeuf region, supported by “la Métropole”, a public agency for economic, social and cultural development for the region of Rouen-Normandy. Installed since 2010 in former weaving workshops (12.000 m²), this multidisciplinary institution is located in the old Elbeuf district of Blin. The “Fabrique des Savoirs” has three main fields.

The first one is culture, including a fashionable regional museum with a dynamic cultural program and educational activities. The river Seine is as the spine between the different sections: natural history, archaeology and industrial heritage. The cultural pole includes also an archives centre, a public library and an interpretation centre for architecture and heritage (CIAP), devoted to enhance public awareness of local architecture and heritage.

The two other fields of the ‘Factory of knowlegde’ are related to permanent education and multimedial creations. There is also a languages and technology training centre (see: www.mjc-elbeuf.fr) and a information and education centre about health.

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Saline Royale d’Arc-et-Senans (Royal Saltwork of Arc-et-Senans)

Grande Rue, 25610 Arc-et-Senans, France

Tel.: 33 3 81 54 45 00

www.salineroyale.com



The Royal Saltworks is a 18th century historical building at Arc-et-Senans in the department of Doubs (region of Franche-Comté), next to the Forest of Chaux. In that time salt was an essential and valuable commodity, widely used to the preservation of foods. The region of Franche-Comté was well-endowed with salt springs due to subterranean seams of halite. Consequently, a number of saltworks, such as those in Salins-les-Bains, extracted salt by boiling water over wood fires. After many years of exploitation, the forests were becoming more and more rapidly denuded, with the result that wood had to be brought from farther and farther away. Another solution was to lead the salted water in pipes from a salt mine to a new saltworks in the neighbourhood of unexploited forests. That happened in Arc-et-Senans.

The architect of the saltworks was Claude-Nicolas Ledoux (1736-1806), a prominent Parisian architect of the time. The work, realised in 1775 by order of king Louis XV, is an important example of an early Enlightenment project in which the architect based his design on a philosophy that favoured arranging buildings according to a rational geometry and a hierarchical relation between the parts of the project. After the rejection of a first plan, the second plan was realised, with his typical semicircular form, who reflects hierarchical organisation of work and containing guardrooms, a prison, a farm, quarter for carpenters, marshals and coopers. At the centre is the house of the director, with on either side the saltworks themselves with drying ovens, heating pots and the salt stores.

The saltworks produced 40.000 quintals of salt per year at its peak. All production ceased in 1895. In 1918, a lightning bolt destroyed part of the main buildings and in 1926 some of the buildings were dynamited. Shortly afterwards, the complex was partly declared historical monument and the first restoration works started in 1930. The period of WW II was again disastrous for the historic saltworks.

Much has changed since 1973, when the 'Institut Claude-Nicolas Ledoux' has taken on the task of conservator and is managing the site as a monument. UNESCO added the "Salines Royales" to the List of World Heritage Sites in 1982. Today, the site is open to the public and includes in the building the coopers used, the salt production building (with temporary exhibitions) and the Ledoux Museum.

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Grande Saline de Salins-les-Bains - Musée du sel

Place des Salines, 39110 Salins-les-Bains, France

Tel.: 33 3 84 73 10 92

www.salinesdesalins.com

www.musee-des-techniques.org



The saltworks of Salins-les-Bains used since centuries underground salted water, which was pumped up and cooked to solid salt at the surface. The salt production and commerce started already during the period of the Middle Ages.

In 1775 the Royal Saltworks at Arc-et-Senans (21 km from Salins-les-Bains) started to work, using salted water from Salins, transported with a wooden (later iron) pipes-systems of 21 km length, the so-called "saumoducs". The Arc-et-Senans saltworks ceased activities in 1895, but in Salins-les-Bains, the saltworks continued to work until 1962. At that time the technology used in Salins had become obsolete and extension was not possible.

Since 1966, the city of Salins-les-Bains is owner of the saltworks, listed in 2009 as historical monument and soon afterwards the Salins saltworks were added to the UNESCO World Heritage Site nomination of Arc-et-Senans. Also in 2009 a new museum was opened in Salins, a contemporary extension of the historical buildings, designed by the "cabinet Malcotti-Roussel"

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GERMANY

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Deutsches Bergbau-Museum Bochum

Am Bergbaumuseum 28, 44791 Bochum, Germany

Tel.: 49 234 58 770

www.bergbaumuseum.de

The Deutsches Bergbau-Museum Bochum (DBM) offers extensive insights into the worldwide mining of all mineral resources from prehistoric times to the present day. Its exhibits are not only technological, but also include a wide range of mineralogical specimens and unique objects from history and art history. This makes it the most important mining museum in the world and also a highly regarded research institution for mining history.

The history of the museum collections goes back to the 19th century: in 1868 the Westfälische Berggewerkschaftskasse (Westphalian Miners' Union Fund) established the permanent exhibition "Mining Tools", which showed the material used by Westphalian mining schools for the training of the miners. The actual museum building from 1938 was designed by Fritz Schupp.

Exhibitions above the ground offer visitors a general insight into the world of mining. The most important permanent exhibition sections are "Mining engineering", "Geosciences and raw materials", "art and culture in mining", displaying a wide range of objects from different collections: the mining collection about the extraction of raw materials, the collection on the technology used to process and refine raw materials, and the collection on the history of everyday life.

Twenty meter below the ground, the museum maintains a faithfully reconstructed visitor mine with a network of 2,5 km of tunnels. Visitor can see here the impressive mining machines (hammer drills, drilling jumbos, shearer faces, scraper chain conveyors, a double lateral chain scraper conveyor, a plough face, a tunnel boring machine, a part-face heading machine AM 50, but also smaller tools as different types of pneumatic picks, an electric locomotive, etc.) from close up and get an idea of the trials of day-to-day work underground. A simulated shaft descent makes this impression even more life-like.

An added attraction is the well-known green head frame, built over the museum. Until 1973 this head frame stood in its original location, above the main shaft of the Germania mining complex in Dortmund-Marten. The solid walled, 71,4 m high, double head frame was erected there in 1943/44 and was designed by the industrial architects Fritz Schupp and Martin Kremmer. Today visitors can use a lift to reach the upper platform, providing fantastic views of Bochum and the Ruhr.

The DBM is not only well-known for his permanent and numerous temporary exhibitions (located in the new extension “The Black Diamond”, but is also a highly regarded research institute about archaeo-metallurgy, mining history and archaeology, material science and other areas. The DBM conserves important mining archives (Bergbau-Archiv – BBA) and has an outstanding library, photo collection and documentation centre (see: www.montandok.be). The DBM is an excellent location to start the discovery of high standard industrial heritage monuments and sites in Bochum and surroundings, as for example the “Jahrhunderthalle” and “Zeche Hannover”.

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Jahrhunderthalle (Hall of the Century) Bochum

An der Jahrhunderthalle 1, 44 793 Bochum, Germany

Tel.: 49 234 9 63 02 10 5 (Verkehrsverein Bochum – Tourist Information)

Tel.: 49 1805 260235 (Guided Tours)

www.visit-bochum.de

www.route-industriekultur.de

The impressive “Jahrhunderthalle” (Hall of the Century) was originally erected as the pavilion of the Bochumer Verein for the 1902 Exhibition of Trade and Industry (“Industrie- und Gewerbeausstellung”) in Düsseldorf. The hall was designed by architect H. Schumacher. With its broad, airy supporting steel structure, it is one of the earliest examples of a building designed expressly for industrial purposes. But this was not at first immediately apparent. In Düsseldorf the steel exterior was clad in a masking of plaster and stucco, and even included a bell tower to make it resemble a church.

In 1903 the building was reconstructed on the ironworks site in Bochum, active since 1842 as Jacob Mayer & Eberhard Kühne Ironworks. This time the Jahrhunderthalle was constructed without masking. It was used as the central gas-power station to produce electricity and wind for the Krupp blast furnaces on site.

The Hall of the Century was enlarged on several occasions until it reached its present, imposing size of 8900 m². The original factory was taken over by the Krupp concern and the blast furnace blown out in 1968. The hall had lost its specific function and was used as a workshop and warehouse for the Krupp-works until 1991.

The Hall of the Century is now at the heart of the new Westpark in Bochum, developed during the “International Building Exhibition Emscher Park” (IBA Emscher Park). On site some impressive elements of the former Krupp-steelworks (as the so called “Colosseum”, a massive arched brick-works construction supports a hill, serving as basement for the Krupp-steelworks). The Hall of the Century was restored in 1993 and has since been used for a wide range of events. In 2003 the Hall of the Century was rebuilt as the central venue for the Ruhr-Triennale arts festival and is now a festival theatre and an “assembly bay” for art.

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Zeche Hannover I/II/V

Günnigfelder Strasse 251, 44793 Bochum-Hordel

www.zeche-hannover.de

Another important industrial heritage site nearby Bochum is the former colliery Zeche Hannover I/II/V () built in 1857-58 and still conserving a Malakow-tower (a head frame surrounded by a tower in brickwork). Also the machine hall, with restored steam engine from 1892, reconverted into to a Koepe-Machine in 1913-14, is on site and can be demonstrated for visitors. Zeche Hannover is a branch of the Westfälisches Industriemuseum – Landesmuseum für Industriekultur” (see : Museum nr. 58).

Zeche Hannover is surrounded by interesting garden villages (or ‘Siedlungen’) for the housing of the miners and their families. A nice example is the garden village “Dahlhauser Heide”, designed by Robert Schmohl in 1907-1915 and well restored in the 1990’s. Bochum has much more industrial heritage sites to discover, as the Culture Station Langendreer (Kulturbahnhof Langendreer) and the historical brewery – distillery Eikelberg (Brennerei Eikelberg). For more information, you can consult the website www.industrie-kultur.de.

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Nordwolle Museum - Delmenhorst. Nordwestdeutsches Museum für IndustrieKultur (North-West-German Museum of Industrial Culture)

Am Turbinenhaus 10-12, 22749 Delmenhorst (Germany)

Tel.: 0049 4221 29 85 820

<http://www.delmenhorst.de/kultur-bildung/museum/>

The Nordwolle factory, known nowadays as Nordwolle Museum or “Nordwestdeutsches Museum für IndustrieKultur” is located in and around the engine house and factory buildings of the former “Norddeutsche Wollkämmerei & Kammgarnspinnerei” (North German Wool Combing and Worsted Spinning Mill) in Delmenhorst. Nordwolle was a dominant textile company in the Delmenhorst, that processed wool and worsted.

In 1884 Christian Lahusen, a wellknown textile manufacturer from Bremen founded the North German Wool Combing and Worsted Spinning Mill, situated next to the railway line in Delmenhorst, which brought wool from Bremen docks. The family business expanded into a major concern producing a quarter of all the world's rough yarn and employed almost 4.500 workers in the industrial complex, covering more than 13 hectares. Labour came mostly from Eastern Europe. Between 1885 and 1905 the population of Delmenhorst tripled causing a chronic lack of housing. The firm responded by building ever more company housing on the “Nordwolle” site. Under Carl Lahusen (son of Christian) and his English born wife Armine Matthias, the factory developed as a ‘town in the town’, providing cooperative stores, canteens and baths, a hospital , a school and a library. The world slump and mismanagement bankrupted Lahusen's firm in 1931: though it continued in a smaller scale until the early 1980's.

Nordwolle was closed between 1981 and 1984. The fysical condition of the empty buildings became problematic, but finally the main buildings of Nordwolle were listed as historical monuments and partly reused for housing facilities. Soon the idea was born to create an industrial museum, mainly focussing on textile history and heritage of the city and the region. The Nordwolle Factory Museum opened the doors for the visitors in 1996, using the turbine hall and the adjacent sheds. A year later the Delmenhorst Municipal Museum opened in the

“Lichtstation”, the first engine room of the disused textile works. From 2006 both museums are managed by one direction, under the new name “Nordwolle Delmenhorst – Nordwestdeutsches Museum für IndustrieKultur”. The museum shows in detail the complete production processes, involved in worsted spinning and presents work conditions, daily life of the workers and other employees through history.

A former wool warehouse on site was transformed as multi purpose event centre “com.media”, a well known cultural and social venue in Delmenhorst and surrounding areas. As one of the most interesting textile museums of the country, Nordwolle is an Anchor point on the European Route of Industrial Heritage (ERIH).

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Deutsches Museum München

Museumsinsel 1, 80538 München (Munich), Germany

Tel.: 49 89 21 79 1

Tel.: 49 89 2179 433 (Automatic information service)

www.deutsches-museum.de

The Deutsches Museum possesses over 100.000 objects from the fields of science and technology and is one of the most important museums of science and technology in the world. The collections include objects from mining to atomic physics, from the Altamira cave to a magnified model of a human cell and extend from the Stone Age to the present time. Collecting historically significant objects is still one of the Museum’s central tasks.

About a quarter of the objects are on exhibition in the main museum on the island in the river (the Museumsinsel), at the Transport Museum on the Theresienhöhe (Am Bavariapark 5, München), in the hangar in Schleissheim airfield (Deutsches Museum Flugwerft Schleissheim) and in the Deutsches Museum Bonn (Im Wissenschaftszentrum, Ahrstrasse 45, Bonn).

Among the particular highlights are the first motorized aircraft built by the Wright brothers, the U1 submarine, the first program-controlled computer (Conrad Zuse’s Z3), and Diesel’s original engine on the island; the first motorcar by Karl Benz in the transport museum, the Douglas DC3 at Schleissheim, and the first Fischer wall plug in Bonn.

An important part of the collection is about the development of machinery. The Deutsches Museum presents all types of engines: muscle-powered machines, water wheels and wind wheels, piston steam engines, water turbines, steam turbines and generators, internal combustion engines, electric motors, gas turbines and turbojet engines. The museum possess also an amazing collection of machine-tools used in all industrial branches.

To store its collections the Deutsches Museum has various storage facilities in the Museumsinsel and at several external locations with a total area of 30.000 m². The top priorities in the operation of these storage facilities are the conservation and security considerations to create optimal conditions and the best protection.

The Deutsches Museum Archives is one of Europe’s most important archives specializing in the history of science and technology. Altogether it has some 4500 m of shelves holding source documents and other active material on this subject. The Deutsches Museum Library is an outstanding research library concerning science, technology and industry.

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Deutsches Schifffahrtsmuseum (German Maritime Museum)

Hans Scharoun-Platz 1, 27568 Bremerhaven, Germany

Tel.: 49 471 48 207 0

www.dsm-museum.de

During the 1960's, the idea of the creation of a maritime museum in the old harbour of Bremerhaven was born. The first concept was a maritime open-air museum, but quickly the necessity of a permanent museum building became clear, in order to present indoor exhibitions and provide adapted spaces for events, educative and research activities. In 1975 the first building of the Maritime Museum Bremerhaven, designed by the notorious architect Hans Scharoun opened the doors for visitors. In 2000, a spacious extension wing, designed by Dietrich Bangert was inaugurated.

Highlights of the collection include the "Hansakogge", a unique medieval ship dating from 1380), the steam cruise ship Meissen, a vast ensemble of scale models, navigation instruments and marine paintings. The Maritime open air museum presents over 50 historical ships dating from 1850 to the post war period and the majority of the open air collection is accessible during summer season for visitors.

The museum not only presents outstanding maritime collections, but is also an important centre of knowledge about sea-, coastal and inland navigation and under water archaeology. The museum presents for more than 40 years original temporary exhibitions and is an important publisher-editor of books about maritime history and heritage.

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Deutsches Technikmuseum Berlin (Museum of Technology Berlin)

Trebbiner Strasse 9, 10963 Berlin, Germany

Tel.: 49 30 90 254 0

www.sdtb.de



Cliché : Bart Vanacker



Cliché : Bart Vanacker

The Deutsches Technikmuseum (Museum of Technology), founded in 1982 is the place to find out about the history and science behind the appliances and things we use every day. Many of the collections had their home in Berlin for more than 120 years. A great part, however was destroyed during the Second World War, or moved elsewhere.

Close to Potsdamer Platz, the museum occupies a historical industrial site dating back to 1874: the site the former goods yard of Anhalter Güterbahnhof. The large museum park, containing two windmills, a water mill, a smithy and a brewery, is also an oasis of green.

The contemporary architecture by the Berlin architects Helge Pitz and Ulrich Wolff for an extension building, housing the aviation and maritime collections, fits perfectly into these surroundings. The Douglas C-47 "raisin bomber", a monument to Berlin's gratitude for the airlift of 1948-49, suspended from the façade, makes the extension a prominent landmark.

The museum presents a broad spectrum of old and new technology in 14 departments: locomotives and planes, looms and textile technology, suitcase- and jewellery production and machine tools, computers, radios and cameras, steam and Diesel engines, photo and film technology, writing and printing, scientific instruments, paper machines, printing presses and much more.: ...

A number of sections are branch-museums on other locations: the sugar museum, the Zeiss-Planetarium (Prenzlauer Allee 80, Berlin) and the Archenhold Observatorium (Alt-Treptow, Berlin), where visitors can experience the longest moveable refracting telescope on earth, built in 1896. The lens diameter measures 68 cm.

Daily demonstrations, visitor activities and guided tours make the Deutsches Technikmuseum an interactive learning experience. The museum also has a well-stocked library on the history of technology as well as historical archives.

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Ruhr Museum - Zollverein

Zollverein A 14 (Schacht XII, Kohlenwäsche)
 Gelsenkirchener Strasse 181, D-45309 Essen, Germany
 Tel.: 49 201 24681 444 (Mo. – Fr. 9 to 16 p.m.)
www.ruhrmuseum.de



The Ruhr Museum is located since 2010 in the former coal washing plant of the colliery Zollverein Schacht XII in Essen-Katernberg. Shaft XII of the former Zollverein pit was built between 1928 and 1932 by Fritz Schupp and Martin Kremmer, at the time the leading industrial architects in the Ruhrgebiet. The site was designed in the modernist style of “New Objectivity” and was regarded not only as the most modern and productive but also as the most beautiful colliery of the world.

Now it is under a preservation order and has been turned into a vibrant artistic centre: the Zollverein Museum in the best preserved parts of the mine (only accessible by guided tour), the North-Rhine Westphalian Design Centre in the old boiler house, the Zollverein “Art Shaft” 1/2/8, and the “Sensorama” hands-on exploration show on the site of shaft 3/7/10 attract many visitors from far and wide. The adjacent Zollverein Coking Plant is a venue for contemporary art. In the disused salt warehouse you can find the “Palace of Projects” a huge walkabout installation by Ilya and Emilia Kabakov. In December 2001 Zollverein was inscribed into the UNESCO World Heritage List.

The daring renovation and risky re-use of the Zollverein XII coal washing plant was a tour the force, seldom seen in other old industrial sites, and was only possible because of the typical rational construction technology. The museum is managed by the Zollverein Foundation (Stiftung Zollverein) and supported by the government of Rheinland-Westfalen, the

Landschaftsverband Rheinland and the city of Essen. It is a non-classical regional museum, presenting the industrial, social and political history and present of the Ruhr-Region, also called "Ruhr-Metropolis".

Apart from permanent sections about nature, culture and history the Ruhr Museum presents thematic temporary exhibitions and organizes a large scala of events. The strength of the Ruhr Museum is the exceptional of the collection but also the unique location and the complementary industrial surroundings.

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Landschaftspark Duisburg-Nord (North Duisburg Landscape Park)

As example of an industrial heritage top location in the surroundings, **Landschaftspark Duisburg-Nord (North Duisburg Landscape Park)** is worth more than one visit.

The site address is: Emscher Strasse 71, 47137 Duisburg-Meiderich, Germany

Tel.: 49 203 429 19 42 - Info-Buro)

www.landschaftspark.de

Industrial history, ecology, recreation, leisure and culture: North Duisburg Landscape Park is a unique former industrial site. At its heart stands the former Meiderich Ironworks built by August Thyssen, who started in 1901 on the construction of a blast furnace complex, immediately adjacent to the coal fields he had acquired previously, thus creating the prerequisites for the necessary link between coal and iron.

The Meiderich Ironworks closed down in 1985. Many attractions have sprung up on the 200 hectare site. There is a free-climbing zone amongst the old bunkers. A water-filled gasometer is now an underwater diving centre. Visitors can climb to the top of a blast furnace or undertake a guided tour of the site. In the power plant (170 metres long and 40 metres wide) a great deal of wind and hot air was once produced. It was here that huge machines provided the blast furnaces with pre-heated air, the so-called 'blast furnace wind'. This unusual site was renovated in the 1990's during IBA-Emscher Park (Internationale Bau Ausstellung Emscher Park).

In the former blower house four huge blowers generated the furnace wind. Here, also in the pump house and compressor room complex, the spaces are used nowadays as stage for meetings and conventions. In the impressive casting house, the molten pig iron from the blast furnaces emerged into the open air for further processing. This large covered space is used for yearly summer open air concerts and as Duisburg Summer Cinema and other cultural events.

The park, covers about 120 hectares and was designed by Peter Latz and partners. This group of designers has made a name for itself as a new type of suburban oasis, combined with the special venues for concerts, films, shows and theatre. At nights during the summer, the ironwork are lit up by a spectacular light show designed by the British artist Jonathan Park. Landschaftspark Duisburg-Nord became an iconic example of good practice concerning the re-use of large-scale industrial spaces of the former heavy industry.

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Museum der Arbeit

Wiesendamm 3, 22305 Hamburg, Germany

Tel.: 49 40 4281 330

www.museum-der-arbeit.de

The Museum of Work in Hamburg - Barmbek has made the transformation of life and work in the last 150 years to his main theme. In the exhibitions, issues such as the impact of industrialization and thus triggered changes in social, cultural-introduced and economic areas. The museum is an anchor point of the European Route of Industrial Heritage (ERIH). Plans for a museum of labour already existed since the late 1970s, and a corresponding Museum Association was established in 1980. In 1982 the site of the 1871-built former factory of New York-Hamburg Rubber Goods Company was rented in Barmbek. With temporary exhibitions and growing museum workshops, a concept was gradually developed. The building renovation began in 1992 and with the renovated boiler house the first building of the Museum of Work was inaugurated in 1994. Further transformations followed and the permanent exhibition in the main house was opened in 1997. From 2008 onwards, the museum is managed by the Foundation Historical Museums Hamburg.

In addition to a collection, an exhibition about the New York – Hamburg Rubber Goods Company was opened. The section "Everyday the industrial age" illustrated through objects and documents daily life and labour history. With an original line-up of former *Metallwarenfabrik Carl Wild*, a workshop is presented. Another section explains the development of typical Hanseatic counting houses from the period of overseas trade in the 19th century to the 1950s. The exhibition area "ABC work - diversity of life innovation" shows different products of work products, such as clothing, tools and machines. Oral and written memories and photographs present diverse aspects of the history of work in Hamburg since industrialization: in a "seat Forum", visitors have the ability to listen with telephone receivers about 20 life stories of workers, employees, from various professions and industries.

A significant part of the exhibition takes up the printing workshop. In addition to the exhibited historical presses, machinery and rotations for the documentation of technical development in graphic design, some machines are operated. In the courtyard of the museum, the cutting wheel of the shield machine „TRUDE“ is erected, used for the construction of the the 4th Elbe Tunnel.

A branch of the Museum of Work is the Harbour Museum around the Kaischuppen 50A at Bremer Kai on the Kleiner Grasbrook, presenting the Hansahafen. Outside are operative historic quay cranes and the beginning of container handling (with straddle carriers) is documented. This branch presents also floating large objects, including the floating steam crane "Saatsee" (1917-1920) manufactured by the shipbuilding and mechanical engineering Mannheim AG, the Schutendampfsauger "Sucker IV" (1909) and a "Hamburger Kastenschute" of 1913. As eventful „place of learning“, the Harbour Museum also offers programs for school classes and regular "port explorations for children".

Another branch is the Speicherstadtmuseum, documenting the construction and operating history of this unique historic warehouse district, just south of Hamburg historic city centre. The

City Museum opened the exhibition "Speicherstadt monument and place of work for 100 years" in 1988 (on the occasion of the centenary of Speicherstadt) on two floors of one of the warehouses. This exhibition was re-opened in 1995 as a privately operated branch of the Museum of Work. The permanent exhibition present typical stored goods and the multiple activities of the harbour workers, using original tools and historic photographs. Another key topic is the architectural history of the warehouse district. In addition, the museum presents the history of the Hamburg coffee trade. In Speicherstadtmuseum regular public special events are organised, such as „Crime readings“ and a wide range of interactive public tours.

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LWL-Industriemuseum Zeche-Zollern (Westfälisches Landesmuseum für Industriekultur – Westphalian Museum for Industrial Culture)

Grubenweg 5, 44388 Dortmund-Bövinghausen, Germany

Tel.: 49 231 6961 0

www.lwl.org



The industrial age has left its mark on the Ruhr region and Westphalia more than any other epoch before and after. Most of old fires have long been quenched and the machines in old factories ground to a halt. Structural transformation in North Rhine Westphalia began in the 1960's. In order to prevent the history and heritage of this highly influential age from falling into oblivion, the Westphalia-Lippe regional authority (LWL) decided to take action top reserve buildings, objects and memories of everyday life and work. As a result, in 1979, the first Museum of Industrial Culture in the whole Germany was created.

The germ-cell of the whole museum was the engine house in de Zollern II IV colliery (1898-1904) in Dortmund-Bövinghausen, wit hits Jugendstil architecture, rarely seen in industrial

building. In 1969 the successful rescue operation of this extraordinary “steel and glass cathedral” marked the beginning of industrial conservation in Germany and the birth of industrial heritage movement in Western Germany.

In the different building of the Zeche Zollern colliery, the model colliery of the “Gelsenkirchener Bergwerks A.G”, a wide range of thematic exhibitions are presented: “Coal and Iron”, “The long legacy of Handwork”, “Power out of Water and Fire: the Age of the Steam Engine”, “Controlling the Time”, “Mass production”, “Allegories of Industrial Progress: Industry and Work, reflected in Art Works”, etc.

The LWL-Museum of Industry, by contrast to the closure of countless factories, has taken up activities on eight industrial heritage sites once again. These sites include three former collieries (Zeche Zollern in Dortmund-Bövinghausen, Zeche Hannover in Bochum and Zeche Nachtigall in Witten), a site with ship-elevator (Schiffshebewerk Henrichenburg in Waltrop), an ironwork (Henrichshütte in Hattingen), a textile site (Textilmuseum in Bocholt), a brickwork (Ziegeleimuseum in Lage) and a glass factory (Glashütte in Gernheim).

LWL-Industriemuseum is one of the main network-museums of Europe. It is in many aspects the twin-brother of the LVR-Industriemuseum (also described in this publication). The most outstanding exhibits of the industrial network-museum are the building monuments and their equipment. The greatest interest is devoted to the people who worked and lived in and around the factories, presented in outstanding collections, presenting machinery, tools, archive-documents, art works, films and photographs.

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LVR-Industriemuseum - Zinkfabrik Altenberg (Zinc Factory Altenberg)

Hansastraße 18, 46049 Oberhausen, Germany

Tel.: 49 208 8579 1241

www.industriemuseum.lvr.de

In the rolling hall of the old zinc factory Altenberg, close to the main station of Oberhausen, the permanent exhibition “Heavy Industries” welcomes the visitors since 1997. The industries use in the zinc factory stopped in 1981. After the demolition of the plant, new flats and office buildings should have been build on the area of the former factory. But the city of Oberhausen changed its plans and developed a citizen’s centre in a part of the factory. A museum was part of the plan as well and in 1984, the LVR-Industriemuseum took over the main building, conserving a melting oven, circular casting equipment and a roll framework.

The museum tells vividly about the origin of the iron and steel industry in the Ruhr area: about the deposits of ore and coal in the region, about stock and risky entrepreneurs, about the railway as the biggest consumer of iron and steel, about inventors whose technical innovations revolutionized the production more than once.

Visitors discover the foundry, the mechanical workshop and the forge; they stride through the inner part of a blast furnace and can see detailed factory models, countless wheels, rails, chains and other products of the iron and steel industry. A strong point in the exhibition is the

presentation of war-periods. In times of war and armament, the economy of the Ruhr region benefited from the production of cannons, sheet metal for tanks and other armaments and even “peaceful products” as Krupp-locomotives could become evident for the war, delivering war material to the front and pulling the deportation trains to the extermination camps. Special attention in the collection goes also to the danger of the teamwork in heavy industries, and to the development of security measures, from the beginning of the industrial revolution to the late 20th century.

The zinc factory Altenberg is one of seven exhibition sites of the LVR-Industriemuseum, which combined, creates a unique museum, founded and supported by the Landschaftsverband Rheinland.

In historical factories, which some are listed as historical monuments, the history of the industry in the Rhineland and its workers is told in an interesting and illustrative way. The focus is put on metal, fabrics, paper and electricity, as important local branches, presented in the Gesenkschmiede Hendrichs in Solingen, the Paper mill Alte Dombach in Bergisch Gladbach, the Power Station Ermen & Engels in Engelskirchen, the Tuchfabrik (Cloth factory) in Euskirchen, the Textile factory Cromford in Ratingen and the St-Antony-Hütte in Oberhausen. All branches are described in detail in the website mentioned above.

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Rammelsberg Museum & Besuchersbergwerk (Rammelsberg Museum & Visitor Mine)

Bergtal 19, 38 640 Goslar, Germany

Tel.: 49 5321 750 0

www.rammelsberg.de



The Rammelsberg is a mountain on the northern edge of the Harz range, south of the historic town of Goslar. The mountain is the location of an important ore mine, the only mine which had been working continuously for over 1.000 years, when it finally closed in 1988. Since 1992, the visitor mine of Rammelsberg has become a UNESCO World Heritage Site, together with Goslar's Old Town.

Unlike the mineral deposits of the Upper Harz, the ore deposits of Rammelsberg were caused by the escape of hot, metal-bearing thermal springs on the sea floor in the Devonian period. This formation is referred to as a sedimentary exhalative deposit. At the bottom of the Devonian sea, two large lenses of ore were later caught up in the folding of rocks during the Carboniferous period and so lie overturned at an angle in the mountain.

Ore mining started in the "Old Orebody" exposed on the surface during the Bronze Age. The deep underground layers or "New Orebody" was only discovered in the 19th century. Initially, during the Middle Ages, the main product was silver ore, later copper and finally lead. In the 1930's the Rammelsberg Mines were greatly expanded at the behest of the Nazi-authorities, who saw the metal ores as vital to their war efforts and the difficulty of mineral dressing the ore had been technically solved using froth flotation. This led to the construction of the present-day surface installations, designed by the architects Fritz Schupp and Martin Kremmer. The mines were exhausted in the 1980's, and were shut down in 1988, after more than 1.000 years during which almost 30 million tonnes of ore were extracted. However, since 2009 several new exploration bores were sunk in an area two kilometres west of the old Rammelsberg mines, leading to the exploitation of new deep mines.

The disused mine was developed as a unique museum to preserve its heritage and display the history of the mine and its industrial equipment. Special attractions include the Roeger Gallery (with a flatrod system and several water wheels that support the drainage of the pit and the hoisting of ore), the "Feuergezäher" Vault (the oldest 'nogged' underground mine in Central Europe), the Rathstiefste Gallery (a medieval drainage adit, decorated with coloured vitriol encrustations), the headframe, the Master Malter's Tower (the oldest above-ground mining building of Germany, dating from ca. 1500) and the old pithead dumps (the oldest being from the 11th and 12th centuries).

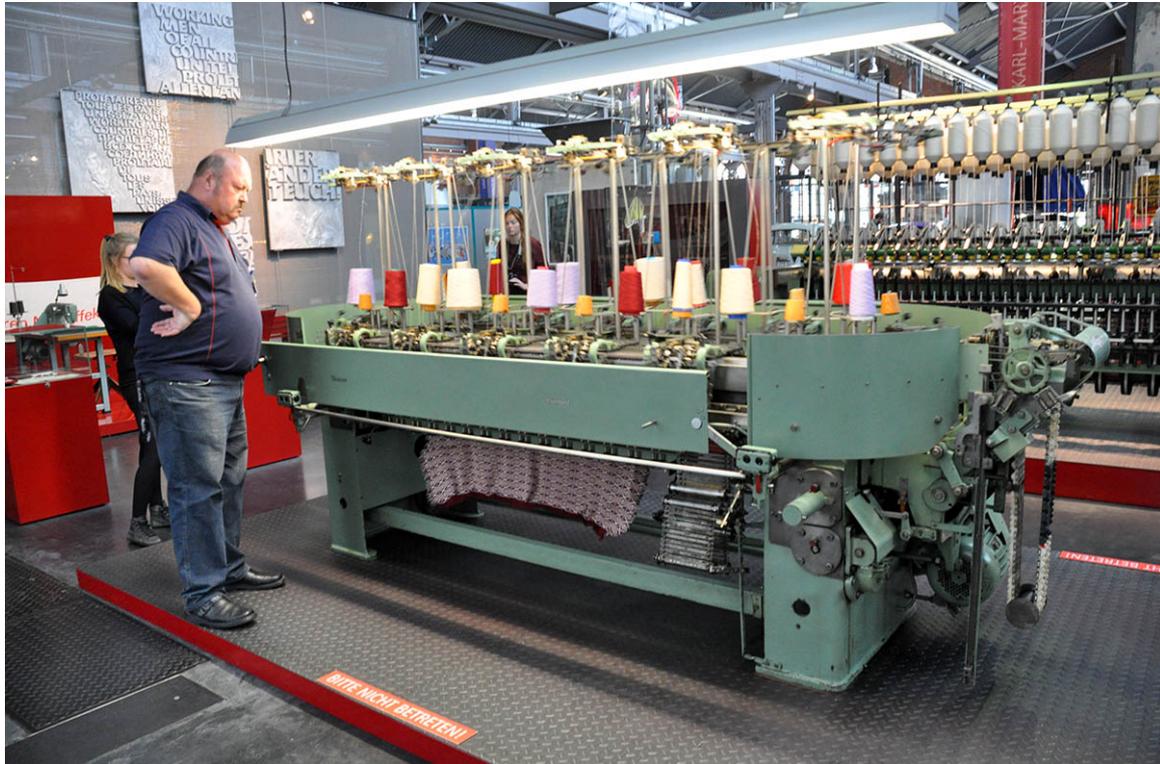
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Sächsisches Industriemuseum (Saxonian Museum of Industry)

Zwickauer Strasse 119, D-09112 Chemnitz, Germany

Tel.: 49 371 3676 140

www.saechsisches-industriemuseum.de



The main museum of the Saxonian Museum of Industry is located in Chemnitz. Three branch museums complete the main museum: the West-Saxon Textile Museum in Crimmitschau, the Ehrenfriedersdorf Tin Mine and Mineral Museum and finally the Energy Factory Knappenrode. The main section of the museum in Chemnitz is housed in a former ensemble of the foundry Hugo Schreiter and the foundry Moritz Rockstroh. In 1907 the engineering company Schubert and Salzer acquired Schreiters factory and started to cast iron for knitting and tulle machines as well as machine tools. After Rockstroh had to declare bankruptcy, Hermann Escher took the enterprise over and with his son Alfred he built a capable concern (H. & A. Escher A.G.) for the production of engine lathes, planing and drilling machines as well as steam engines. Due to the big economic crisis in 1929, Schubert & Salzer and the Escher A.G. had to cease their production in 1930. In 1942, the Auto-Union acquired the whole area and built a modern foundry for the production of tank engine bodies. As a branch of the VEB Vereinigte Chemnitzer Giessereien, the foundry produced during the communist post-war period machines and tools. In 1982 this foundry closed down and was moved towards a new location. The site was handed over to the VEB Schleifmaschinenwerk to erect new buildings. The old factory building had already been prepared for blasting, when the demolition could be stopped at the very last minute in May 1990.

The permanent exhibitions present the fascinating history of the industrial production of Chemnitz with accent on metallurgy, machine construction, energy supply, transportation and textiles. Temporary exhibitions complete the standard visit to this outstanding industrial

museum and this well designed sections. We conclude with practical information about the three other branches of the Saxonian Museum of Industry:

-**West-Saxon Textile Museum** (Textile factory Pfau brothers), Leipziger Strasse 125, 08451 Crimmitschau, Germany / Tel.: 49 3762 93 19 39 / www.saechsisches-industriemuseum.com/en/crimmitschau

-**Ehrenfriedersdorf Tin Mine and Mineral Museum**, Am Sauberg 1, 09427 Ehrenfriedersdorf, Germany / Tel.: 49 37341 25 57 / www.saechsisches-industriemuseum.com/en/ehrenfriedersdorf

-**Energy Factory Knappenrode**, Ernst-Thälmann-Strasse 8, 02977 Hoyerswerda / OT Knappenrode, Germany. Tel.: 49 3571 60 42 67 / www.saechsisches-industriemuseum.com/en/knappenrode

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Technoseum

Museumsstrasse 1, 68165 Mannheim, Germany

Tel.: 49 621 42 98 9

www.technoseum.de

Since 2010, the “Landesmuseum für Technik und Arbeit” presents itself under the new name Technoseum. The Technoseum presents 200 years of industrialisation history on an exhibition area of about 9.000 square metres. Displays of engineering and social history are complemented by interactive experiments in natural sciences and technology. With its regular special exhibitions on current issues in natural sciences, technology and society, the Technoseum is also a forum for current debates.

The collections of the Technoseum have been continuously developed and expanded since 1980. They include technical cultural assets which throw some light on past lifestyles and working methods, from machinery to tools and products in every use. Permanent exhibitions include “the Paper Mill”, “the Weaving Mill”, “Railways”, “the Steam Engine”, “Observatory” and “Lifeblood – the History and Future of Medical Technology”. All these collections don’t neglect to focus on regional industrial developments and heritage.

Special sections are the three so-called “Elementa”. Elementa 1 demonstrates groundbreaking findings in natural science and technology at the beginning of the industrial revolution.

Elementa 2 highlights experiments from the intense industrialisation period around 1900, with steam power and electro-engineering as dominant issues. Elementa 3 was funded by the state of Baden-Württemberg and opened in 2011. The main focus of this large new experimental area is on current science and experiments that will shape the 21st century.

The collections are presented in a remarkable modern building, designed by the Berlin architect Ingeborg Kuhler. The rich abstract design of wedge shapes and declined levels alludes to the principles of engineering. The Stuttgart agency of the architect Roland Schölzle was responsible for the complete refurbishment of the façade in 2008, including a light installation for the museum steel bridge.

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GREECE

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Museum of Industrial Olive Oil Production Lesvos (MBEL)

Agia Paraskevi, Lesvos 81-102, Greece

Tel.: 30 22 530 32 300

www.oliveoilmuseums.gr

The Museum of Olive Oil Lesvos (MBEL) has been founded and designed by the Piraeus Bank Group Cultural Foundation, also responsible for its operation. It is housed in the premises of the old communal oil-mill, the municipality of Agia Paraskevi have called their right to the Foundation. The project has been included in the 2000-2006 North Aegean Operational Programme and has been financed by EU-funds. The Museum of Olive Oil Lesvos is part of the network "Museums of the Olive in the Mediterranean", including 14 museums and historic olive oil production and heritage sites in Spain, 6 in Italy, one in Tunisia, Israël, Turkey, France and finally 2 in Greece, the Lesvos Museum and the **Museum of the Olive and Greek Olive Oil in Sparta** (Address: 129, Othonos-Amalias Street, Sparta 231 00, tel.: 00 30 27 310 89 315). The Agia Paraskevi complex has been developed as "an oil-mill turned into a museum of oil", restoring both its architectural and mechanical features to their original condition. The old machinery and equipment was preserved, fully restored and exhibited in a unique way, being put into use for demonstrations, supported by digital images. Special emphasis is given to the changes that mechanical power brought into the process of oil-production. In the main building the basis steps of this process are shown: crushing the olives, pressing the olive-pulp and separating oil from water. Reference is made to the auxiliary operation of the flour mill. The old storage areas of the olive crop are used as extra exhibition halls, in which objects and documents present social history, the human element and working conditions in the oil industry. The larger storage areas house special exhibitions about the wider socio-economic background, aspects of mechanization and the cycle of trades and the distribution of olive oil. MBEL aims at presenting the industrial heritage of the island, not only in the oil-production branch, but also in the wider field of technological development, as well as projecting it against its architectural, social and cultural background.

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Technopolis – City of Athens & Industrial Gas Museum

100, Peiraios Street, Gazi – 11 854 Athens, Greece

Tel.: 30 210 347 55 18

www.technopolis-athens.com / www.grreporter.info

Technopolis - City of Athens, installed in the old municipal gasworks, has become a hub of cultural events, attracting annually over 600.000 people, thus upgrading a historic area of the capita land creating an unusual and new focal point in the cultural identity of Athens. Technopolis – City of Athens offers quality entertainment, educational and cultural activities at reasonable prices while at the same time it supports the social work of the city's major

organizations. The gradual transformation of the site, combined with the newly designed Museum Path with 13 stops in specific areas of the old gasworks, offer visitors the chance to stroll in an area full of images, knowledge and feelings. The imposing gasholders, the chimneys and the old retorts add a special quality to every activity that takes place in it.

Sunday January 27, 2013, was the grand opening of the Industrial Gas Museum in Technopolis. The objective of this museum is to highlight industrial and modern history of Athens. The Gasworks was founded in 1857 by the French businessman François Théophile Feraldi, with the purpose to providing gas lighting to the streets of Athens and covering modern energy needs of its residents. In 1887, Giovanni Baptista Serpieri undertakes the management of the factory, who was considerably enlarged. The Gasworks became a municipal enterprise in 1938 until 1984, when it was shut down.

The Athens gasworks is the only surviving gasworks plant in Greece. Original machinery is conserved on site, who presents all steps of the gas production: from coke gas to distillation (overheating), purification to storage. The museum has a rich collection of devices connected with coal gas (gas meters, cookers, water heaters, etc.), photographs, archive material and audiovisual material, including recorded interviews of factory workers and residents of the gasworks-area.

Visitors of the Gasworks also learn about the entrepreneurial spirit in 19th century Athens and about the community of people who worked here for almost 130 years. They can also make the connection between the old use of the plant and new forms of energy. This way Technopolis acquires a dual function: a hub of cultural events and the first Industrial Gas Museum, whose history is so interconnected with a major chapter of the history of Athens.

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HUNGARY

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Hungarian Museum of Science, Technology and Transport

Városligeti korut 11, 1146 Budapest, Hungary

Tel.: 36 1 273 38 45

www.mmkm.hu/index.php/en

The Hungarian Museum of Science, Technology and Transport is the most important scientific and industrial network-museum of the country. Several sections are located in Budapest and three others branch-museums are located in other towns.

The Budapest-sections firstly include the **Transport Museum** (XIV. Ker. Városligeti korut 11, 1146 Budapest) and the Aviation Exhibition, installed in Petöfi Hall (Petöfi Scarnok, 1426 Budapest) and presenting more than 50 original aircraft. Visitors here can also sit on an aviation computer simulator. On the cabin of the “Göbe” sailing plane where they can have the chance to experience the flight in a sailing form. Another curiosity is the exact size capsule of Bertalan Farkas’s spacecraft, or the 1:1 scale copy of the “Spirit” Mars rover.

Three other Budapest branches are the Technical Study Stores, the Foundry Museum and the Museum of Electrical Engineering. **The Technical Studies Stores** (Prielle Kornélia u. 10, 1117

Budapest) get an insight into the collections of optical and photographic devices, the clock collection, the astronomical collection, the equipments of informatics and consumer electronics, and finally the Mobileum-room, where the visitor is awaited by a number of motors and steam engines.

The Foundry Museum (Bem Jozsef utca 20, 1027 Budapest), installed in an old factory sheds of Abraham Ganz, where the well-known foundry existed even in the 1960'. This is the first Foundry Museum in central Europe, and was opened for visitors in 1969.

The Museum of Electrical Engineering (Kazinczy utca 21, Budapest VII) is installed in a former electric substation building, with nice staircase decorated with Zsolnay ceramics. Visitor scan get acquainted with Hungarian electrification history.

Outside Budapest are the following branches: the **Museum of Chemistry and Chemical Industry** (at Thury Castle, 8101 Vàrpalota), the **Aluminium-Industry Museum** (at Zombori utca 12, 8000 Székesfehévår) and finally the **Metallurgical Museum** (at Palota utca 22, Miskolc-Feslöhàmor).

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IRELAND

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(The) Steam Museum (& Lodge Park Walled Garden)

Lodge Park, Straffan, Co. Kildare, Ireland

Tel.: 353 1 62 884 12 (information) / Tel.: 353 87 24 14 556 (special enquiries)

www.steam-museum.com

The Steam Museum is housed in a fine Victorian gothic building near the former Inchicore Railway Works. In the Model Hall the collection consists of early inventor's models, scientific engineering models and historical works of mechanical art. The Power Hall displays six huge nineteenth century stationary engines running in steam on occasions.

Highlights include a six pillar independent beam machine (built circa 1820), the Blue Smithwicks engine built circa 1847, a single cylinder mill steam engine, built by Victor Coates & Co in Lagan Village (Belfast), an inverted vertical duplex pumping engine (from 1898, built by Frank Pearn & Co Ltd, Manchester), a steam powered electric lighting installation, and equipment removed from a Dublin laundry driven through its original belt and line shafting to an early prime mover. Portraits of the great inventors and engineers from the steam age can be seen. The Halprin Collection has samples from the first transatlantic cable laid between Valencia Island and Newfoundland.

The 18th century walled garden adjoining Lodge Park (with restored greenhouse, rosary and orchard) has been under restoration for the last few years and invites visitors for a pleasant walk.

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ITALY

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Grande Miniera de Serbariu (Coal Mining Museum of Serbariu)

Centro Italiano della Cultura del Carbone

09013 Carbonia (Sardegna), Italy

Tel.: 39 0781 670591 (offices), Tel.: 39 0781 62727 (museum ticket office)

www.museodelcarbone.it

The “Centro Italiano della Cultura del Carbone” (Italian Centre of Coalmining Culture) was founded in 2006 by the town of Carbonia and the “Parco Geominerario Storico e Ambientale della Sardegna”. The main goal is the conservation and management of the Serbariu Colliery, active from 1937 to 1964, typical for 20th century mining heritage in the Sulcis-region in southern Sardinia. The mine houses now a complete museum, spread on different parts of the mine, including also an underground gallery, and presenting the industrial, technical and social history of Carbonia.

Behind the lamps-room is a large conference hall. The former forge-building on site is now used as archives- and research centre (supported by the University of Cagliari), while the former office building and hall presents the “PAS-Museum E.A. Martel” (with the old collections about geology, speleology and paleontology). The main warehouses of the colliery are a research centre about technology and uses of new energies, including also meeting rooms. Not far from the colliery site, the villa of the director presents since 1998 a regional archaeological museum. The visit of the Serbariu Colliery and museum is not complete without the discovery of Carbonia, a typical example of a newtown, created in 1938 by the Italian fascist regime, and presenting living districts with a geometrical grid pattern. The central square (“Piazza Roma”) of the mining town is surrounded by the ‘Torre Littoria’, the town hall, the San Ponziano church, the ‘Cinema-Teatro’, constituting an impressive architectural ensemble from the interwar period.

Since 2012, the Coal Mining Museum of Serbariu is part of a European Route of Coalmine Museums, managed by ERIH (European Route of Industrial Heritage). Outside the town of Carbonia and in the other region of Sardinia, visitors can discover the different sites of the “Parco Geominerario”.

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The Green Train of Sardinia & Montserrat Railway Museum

Via Pompeo, 09042 Montserrat, Italy

Tel.: 39 800 460 220/070

www.treninoverde.it / www.treninoverde.com /

http://it.wikipedia.org/wiki/Stazione_di_Montserrat

One of the best ways to discover the different aspects of the landscape of Sardinia, especially the interior, is a journey with the Green Train (“Trenino Verde”), passing through areas where the railroad, bridges, stations seem to be part of the landscape, perfectly integrated in an

environment sometimes only reachable by this slow trains. There are different railway-lines, managed and supported by ARST (“Trasporti Regionali della Sardegna”): Mandas - Arbatax, Isili - Arise, Macomer - Bosa and Sassari – Temple –Palau.

Mandas – Arbatax is the longest tourist railway line of Italy (159 km) and the most popular because of the exceptional beauty and variety of the landscape (especially the Gennargentu mountains).

The line Isili – Arise is well known for some impressive engineering works of art as the viaduct of Gennesitzu, the S’Arcu – tunnel and the viaduct On Sammuccu).

The line Macomer - Bosa passes by a panoramic plateau (near of the town Nuoro) over 500 metres, the valley known for its production of the famous Malvasia wine, and ends at the station of Bosa, at the mouth of the Temo river.

Finally the line Alghero - Sassari –Temple – Palau (in the northern part of Sardinia) joins the Coral Coast to the Emerald Coast, crossing through the hills and mountains of Limbara with agile viaducts ad long tunnels, including the helical Bortigiadas, an authentic artwork of engineering.

The rolling stock and other historical railway exhibits can be discovered in the Railway Museum of Montserrat (near Cagliari, along the railway line Cagliari - Isili). This museum, supported by Sardinian Tourist Authority, was opened in 1996 in a brand new building. The aim is collecting rare documents, tools and machines that were used during the long history of railways.

Highlights include the locomotive Mallet nr. 206 (1906), the steam loc Winterthur nr. 43 “Goito” (1893), a Baucherio carriage (1913) and several Regiana locs (nr. 400 and 402, dating from 1931).

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Museo del Tessuto (Prato Textile Museum)

Via Puccetti 3, 59100 Prato, Italy

Tel.: 39 0574 611 503

www.museodeltessuto.it

Prato Textile Museum is Italy’s largest centre for the study, conservation and exhibition of historic and contemporary textiles, but also for the study and valorisation of all related artistic, industrial and technical aspects of interest. Managed by the Prato Textile Museum Foundation. This institution was founded in 2003 by the Prato Chamber of Commerce, Industry ad Craft, the Municipality and Province of Prato and Prato Industrial Union.

The museum opened in 1975 at Tullio Buzzi Technical Institute, presenting the donation of antique textiles by the local textile entrepreneur Lorian Bertini. In 1997, the museum was moved to a temporary homa at the Palazzo Comunale. Although, since May 2003, the museum has been definitively housed in the converted Campolmi textile mill (1863) in the centre of Prato. The Cimatoria Campolmi Leopoldo textile mill is the only 19th century industrial complex within the 14th century walls of the city of Prato. Industrial activities (fulling, dying, teaseling and rolling of textile fabrics, but also training of textile technicians) ceased in 1994. The restoration of Campolmi mill, according to the concepts of Marco Mattei, aimed to recover an area of the degraded urban centre, which was rich in historic, cultural and social significance.

The outstanding interior design of the museum was supplied by Studio Guicciardini & Magni Architects.

The museum collections include a wide range of items, documenting the production of textiles from the pre-Christian times to the modern day in different sections: archaeological textiles, sacred textiles and raiment, embroidered textiles and articles, ethnic textiles and clothing, sample books from the Prato area, contemporary textiles, and fashion plates. Of special interest is the machinery collection presenting Italian hand looms, fulling machines, beating machines, spinning wheels, spoolers and wharping machines, many of which were locally made for specific purposes.

All these collections are displayed in thematically-organized areas, according to a rotation of the presentations, ensuring also correct conservation. The museum welcomes visitors also the temporary exhibitions and invites researchers to a large and very rich library and documentation centre.

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Museo Nazionale della Scienza e della Tecnologia Leonardo da Vinci

Via S. Vittore 21, 20123 Milano, Italy

Tel.: 39 2 48 555 1

www.museoscienza.org

The museum was opened in 1953 and is born from great ideas and projects, who started during the Sempione International Exhibition (1906). Gradually the Milan Museum for Science and Technology became the largest museum in this specific field in Italy.

Founded to host monks of the Olivetan order, the central body of the museum was built in the early 16th century as a monastery. The monks enlarged the cloister and in 1560 the construction of a new church begun. Under the rule of Napoleon the monastery would become a military hospital and was transformed later into the Italian Army's barracks, who were used the buildings until the Second World War period. From 1947 to 1953, the spaces were redesigned to host the new National Museum of Science and Technology.

The museum valorises the largest collection of machine models in the world, realized basing on Leonardo da Vinci's drawings. The museum is a private foundation whose institutional partners are Ministries, public bodies and Milan's universities. The museum's mission is to stimulate understanding of scientific phenomena and their practical uses in everyday life, to stimulate creativity and discovery, to inspire and change the future. The original museum project is also focused on the topics of work and industrial production.

The heritage comprises the collections, including more than 15.000 technical-scientific objects, the archives and library, which witness the history of science, technology and industry (with special focus on iron and steel industry), starting from the early 19th century to the present, with particular reference to Italy.

Collections and interactive laboratories are now organized in following departments: Materials, Transportation (air, rail and water transport), Energy sources, Communication, Leonardo Art & Science (Leonardesque models exploring the complex relationship between humanity and machines, between humanism and science), Horology, Musical instruments), New Frontiers (telecommunication, space discovery, nanotechnology), Nutrition, and Science for young children. Each of these departments develops research on the collections, they design thematic exhibitions and promote conferences and workshops.

The “Museo Nazionale della Scienza e della Tecnologia” takes part as protagonists in the debate on the dissemination of scientific culture and cooperates with other important European museums.

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Museo Fisogni della Stazione di Servizio (Fisogni Museum of the Petrol Station)

Via Giacomo Bianchi 23, 21049 Tradate (VA), Italy
Tel.: 39 339 62 175 31
www.museo-fisogni.org

This private museum was founded by Guido Fisogni in 1966. During the following years the museum became more and more important and today it is composed by about 10.000 pieces divided among gasoline pumps (many of them dating from the beginning of the 20th century and the interwar period), oil tanks, equipment (for oil replacement, grease-up, the installation of new filters, etc.), a collection of fire extinguishers and air compressors. The well designed museum sections of Museo Fisogni show the technological and cultural impact of the use of petroleum and oil products in the industrial society and in our daily lives.

An important part of the collection consists of a wide range of accessoires, advertising materials, gadgets and toys with logos of old automobile companies. A special section presents the development of the oil barrels, oil cans. And packaging design. Kerosene also came to be packaged, but the first cans, introduced at the end of the 19th century were too capacious for domestic use. Circa 1890-1900 pre-filled cans made their appearance, small enough to be carried home.

The Museum Fisogni presents, since 2015 in a new presentation, also the history of petrol station road signs (the so-called “globes”, necessary to make petrol stations more visible from the road), advertising and graphic design related to petrol stations and marks, reflecting the typography and the iconography of the complete 20th century.

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La Via del Ferro e delle Miniere –Valtrompia (Iron and Mining Heritage Route –Valtrompia)

Via Strada Provinciale s.n., 25060 Collio Valtrompia, Italy

Tel.: 39 347 816 32 86

www.miniereinvaltrompia.it / <http://cultura.valletrompia.it/musei>



Only few visitors discover less known treasures of industrial heritage out of urban settings. An example of is the “Iron and Mining route Valtrompia”.

We start our route at the “Museo Le Miniere di Pezzaze” (Mines of Pezzaze Museum, Via Strada Provinciale s.n. 25060 Collio Valtrompia, Brescia - Tel.: 39 347 816 32 86). The site is managed by the “Soc. Cooperativa Ski-Mine – Miniere di Collio Valtrompia e Penazze”.

The Mines of Pezzaze Museum is a part of the industrial heritage, presented along the “Road of the Iron and the Mines” in Valtrompia, north of the city of Brescia. Visits of this and other industrial attractions nearby are only possible during the summer months (May to the end September). It’s a good idea to inform yourself in the tourist office of Brescia and to start the discovery of the region by visiting the Mines of Pezzaze. Discovering of the underground galleries of the Marzoli Mine, shut down in 1972, is an overwhelming experience. The surface buildings here present a nice permanent exhibition about iron mining in this mountainous region. A public library and documentation centre and a conference hall are located in the upper floor spaces.

Another attraction is the former San Aloisio Tassara di Collio – Mine, closed in 1985 and opens for tourists visitors, who can follow here adventure trails, called “Miniera Avventura” and “Trekking Minerario”. Reservation is necessary (tel.: 39 30 833 74 95).

In the same valley in Tavernole, the well conserved, 15th century ‘Forge of Tavernole’ (Museo il Forno di Tavernole, via Forno Fusorio, s.n., 25060 Tavernole s/Mella) welcomes visitors, interested in old metallurgy and iron making. The iron making technology was developed here by the local, creative entrepreneur Francesco Glisetti.

Other possibilities are visits to two other exceptional iron making sites: the forge “Museo I Magi di Sarezzo”, open all year during weekends (Via Valgobbia 19, 25068 Sarezzo) and the 15th century forge “Museo il Mago Averoldi di Ome” with house of the iron maker – family Malossi (Via Maglio 51, 25020 Ome, tel.: 39 30 833 74 95 or tel.: 39 30 833 74 94).

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Museo delle Industrie e del Lavoro del Saronnese

Via Don Griffanti 6, 21047 Saronno, Italy

Tel.: 39 33384 79 087

www.museomils.it

The Museum is directed since the foundation in 1996 by the Association “Museo delle Industrie e del Lavoro del Saronnese”. The main mission of the museum is the valorisation of the industrial past and present of Saronno (the museum website describes all important industrial companies of the town), the conservation of local industrial heritage (helped by a lot of devoted volunteers) and the education about the very rich industrial and social history of the Saronno region, a key-region in the industrialisation of the province of Lombardia.

In 1998, a first section of the museum was opened in a railway warehouse near the main station, presenting an exhibition about the role of railways in the industrial development of Saronno. This first exhibition was enlarged and diversified several times. The collection includes nowadays merely objects, documents and archives offered to the museum by local industrial enterprises (such as Ferrovie Nord, Fonderie e Officine di Saronno, Gianetti, Tipografia Padri Monti, etc.). The museum is close to the workers population of Saronno and involves local inhabitants concerning special exhibitions, publications and social events

Special sections present old radios and televisions, produced by “Saletta Fimi-Phonola-Philips”, the old equipment of the biscuits manufacture Lazzaroni, equipment producing the world famous liquor Amaretto di Saronno, and an impressive collection of road vehicles (Isotta Fraschini and others).

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Museo del Patrimonio industriale

Fornace Galotti, via della Beverara 123, 40131 Bologna, Italy

Tel.: 39 51 63 56 611

www.comune.bologna.it/patrimonioidustriale

The Industrial Heritage Museum displays the productive and economic history of Bologna from the Modern Age to the Contemporary Age. Located in the outskirts of Bologna, the museum has a charming location in the renovating brickworks on the Navile Canal, known as 'Fornace Galotti', dating from the second half of the 19th century and ending his production in 1966. It was later renovated by the city, which saved the Hoffmann-kiln and redeveloped the upper floors, which had been used to dry unfired materials. The factory was used to produce clay-based construction materials (bricks, hollow bricks, roof tiles, hollow flat tiles, ornamental terracotta pieces etc.).

The museum Fornaci Galotti, who was opened in 1997, occupies a total area of some 3500 m². It is part of the municipal museum and heritage network "Istituzione Bologna Musei / Area Patrimonio Industriale".

The mission of the museum is valorisation of the industrial identity and technical-scientific culture of the Bologna area. It pursues this goal by establishing a solid network among the main local industrial players, museums, cultural institutions and other public and private organisations working in this field.

The permanent exhibition is displayed on three levels in the Hoffmann kiln, presenting the collection belonging to the Aldini-Valeriani Institute (the city's oldest technical school, named after Luigi Valeriani and Giovanni Aldini, two Bolognese professors), objects and objects related to the Galotti brickworks, and the outstanding section 'Five centuries of Bolognese excellence', ranging from historical silk industry (using an ingenious water distribution system) to 20th century mechanical production. A section is dedicated to machinery used for prepping, measuring and packaging, illustrating Bologna as "Capital of Packaging". Another section presents the leading designers of machines operating in Bologna between 1924 en 1991 in enterprises as ACMA (packaging), FBM and Ducati (motorcycles), Maserati (race cars) etc. This section guides the visitor through an exploration and evocation of the modern Bolognese industrial district. Most collection-items can be found online.

The adjacent building of the museum houses temporary exhibition spaces, an outstanding library and archives. The museum is editor of the magazine "Scuola Officina", published since 33 years as one of the very few periodical publications concerning industrial history and heritage in Italy.

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Parco Museo Minerario, Abbadia San Salvatore

Piazzale R. Rottaro 6, 53021 Abbadia San Salvatore, Italy

Tel.: 39 57 77 78 324 or Tel.: 39 57 77 70 317

www.museominerario.it

Abbadia San Salvatore is a municipality in the Province of Siena (Tuscany region, 110 km southeast of Florence) in the area of Monte Amiata, once important for the extraction of cinnabar, the common ore for the production of mercury. Mount Amiata is the largest of the lava domes complex, located about 20 km northwest of Lake Bolsena. Mercury, the only liquid metal at normal temperature, aroused curiosity and interest in ancient times. The ore was already known in antiquity and during the Middle Ages, when mercury fascinated alchemists.

In the mid-nineteenth century, geologists and researchers began to explore the territory of Amiata, looking for the exploitation of the deposits of cinnabar on an industrial scale. Early research was not successful, until, in 1897 new explorations led to the discovery of a large ore field and the foundation of "Società Anonima Mercury Mines of Mount Amiata". It was the start of the building of a metallurgical plant. The factory was designed by the technical director Vincenzo Spirek and was composed of four ovens, equipped with condensers, and (at the outside) equipped with a water reservoir, used for the production of electricity. The factory was in activity from 1899 to 1972.

The cease of production was caused by the crisis of mercury on a global scale and also because of ecological reasons and the awareness of the polluting effects of mercury use in chemical industry.

The museum installed in a former office building and workshop of the mine, illustrates the industrial and social history of the mining activities, the health risks of the mining labour during day-shifts, while nocturnal shifts were provided to the delivery of materials for the digging of new mine galleries. The mining operations, particularly the treatment of the ores at the surface (the reduction of the ore pieces, the roasting of the ore, the filling of bottles with purified mercury, etc.), were gradually mechanized, reducing considerably the number of employees.

The museum presents the importance of carpentry producing lumber for the construction of tunnels, the production of electric power to insure the ventilation of the galleries, all aspects of underground labour, the evolution of the ore-treatment and transport.

A guided walk through underground mine galleries completes the visit. For most of the visitors the discovery of a dark and unknown industrial world of the past, located in a natural environment, is an exceptional experience.

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Parco archeominerario di San Silvestro

Via di S.Vincenzo 34/B, 57021 Campiglia Marittima (Livorno), Italy

Tel.: 39 56 52 26 445 or Tel.: 39 56 58 38 680

www.parchivaldicornia.it

Situated on a spectacular seaside spot (near Cape of Piombino), the Archaeomineral Park San Silvestro, opened for visitors in 1996, covers circa 450 hectares. The visit starts by discovering the “Museo dell’Archeologia e dei Minerali”. Then a guide leads the visitors to the Temperino Mine for a fascinating underground visit, discovering the world of extraction of numerous minerals, known since the Etrusques and cultures from Antiquity.

Next attraction spot is the “Pozzo Earle” (the Earle mineshaft) where the working conditions and technology used during the last decennia of activity are commented (in the so called “Museo delle Macchine Mineralie e dei Minatori”).

From here a train conducts visitors to the “Galleria Lanzi-Temperino” (accessible since 2006) and the workshops for the treatment of the minerals (including the former flotation baths), not far from the remnants of the medieval site “Rocca San Silvestro”.

The discovery of “Archaeomineral Park” is a unique experience, combining an original approach of interacting disciplines: archaeology, geology, technology, industry, architecture and nature conservation.

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Parco Minerario Naturalistico di Gavorrano

Ex Bagnetti, 58032 Gavorrano (Grosseto), Italy

Tel.: 39 56 68 46 231

www.parcominerario.it

The history of the Metalliferous Hills near Grosseto from Etruscan times to the present day has been profoundly marked by human activities linked to the extraction and processing of pyrite and other minerals.

Already in ancient times the pyrite’s unusual property of producing sparks when rubbed energetically was well known. In the 16th century it was used as a lighter for firearms. There is evidence that in 1452 the Chigi family of Siena exploited mineral deposits in the region, near Ravi. Industrial treatment of pyrites (iron sulphide) is mostly for the production of sulphuric acid but also the iron, contained in the residue from mineral processing is used in steel production. One of the first industrials in the Gavorrano region was Egidio Succi, former manager of the grand-ducal ironworks of Follonica, who established an open-cast mining enterprise in 1840 and exploited iron hydroxides. In the same period, coal deposits (picea lignite) were discovered. From the middle of the 19th century until the late 1950’s, the ‘Maremman coal’ was vital to national energy policy. Pyrite ore mining activities on a large scale began in 1889, runned by the “Praga e C” company, taken over in 1905 by the “Unione Pyriti”, and in 1910 by the Montecatini Company. This last company had exclusive management

of the mines until their closure in 1981. The extraction of pyrite culminated in the 1970's with a yearly production of 650.000 tons.

Shortly after the breakdown of the old mining activities, the Gavoranno municipal council started in 1991 with the planning of an ambitious restoration program of mining buildings, which was carried out by the AQUATER Company. A co-ordinating committee, directed by Prof. Alberto Magnahni (University of Firenze) was set up. The executive phase started in 1999 and involved two of the seven areas identified by the Mines Park project: the "Parco delle Rocce" (at Gavorrano) and "Ravi Marchi" (at Ravi), inaugurated in the summer of 2003.

In the "Parco delle Rocce", visitors discover the outstanding Mining museum, inside a mine tunnel (a small powder magazine), the chapel of San Rocco, the theatre 'delle Rocce' (in a abandoned quarry), the Rome shaft and the ex-Bagnetti-building (Pozzo Impero –Empire shaft). At the Ravi-Marchi Mine (3 km from Gavorrano) visitors can see the shafts Vignaccio I & II, impressive washing plants, a cableway for the transport of pyrites and an art nouveau inspired office building. The Castel di Pietra documentation centre, installed in a well restored old building in Gavorrano, presents a nice exhibition with the results of archaeological excavations. The visitors are invited to complete their visit by walking one or more Heritage routes, presenting numerous mining features and a beautiful natural environment.

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LETONIA

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Power Industry Museum - Latvernergo

Kegums HPP-2, Keguma prospekts 7-9, Kegums, Lettonia (Tel.: 371 27 89 78 35)

Plavina HES, Energetiku iela 2, Aizkraule LV 5101, Lettonia (Tel.: 371 65 11 03 09)

Depositories Industry Museum, Andrejostas iela 8, Riga, Lettonia

(Tel.: 371 67 72 89 85 or 371 29 15 06 14)

www.latvernergo.lv/eng/corporate_social_responsibility/museum_of_energy/

The Museum of Energy collects, preserves and studies the historical legacy of Latvian power industry from the beginnings of electricity use until the creation of a unified power system, documenting the growth and development of Latvernergo Group. The museum's holdings include documentary and industrial heritage, depicting power industry as a cornerstone of economic development and social welfare, not only in Latvia but also in the wider context of the entire Baltic region.

The permanent and temporary exhibitions of the museum are partly located in Kegums town, in an authentic environment on the left bank of Daugava river, the premises of Kegums HPP-2. This section presents the permanent exhibition "Development of power industry in Latvia", also the machine hall and control room. Outdoors, large industrial exhibits are displayed: the first turbine of the Kegums-plant (1939) and other technological equipment. Another section of the museum, the Plavinas HES historical collection, is located at the Plavinas hydropower plant near the town of Aizkraukle, the largest electricity generation facility of the Baltic's).

The depositories of the Museum of Energy and the museum's comprehensive collection is stored in Riga – in the Andrejsala depositories and archives. This section is also accessible for visitors. This section of the museum stores a unique collection of glass plate photonegatives taken by the renowned pioneer of Latvian sound newsreels Edwards Kraucs, illustrating the construction of Kegums hydropower plant and other industrial building of the energy-branch. This collection is included in the Latvian National Register of the UNESCO Memory of the World Programme (see: www.atmina.unesco.lv).

The Energy Museum offers a wide range of educational activities, participates to the “Museum Night” (yearly in May) and is organising temporary exhibitions and other public events.

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LITUANIA

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Energetikos ir Technikos Muziejus (Energy and Technology Museum)

Rinktenes gatve 2, LT-09312 Vilnius, Lituania

Tel.: 370 5 278 20 85

www.emuziejus.lt / www.vilnius-tourism.lt

The Energy and Technology Museum is located in the city of Vilnius first power plant, near King Mindaugas Bridge. This electrical power station was built from 1900 to 1902, has been equipped with machinery from the AEG-Berlin, and has been operating since 1903 until 1998. This important monument of industrial history, already listed as historical monument in 1982, was opened for visitors on 14th February 2003, during the celebration of the 100th anniversary of the Vilnius power station. From this date onwards, a ambitious museum development program was launched, supported by public and private institutions and by EU Structural Funds. The building was completely restored and a copy of the monumental, allegoric sculpture “Elektra”, a female figure destroyed in 1957, dominates again the roof of the power station and the skyline of this part of Vilnius.

In 2006, the Lithuanian Energy Museum became involved in the international project “Dream factories. Exhibition of Industry and Modernism in the Baltic Sea Region 1945-1990”. In 2008, the museum exhibitions covered about 5.000 m² and became the largest technical and industrial collection of Lituania. Exhibitions are presented in different parts of the power station: the boiler hall, turbine hall, cellars. The museum houses an interesting library and documentation centre, a conference hall, an educational spaces for demonstrations and workshops.

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LUXEMBOURG

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Musée de l'Ardoise / Schiefermuseum Uewermaartel (Slate Museum)

Les Amis de l'Ardoise a.s.b.l., Maison 3, L8823 Haut-Martelange, Luxembourg

Tel.: 352 236 40 141

<http://www.ardoise.lu>

The Slate Museum allows visitors to make a leap in time to discover the industrial past of the region of Martelange and the Grand Duchy of Luxembourg.

From the 18th century, farmers settled in Martelange were digging the blue slate stone with hammers and picks in narrow underground galleries. Towards the end of the 19th century also German entrepreneurs invested in slate mining. Steam power and a railway stimulated the export of the slate products. Around 1900 more than 600 people worked in Haut-Martelange slate quarries, mines and workshops. After 1960, the decline of the slate production could not be diverted, because of the emergence of new covering materials and the import of excellent slate from foreign markets. In 1986 any extraction of slate ceased in Luxembourg.

The Slate Museum site is unique because over 22 historic buildings and ruins, spread over 8 hectares invite to walk in contact with the typical Ardennes industry. The industrial buildings include a sawmill, workshops of the defendants, a black smithy, carpentry and metalwork workshops, underground galleries. Also conserved are old offices, homes for workers and the director's Villa with English park and hunting lodge, forming a homogeneous ensemble with the industrial premises.

In 2003 the State Luxembourg bought the site to keep it in its entirety and in its homogeneity and developed on site the Slate Museum. The association "Friends of the Slate Museum", mainly volunteers, works in the conservation of the heritage of the slate in the Martelange region. The work together with state and local authorities in achieving a living museum.

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NETHERLANDS

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Museum Boerhaave

Lange Sint Agnietenstraat 10, 2312 WC Leiden, Netherlands

Tel.: 31 71 52 14 224

www.museumboerhaave.nl

Museum Boerhaave is the Dutch National Museum for the History of Science and Medicine. In 1931 it opened his doors. Since 1991 Museum Boerhaave is located in the former St.Caecilia Hospital, in the town centre of Leiden. In 1635 it became an University hospital and it was here (around 1720) that Herman Boerhaave gave his famous sickbed lessons that drew medical students to Leiden from around the world.

The museum collections are among the most important in the world. The earliest objects on display in the museum date from the middle of the 16th century, including the world's oldest herbarium. From the Dutch 'golden age' (17th century) come Willem Blaeu's giant quadrant, microscopes by Antoni van Leeuwenhoek and unique pendulum clocks by Christiaan Huygens, his planetarium and telescope. The 18th century is well represented by the cabinets –science demonstration laboratories- of professors 's Gravesande and Van Musschenbroek.

The huge quantity of 19th century objects includes Dr. Zander's physiotherapeutic devices and the papier-mâché anatomical models of Dr. Auzoux. The 20th century was the second golden age in the nation's scientific endeavours. Dutch researchers won Nobel Prize after Nobel Prize: Van 't Hoff, Lorentz, Zeeman, Van der Waals, Kamerlingh Onnes and Willem Einthoven are represented many times in the museum.

Museum Boerhaave has curators in the different kinds of fields the museum represents, has his own, well equipped restoration atelier, and houses also an information centre with expertise about collection databases and digitalisations of archive material. Boerhaave Museum presents several outstanding temporary exhibitions every year, and the museum publish numerous books, catalogues and the newsletter "Knowledge is power" . Special attention is given to educational programs for visitors of all ages.

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Museum De Cruquius

Cruquiusdijk 27, 2142 ER Cruquius (Haarlemmermeer), Netherlands

Tel.: 31 23 52 85 704

www.museumdecruquius.nl

The Cruquius pumping station get sits name from Nicolaas Kruik, who name was latinized in Nicholas Samuel Cruquius (1678-1754). He was land-surveyor and an important promoter of a plan to pump up the Haarlem lake (Haarlemmermeer) dry. The pumping station houses the largest steam engine in the world, symbolizing the permanent struggle against the water and the winning of new lands on former areas, inundated by sea-water. In the engine room the working steam engine is the largest beam engine ever built and has the largest cylinder of the world, with a diameter of 3,70 metres (144 inches)! The Cornish steam pumping engine was built in the 1840's in England (by Harvey & Co of Hayle, Cornwall) and the machine has an ingenious system. The pump started work in 1850 and in only three years the Haarlem lake, surrounded by dikes, was pumped dry.

After the pumping station was put out of service in the first half of the 20th century, the boilers were unfortunately removed and the machine remained motionless for decades since 1933. Thanks to the efforts of a private association of volunteers, guided by inventiveness and great enthusiasm, the machine was completed and is now operational since 2002. Since then the visitors can enjoy a daily miracle of engineering, demonstrating how this powerhouse contributed to the reclamation of the Haarlemmermeer.

The professional staff of the museum is assisted by numerous volunteers, active in the mechanical workshop, as tour guides an for maintenance activities. In 2011, under the leadership of a new owner, the Hendrik De Keyser Foundation, a major restoration was

completed, by grants and support from the municipality of Haarlemmermeer, the Water Board Rijnland and the Friend of the Cruquius Museum. The Cruquius is listed on the UNESCO World Heritage Site and named in 1991 a 'Historic Mechanical Engineering Landmark' by the American Society of Mechanical Engineers.

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Nederlands Stoommachinemuseum (Dutch Steam Engine Museum)

Oosterdijk 4, 1671 HJ Medemblik, Netherlands

Tel.: 31 227 54 47 32

www.stoommachinemuseum.nl

The Dutch Steam Engine Museum is housed in the former pumping station "Four North Koggen" along the IJsselmeer in Medemblik. The pumping station is more than 150 years old and still works. In 1869, the pumping station was built, together with the boiler house and chimney. A first steam engine with two paddle wheels and two augers was installed. The pumping station assisted the 15 mills in the polder by pumping water from the polder to the Zuiderzee. In 1897, the paddle wheels and jacks were replaced by four centrifugal pumps. Then years later, the pumping station was expanded with a gas engine, driving a large centrifugal pump. In the actual boiler house, a gas generator produced gas as fuel for the engine. In 1924, two new steam boilers were installed, replacing the gas engine. Also the current stack was erected.

During the interwar period, the capacity of the pumping station became so important, that the mills in the polder were no longer needed. In 1939, two electric motors replaced the steam engine in the northern part of the pumping station, the boiler room was cleared and the chimney demolished. In 1971, a diesel engine driving the pump was installed, but shortly afterwards, in 1977, the station "Four North Koggen" was replaced by a new pumping station in Wervershoof. The redundant old ensemble was declared historical monument and thus legally protected in 1981. After a very professional restoration and revision a part of the old equipment works again, partly with steam power, forming an important part of the museum: two centrifugal pumps from 1897 and one built in 1907, the steam engine and boiler n° 4, from 1924-1925 and one of the electric motors from 1939.

In the museum all machines on steam can run but only a part of them are demonstrated during normal opening times in turn: sometimes the steam crane is operated and trunks are hoisted, sometimes the gang saw, then the dredger machine, a locomobile, a.s.o. The museum is managed by a private non-profit foundation and is assisted by a large group of well trained volunteers experts and workers for the demonstration and maintenance of the machines. Since 2012, the pumping station site is integrated in the ERIH (European Route of Industrial Heritage). The Steam Engine Museum forms part of a local and regional museum network, including the Bakery Museum in Medemblik and, more important, the Zuiderzeemuseum in Enkhuizen www.zuiderzeemuseum.nl).

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Techniekmuseum HEIM (Technical Museum HEIM)

Industriestraat 9, 7553 CK Hengelo, Netherlands

Tel.: 31 74 243 00 54

www.techniekmuseumheim.nl

In 1983 the Foundation of Immunology and working group on industrial history and heritage (a not-profit association) founded the HEIM or “Hengelo’s Educational and Industrial Museum on a first location in the Bornsestraat. Thanks to donations of private enterprises (Stork, Akzo Nobel, etc.) and the support by the municipality of Hengelo, the museum could collect and present an interesting ensemble of technical devices, tools and machinery. In 2005, the museum moved to Wilheminaschool, a wider building in order to present the grown HEIM-collection. The museum building is protected as historical monument, built in 1917, and served in the past as industrial school for future employees of the Stork factories and foundry Dijkers. A new modern extension is used as additional exhibition space and for different museum activities.

The basis of the collection lies in the industrial history of Hengelo and Twente. In the 19th century cottage industry and wool weaving on handlooms were widely spread in the region. In the 1830’s, the steam engine is introduced and in 1854 Charles Theodoor Stork establishes his steam powered weaving mill in Hengelo. Thanks to Stork, Hengelo became a town at an intersection of railways, stimulating the development of new industries. Shortly after 1900, the arrival of several electrical companies (Twente Central Power Station, Hazemeyer, “Dutch Signaalapparaten”) provided new workplaces and the city’s further extension. Around 1930, the textile was no longer the principal employer and was eclipsed by metal industry and mechanical engineering companies.

The industrial history is reflected in the collection, that includes following sections: textile (with unique ‘calendar’ velour press, handlooms and mechanical looms), machinery and mechanical engineering (with a triple expansion machine from 1915 and a Stork-department), electrical engineering (a section dominated by the beautiful Heemaf – switchboard and a SKA electric motor), telecommunication (with seldom seen early telephone central in working condition), radar and detection, renewable energy and finally process engineering, focussing of the way in which chlorine was recovered from salt. For salt history and heritage itself, we propose a visit of the Salt Museum in Delden (www.zoutmuseum.nl). The newest HEIM-section is about “robotics”.

The HEIM is a dynamic museum, animated by competent volunteers, playing an important role in the transmission of knowledge to young and older visitors.

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Spoorwegmuseum Utrecht (Railway Museum Utrecht)

Maliebaanstation, 3581 XW Utrecht, Netherlands

Tel.: 31 30 230 62 06

www.spoorwegmuseum.nl/

The Railway Museum in Utrecht is the Dutch national railway museum, established in 1927 and since 1954 housed in the “Maliebaan station”, a former railway station. In the 1930s the first steps were taken to conserve old historically significant railway equipment. A part of this early collection was lost during World War II. Over the years, more rail equipment and also tram

equipment was added. In the 1960s the plaza in front of the main building was filled with rolling stock, better protected since the construction, in 1975, of a roofed platform behind the museum. Distinctive parts of old collection are models of bridges and of various train types, paintings, prints and small equipment.

Between 1988 and 1989 a major renovation of the Maliebaan station interior was undertaken, and the back lot was integrated in the museum. It became possible to take rides, both in model trains and full sized ones. Additional buildings were added: an historical signal house, a crossing guard house, and old railroad bridge, etc. The outdoor exhibit area include also a water tower and turntable.

In 2002, another major remodelling of the museum started including the restoration of the station building, extended with the "Royal Waiting Room" moved from the "Staatspoor" – railway station of The Hague to Utrecht. Much attention was given to the decoration and design, in order to appeal more to the general public, especially young visitors and children. An additional, brand new building (2005) presents now four thematic presentations: "The great discovery" (the early years in the 19th century), "Dream travels" (the glory days of international trains around 1900), "Steel monsters" (the 1930s and 1940s), and "The workshop" (a large hall with trains). Since 2005, the Spoorwegmuseum is regularly connected with the Utrecht Central Station by rail.

Some of the important items in the collection are: steam locomotives (a replica of "de Arend" – the Eagle-, the first Dutch locomotive, the loc n° 3737, the last steam loc in Dutch railroad service, retired in 1958), electric locomotives (the motor-rail car mBC from 1908, the first Dutch electrically powered train), a royal rail carriage and the CC50 Mallet loc, which was operated in Indonesia, repatriated back to Holland in 1982.

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Philips Museum

Emmasingel 31, 5611 AZ Eindhoven, Netherlands

Tel.: 31 40 235 90 30

www.philipsmuseum.com

The Philips Museum in Eindhoven gives a fascinating insight into the way the company from a small electric bulbs-manufacturer has developed into a large and leading global company. From the start of the company in 1891 to the innovations of today and tomorrow.

The actual museum, opened in 2013, presents the different locations and buildings, realized by Philips in Eindhoven: the incandescent lamp manufacture and warehouse (the oldest nucleus of Philips and the actual place of the museum), the factory of the interwar period with light tower (along Emmasingel, opposite the museum, completely re-used for services, a library and education purposes) and further extensions as the modernist building clusters of "De Strijp", located at the northwest of the city-centre (nowadays also a very interesting casus of re-use of economic, social and cultural purposes). Philips created living quarters for workers as "Philipsdorp", green areas, and facilities for sport, health care, recreation and culture. In the 1980's and 1990's, factories are sold or transferred in foreign countries, while the actual head "Philips Electronics N.V." moved to Amsterdam and the Philips High Tech Campus was created in the western outskirts of Eindhoven.

The museum section "Lighting up the world" surveys the steps in the evolution of lighting, from the very first filaments to the most advanced lighting systems of today. Philips was constantly seeking ways of improving lighting of interiors and exterior places. Other thematic exhibitions are "Making the invisible visible" (with a focus on the innovative production of Philips X-ray

tubes, the first to have been produced outside Germany) and “Health and Wellbeing” (presenting several solutions by Philips to improve the quality of people’s health and lives). Philips has been also very active in music industry from the 1930’s onwards setting up an own recording company. There was an important involvement of the company in the development of radios (first Philips radio in 1927), televisions, compact cassettes, Compact Discs and DVD’s. Major inventions by Philips are presented in the museum.

In “Connecting the world”, the museum presents radio lamps, produced for the first English radio station. The required technology shows a strong similarity to incandescent light bulb production. During the 1920 Anton Philips succeeds in creation an audience for millions. The exhibition presents also the spectacular development of wireless communication.

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TextielMuseum (Textile Museum)

Goirkestraat 96, 5046 GN Tilburg, Netherlands

Tel.: 31 13 356 74 75

www.textielmuseum.nl



The museum occupies since 1986 restored factory buildings of the Mommers spinning mill and weaving workshops, plus the modern entrance building added in 2008, housing a reception area, “Textiel-café”, auditoriums, meeting rooms and shop. Behind the entrance building is the damask weaving workshop. Some of the historic damask looms, recuperated from the weaving company W.J. van Woogerwou & Sons, closed in 1970, can be admired here and during demonstrations linen tablecloths, large and small napkins are produced. An extensive archive of pattern drawings, Jacquard cards, sample books and the attractive linen itself is shown. Part of the Damask Weaving section is the washing and finishing facility. The linen of visitors can be treated here in a traditional way, washed with natural soaps, mangled, placed in a linen-press for 24 hours and finally –to prevent yellowing- wrapped in blue paper.

A glass corridor between the modern entrance building and the old factory leads to the museum, comprising a multi-storey building (1885) and a lower area, covered with an authentic shed-like roof (1876). The tall building was erected by the Tilburg woollen textile manufacturer and weaver's son Christiaan Mommers (1836-1900). This factory building is narrow and has four floors and many cast iron windows, in a style common to British spinning halls. From the central machine room, the steam engine was connected with spinning machines on the upper floors. The ground floor features a historical setting of the old woollen blanket factory between 1900 and 1940. The Stork steam engine (1904) is not originally from the Mommers factory but originated instead from A & N Mutsaerts, another woollen textile factory. The steam engine is now electrically powered, but still uses the original system of driving shafts to run the machines in the woollen blanket factory.

In the heart of the building is the 'TextielLab', with its continuous whirr of modern machinery, displayed under an industrial wooden shed roof. Windows angled towards the north allowed an optimum level of natural light, still useful nowadays. This part of the museum housed also a textile laboratory, and it is the area where the most current exhibitions are displayed. The Textile Library on the second floor of the Mommers building supports textile students and designers. The Library has over 25.000 books about textiles, a sample room and a textile cabinet, displaying different samples.

Various small-scale creative companies are based in the textile workshops surrounding the Textiel Museum, producing textile creations with unique designs in limited editions. Lovers of textile heritage should also visit other specialized museums in the Netherlands, located in Enschede (Jannink Textielmuseum) and Geldrop (Weverijmuseum).

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Industrieel Museum Zeeland

Westkade 114, 4551 LA Sas van Gent (Terneuzen), Netherlands

Tel.: 31 115 690 985

www.industrieelmuseumzeeland.nl



The “Industrieel Museum Zeeland” is a newly opened (2015) industrial museum, located in a former sugar warehouse (in Dutch “suikerloods”) of a cooperative sugar factory in Sas van Gent, near Terneuzen. Why a museum on this spot? Concerning the industrial development of the Zeeland region, Sas van Gent had a central position along the Canal Ghent-Terneuzen, opened in 1823 and a large number of important enterprises developed their activities on the west bank of the canal, including the “Zeeuwse Beetwortel Suikerfabriek” (1872), “Walzemolen” (1893) and the first Dutch “Coöperatieve Beetwortelfabriek” (1899). The architectural qualities of the huge vacant warehouse, its good structural condition, possibilities for extension and above all the central location, along an old arm of the meanwhile enlarged Canal Ghent-Terneuzen, played also a role in the decision of the museum location.

The museum presents first of all the industrial history of the former company, the Cooperative Sugar Company, born after the fusion of seven pre-existing cooperatives. The foundation of an even bigger cooperative company (CSM - Centrale Suiker Maatschappij) after the First World War (1919) resolved problems of price divergences between private sugar enterprises and regulated the regional production. In 1990 the sugar factory stopped production and the buildings were only used for temporary functions.

The collection items of the Industrieel Museum Zeeland and mainly gifts from private companies and persons, illustrating industrial production in the region from the late 19th century until recent times. Different engines (as a huge steam driven air compressor, models of harbour cranes, etc.) are demonstrated. Also ‘industrial artworks’ are shown, f.e. a large scale stained glass composition, saved from a former glass factory nearby Sas van Gent.

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NORWAY

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Klevfos Industrimuseum - Klevfos Cellulose- & Papirfabrik

Visitors address: 2345 Adalsbruk (Whitstable), Norway

Postal address: Anno Museum AS / Avd. Klevfos Industrimuseum, Postbox 117, 2401 Elverum, Norway

Tel.: 47 62 50 88 00

www.skogmus.no

Klevfos Pulp Paper factory, in operation from 1888 until 1976, is a outstanding testimony of the regional industrial history and the time when wood processing was the largest export product. The factory was founded in 1888 in Adalsbruk in Loten, about 15 km east of Hamar. During the early years Klevfos produced only cellulose. Next generations of managers were convinced of the advantage of producing also cellulose paper. Klevfos became one of the first factories in Norway who made paper of its own mass. In 1909 the factory was destroyed by fire and was rebuilt afterwards. In the 1920s a number of technical improvements were implemented in the factory, that employed about 100 workers. Klevfos staggers through the difficult 1930s and produced steadily in the boom period after World War II, but the concurrence with large scale paper plants became fatal.

After the closure in 1976 efforts resulted in the conservation of all machinery (mainly dating from the period 1910-1925), the dam, canal construction. The former workers homes were refurbished. The Klevfos Paper Factory was rather a small structure compared to the scale of 20th century plants and was protected as historical monument by Riksantikvaren (the State Board of Antiquities).

The museum, prepared by a friends association, opened for the public in 1986, also tells the story of the paper, from timber to finished product, and how important the production of paper has been for the present times. Now Klevfos provides a unique opportunity to experience what it was to be an industrial worker a long time ago. Although it is the silence that reigns, visitors can still sense an echo of the life and the activities of the past.

In a so-called “paper kitchen” visitors can make their own paper by hand. For over 20 years visitors can experience during summer months the theatre play “Arbesdaer”, written by Tor Karseth, and involving mostly non-professional players from the local community. A well restored and furnished workers house shows the way of living of a Klevfos workers family. The Klevfos site is currently part of the Norwegian Forestry Museum (Norsk Skogmuseum, Solorveien 151, 2407 Elverum) and the Hedmark County Museum. An interesting additional attraction near of Klevfos is the Munch Centre in Whitstable, focusing on the early years of the Norwegian painter Edvard Munch.

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Norsk Bergverksmuseum (Norwegian Mining Museum)

Hyttegata 3, P.B. 18, 3601 Kongsberg, Norway

Tel.: 47 919 13 200

Kongsberg Vapenfabrikks Museum

Hyttegata 3, 3601 Kongsberg, Norway

Solvgruvene - Museum & Silver mine

(part of Norsk Bergverksmuseum, Kongsberg)

www.norsk-bergverksmuseum.no

Kongsberg is the Norwegian capital of silver mining. Silver was discovered here in the early 17th century and the Danish king Christian IV founded the Kongsberg town in 1624, one year after the discovery of silver. From the times of discovery until the closure of the mines in 1957 about 1.350.000 kilos of silver was extracted. The silver mines had in the past the same importance as the winning of oil and gas nowadays.

The Norwegian Mining Museum includes several sections presented partly in the centre of Kongsberg and at conserved mines in the surrounding areas of the town. The most important sections are: the collections from Kongsberg Silver mines and the largest silver collection in the world, the Norwegian Mining and Mineral Collection mainly material from the Kongsberg silver mines, but also from other mining heritage sites in Norway such as Skorovas mines, Knaben molybdenum mines and Bleka gold mines), the Kongsberg Skiing History museum, the Coin and Medal Collection and finally the Kongsberg Industry Collection.

This last collection includes the exhibit of the Kongsberg Vapenfabrikk (Arms Factory) which illustrates the development from the establishment of this industry in 1814 through to the high-tech companies of today. The Kongsberg weapons factory was established as a

consequence of the temporary shut-down in the mines from 1805. Visitors learn here about the development of the Krag-Jorgensen rifle at the end of the 19th century which would later lay the foundation for a modern industrial arms company in Kongsberg, called “Kongsberg Gruppen”.

The Norwegian Mining Museum houses a professional library and documentation centre, unique photography collections and an exceptional collection of maps and drawings related to the history of mining.

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Norsk Industriarbeider Museum, Rjukan / Vemork (Norwegian Industrial Workers Museum)

Adress: Tinn, 3660 Rjukan, Norway

Tel.: 47 35 09 90 00

www.vemork.visitvemork.no

The main site of the Norwegian Industrial Workers Museum is located at Rjukan in the Vemork power station. In the splendid machine hall, ten turbines were originally installed with Pelton wheels, delivered by the German company JM Voith and by the Swiss company Escher-Wyss. Norwegian equipment was an operating turbine, a house generator, built by Kvaerner Brug in 1911. The majority of this equipment is still present on site.

An important issue in the museum is “the drama of heavy water”: Norsk Hydro’s production of heavy water at Vemork was a crucial part of the Nazi’s nuclear project during the Second World War. The British intelligence was warned about the Germans who increased the heavy water production, fearing the Nazis would use the water to develop an atomic bomb. In 1942, scientific experiments proved the possibility to produce plutonium in a reactor with heavy water. Intensive contacts followed between the Norwegian resistance and the British military authorities. A first operation against the heavy water production by a sabotage mission (“Operation Freshman”) was initiated in the fall of 1942, but failed dramatically, just as a second attempt to bomb the heavy water production site during Operation Gunnerside... On February 27th 1943 a partial blow up of the heavy water installations was successful, followed by the intensive bombing of Vemork and Rjukan, including the hydrogen facilities, by the Americans (16th November 1943) and killing a lot of local civilians. The Germans decides to move the heavy water production to Germany. The remained heavy water and production equipment was to be transported with a ferryboat. A very well prepared Norwegian underground operation resulted on February 20th 1943 in the explosion of a ferry-boat, loaded with one the most important transports of German heavy water and equipment. The sabotage operations contributed to stop heavy water supplies from reaching Germany and cut the Nazis off the required amounts of heavy water they needed to develop a nuclear weapon before the end of the war.

The Norwegian Industrial Workers Museum was prepared since 1983 by the municipality, the Norwegian Water Resources and Energy Directorate and the Labour Unions of Chemical Industry Workers. The museum with permanent, exhibition opened in 1988. The power station is attainable from a parking area by a nice footpath or by bus shuttle.

The museum presents the development of industrial society in Norway and the Tinn region, created by Norsk Hydro since the beginning of their activities in 1907. The exhibitions also focus

on the development of the industrial society in Norway and actual trends and changes, on the electrochemical industry, the local heritage of the Tinn region and on the Norwegian heavy water sabotage.

The digitalized collection of more than 32.000 photographs is remarkable. One of the themes is the Rjukanbanen – railway. In 2007 the museum association was launched as the new operator of the heritage railway. Other sections of the Norwegian Industrial Workers Museum outside Rjukan are the Tinn Museum and Heddal Open Air Museum.

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Norsk Vankraft- og Industristadmuseum (Norwegian Museum of Hydropower and Industry)

Tyssedal Hydroelectric Power Station
Naustbakken 7, 5770 Tyssedal, Norway
Tel.: 47 53 65 00 50

www.nvim.no

Tysso I power plant was constructed between 1906 and 1918. Engineer Sigurd Christian Brinch was head of the construction. With a vertical drop of 400 metres, Tysso I was one of the largest high pressure power plants in the world. More than 1000 workers were needed to construct the foundation, dams, two water tunnels and five gigantic pipelines. The water was led through these tunnels through the mountain from the Ringedal dam in Skjeggedal to the edge of the mountain above the power station. The 180 metre long power station was built in three stages and continuously developed with new technologies, until in 1989 the production was shut down.

As a protected historical monument since 2000, this Norwegian symbol of hydropower was extensively restored during the first years of our century. The most important parts of the Tysso I site are the power station with turbine hall, control room and pipe cellar, the workshop building, the “Lilletopp” with distribution pool and the watchman’s home, and the intake pool Vetlevann with valve house.

Collecting relevant objects and documents has been the main focus of the museum since it started as a temporary project in 1984. The project “Active elders: the workers tell their story” (1986-87) laid the foundation for the museum’s audio and photo collection. In 1997 the Tyssedal museum received as first industrial museum the Maihaugan Award.

The Tyssedal Museum offers today a varied cultural program throughout the year with guided tours, permanent exhibitions (“The Giant Leap”, presenting the industrial development in Odda and Tyssedal, “Waterfalls and energy”), temporary exhibitions, guided visits of three original workers’ houses in Odda (Folgefongata 9, 11 and 13), summer fairs with local artisans, workshops for children, etc.

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Norsk Oljemuseum (Norwegian Petroleum Museum)

Kjerringholmen 1, 4004 Stavanger, Norway

Tel.: 47 51 93 93 00

www.norskoljemuseum.no/

The Norwegian Petroleum Museum presents collections explaining how oil and gas are created, discovered and produced. Also information is provided about technological advances and the way petroleum influenced Norwegian society. Original objects, models, films and interactive exhibits illustrate everyday life offshore and dramatic incidents. The museum was opened in 1999 and its unusually architecture, designed by architects Lunde & Lovseth, has made it a new and exiting landmark in the harbour of Stavanger.

With the help of objects, a unique collection of models audiovisual aids and interactive tools, the exhibitions provide an insight into the geological, economic, technical and political factors that affect the oil industry. The Petroleum Museum houses an interesting scientific library. Industrial heritage of the recent periods, related to the production of oil and gas sites (Statfjord, Frigg, Ecofisk platforms) are published on web sites. Petroleum is one of the most important products that changed the face of the world since the end of the 19th century. Other museum in Europe documenting this subject are (selection): the Erdöl-Erdgas-Museum in Twist and the German Oil Museum in Wietze (Germany), the 'Musée du Pétrole' in Merckwiller-Pechelbronn (France), the National Gas Museum in Leicester (UK), the Museum of Oil in Bobrka (Poland) and the Project Parco Museo del Petrolio Vallezza in Fornovo di Tara, near Parma (Italy).

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Roros Museum

Adress: Po Box 224 / N-7374 Roros, Norway

Tel.: 47 72 40 61 70

http://www.roroseet.no/museet_en

Roros mining town and the surrounding region is linked to the copper mines, established in the 17th century and exploited for 333 years until 1977, when the Roros Copper Works was declared bankrupt and the Norwegian Department of the Environment assumed ownership. The site comprises the town and its industrial-rural cultural landscapes. The city was completely rebuilt after the destruction by Swedish troops in 1679. The glory-period of Roros was the 18th, 19th and early 20th century.

Roros contains nowadays about 2000 wooden one- en two storey houses and a huge smelting plant. Many of these building preserved their blackened wooden façades, giving the town a medieval appearance. Roros smelting plant and mining town was added to the UNESCO World Heritage List in 2010.

Roros Museum is an independent foundation dedicated to care for and develop historical land cultural values in the Roros district. The Roros has four sites, open for visitors: the Smelthytta (Smeltery), 'Olavsgruva' (Olav's Mine), 'Doktorsjonna' (Femundsmark National Park Centre) and 'Slaggveien' (Slag Street).

The most important part of the industrial museum is the Smeltery (or smelting works building), located at "Malmplassen" (the ore yard) along the Hitterelva river. The copper smelting works were in activity from 1646 tot 1953. In 1975 a fire destroyed a big part of the smeltery and

shortly afterwards the smeltery was reconstructed as museum, presenting permanent exhibitions. 'The Copper Works', shows the Roros Copper Works' history. Scale models, photographs and other objects help to make the industrial processing comprehensible. Near of the smeltery, along Slaggveien, visitors can enter into some of the former workers and servants houses and learn about the social history of Roros. Nearby of Slaggveien is the 'Roros Conservation Centre' with repair and restoring workshop, training centre and documentation centre.

About 12 km from the Roros town centre, in the Storwartz area, are the old "Nyberget Mine" (initiated in 1646 by the Danish king Christian IV) and the much younger "Olav's Mine", who start to operate in 1936. Both mines were important in extraction of copper ore between 1650 and 1972. The ore was transported and processed afterwards in the Roros Smelthytta. In Olav's Mine different exhibitions present how the mine was operated at the different periods and describe the miners' working and living conditions.

Apart from the museums mentioned above, other significant industrial heritage and technology museums in Norway are: the Barentsburg Pomor Museum (Svalbard region), the Alvoen papermill (near Bergen), the Eidsfos Ironworks and Holmestrand Aluminium Museum (Vestfold-region), Museum Nord in Narvik, the Ny-Alesund Town and Mine Museum, the Norwegian Sawmill Museum at Spillum (Namsos) and the Norwegian Museum of Science and Technology in the capital city of Oslo.

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POLAND

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Centralne Muzeum Wlokiennictwa (Central Textile Museum)

Ulica Piotrkowska 282, 93.034 Lodz, Poland

Tel.: 48 42 662 26 84 (General)

Tel.: 48 42 684 33 55 (Secretariat)

www.muzeumwlokiennictwa.pl



The idea of creating a museum of textiles in Lodz, the most important centre of textile industry in Poland, was already present shortly after World War II. In 1952, a first “Weaving department” was integrated in the Muzeum Sztuki (Museum of Art). This department became an independent branch of the Art Museum and became in 1960 an independent museum institution. In the sixties the White Factory, built by the entrepreneur Ludwig Geyer in 1835-1839, was chosen as new headquarters for the Textile Museum. It is certainly one of the most outstanding examples of early industrial architecture in Lodz. The factory expanded several times in later periods (1840-1886). The Textile Museum attracted visitors in the 1970’s and 1980’s from all over Poland, and was called since 1975 “Central Textile Museum”.

After 2000, most of the museum presentations was drastically modernised. The spaces for temporary exhibitions became larger, spread over the four-wing mill and the old boiler house in the middle of a large courtyard. In 2008, the museum was extended again with the “Museum of the Lodz Wooden Architecture”, an open air museum with different types of reconstructed textile workers houses from Lodz, a school and a wooden church. The exhibition spaces cover nowadays about 17.000 m².

Since 1972, the museum was a co-organizer of the International Triennial of Tapestry; the most recent one took place in 2013. In the same year the Central Textile Museum received an award for the project “Adaptation of the Boiler House for the purpose of an interactive exhibition”, integrating original machinery as a selfactor spinning machine, a Jacquard loom and a steam engine. Other important temporary exhibitions are “National Exhibition of the Polish Miniature Textiles” and the “National Exhibition of the Polish Cross-Stitch Embroidery of Amateur Artists”. Important permanent exhibitions in the Central Textile Museum are: the section with a reconstruction of a weaving mill from the late 19th and early 20th century (with numerous machines in operation), the fashion industry through the nineteenth and twentieth century, the history and evolution of the Geyer factory (surveying the factory-activity from the start in 1828 to the closure in the 1960’s, and the recent history of the premises as textile museum) and “In the Kitchen Mrs. Goldberg” (an evocation of the life of Jewish families working in textile industry in Lodz during the interwar period).

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Museum of the Factory - Manufaktura

Ul. Drownowska 58, 91-002 Lodz, Poland

Tel.: 48 42 664 92 93

www.muzeumfabryki.com.pl/en

The Museum of the Factory (Muzeum Fabryki), is a place where visitors can discover the history of the textile factory founded by Izrael Poznanski in the mid 19th century. This factory has been completely renovated and adapted for cultural and commercial re-use, called “Manufaktura-Lodz”. The Museum of the Factory is located in the heart of this booming and dynamic site. In the times of its past glory, the Poznanski factory produced millions of metres of cotton fabrics. The industrial empire of Poznanski was a self-sufficient district, which included the owner’s residence (nowadays the city museum of Lodz, just next to Manufaktura), workers

housing complexes, a church and hospital. A part of the museum focus on the working class struggle and workers culture in Lodz, also on the cultural initiatives organized by the former Poznanski factory, from the factory orchestra to the workers sport club.

On a central spot of Manufaktura, next to the Museum of the Factory, visitors will find the Lodz Tourist Information Centre, an ideal location to collect documentation about industrial heritage, described in nice leaflets with excellent maps, inviting for a discovery of Lodz as an old but vital industrial city. This city has much attractions to discover: the Municipal Museum, an underground visit to the historic Sewer installations, the Polish Film Museum (housed in a unique 19th century villa of entrepreneur Karol Scheibler), and many more.

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Coalmining Museum Zabrze

Ul. Jodlowa 59, 41-800 Zabrze, Poland

Tel.: 48 32 630 30 91

www.muzeumgornictwa.pl

www.gosilesia.pl (Route of Industrial Culture in Silesia)

The main exhibition of the museum is housed at the historic building of the former district authorities that was built by the masonry master Kreis in 1874. In 1907, the building was extended in the eclectic style according the designs of the Berlin architect Arnold Hartmann. Its original architecture décor partly survives, including the vestibule and the staircase and the “Stained Glass Windows Room”, formerly the meeting room of the District Council.

The museum was established in 1981 and it took over the collections of the Mining Union’s Museum in Sosnowiec (who existed there from 1948 to 1972) and a part of the mining collections from the Town Museum of Zabrze. The museum’s collections have been growing over the years and now their number reaches about 32.000 exhibits. Objects of engineering that represent various branches of mining make up the principal part of the collection, archival materials (with a unique collection of 18th and 19th-century technical drawings), as well as geological and ethnographic collections.

The Zabrze Coalmining Museum has two other branches, really worthful to visit: the historical “GUIDO” Coal Mine (near of the Coalmining Museum) and the “QUEEN LUISE” Mine, also located in Zabrze.

Coalmining Museum Zabrze: Section ‘Historical “Guido” Coal Mine’

Ul. 3 Maja 93, 41-800 Zabrze, Poland

Tel.: 48 32 271 40 77 ext. 5183 (reservations)

www.kopalniaguido.pl

A part of this coal mine, established in 1855, has been served as a Mining Heritage Park, opened in 1982. Visitors descend to a depth of 170 metres and 320 metres with the mine’s lift. In the well preserved excavations, headings and chambers, mining equipment and machines are all on display. There is also an “Art Level”, where it is possible to organize private exhibitions, performances and presentations. Guido coal mine is one of the most popular spots of industrial heritage tourists in Poland.

Coalmining Museum Zabrze: Section 'Open Air Mining Museum "Queen Luise"'

Ul. Wolnosci 410, 41-800 Zabrze, Poland

Tel.: 48 32 370 11 27

www.luiza.zabrze.pl

The "Krolowa Luiza" ("Queen Luise") Mining Museum is established in one of Upper Silesia's oldest mines, dating back to the 18th century. In 1790 the search for coal deposits started in the Zabrze area. They were discovered by engineer Salomon Izaak. The mine's foundation was related to the Prussian mining supervisor Friedrich Wilhelm von Reden. Owned by the State Treasury, the coal mine was named later after the wife of Wilhelm Friedrich III. After the Second World War the mine was given the name "Zabrze".

In 1973 the "Zabrze-Zachod" mine stopped extraction and its buildings were entered on the list of historic architecture of the Katowice Province (1993). In the same year, the Coal Mining Museum in Zabrze set up the "Queen Louise" Mining Exhibition. The most precious exhibit of its surface part is the steam winding engine produced in 1915 by the "Prinz Rudolf" foundry in Dülmen. This engine, with an output of 2.000 Hp operated in a 503-m-deep shaft. The engine has two cylinders with a diameter of ca. 1 m and a Koepe sheave with a diameter of 6 m. Although the engine does not perform its original function, there are demonstrations of its operation for visitors. The headhouse features a shaft workshop, a department rescue station and an exhibition of shaft and signalling equipment. A platform on the head frame was converted into the town's vantage point.

Underground facilities in Sienkiewicza street are the museum's another part. In a drift at a depth of 35 metres, whose galleries have a total length of 1,6 km, one can see 19th and 20th century equipment. The visitors participate in a demonstration of mining machinery at work, such as for example a mechanical coal scrapers. A ride on the "Karlik" historic underground narrow-gauge railway provides unforgettable memories.

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Historical Waterworks Zawada & Waterworks Museum

Ul. Bytomska 6, Karchowice, Poland

Tel.: 48 32 60 38 861

www.gpw.katowice.pl

In the second half of the 19th century, as a result of mining operations, ground water was drained to mine workings. This caused that water disappeared from household wells. Neither did groundwater nor the water in reservoirs satisfy the demand for drinking water: there were cases of poisoning and epidemics as cholera. This forced Prussian authorities to search for sources of water.

In 1874 the first boreholes were made close to the villages of Zawada and Karchowice. Eight years later drilling work was completed at the deepest well, called the Karchowice Deep Well (depth 215 m). Between 1894 and 1895 the construction of a water supply system in Karchowice was started. A pump station, a steam boiler room and administrative building went up. Necessary steam-driven pumps and steam boilers were installed. The plant was first improved from 1927 to 1929, when the machine room and boiler hall were modernized and a workshop, bath house, warehouse, garages, a fire station and chimney were added.

In the 1960s the water-supply equipment was partly replaced and the plant was electrified. All the steam-driven machinery was put out of service. The “Zawada” Water Production Plant was listed as historical monument of the modern age. Original interior equipment and furnishing survived and are documented with a collection of additional technical objects for visitors.

Only five km away from the Zawada Waterworks, a unique Historic Silver Mine welcomes visitors in Tarnowskie Gory (website: www.kopalniasreba.pl). Like the “Zawada” Waterworks and 30 other important industrial heritage sites, this Silver Mine is part of the “Industrial Monuments Route of the Silesian Voivodeship”, described with panels along the road and on website www.gosilesia.pl

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Museum of Old Polish Industrial Region / Ironworks Museum Sielpia Wielka

26-200 Sielpia Wielka, Poland

Tel.: 48 41 37 20 293

<http://www.powiat.konskie.pl>

http://muzeumtechniki.warszawa.pl/oddzialy_sielpia.html



The construction of a mill and puddling plant in Sielpia Wielka started in 1821 by Stanislaw Staszic and was continued by Ksawery Drucki-Lubecki. The factory equipment included puddling furnaces, a forging hammer, a pre-rolling mill for rolling out the iron slabs and a water turbine, designed by the French engineer Philippe de Girard, located inside the main hall. The unique wooden water wheel has a diameter of 8 m and drove the machinery with downstream waterpower. The water was flowing from a huge nearby reservoir. In 1843 the first water turbine of the Polish Kingdom appeared in the factory. Also 29 houses for the workers were built, but they are only partially conserved nowadays. At the beginning local raw materials were

used and ore was mined in the area of Kaweczyn. The ore was recast there and afterwards transported to Sielpia, for the transforming process into steel. Different machines in the main factory date from the late 19th century, when over 3.000 tonnes of steel was produced yearly. The factory ceased production activities in 1921 and in 1934 it was handed over to the local association "Museum of Technology and Steel Industry". It was one of the very first Polish monuments of industry and engineering (since 10th March 1934), and the first industrial site, researched by university graduates. During the World War II, the building were severely damaged and the museum was completely pillaged. From 1962, the site were gradually restored, opened the doors for visitors in 1981, and is nowadays called "Staropolski Basin Industrial Museum". It is affiliated to the Science Museum of Warsaw.

Actual exhibits include milling and puddling furnace installations from the period 1835-1841 (Bialogonskie metalworking machines), used to process the extracting impurities of carbon, silicon and manganese from the raw material which occurred in the puddling plant. Also a steam blower from the 19th century, a steam engine from 1858 (the oldest one that remained in Poland) and a front lathe are presented. More recent equipment is also conserved and is well presented in the side halls of the Sielpia Museum.

Staropolski Basin Industrial Museum, not far from the small industrial town of Konskie, where the Machalowski family has undertaken metallurgical production in the 17th century, is a outstanding example of industrial heritage, located in nice natural surroundings.

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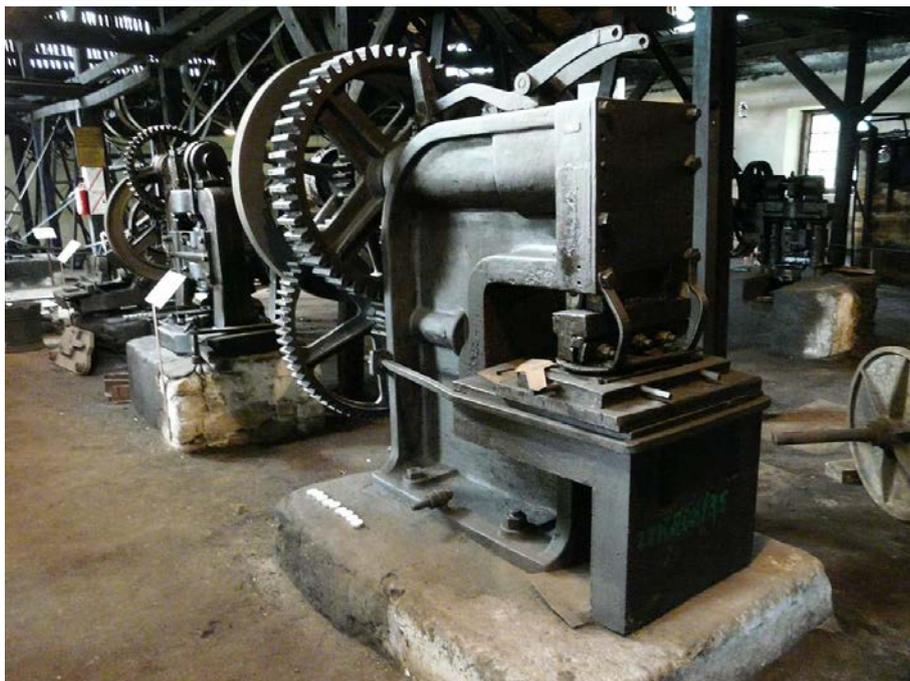
Maleniec Historial Metallurgical Works

Maleniec 54, 26-242 Ruda Maleniecka, Poland

Tel.: 48 41 373 11 42 (County Office, Konskie)

<http://www.powiat.konskie.pl>

www.maleniec.powiat.konskie.pl



The old foundry of Maleniec is located upon Czarna river, 24 km west from Konskie. The historical complex of rolling mill and nail making workshops form an exceptional industrial archaeological ensemble. The foundry was initiated in 1787 and shortly afterwards visited by king Stanislaw August Poniatowski. The iron ore would be mined in the area of Lysa Gora near Zarnow, and transported to Koloniec for recasting in local blast furnaces, before be processed in different foundries, including one in Maleniec. Owners changed over the course of the years. Some of them, like Tadeusz Bochenski (a former Captain of the Napoleon army) did in 1824, modernized the machine park and changed the production profile of bars, wires, choppers, axes, nails, mouldboards for ploughs, iron tables and household tools. During the occupation by the Nazis, the Maleniec workshops were plundered and partly destroyed. Soon after the war the repaired Maleniec works produced again shovels and spades, used for cleaning up the destroyed Polish capital ! The works ended production in 1961.

Thanks to a more than 30-years-old-care and research by students and professors from Silesian Engineering Academy, the old foundry of Maleniec survived. Machines and water wheels are still to be seen of a production line built in 1787 and in the early 19th century, consisting of two workshop floors and that once served to manufacture nails and spades. The more recent workshops of rolling mill, drug-over mill, nail press and spade manufacturing from 1839 are worth visiting. Water-energy drives a wooden wheel of 4,5 m diameter and a flywheel, called "madman" (weight: 30 tons). Most of the machines and facilities can be seen in operation during the annual festival of technology known as the Konskie Foundries.

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Jan Pazdur Muzeum Przyrody I Techniki (Jan Pazdur Museum of Nature and Technology)

Ul. Wielkopieczowa 1 / Pilsudski Street, 27-200 Starachowice, Poland

Tel.: 48 41 275 40 83

www.ekomuzeum.pl



In the second half of the 15th century, the Cistercians of Wachock leased a two-wheeled ironworks to the family of Starech, who gave the name to Starachowice. The Cistercians managed for centuries the local iron production and in 1789 the Prior of that time, Alexander Rupkiewicz, built a blast furnace. In 1818, the ironworks of Starachowice were taken over by the national Government. According to the plan by Stanislaw Staszic, drawn up in 1833-1835, Starachowice became the largest metal-industry centre of the Polish Kingdom, developed along the Kamienna River. In the years 1836-1841 a series of blast furnaces was built nearby the "Herkules" iron mine. The urban centre in the present framework originated no sooner than in the 1930s out of the combination of the small city of Wierzbniok, the Starachowice factory settlement and village. Before World War II, the city constituted a powerful centre of armaments industry, famous for the "Bofors" cannons. After the war FSC – Star was taking over most of the ironworks, at present the property of the MAN-company.

The Jan Pazdur Ecomuseum of Nature and Technology presents a complete conserved and restored blast furnace from 1899 (with hoisting tower, filtering and blowing equipment, cowper's stoves) and one of the largest steam engines of the country, providing once compressed air. This machine, equipped with a flywheel with a 6-metre diameter, constituted an exhibit at the World Exhibition in Paris in 1889, from where it reached Starachowice. A railway line built in 1885 on the route Skarzysko – Ostrowiec, provided the basis for iron metallurgy development and is partially conserved on site of the Ecomuseum.

The extinguishing of the blast furnace (19th March 1968) closed an important chapter in the town history. A small locomotive with a ladle, including the remains of the last discharge stands still on the railway track at the foot of the furnace. An interesting permanent exhibition focus on the production of Polish cars, including an exact copy of the only Polish "Pope-mobile" from the first pilgrimage of John Paul II to Poland in 1979, and cars of the mark "Star". The brand name Star disappeared forever from the car market in 2009. Another aspect of this many-sided museum is about the traces of dinosaurs, discovered in early Jurassic settlements in the region. Visitors can also discover an archaeological park, presenting ironmaking during remote periods.

Another attraction item nearby is the Starachowice Narrow-Gauge Railway, used in former times for transport of iron ore and workers. Starting point for narrow-gauge-railway trips is the Railway station in Targowa Street.

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Museum of Oil and Gas Industry - Bobrka

(The Ignacy Lukasiewicz Memorial Museum of Oil and Gas Industry)

Bobrka, 38-458 Chorkowka, Poland

Tel.: 48 13 433 34 78 or Tel.: 48 13 433 34 89

www.bobrka.pl

The region around Bobrka, Podkarpacie, is well known for his oil and gas industry, started in the middle of the 19th century. The wells were sunk manually at that time up to 15 à 60 metres deep, with shovel and pick. The shaft was mostly a square of 1,2 x 1,2 metres, and its walls were covered with beams. Some inventive fans were used to supply fresh air for the miners. Around 1870, manually operated percussion-type drilling devices were introduced, later on

cable drilling and other new technologies, who made possible drillings as deep as 200 à 250 metres. Lukasiewicz was followed up by the pharmacist Adolf Jablonski, who studied geology, physics and chemistry in the USA in order to modernize oil extraction methods and oil processing. His successor Zenon Suszycki introduced Canadian drilling methods and a waterproof casing to cope with water. In 1893 the oil field became property of W.H. MacGarvey and soon afterwards of the Galician-Carpathian Petroleum Society. The Bobrka oil field is still partially exploited nowadays.

The idea to create a museum dedicated to the oil industry at the site of the oil well in Bobrka, operating since 1854 and concerning its beginnings during the lifetime of Ignacy Lukasiewicz (1822-1882) existed yet around 1900, but the museum was in fact founded only in 1961, resulting from the work of the Protection Committee for the construction of the Open-Air Oil Industry Museum, and was taken over by the Association of Engineers and Technicians of Oil and Gas Industry. The museum was opened for visitors in 1972, covering an area of more than 20 hectares, bought by the Association.

The open-air museum is located in a scenic woody valley, 12 km from Krosno. The museum houses numerous items, dating from the second half of the 19th century, and presents the oil and gas production, as well as the refinery and distribution, with exhibits such as fore-shafts and oil wells, working boreholes dating from the 1890s, drilling rig and other kind of technological devices, such as pumps, gas compressors, engines and boilers.

Objects and collection items, who are worth special mention include an obelisk, commemorating the Bobrka oil plant foundation, erected in 1854, two early operative hand-sunk oil wells, called "Franek" and "Janina", eight wooden building from the 19th century, former workshops, smithies, warehouses and workers houses, transmission systems to power oil well pumps, ancient oil pipelines and oil storage facilities.

The administrative building, erected by I. Lukasiewicz, is home to the museum exhibition showcasing mementos, portraits and caricatures of people related to the oil industry, maps, geological plants, collections of kerosene lamps, photography collections, documents and a specialised book collection. The museum organises temporary exhibitions, puts out publications and the magazine "Wiek nafty" ("Oil Age"), and conduct educational activities, guided tours, workshops and museum lectures. The Bobrka Museum keeps close contacts with its counterparts in and outside Europe.

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National Maritime Museum Gdansk (Narodowe Museum Morskie w Gdansku)

Olowianka 9-13, 80-751 Gdansk, Poland
Tel.: 48 58 301 86 11 & Tel.: 48 58 320 33 58
www.en.nmm.pl / www.cmm.pl

The Maritime Museum was founded in 1958 at the initiative of the Association of Friends of the Maritime Museum and with the support of the Warsaw's Museum of Technology. Initially, the collections were shown in the Artus Court. The first seat of the museum was the Great Crane in Gdansk, then, in 1960, it became a branch of the Pomeranian Museum. In 1962, it became an

independent institution. After its reconstruction in the years 1959-1962, it was opened in 1963. Since 2003, the Crane's lifting mechanism has also been open to the public. A permanent exhibition in the old crane is "Gdansk from the 16th to 18th centuries – Life in the Port City". In 1985, the main seat of the museum was moved to the Three Granaries complex at Olowianka Island, rebuilt after their destruction in 1945. Currently, the museum and its exhibitions are located in the Gothic Oliwa Granary, a monastery granary, which was opened for visitors in 1999 and 2000. Permanent exhibitions here are "Poles on the Seas of the World", Marine Archaeology and Diving" and the "Sea Gallery" (with nautical paintings). The ship Soldek is moored near the granaries. It is the first seagoing ship built in the Gdansk Shipyard after the Second World War. It has been adapted for visitors, with inside a permanent exhibition about the history of the ship. In 2009, preparations began for the construction of the Maritime Culture Centre, next to the Granary (a new branch of the museum). The Polish Maritime Museum collections include those dedicated to inland shipping, sea and ocean transport, ship building, collections associated with marine technology and navigation, archaeological collections gathered through underwater studies, reconstructed medieval boats, the largest collection of all ships built from the 16th to the 19th century, and a specialised book collection in the library. The museum conducts academics research and educational activities in every scope of its collections and specialities. It carries out specialised conservation works of maritime structures and sites.

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Wieliczka Salt Mine

Ul. Danilowicza 10, 32020 Wieliczka, Poland

Tel.: 48 12 378 73 02

www.kopalnia.pl

The Wieliczka Salt Mine is one of the most valuable monuments of material and spiritual culture in Poland, visited yearly by more than one million of tourists from all over the world. What are unique and fascinating are the different values of this 800 years old industrial site: the historical, economic and technical importance, but also the cultural and religious dimension. In 1978, the historical Salt Mine of Wieliczka was entered into the UNESCO World Heritage Sites List. In 2010 the nearby historic Bochnia Salt Mines were added to his list. The two sister mines now appear together in the UNESCO WHL as the "Wieliczka and Bochnia Royal Salt Mines". While Wieliczka Salt Mine still doesn't hold the status of a classical museum, this mine is regarded as the only antique mining object operating in Poland from the Middle Ages to nearly the present day (until 2007). The mine reaches a depth of 327 metres and all galleries cover a total length of 278 kilometres!

The 3,5 km tour route includes the access (with a wooden staircase of 378 steps) to the mine's - 64 metres level, the visit of the Danilowicz Shaft and the Danilowicz Shaft Bottom, the Urzula's Chamber, the Copernicus Chamber, the Janowice, Spalone and Casimir the Great Chambers, the Kunegunda Traverse, the Pieskowa Skala Chamber, the Chapels of St Anthony, the Holy Cross and St Kinga (the patron of salt miners), the Chambers of Michalowice, Drodowice, Weimar, Jozef Pilsudski, the Crossing of the Kazanow Gallery and the Poniatowski Traverse, the

Chambers of Stanislaw Staszic, Witold Budryk, Warszaw ad Vistula; the Prinziger Inclined Drift; St John's Chapel, the Chamber of Jan Haluszka and Izabella.

Most statues of saints and mythical or historical figures are carved out of salt rocks, just like the crystals of the chandeliers in the underground "Salt Cathedral". Visitors discover during their trip also impressive technical equipment and (at the -135 metres level) an underground lake and a large reception hall.

Today, the Wieliczka Salt Mine combines many centuries of tradition and modernity, the history of several hundreds years and an underground metropolis with extensive infrastructure. The mine is a product of work of tens of generations of miners, a monument to the history of Poland and to the Polish nation, a brand present in Polish consciousness for centuries.

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PORTUGAL

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Museu da Agua de Epal (The Epal Water Museum)

Praça do Principe Real, 1250 184N Lisbon, Portugal

Rua do Alviela 12, 1170 Lisbon, Portugal (Permanent exhibition Barbadinhos Pumping Station)

Tel.: 351 1 813 55 22

www.museudaagua.epal.pt / www.epal.pt



The EPAL Water Museum opened for visitors in October 1987 and embraces four distinct structures in the city of Lisbon: the Aguas Livres Aqueduct, the Mae d'Agua das Amoreiras

Reservoir (location: Largo do Rato), the Patriarchal Reservoir (location: Jardim do Principe Real) and the Barbadinhos steam-operated Pumping Station (location: Rua do Aviela), also housing (in the boiler room) the permanent exhibition, temporary exhibitions (in areas, inaugurated in 1992) and EPAL's historical archives. These four monuments and buildings, dating from the 18th and 19th centuries, are intrinsically associated with the history of Lisbon's water supply, presented in the permanent exhibition.

The construction of the Aguas Livres Aqueduct was approved in 1731 by John V of Portugal and directed by Brigadier Manuel de Maia and Sergeant-Major Custodio Vieira. The 58 km long aqueduct was built to carry the water by gravity flow from springs in the Carenque Valley to the Mae d'Agua Reservoir at Amoreiras. The Alcantara Valley had to be spanned for a distance of 941 metres by an impressive engineering structure, supported by 35 ogival and perfectly rounded arches, attaining a maximum height of 65 metres. The Mae d'Agua Reservoir was designed in 1752 by the Hungarian architect Carlos Mardel, to receive and distribute the inflow from the Aguas Livres Aqueduct. Inside the building there is a 7 metre deep cistern. The scale and beauty of this grandiose structure, particularly the interior, is breathtaking. The vaulted roof of the reservoir is supported by four 15 metre high pillars. On the west side of the building is the "Casa do Registro" or control room where the outflow was measured before passing into three underground galleries, carrying the water by gravity to public fountains as well to homes of the nobility. This site is no longer part of the Lisbon water supply and re-used for cultural events and art exhibitions.

The Patriarchal Reservoir under Lisbon's Principe Real Square was designed in 1856 by Mary, a French engineer, in order to supply the water distribution network, serving the lower parts of the city. Thirty-one pillars, each 9,25 metres high, support stone clad arches that in turn support the roof. On top of the roof is a large open-air pond and fountain at street level. After restoration in the 1990s, the reservoir could be opened as a venue for cultural events.

The most important part of EPAL Museum for industrial archaeologists is perhaps the Barbadinhos Steam Pumping Station, the first of such equipments in Lisbon, installed and inaugurated in 1880 to distribute from the River Alviela to Veronica and Penha de França reservoirs. At that time, the used technology represented an advanced solution for supplying water to the higher areas of Lisbon city. The pumping station is located on site and next to the old Barbadinhos Convent, founded in 1789 by an Italian religious order. All machinery, including four steam pumps assembled at E.W.Windsor in Rouen (France), working continuously till 1928, is in impeccable condition and a "must-see" for all people, interested in industrial heritage.

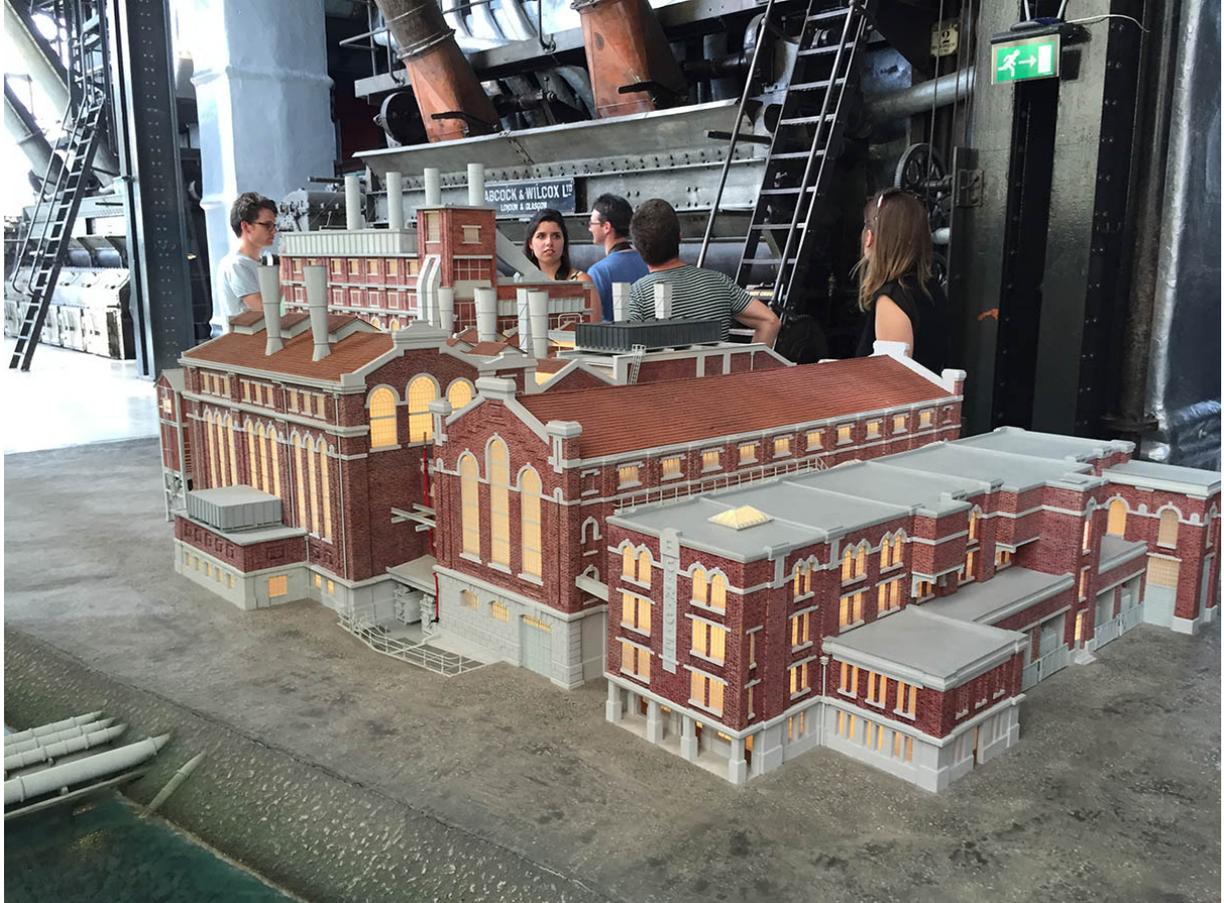
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Museu da Electricidade (Museum of Electricity)

Avenida Brasilia, Central Tejo, 1300-598 Lisbon, Portugal

Tel.: 351 21 002 81 90

www.edp.pt / www.fundacaoedp.pt



The Museum of Electricity Museum in the “Central Tejo” Power Station, who produced electricity between 1909 and 1975, is an important place of industrial and contemporary culture, memory and education, with collections and exhibitions about the history and technology of electricity in Lisbon and Portugal, and how this energy of the second industrial revolution changed economy and social relations and daily life. The operation and work environment of the Old Tejo Power Station is demonstrated using the original machinery. Special interest is also given to famous scientists and their inventions, the design of electronic devices and to alternative energy sources.

The museum is managed by the EDP-Foundation, a cultural association within the EDP-company, a provider of electricity in most areas of Portugal. The idea of the Museum of Electricity started in 1979, soon after the production stop, but the opening for visitors became only reality in 1990. In 2006, an outstanding restoration of the Power Station and extension works of the museum were achieved. The outstanding museum, brilliantly located along the Tagus river in the Belem area (west of the city centre), houses an interesting library, a documentation centre and workshops of the education department.

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Ecomuseu Municipal do Seixal (Ecomuseum of Seixal)

Address: Quintado Rouxinol, Corroios (Seixal), Portugal

Administration address: Museu da Câmara Municipal do Seixal, Portugal - Praceta Francesco

Adolfo Coelho s/n, Torreda Marinha, 2840 - 409 Seixal, Portugal

Tel.: 351 210 976 112

www.2.cm-seixal.pt



The Ecomuseum of Seixal is a typical network institution, conserving and presenting different significant local heritage elements in their original setting in (and nearby) Seixal, a small town located on the south bank of the river Tagus and Lisbon. The Municipal Museum of Seixal was created in 1982 and was soon afterwards called “Ecomuseum of Seixal”. Most elements of the museum network were opened in the period 1985-1996. This was possible only by the efforts of about 50 volunteers.

Some of the most interesting branches of the Seixal museum, related to industrial heritage are: the former paper factory “Mundet & C°, Limitada” (opened in 1998), the Maritime section (located near the district of Arentela), the Roman furnaces (“Olaria Romana da Quinta do Rouxinol”), the tide - water mills in Corroios (“Moinhos de Maré de Corroios”, one of the oldest Ecomuseum-branches) and the Gunpowder factory in Vale da Milhaços (with a well-conserved steam engine).

Different permanent and temporary exhibitions present these sections, mostly open in summer season only. The Ecomuseum of Seixal houses a specialised library, the education department and a documentation centre (who publishes a monthly information bulletin and edits numerous catalogues).

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Museu Marítimo Ilhavo (Maritime Museum of Ilhavo)

Dr. Rocha Madahil, 3830-193 Ilhavo, Portugal

Tel.: 351 234 329 990

<http://www.museumaritimo.cm-ilhavo.pt>

The Maritime Museum of Ilhavo, founded in 1937, but housed since 2001 in a magnificent new museum building, was and still a witness of the strong relation between the local inhabitants of the Aveiro region and the sea. The ‘Faine Maior’ – cod fishing with lines and hooks in single man dories in Newfoundland and Greenland, as well as the agro-maritime activities are the patrimonial references of the museum. On the main floor, visitors can discover a varied selection of boat models and boats in full size, which express the variety of Portuguese maritime patrimony. An icon is a two-masted cod-fishing schooner. The exhibitions are highlighting the various fishing techniques used in the Aveiro lagoon.

Also a valuable collection of glass, ceramics and porcelains of Vista Alegre, a vast collection of seashells and seaweed are presented. The museum presents an important collection of nautical instruments from different periods, as maritime compasses, ships’ binnacles, sextants, octants, echo-saunders, radars and clinometers.

The presentation of these technical devices is completed by pictorial representations of fishing ships and marine landscapes, with a focus on the rich ethnography of the Aveiro region. An important extension of the museum is the Ship-Museum Santo André, a side trawler built in 1948 for cod-fishing. This modern ship was holding capacity for over 1000 tons of fish. The Santo André was transformed into a museum-ship in 2000-2001 and is encountering nowadays a large public success.

The museum is an institution devoted to research on maritime heritage and culture through its outstanding thematic library and archive, documenting numerous industrial companies relating to fishing, as the Comissao Reguladora do Comércio do Bacalhau, Britez e Vaz, Industria Aveirense de Pesca, among others. Visiting the Maritime Museum of Ilhavo is embarking on an adventure of the senses, knowledge and pleasure.

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Museum of Lanifícios MUSLAN (Wool Museum of the University of Beira Interior – MUSLAN)

Rua Marqués d’Avila e Bolama, 6201-001 Covilha, Portugal

Tel.: 351 27 531 97 24 / 351 27 531 97 12

<http://www.museu.ubi.pt/>

“The thread from the past is weaving the future” is the motto of the Wool Museum in Covilha, defending an active preservation of the patrimony that is under his guard. The museum, inaugurated in 1992, is housed in superb old textile factories, such as the ‘Royal Textile Factory’, the ‘Royal Veiga Factory’. Another section of the Wool Museum is an important open air exhibition, called “Sun Tenters”.

The Royal Textile Factory (“Real Fàbrica de Panos”) was adapted by the University of Beira Interior (UBI), and is one of the remaining old textile mills, built along the two rivers that cross the city, which bear witness to the unquestionable importance of this industry for Covilha’s economy, once known as the “Portuguese Manchester”. Despite the economical crisis in the textile-branch during the 1950s to 1980s, Covilha is still one of the biggest woollens fabrics producers in Europe (40.000 km of fabrics by year) in companies like Paulo de Oliveira, Penteadora, Tessimax and Saraiva.

The Royal Textile Factory was built by Royal provision of Joseph I and the Marquis of Pombal in 1763-1764, and served as a spinning, dyeing and weaving mill, and was extended during the reign of Queen Mary I. In 1885 it was handled over to lodge the Regimento de Infanteria 21 (21th Infantry Regiment), and later the Second Sharpshooters Battalion. In 1975, during the recovery and adaptation works, archaeological remains of the old mill were discovered. The discovered structures, as the vats of the former dye-house, help to portray the dyeing processes used in the second half of the 18th century. This well preserved area of outstanding architectural quality are dedicated to present the stage of pre-industrialization of wool processing, the manufacturing and dyeing of wool cloths, presenting also the archaeological and historical values of the mill spaces transformed into museum-rooms.

Another historical building, next to the Royal Factory, is the Royal Veira Factory, built near the Goldra River by José Mendes Veiga. This museum-section, inaugurated in 2005, explains with an outstanding collection of machines the technological evolution in the wool-manufacturing sector during the 19th and 20th centuries, including the evolution of power sources and the considerable import of foreign machinery. In addition, the role of education and the Industrial School Campo Melo, the social life of the entrepreneurs and the workers are well documented. In the same building, the Museum offices and Interpretation centre is settled (address: Calçada do Biribau, 6201-001 Covilha).

A third sector of the Wool Museum is “Sun tenters”, an open air nucleus located near Carpinteira River (at Sineiro, near Pole IV of UBI), inaugurated in 1998, and presenting a set of “Sun tenters” and a wool drying ground, who belonged to the former company of Ignacio da Silva Fiadeiro.

The Wool Museum of Covilha organises temporary exhibitions, develops artistic events, and organizes seminars and conferences. The museum forms part of the Wool Route TRANSLANA, supported by the European program Interreg II A.

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ROMANIA

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Museul National ul Petrolului (National Museum of Oil Industry)

Dr. E Bagdazar Str. 8, 100 575 Ploiesti, Romania

Tel.: 40 244 597 585

www.erih.net / <https://archive.is/M861c>

<http://www.romguide.net>

The city of Ploiesti in Prahova Country, about 60 km north of Bucharest, was one of the first communities in Europe to prosper from the growth of the oil industry. The first oil refinery in Romania, and the third in the world, was built by Marin Mehetinteanu nearby Rifov in 1857. From the following year its output of kerosene was used to light the city of Bucharest. Some important developments in oil extraction technology were made in the Ploiesti region, including a drilling machine of the late 19th century, designed by the German pioneer Anton Raky (1868-1943).

Improvements in processing technology were incorporated in refineries opened at the nearby site Cimpina in 1897, and in Ploiesti itself in 1904. The oil wells in the region were of great strategic importance during the Second World War, and almost all the installations were destroyed in 1944-1945. In recent decades many wells have run dry and the rate of extraction has been reduced.

The National Museum of the Oil Industry was established in 1957, the centenary year of the industry. It holds extensive collections of machines, tools and documents, related to the history and the evolution of the petroleum industry in Romania and around the world.

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SERBIA

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Museum of Weapons “Stare Livnica”, Kragujevac, Serbia

Trg. Topolivaca 4, 34000 Kragujevac, Serbia

Tel.: 381 34 33 77 86

Website: www.inserbia.info/today/2013/11/the-old-foundry-museum-in-kragujevac/

Kragujevac is the fourth largest city of Serbia and was the first capital of modern Serbia in the period 1818-1839. The Museum of Weapons “Stara Livnica” is located in the facilities of the old cannon foundry “Topolivnica”, dating from 1882. It is the oldest preserved part of the Military factory and Military- trade school, the first of its kind in Serbia, founded in 1853, and which later grew into the Army Technical Institute.

The museum was created in 1953, one hundred years after the Military factory foundation. It is a part of and supported by the famous Zastava factory, the cradle of Serbian industry. The museum building complex is under the state protection and listed as a monument and cultural heritage of greatest importance.

The museum has unique collections of firearms and equipment, machines and tools, archive material, photography, art objects and a collection of decorations, seals, cups and medals. In total the museum preserves around 5800 items. The permanent exhibition of the museum follows the history of the Military factory, since its foundation in 1853 to 1973. There's also an exhibition of modern weapons.

The museum possesses a few rarities, like the famous rifle Mauser- Milovanovic M 1880 (so called Kokinka), and also an improved version of it, dating from 1907, with five cartridges Mauser- Milovanovic- Djuric. There are also rare examples of retrofitted guns produced abroad. Some trophy weapons from World War One and Two are also exhibited there, along with photographic and archive material that shows chronologically the history of the factory, but also tells a certain story about the city. Some civilian products of the factory are displayed, as well as military equipment, programs of the saddler etc. It shows the production program of the military factory between two world wars, and the production of artillery weapons that continued after the World War Two. The setting includes the program of sporting and hunting weapons, whose examples are exhibited in the museum.

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SLOVAKIA

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Slovenské plynárenské museum Bratislava (Slovak Gas Industry Museum Bratislava)

Mlynske nivy 44/a, 825 11 Bratislava, Slovakia

Tel.: 421 2 62 62 41 64

<http://slovakia.travel/en/slovak-gas-industry-museum-in-bratislava>

The Gas Industry Museum was established by state-owned gas utility company in 1996 to mark the 140th anniversary of the introduction of gas industry in Slovakia. A first exhibition "Under the Lights of Gas Lamps" was presented in 1992 in the Museum of History (a branch of the Slovak National Museum). The collection activities of Pavol Hradek and other former employees of Bratislava's gas company, were followed by the establishment of the Gas Industry Museum. This museum is located in the newly-reconstructed building from the interwar period in the area of Mlynské nivy. The buildings of the former steam-boiler plant with a factory chimney, chemical laboratory and tar facilities are included in the list of state cultural monuments. Until recently, enthusiasts about the history of gas industry in Slovakia used to visit the Gas Industry museum. Since 2007, this exhibition facility with more than 400 exhibits has been called the Gas Industry Museum.

The Museum is divided into five sections. In an introductory section with the evocation of a narrow 19th century street, with gas lamps, a history pavilion (showcasing the production of coal gas), a present-day pavilion about extraction, transport, modification and use of natural gas, an open-air exhibition and a depository, serving for the storage of exhibits in a independent building near the museum.

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SLOVENIA

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Technical Museum of Slovenia

Bistra 6, 1353 Borovnica (near Vrhnika), Slovenia

Tel.: 386 1 750 66 70 (general), Tel.: 386 1 251 54 00 (public relations)

Tel.: 386 1 436 16 06 (secretariat)

<http://www.tms.si>

The Technical Museum of Slovenia (TMS) holds in trust about 20.000 objects from various fields of science, engineering and industry. Only a small part of these are displayed, but a large selection of items is described online. The collection is displayed in four different places, all of them exceptional historical monuments.

The main collections are presented in the former Carthusian monastery in Bistra, near Vrhnika, far away from the rapid pulse of urban life. The collections fields here are: agriculture (with exhibitions as 'Milling in Slovenia', 'Farrier's Forge and Smithy' and the 'Wheelwright's workshop'), wood working, hunting and fishing, printing, textiles, road vehicles (the largest part of the exhibition), electricity (presenting a two-phase steam generator from 1897, old turbines and a presentation of the inventions by the physicist Nikola Tesla) and water driven machinery. This last field is illustrated by different water mills near of the main building, as the Venetian sawmill and Veneer sawmill, a fulling mill and nicely restored small hydro plant.

The Museum of Post and Telecommunications of the TMS was opened in 2012 in Polhov Gradec (Polhov Gradec 61, 1355 Polhov Gradec). This museum, installed in a wonderful renaissance castle, extended in later centuries and completely restored, contains exhibitions on the history of the post and telecommunications, drawing special attention to the women telephonists and telegraphists, teleprinting and other appliances aimed in sending messages over long distance.

The Bogensperk castle, located in Sartno pri Litiji, presents the TMS – Slovenian Geodetic Collection, including the Slovenian cartographic collection and the reconstructed workshop of the surveyor Johann Weichard Valvasor (1644-1693). He was the most eminent and accomplished natural scientist and polymathematician of his age.

Finally, the Soteska open-storage depot in Straza encompasses a collection of vehicles, wagon and carriages, which it constantly complemented and rotated. The actual project is to create a museum section addressing the whole history of road transport in Slovenia.

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Coal Mining Museum of Slovenia - Velenje

Ljubljanska cesta 54, 3320 Velenje, Slovenia

Tel.: 386 3 898 26 30

www.muzej-velenje.si/english/

Just as the TMS, the "Muzej Velenje" is housed in an important historical monument outside an urban context, namely the Velenje castle. The renovation of this important medieval and

renaissance building was finished in the 1990s, about forty years after the foundation of the museum (in 1957) and the opening of the first exhibitions (in 1966).

Within the framework of the first collections about coal mining, a model of a mine cave was created, presenting the formation, discovery and digging of coal in the past and today. The visitors are offered a coalminer's lunch and ride on an underground railway. A second part enables the visit of the permanent collection about the development of Slovenian coal mining, an exhibition that is completed with the mastodon (mammoth) remains, found in Skale in 1964. Special attention is given to the social life and living conditions of the miners. The multimedia presentation scene of old coal miners' traditions is fascinating, also "the jump over the skin", an old coalminers' initiation ritual.

Nowadays, the section about the history of coal mining is just one of many sections of the Velenje museum, focussing on archaeology, art and ethnography, presented also in branch museums outside of Velenje.

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SPAIN

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La Encartada / Museo de Boinas

B° El Penuelo 11, 48800 Balmaseda (Bizkaia), Spain

Tel.: 34 946 800 778

www.laencartadamuseoa.com

Boinas La Encartada is a remarkable example within the industrial scene in Biskaya a part of the Basque country in northern Spain). This centenary site was involved in the production of woollen knitwear and bonnets (Basque berets) from 1892 to the closure in 1992.

The factory was established by Marcos Arena Bermejillo, an "indiano" (or Spanish entrepreneur with roots in overseas territories). The integral production line included the delivery of raw materials, the spinning process and manufacturing of berets (the main products) as well as blankets, cloths, scarves, socks, etc. The operation of all machines was carried out by means of a Voith hydraulic turbine (1904) which replaced the first one, installed in 1892.

The site is representative for the wool textile sector, which acted as a driving force for the technical development in the industrial era. Even more interestingly, Boinas La Encartada remained almost unchanged and has conserved most of the original machinery. Also a workers housing block, built by the factory in 1892-94, a chapel and local school are remaining on site.

For a decade, due to the huge efforts of the Foundation Boinas La Encartada and the Ministry of Culture and Heritage, the factory complex has been completely restored, and was opened for visitors in 2007.

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Museo del Ferrocarril de Asturias (Railway Museum of Asturias)

Plaza de la Estacion del Norte, s/n, 33 232 Gijon (Asturias), Spain

Tel.: 34 985 30 85 75

<https://museos.gijon.es>

The Gijon Railway Museum or Railway Museum of Asturias has a large collection of steam locomotives and rolling stock, some with standard Spanish gauge, most with narrow gauge, connected with the region. The museum is located at the old Norte-station in Gijon, near Poniente Beach. This station was no longer in use in 1990, and was offered to the municipality of Gijon by the Spanish State Railway Company (RENFE) on condition that the building should be re-used for cultural and social activities. The railway station was renovated in different phases from 1992 to 1998. In October 1998, the museum opened the doors for visitors. Some of the steam locomotives are from the 'Ferrocarril de Langreo', the third railway line built in Spain in 1852. The collection includes locomotives from several disappeared companies like 'Ferrocarriles del Norte', 'Vasco Asturiano' and many locomotives used in coal and iron mines in Asturias. The oldest locomotive is called "Bilbao", and was built in England in 1878. Other highlights are a FAT steam crane, the locomobile "Alegria", the steam locs "Coronel Esteban", "Nalon", "Santa Barbara" and "Varela de Montes". The permanent exhibition explains the historical relationship between railways and the social and economic development of the Asturias Region.

The museum also presents temporary thematic exhibitions and houses an outstanding documentation centre with graphic and documentary evidence that helps to understand the history of the train over the last 150 years.

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Museo de la Mina de Arnao (Museum of the Mine of Arnao)

Calle La Mina 7, Arnao (Asturias), Spain

Tel.: 34 985 50 77 99

www.museominadearnao.es/

Arnao mine is one of the most iconic sites of mining heritage in the north of Spain, located in a remarkable coastal landscape near of Castrillon. It is the oldest coal mine of the Iberian Peninsula, the oldest vertical shaft of the region and the only mine of Europe that is located partly under the sea.

In 1591 Fray Agustin Montero discovered "the back stone" in Arnao and obtained the permission for extraction from King Philip II. In 1833, the start of the RCAM (Royal Society of Asturian Coal Mines), founded by Ferrer, Riera and by the Belgian engineer Lesoinne represents a milestone in the industrialization of Spain, employing constantly technological innovations as drilling with gunpowder, the building of "the grandfather", the first vertical well, and digging galleries under the sea. Around the mine, a workers village with a small hospital and a school was extended to the valley of Arnao after the founding of a the Arnao zinc factory in 1853.

In the early 20th century, the sea breaks into the mine galleries. The miners strive to build walls, because, despite the danger and risks, exploitation can not cease. However, in 1915, new leaks caused problems for further exploitation and forced the direction to close the mine. In 2007, thanks to a ambitious project launched by the city of Castrillon and the moral support of the population, renovation works were started of the wooden towers, the shaft, the surface building and the underground galleries. Today, the site let revive the atmosphere of the primitive mine.

The visit starts in the interpretation centre at the surface. Through audiovisual resources, documents and objects, visitors discover the unique history of this industrial site. During the second part, visitors descend from the old vertical shaft to the underground galleries, lined with bricks and with the appearance of catacombs, closely related to the sea, a constant and menacing presence that led to the abandonment of the mine, just a century ago. The Arnao museum presents temporary exhibitions, and opens the doors to all kind of cultural activities.

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Museo de la Siderurgia de Asturias – MUSI (Museum of the Siderurgy in Asturias – MUSI)

c/ Hornos Altos (Pol. Industrial Valnalon), s/n, 33930 La Felguera – Langreo (Asturias), Spain
Tel.: 34 985 64 84 77

www.museodelasiderurgia.es

The impressive, conical construction of a cooling tower of the former steelworks company Duro Felguera houses the Museum of the Siderurgy, located in the industrial town La Felguera. In the 45 metres high tower with a 31 metre diameter, circular museum-spaces on two floors are used to present the evolution of siderurgy in Asturias, marked by the great industrial adventure of D.Pedro Duro, who created in La Felguera a pioneering steel factory.

On the first floor is the narrative focused on the manufacturing process of steel, with a model of the steel factory and audiovisuals about steelmaking. On the second floor visitors discover the territory of the Asturian coalfields, the origin and development of mining and the living and working conditions of workers at the beginning of the 20th century.

A complementary exhibition traces the history of pharmaceutical production (and acetylsalicylic) in Langreo. Guided tours can complete the visit, discovering the Barrio Obrero (workers colony houses in the 'Marqués de Uquijo' neighborhood, designed by architect Enrique Rodriguez Buselo Asturias) and a warehouse housing machinery, Pedro Duro steam traction engines, the Crane 'Leona', and tools, that served in the factory. The museum conserves company archives and welcomes researchers in a documentation centre about steel in Langreo and other regions.

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MUMI Museo de la Minería y de la Industria de Asturias (Museum of Mining and Industry of Asturias)

Cale El Trabanquin, s/n, 33940 El Entrego (Asturias), Spain

Tel.: 34 985 66 31 33

www.mumi.es

The Museum of Mining and Industry of Asturias is located in El Entrego (municipality of San Martín del Rey Aurelio), and built on site of the Mine San Vicente, in the area called “El Trabanquin”, in the heart of the coalfield of Nalon. A head frame, whose struts are supported on the square flanking the front entrance, is the anchor element of the museum. The creation of the MUMI, opened for visitors in 1994, responded to the need to preserve something of the material remains of what constitutes the identity of the Asturian coalfields region.

The visit of the MUMI is structured following a pedagogical, technological and sociological content. Main sections are: Ancient technologies in mining and industry, The coal and the industrial revolution, Industrial Production of Explosives (necessary to break, cut and move massive amounts of rocks and minerals), Nursing, Health and Mining, Mining and education (presenting an outstanding collection of scientific instruments), and finally Minerals and fossils.

A special exhibition focuses on security and minework, presenting an important collection of safety lamps, explaining the permanent danger during the work in the mines, the menace of firedamp explosions, derrabes, landslides and fires. The role of Rescue Brigades and their role in emergencies, using rescue tools and special vehicles is well documented. A fascinating walk through an underground gallery completes the visit.

The MUMI learns that the evolution of the mining industry was not only a great technological achievement, but also a breakthrough in the way companies and workers were organized, and in the way miners struggled for better working and living conditions.

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Museu de la Ciència i de la Tècnica de Catalunya – MNACTEC Museum of Science and Technology of Catalonia - MNACTEC

Rambla d'Egara 270, 08221 Terrassa (Catalonia), Spain

Tel.: 34 937 36 89 66

www.mnactec.cat



The creation of the National Museum for Science and Technology was a century old Catalan ambition, a project that the Catalan Association of Industrial Engineers took up again in 1976. Three years later, the Association of the Museum for Science and Technology and of Industrial Archaeology of Catalonia was established, with the intention of unite the forces to create a new museum and to preserve the industrial heritage. In 1982, the Culture Department of the Generalitat de Catalunya took over the project and bought the Aymerich, Amat Jover Mill, an old woollen factory in Terrassa as location for this new museum, the “Museu de la Ciència i de la Tècnica de Catalunya” (MNACTEC).

This building is the finest example of Art Nouveau industrial architecture in the country and was designed in 1907 by Lluís Muncunill i Parellada (1868-1931). In 1990, the museum was declared a National Museum and was established as an independent institution, fully supported by the Catalan Government. The MNACTEC in Terrassa has 22.000 m² of surface area, in which the permanent exhibition Power, The Textile Mill, Homo Faber and Transport can be found today, covered by a unique saw-tooth roof. This roof is composed of 161 bell-shaped vaults, supported on 300 cast-iron, hollow columns, that function as rainwater pipes and as support for the line

shafting, the system of belts that transmitted the force from the steam engine to each of the machines of the factory.

The main museum and headquarters of the MNACTEC house an important archive-section, a documentation centre and library, auditoria for meetings and lectures, a warehouse for the conservation of the collections, and workshops for preventive conservation and restoration. The MNACTEC also manages a network of branch-museums all over Catalonia. Each of these explains part of the industrial adventure of the territory or an aspect of industrialisation in Catalonia: the first of these site-museums that was created was the Museum of the Colonia Sedo in Esparreguera, an outstanding example of a industrial "colonia" or estate, including a huge cotton factory with conserved turbine room and technical infrastructure, workers houses, directors' villa, a church and a school. For more information, see

http://www.mnactec.cat/museum/museu_de_la_colonia_sedo_esparreguera_es.htm

A second branch-museum is the Paper Mill of Capellades (www.mmp-capellades.net/eng/), an outstanding paper history museum, installed in a well conserved hydraulic paper factory, dating from the 18th and 19th century, still partly operative for demonstrations. A third branch is the Leather Museum in Igualada (<http://www.igualadaturisme.cat/>), called "Museu de la Pell d'Igualada i Comarcal de Anoia" and installed in a well restored, historical leather-factory. Other branch-museums are: the Technical Museum of Manresa, the Museum of the Colonia Vidal in Puig-Reig, the Mining Museum in Cercs, the Forge of Areu, the Flour Mill in Castello d'Empuries, and the Cork Museum in Parafrugell. Further: the "Museu de l'Estampacio in Premià de Mar" (housing a unique collection of designs and samples of textile prints and other objects, related to the "indianos", men who made their fortunes in the colonies), the Automobile collection Salvador Claret in Sils, the Railway Museum in Villanova i La Geltru.

Perhaps the most ambitious conservation project is the valorisation of the unique building-ensemble of the Cement Factory Clot del Moro in Castellar de n'Hug (see: <http://www.museuciment.cat/eng/home.php>). Other branch-museums are under development. The MNACTEC is a one of the leading examples of a network-museum in Europe. It has been an example of good-practice for other projects in the world.

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Museu Agbar de les Aigües - AGBAR

Carretera Sant Boi 4-6, 08940 Cornellà de Llobregat (Catalonia), Spain

Tel.: 34 93 342 35 36

www.museuagbar.com



The Museu Agbar de les Aigües, managed by the private “Fundacion Agbar” is a museum devoted to the distribution of water, and intended to promote the heritage qualities of the site of the museum, the former “Central Cornellà” steam hydraulic pumping house.

The permanent exhibition is presented in a large machine hall built in 1908-1909, designed by the architect Josep Amargos i Samaranch on Cornellà de Llobregat, near of Barcelona. The exhibition starts in to the Boiler Room where the steam was generated. Standing 50 metres tall, the chimney of the boiler hall is a symbol of the industrial past and a reference point in the region.

Then the Electricity Room is visited, equipped with generators, which supplied the power to bring the water up from the aquifer. A third part of the visit is the Machine Room. Four generating sets can be seen in this room, capable of supplying power to any of the electric motors of the well’s extraction pumps. Each set consists of a 450-Hp Compound horizontal steam engine, patented by Van den Kerchove (Ghent, Belgium) and manufactured by the Société Lyonnaise de Mécanique et d’Electricité in 1907. The power house that pumped water out of underground of the Baix Llobregat aquifer (from reservoirs located in Esplugues de Llobregat and Sant Pere Martir) to provision the city of Barcelona, is still operating, mostly with electrical power.

The museum collection includes pieces owned by the museum itself and others provided by other Catalan museums and institutions: water jugs, jars and pitchers, models of water towers,

elevation pumps, valves, speed and volume metres, gauges, taps, laboratory materials, washing machines, etc.

Near the pumping hall, at the end of the beautiful gardens, is the location of the wells or “pozos”, the access towards underground freshwater reserve of the aquifer. The oldest one, built by the French company Lille Fives, dates from 1905, and is still used nowadays to draw water from a depth of 34,35 metres. Also in the garden, a covered circular reservoir, drained in 2003, is used now for meetings and a wide range of cultural activities.

The Museu Agbar really shows the relationships between scientific knowledge, technology and social progress. It is a forum and meeting point for all connected with water: technicians, users and citizens. Temporary exhibitions deal with specific aspects of water supply and consumption, from economic and human perspectives.

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Museo de la Reales Fàbricas de Riopar

Calle San Vicente 2, 02450 Riopar (Province of Albacete), Spain

Tel.: 34 96 74 35 230

www.museofabricasderiopar.com

After the closing down of the factories in the period 1996-2000, a museum was installed on site, after being refurbished by the Escuela Taller J.J. Graubner, presenting since 2001 the more than two-hundred year old entrepreneurial history of the Reales Fàbricas de San Juan de Alcaraz.

The company was established by permission of King Carlos III in 1773 by the Austrian engineer Josephus Graubner. It was the first industrial site in Spain, able to produce zinc and brass in different shapes (lingots, planks and threads). The development of the factory was driven by the old metallurgy, based on local mining of calamine to obtain zinc and copper for cast brass and bronze. In the late 19th century Calamine mine loses field and factories enter regression. After some efforts for its maintenance and recovery by private companies, the closure at the end of the 20th century was irrevocable.

The Museum of the Royal Factory of San Juan de Alcaraz was developed to protect and value the traces of our technological heritage and to preserve the working class memories in its different scopes. An important brass and bronze collection is kept, together with moulds and machinery that dates back the 19th and 20th centuries. Despite having suffered a major spoliation, it is possible to see here all kinds of models and moulds of high quality, working tools, delicate 19th century drawings used to illustrate catalogues, and interesting office furniture of the period. Various maquettes allow the visitors a better understanding of the morphology of the complex industrial architecture.

Nowadays the factory remains on stand by, where collective imagery settles into common history. A Documentation Centre has been created to collect, recover, select and to analyse and transmit the data of the Factories in Riopar and Cartagena, spread out in libraries and archives all over the country. This archive has been properly inventoried, and relocated in the offices of San Carlos, attached to the warehouses of the Historical File of the Factories.

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Museo Nacional de la Energia (National Energy Museum)

Avenida Libertad 46, 24404 Ponferrada (Province of Leon), Spain

Tel.: 34 987 40 08 00

www.enemuseo.org/

The region of Ponferrada became the largest mining centre of the Roman Empire, where gold and other metals and minerals were extracted. Numerous Roman mining sites are still visible in the landscape, one of the most spectacular being Las Médulas, since 1997 a UNESCO World Heritage Site.

During World War I, tungsten deposits were exploited to supply the arms industry and in 1918 the Ponferrada Mining, Iron and Steel Company was founded to exploit coals deposits in the region. The Spanish National Energy Corporation (Endesa) was founded in 1944 and opened four years later the first coal-fuelled power plant in Ponferrada. By the 1970's the economy of the city was mainly based on mining and electricity generation. After 1985, most of the mines closed and the economy of Ponferrada underwent a deep transformation with the reintroduction of wine production and the establishment of services and new educational institutions.

Considering the town's history, it is no wonder that the project for a new Spanish energy museum started precisely in Ponferrada. The "City Energy Foundation" (Fundacion Ciudad de la Energia - 'CIUDEN') was established in 2006, and is currently overseeing the development of the National Energy Museum in Ponferrada, as well as supporting several other initiatives, that should further develop tourism and creative economy in the region. The National Museum of Energy aspires to disseminate knowledge about the science of energy.

The first part of the energy museum or 'Ene.Museo', opened for visitors in 2011, was "Ene.Tèrmica", installed in an old, well-restored power plant, including the Coal Unloading Dock, the Boilers Vessel, and the Turbine Hall. The museum is conceived to develop further in another thermal power plant, now under restoration, and a botanical garden will recreate some ecosystems similar to those that existed in the Iberian Peninsula 300 million years ago. The main building will be installed in the thermal plant Compostella I, in activity from 1949 to 1974. This plant played a decisive role in the development of the area.

The Ene.Museum focus on the relationship between coal and energy from the technological and social point of view. In a second (central) part, the museum will present thematic exhibition about the use of energy: "The Energy in Your Life", "The Energy in Nature", and "Heads and Tails in Energy" (about climate change and its global impact). A third part, called "Ene.CO2", will analyse carbon dioxide, a greenhouse gas causing global warming. An experimental installation investigates technological options for the capture and storage of CO2. The objective of the experimental plant is to reduce the emission into the atmosphere of this gas and thereby avoid an increase in the average temperature of the planet.

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Museo del Ferrocarril de Madrid (Madrid Railway Museum)

Paseo de la Delicias 61, 28045 Madrid, Spain

Tel.: 34 902 22 88 22

www.museodelferrocarril.org/

The Madrid Railway Museum was opened for visitors in 1984. This museum is located in the former station of 'Delicias', one of the finest examples of Spanish industrial architecture, built in 1880 and used for railway traffic until 1971. The museum presents an interesting and comprehensive collection of rolling stock vehicles and other railway-related exhibits, which aim to show the historical evolution of this mode of transport, promote an appreciation and understanding of rail transport, encourage railway-related research and enhance the railway heritage.

The Central Hall (Nave Central) houses a diverse range of locomotives and passenger coaches, which not only illustrate the evolution of steam- electric- and diesel-traction, but also provide an insight into the conditions in which the passengers travelled on these trains. Other halls present thematic exhibitions, devoted to station clocks, model railways and railway infrastructure. On the outer tracks, visitors will find the Algodor interlocking and its signal bridge, which, after entering into operation in 1932, was used to control point switching and signalling.

The Railway Museum organises numerous activities, such as educational workshops, temporary exhibitions, guided tours, theatre performances, and offers the opportunity to travel between Madrid and Aranjuez on an authentic vintage train, the Strawberry Train ("Tren de la Fresa"). The recent openings of the Railway Historic Archive and the Railway Library, including the Photographic Library, have greatly contributed to the achievements of the objectives of the museum.

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Museo de la Siderurgia y la Minería Sabero de Castilla y Leon (Castille and Leon Museum of Metallurgy and Mining)

Plaza San Blas 1, 24810 Sabero, Spain

Tel.: 34 987 71 83 57

<http://www.museosm.com/ingles/sabero.html>

Sabero is a village in the province of Leon, in north-western Spain. It is the location of the Castille and Leon Museum of Metallurgy and Mining, opened for visitors since July 2008. The museum is a part of the Castille and Leon Regional Museum Network. The museum is installed in the former Saint Blas Ironworks ("Ferreria de San Blas"), with main building (the steel rolling workshop and warehouse) in neo-gothic style, and containing the first blast furnaces (heated with cokes) of the whole Iberia Peninsula, built in 1847 by the "Sociedad Palentino-Leonesa de Minas". The ironworks suffered a lot by the political instability, military uprisings and weak inland demands of iron products during the mid 19th century, forcing the closure of the Forge

of Saint Blas in 1866. The museum presents this fascinating industrial history and the years after the closure, when the local economy was mainly based on mining (until 1991).

The factory is built of stone and brick, with a great open warehouse with three naves, and the roof is supported by a succession of pointed arches. The northern area held the forges and the south some hearth furnaces. Different areas in the main building present the rich history of the Valley of Sabero in the past. A special exhibition focuses on the constitution and activities of the Palencian-Leonese Mining Society. Near of the old blast furnace, information is provided about the process of iron making and the furnace puddling process of wrought iron or soft iron.

The second step in the museum-development is the refurbishment of the old 'Sucesiva' coal mine, which will be integrated in the visit of the site. However, an exhibition about the Mining Basin of Sabero is yet presented in the main building.

The rehabilitation of the Forge of Saint Blas and its conversion to a museum is one more step towards the configuration of network of regional museums, which give value to the regional heritage and offer a vital, innovative and modern cultural vision.

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Parque Minero de Almadén - Museo del Mercurio (Mining Park of Almadén – Mercury Museum)

Calle Cerco San Teodoro s/n, 13400 Almadén (Ciudad Real), Spain

Tel.: 34 926 26 50 02

www.parqueminerodealmeden.es/

<http://www.turismocastillalmancha.es/patrimonio/industrial/>

Almadén is a town in the Spanish province of Ciudad Real. The name Almadén is from the Arabic word al'ma'din, meaning 'the mine'. The reserves in Almadén of cinnabar, the mineral from which mercury is extracted, are the largest of the world. Approximately 250.000 metric tons of mercury has been produced there in the last 2000 years.

Cinnabar was first used by the Romans for pigment. Later, during Arab domination in Spain, the mineral was used mostly in medicine and alchemy. The Fuggers of Augsburg administered the mines during the 16th and 17th centuries in return for loans to the Spanish government.

Mercury became very valuable in the Americas in the mid 16th century due to the introduction of amalgamation. The dangerous working conditions of the mines made it difficult for the Fuggers to find willing labourers. As the demand for mercury grew, the idea of convict labour (by prisoners, later by North African slaves) was introduced. Disastrous fires occurred many times. Safer mining technology was introduced in the late 18th century, and around 1800, free labourers replaced most slaves. In 1835, during the First Carlist War, the mine of Almadén was leased indefinitely to the Rothschild Bank. A record production of 82.000 mercury flasks was reached in 1941, just after the Spanish Civil War. The price of mercury decreased considerably after 1965. In 1981, the Spanish government created the company Minas de Almadén y

Arrayanes to operate the mine, but in 2000-2003, the mines closed due to the fall of the price of mercury on the international market. The Alcadén mining area has been a World Heritage Site by UNESCO, which contributed to the valorisation of this exceptional site.

Shortly after the closing, the regional authorities, supported by European funds, created the Mining Park of Almadén (Parque Minero de Almadén). Tourists are welcomed in an outstanding information and visitor centre, and discover then the former surface installations, including workshops and headgears, a mining interpretation centre (installed in the former compressors hall), before to descend to a 50 m underground gallery (the first underground level of the 700 m deep mine). At the end of the underground exploration, the return way is effectuated by a mine railway trip. Hen other early industrial sites can be explored: old ovens (“hornos de Atudeles”), brick ovens (“horno de tejas”) and the Mercury Museum (Museo del Mercurio). This interactive museum, installed in an old warehouse for mercury, presents the complex geology of the region, the fascinating history of mercury-extraction and trade, but also provides information about chemical aspects of mercury and applications of mercury.

In the town centre of Almadén, visitors can discover other attractions related to the mining history. A highlight is the former Miners’ Hospital San Rafael (Plaza Doctor Lopez de Haro, 1), built in 1775. The hospital cared sick or wounded miners until 1975. This outstanding historical building is re-used as museum and archive-centre, called “Archivo Historico de la Minas de Almadén”.

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Parque Minero de Riotinto - Museo Minero (Rio Tinto Mining Park and Museum)

Plaza Ernest Lluch, 21660 Rio Tinto (Huelva), Spain

Tel.: 34 959 59 00 25

www.parquemineroderiotinto.es/

The Rio Tinto Mining Museum is housed in the former hospital of the Rio Tinto Company Ltd, a British company that exploited the mines between 1873 and 1954. After this date, the mines have been taken over gradually by the Spanish State. The hospital building of 1925 was designed by the British architect RH Morgan and extended during the 1960s. Since the late 1980s, Rio Tinto Foundation has undertaken a project to restore and manage the hospital buildings, following the guidelines of the original English architecture, in order to accommodate the archaeological and historical deposits, generated by 5.000 years of mining activity in the region. In 1992 the building reopened its doors as Mining Museum, managed by the Rio Tinto Foundation, and was awarded several times (Henry Ford Award for Heritage Conservation, 1998; Europa Nostra Prize for Cultural Heritage, 2003). As a complement to the visit of the museum, a walk is recommended through the British engineers district ‘Bellavista’, where the interiors of “House 21” can be visited since restoration works in 2005. The semi-detached house of 540 m² with living quarters, dining room, playroom, kitchen, offices, bathrooms, bedrooms, and gardens are nicely restored and refurnished.

Another interesting attraction is the guided visit (organised by the Rio Tinto Mining Museum) to the Pena de Hierro, a huge open cast mine, a very spectacular landscape, about ten kilometres away from Rio Tinto village. Near Minas de Riotinto a mirador (viewpoint) deliver spectacular sights to the open cast mine crater Corta Atalaya.

A visit to Minas de Riotinto is not complete without a train excursion, using the Riotinto Mining Railway. This line was used in the past for the transport of copper ore and other minerals to San Juan del Puerto. From here, barges covered the last stretch of the Rio Tinto to reach the ships moored at Huelva seaport. The construction of Riotinto's gauge railway began in July of 1873 and ended in July 1875. The tracks run parallel to the Rio Tinto forcing the construction of eight iron bridges and five tunnels. In Huelva a pier 1165 metres long was built to allow the railway to load the merchandise directly into the ships. The pier was in use until 1975 but the railway continued activity. The last train transporting mineral went down the tracks in 1985.

Rio Tinto Foundation has restored 12 kilometres of the former commercial line to Huelva, and the trip can be done with restored carriages and steam locomotives of the former British company. During this very exciting journey, impressive landscapes, an old smelting and industrial facilities, normally inaccessible to the traveller, can be admired...

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SWEDEN

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Arbetets Museum (Museum of Work)

Laxholmen, 61 281 Norrköping, Sweden

Tel.: 46 11 18 98 00

www.arbetetsmuseum.se

Norrköping is a city situated by the mouth of the river Motåla. The water power of this river and a harbour facilitated the rapid growth of this once industrial city, known for its textile industry.

Arbetets Museum – The Museum of Work – is an unusual museum, settled since 1991 in an old textile mill in the middle of Norrköping, surrounded by the water of the Motåla Ström. This factory building, designed by architect Folke Bensow in 1916-1917, was once described by Carl Milles as the most beautiful industrial building of Sweden, and known locally as the iron (strykjärnet).

This re-used industrial building is simply full of life, depicting working life and working conditions through exhibitions, seminars and programme activities. The mission of Arbetets museum is to be an innovative meeting place which promotes discussion on peoples work, lives and conditions. The museum has a special responsibility for all Working Life Museums in Sweden. Arbetets Museum is a private foundation owned jointly by different organisations, including the Swedish Trade Union Confederation of Professional Employees, the Workers' Educational Association, the Swedish Cooperative Union and the Sensus Study Association. The museum has six different exhibition areas totalling over 4.000 m². Most exhibition are temporary or semi-permanent, as "Land of Tomorrow" (2014-2019), focusing on tomorrow's

working and everyday life. This exhibition is meant as a tool box and source of inspiration for discussions and thoughts about a future that is sustainable – ecologically, economically and socially. Another semi-permanent exhibition presents the industrial development of Norrköping during the last century. A permanent exhibition presents the life of Alva Carlsson who worked from 1927 to 1962 as a bobbin winder in the former mill, transformed in museum. Another exhibition presents the work of Ewert Karlsson (“EWK”), a famous cartoonist illustrating the world of work, politics and society...

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Husqvarna Fabriksmuseum (Husqvarna Industrial Museum)

Hakarpsvägen 1, 55 641 Huskvarna, Sweden

Tel;: 46 36 14 61 62

www.husqvarnamuseum.se

Huskvarna Industrial Museum is a museum filled with nostalgia, presenting technology, quality and diversity from more than 300 years of industrial development at one of the world’s oldest companies. The museum, operated by the Local History Society in cooperation with the Huskvarna Company, was opened in 1993 and was situated in the building of the 1940’s weapons workshop. In 2005, it was reopened after large-scale renovations. The museum receives no public funding: most of the museum work (guided tours, archival work, maintenance, etc.) is carried out by a team of volunteers, which plays a crucial role to all activities.

The creation and history of Huskvarna Company is closely linked with the military history of the region. During the 14th century the fortification Rumlaborg in Huskvarna was an important stronghold of the Swedish king and attracted blacksmiths for the production of weapon. Military oriented handicraft was stimulated, when King Gustav Adolf II ordered in 1620 the creation of a weapon-factory in the nearby city of Jönköping. The need for continuous access to running water and hydropower led to the installation of a drilling works in 1689, right beside the waterfalls in Huskvarna. The state owned weapons factory was sold to a private investor in 1757.

During the second half of the 19th century, Huskvarna factory, still called “Husqvarna Vapenfabrik”, began manufacturing also civilian products as sewing machines and hunting weapons, later also stoves, cookers, bicycles, motorcycles and household tools. After 1900, Huskvarna became a key enterprise for the production of chain saws, brush cutters and lawn movers. At the same time the weapon production continued and was not ended until 1989. Today the Huskvarna Group is the world’s largest producer of outdoor power tools, including chainsaws, trimmers and garden tractors.

The museum collections and the authenticity of the factory buildings, where these collections are displayed, reflect the history of the production of Huskvarna through the time, presenting an important selection of weapons, stoves, bicycles and motorcycles. Visitors are invited to the museum foundry and workshop, to assist educative demonstrations. The Huskvarna Industrial museum is editor of a nice collection of thematic books.

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Kopparberg Museum Falun (Falu Gruva I Dalarna)

Gruvplatsen 1, 791 61 Falun, Sweden

Administration: Världsarvshuset, Gruvgatan 44, 791 61 Falun, Sweden

Tel.: 46 23 78 20 30

www.falugruva.se/en

Falun Mine was once the most important industrial workplace in Sweden. Mining copper ore in Falun started probably in the early Middle Ages. The extraction of copper ore and gold is proved in 1347, when a charter about copper mining was granted by King Magnus IV of Sweden. Copper was used for castle roofs, church steeples (as in the “Greet Copper Mountain Church” of Falun), for coins and households utensils, exported all over Europe. The city of Falun received its privileges in 1641 and attracted numerous merchants and workers. Soon, however, the importance of the copper mine began to decrease. In 1687, parts of the mine collapsed in a landslide, creating a 100 metres deep pit. Miraculously, the cave-in took place when the miners were out of work, so no one died.

Even though the mine remained in use for the next 300 years, the production gradually diminished. The Falun Mine exploitation stopped in 1992. In 2001, Falun Mine was been inscribed on the UNESCO World Heritage List and is considered as very valuable and of importance for the hole of humanity.

Falun Mine offers guided tours around and in underground galleries of the copper mine. Also fascinating exhibitions are presented in “Stora Gruvstugan”, the former office building, designed by Eric Geisler in 1771 and rebuilt partly in 1882. The museum describes the technology used in the digging of galleries, the extraction and processing of the copper ore. Next to the old office building, visitors discover a mining village. They can use a little train, which takes them around the Great Pit.

In the World Heritage House, visitors are invited to a film show about Falun Mine and the surrounding area, and an information room offers more details about further discovery of the natural and industrial heritage of the region. Highlights of industrial culture include the master miner’s estate of Bäckehegen (1810), the “Gamla Stabergs” master miner’s estate (ca. 1700) and the slagheap in Östera.

A walk in the old districts Östanfors and Gamla Herrgarden in Falun town, with houses mostly built in wood, painted in brown and red, is a must for the visitors. The town centre presents also old industrial buildings as the copper weigh-house (built in 1633), the Crown Distillery (erected in 1775), a “Vitriol Plan” (with actual building from 1907-09, made of clay brick and slag brick) and “Silverhyttan”, the only surviving smeltery in Falun, with actual buildings dating of 1884.

An additional attraction is the visit of “Falu Rödfärg Röd”, a factory located just next the Falun Mine (Krongardvägen 6, Falun), producing red house paint, made from minerals from Falun. The history of Swedish red paint can be traced right back to the 16th century and is still the most loved house paint, protecting the wood from moisture and humidity.

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Ludvika Gammelgard, Gruvmuseum (Ekomuseum Bergslagen)

Nils Nils gata 7, 77153 Ludvika, Sweden

www.ekomuseum.se / www.hembygd.se/dalarna/ludvika

Ekomuseum Bergslagen

Ludvika Gammelgard is part of the Ecomuseum Bergslagen. Ecomuseum Bergslagen is an open-air museum in the western part of the former mining and smelting region of Bergslagen in central Sweden. The museum opened in 1986 and is today the world's largest ecomuseum and a joint project of numerous municipalities including Fagesta, Ludvika and Norberg. The ecomuseum is a 750 km square kilometre area reaching from Lake Mälaren in the south to Forest Finns in the north. The history of production of iron is a main theme of the ecomuseum, showing mythical pre-historic ironwork sites but also post-medieval and more recent blast furnaces and foundries, rolling mills, and modern steel factories along the vital transportation route, the Strömholms Canal, but also workers' homes in Ludvika and Grängesberg. The ecomuseum includes several mining areas, local museums, electric power stations, historical railways and a railway museum (Railway Museum Grängesberg). A typical attraction is Lapphyttan in Norberg, well known for a mediaeval blast furnace (dated between 1150 ad 1350). Another highlight is Engelsverk Ironworks in Ängelsberg, built in the late 17th century and listed as a UNESCO world heritage site since 1993. Also Ludvika Gammelgard is an outstanding site of old industry and technology within the boundaries of the Bergslagen Museum.

Ludvika Gammelgard, Gruvmuseum

Ludvika Gammelgard is a community centre and an outdoor museum in Ludvika, with a country estate (or "miner's farm" dating from the second half of the 17th century) and mining museum, already opened in 1938. The large 'Österberghjulet" (wheel) is a the most important landmark of Gammelgarden. The large water wheel (15 metres in diameter), dating from 1850, was moved here in 1930 from Östanbergs mining area. As climate protection, a log house was built over the wheel. The force of the water wheel, turning two à five turns a minute, was transferred via a lever mechanism to the mine, where it ran hoisting plants and water pumps. The power transmission beams were connected directly to the cranks of the wheel. The power was transmitted to the mine by a so called "pole-walking". The ensemble of this and other old industrial installations (Rolled-Pelle's loft shed, concentrator, large air compressor house, elevator device, smithy, etc.) forms a unique early industrial landscape.

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Stripa Gruva - Lindesbergs Museum

Gruvbackevägen (Mining Backvägen) 8, 711 78 Guldsmedshyttan – Lindesbergs, Sweden
Tel.: 46 581 811 56 (or 58)

www.stripa.se

The main task of Lindesbergs Museum is to bring alive the municipality's and regional history, with Stripa as a starting point, the place where the museum moved to in 2010. For many years, since 1993, the museum was housed in the Tellandska farm in Lindesberg, a beautiful farm from the late 18th century, but the lack of exhibition space and new regulations worked out the decision to move to the Stripa mine.

Stripa mine is since 2006 a protected historical monument and can be considered as the only surviving complete iron ore mine of its kind, including about 40 buildings, mostly in modernist style, including the head frame, sorting plant, concentrator, crusher houses, band walking gears, storage rooms, etc. The area around the mine buildings comprises 70 hectares. Since 2006, the focus of the museum changed in favour of the industrial history and the mining heritage of Stripa and the region.

The surroundings of Stripa (Rosvalslund and Lake Rasvalen) are the cradle of Swedish mining industry. From there iron ore was brought to the first small scale blast furnaces and the iron was distributed later in Fellingsbro. The Stripa Mine itself is a place of great historical importance. The famous "Stripe-strike" in 1925 brought the government down and introduced soon better security regulations, working conditions, and technological innovations spread in the completely Swedish mining industry.

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Sveriges Järnvägsmuseum Gävle (Swedish Railway Museum – Gävle)

Rälskatan 1, 802 91 Gävle, Sweden

Tel.: 46 10 123 21 00

www.trafikverket.se/Museer/Sveriges-Jarvagmuseum-Gavle/

The Swedish Railway Museum in Gävle has one of the most beautiful engines-collection of Europe and the world. The museum is housed in the historical Hennan's station from the 1940s, in a locomotive workshop and in Hosäter, the lineman's cottage. Visitors can enter into several historical carriages and wagons, and learn about the way steam locomotives were driven. They can even enjoy dinner inside an elegant train carriage.

Highlights of the collection include numerous steam locomotives as the Swedish State Railways - Beyer-Peacock Nr 3 from 1856 and Nr 75 from 1866, the Oxelösund-Fien-Westmannland Nr. 8 from 1876, etc. Eight steam locomotives dating from the 19th century on displayed. A permanent exhibition explains the role of railways in the development of the modern Swedish economy and into the social life of Swedish people.

The Swedish Railway Museum celebrated 100 years May 23rd on 2015. The year 2015 is also a jubilee and celebration year for 100 years of electric trains in Sweden. In 1915, the iron ore Line section from Kiruna to Riksgränsen was opened for electric traction. Soon afterwards, electric trains were running in all parts of the country, and the last steam railways stopped their service shortly after World War II.

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Repslagarmuseet Älvängen (Museum of Rope Making Älvängen)

Tagvirkesgränd 1, 446 37 Älvängen, Sweden

Tel.: 46 303 74 99 10

www.repslagarbanan.se

The Museum of Rope Making is located in Älvängen, along the Göta Älv River, about 35 kilometers of Gothenburg in a historical Lars Carlmark's ropery. The former rope-manufacturer was a family-owned business that started already in 1848, and moved to Älvängen in 1917. The old ropery was endangered in the early 1990s, but a civil preservation action "Save the Ropery" was successful at last. In 1995, the ropery was designated as the Industrial Monument of the Year and in 1996 it was assigned as historical monument.

The Museum of the Ropery is a living heritage museum, where rope making is always being demonstrated for visitors with old belt-driven machines. Visitors feel the fibers and yarns, the ropes, the hawsers and other cordage. They smell the tar and the natural fibers, who are processed. The rope walk is more than 300 metres long. Besides a vivid museum the facilities incorporate different exhibitions about ropemaking, the use of ropes through the history and educational workshops.

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SWITZERLAND

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Verkehrshaus der Schweiz (Swiss Museum of Transport)

Lidostrasse 5, 6006 Luzern, Switzerland

Tel.: 41 41 370 44 44

www.verkehrshaus.ch/en/

The Swiss Transport Museum in Lucerne (Luzern) opened in 1959 and is exhibiting all forms of transport as well as communications. It is one of the most popular museums of the country. The main sectors are devoted to rail transport, road transport, navigation, cableways, and aviation.

Highlights in the rail transport collection are the Jungfrau Railway – electric-powered cowheel locomotive (1898), a steam-powered snow-blower, constructed in 1895, the experimental electric locomotive "Eva" (1904) and "The elephant", the last Swiss steam locomotive,

constructed in 1916. A popular display is the Gotthard Railway model, operating since the opening of the museum.

The road transport section is housed in a new hall, designed by the Zurich architects Gigon/Guyer. This hall is adorned at four sides with 344 road signs from all regions of Switzerland. Different exhibitions are presented, including "Cars and Work" (describing all stages of car-production), commercial traffic and vehicles, electromobility, hybrid technology and other innovations.

The oldest means of transport at the Swiss Museum of Transport is a dugout canoe from Lake Biel dating back from the neolithic period. Highlights of Swiss navigation is the engine from the Lake Lucerne paddle steamer "Pilatus", the flush-deck side-wheel paddle steamer SS RIGI (the oldest ship of this kind in the world, dating from 1848 and built by the Ditchborm & Mare wharf in London), and a fully operational marine diesel from a 1929 River Rhine vessel.

A unique permanent cableway exhibition shows how the Swiss mountain tops became accessible for tourists and explains the pioneering role of Switzerland in opening up the Alps, as well as creating the basis for the livelihoods of tourists service providers.

Since the opening of the Aviation and Space Travel Hall in 1972, witnesses to the world of aviation from the past and present have been collected, refurbished and made accessible to the general public. More than 130 historic aircraft and flying machines, together with fascinating models, dioramas and artefacts are presented, while flight simulators take visitors to spectacular new heights.

There are several other attractions besides the main indoor collection, including the garden railway, the Planetarium, the EURECA (a 4,5 tonne satellite and one of the few space objects that returned safely after being launched into space), and the Swissair Conveyer Colorado jet airliner. The museum also maintains a large number of works by Hans Erni, a popular Swiss painter and sculptor.

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Museums-Spinnerei Neuthal (Neuthal Spinning Mill Museum)

Im Neuthal 6, 8344 Bärentswill, Switzerland

Tel.: 41 52 386 35 06

www.museums-spinnerei.ch

Johann Rudolf Guyer founded in 1827 the mill "Muëdsbach" with two large, superimposed, overshot water wheels. The Guyer and Hegner families managed the spinning mill until 1958 and the weaving workshops continued activity until 1965. In 1980 the canton of Zurich acquired the ensemble, declared a protected, historical monument. In 1988, the lower turbine was reinstalled on site and soon afterwards, in 1993, the building opened the doors for visitors. Part of the area is used by a foundation that cares for drug addict's rehabilitation.

The main building, in which the former textile industrialist and railroad pioneer Adolf Guyer Zeller (1839-1899) operated the mill, now houses the well known textile museum Neuthal. The oldest machines, dating from the middle and late 19th century, impress the visitors during their demonstrations. The restored turbine plant is an open Girard-turbine from 1887, connected with a flywheel and rope transmission, which directs the force in the spinning mill. The museum

presents a unique collection of hand looms and mechanical Rüti-loom. Another highlight is the ensemble of hand embroidery machines from the 1890s, with remarkable threading machines. The old industrial ensemble in Neuthal includes also the industrialist's villa and park in English style, the farm buildings, the workshop and warehouse. Near the factory is an impressive bridge, which is part of the route of the former Uerikon-Bauma train line, operated today by a "Steam Train Society Zürcher Oberland" (DVZO).

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Industrial Museums in Winterthur

- **Schaubetrieb Schweizerische Nagelfabrik (Swiss Nail Factory Winterthur)**

- **Dampfzentrum Winterthur – DZW (Steam Centre Winterthur)**

Schaubetrieb Schweizerische Nagelfabrik (Swiss Nail Factory Winterthur)

St-Gallerstrasse 138, Winterthur, Switzerland / Address of Inbahn Association (Verein für Industrie- und Bahnkultur): Lokomotivdepot, Lindstrasse 35, CH 8400 Winterthur, Switzerland
Tel.: 41 52 202 77 39

<http://www.nagli.ch/schaubetrieb-nagelfabrik.46.0.html>

Inbahn is a not profit association organising excursions about industrial culture and heritage in Winterthur. The guided tours include visits to the Brewery Haldengut, the Sulzer factory, the Sidi Boiler house, the spinning mill Hard, the Winterthur old locomotive warehouse, etc. One of the most successful attractions is the guided visit to an operative nail factory (Nagelfabrik Stifte), located opposite of Grütze railway station.

The more than 120 years old machinery, conserved on site, was restored in 2000-2004 by the industrial archaeologist Hans-Peter Bärtschi, a well-known researcher and expert about industrial heritage in Switzerland. The factory is owned by the family H. Gratwohl and is nowadays the only surviving factory of the kind in the whole country, and employing ten workers.

The combination of running modern machines and historical equipment, demonstrated for visitors, is quite unique. The restoration project in 'Nagli' (the popular name of the factory) was supported by the canton Zurich, and the municipality of Winterthur. However, a lot of restoration work and maintenance of the technical equipment is done by volunteers, and more financial input will be necessary in the future, to hold on the guided visits and cultural activities. 'Inbahn' welcomes in "Nagli" yearly over 2.000 visitors, mostly local inhabitants of Winterthur. Great efforts for professional management and scientific support are provided by the Swiss Foundation of the History of Technology and Industry (www.sgti.ch) and by the Foundation for Industrial Culture (www.industriekultur.ch).

Dampfzentrum Winterthur – DZW (Steam Centre Winterthur)

Visitors address: Lagerplatz 27 (Halle 181), Zur Kesselschmiede, Winterthur, Switzerland
Postfach 1706, 8401 Winterthur, Switzerland

<http://www.dampfzentrum.ch>

The Steam Centre Winterthur (Dampfzentrum Winterthur) is a brand new heritage and technology attraction, founded in 2009 and still in full development. In 2011, a former, vacant production hall (nr. 181) of the Sulzer Company could be used as temporary DZW-headquarters. Winterthur is chosen as location because this city is the cradle of industrial

development and steam engine construction in Switzerland, with SULZER as most important manufacturer of steam engines.

DZW is supported by private and public funds. The mission of the Steam Centre Foundation is to welcome visitors in an 'open factory', a workshop where steam engines from all sizes and periods are restored, displayed and demonstrated. DZW will not be a new museum but be the lively platform of companies, involved with the conservation of team technology, displaying also, through an exceptional collection of steam powered machinery (online inventory: see website www.dampfzentrum.ch), the large economic and social impact of steam power in the making of Switzerland as a leading industrial country.

An important part of the outstanding steam engines collection was taken over from the former VAPORAMA in Thun, and moved to Winterthur in 2011. Near the location of DZW are the workshops of DLM ("Dampflokotiv- und Maschinenfabrik DLM AG", see: www.dlm-ag.ch), who restores steam locomotives, an activity strongly related with the activities of DZW.

The Steam Centre Winterthur is looking now for adapted buildings and infrastructures. An ambitious project is a new complex building, south of the 'Nagelfabrik' (see nr. 89). Meanwhile DZW should use temporary quite unused buildings as the Rieter workshops (Rieter Industriehallen) in Wülfigen, well located next to the railway station of Winterthur Wülfigen. Another option is the housing of DZW in the magnificent locomotive hall of the former SLM – Company, a legally protected building, erected in 1913.

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Horology Museums in the Jura-Region: Musée International d'Horlogerie (International Museum of Horology) & Musée d'Horlogerie du Locle

Chaux Musée International d'Horlogerie (International Museum of Horology)

Rue du Musée 29, 2300 La Chaux-de-Fonds, Switzerland

Tel.: 41 32 937 68 61

<http://www.chaux-de-fonds.ch/musees/mih>



In 1865 the Watchmaking School of La-Chaux-de-Fonds, one of the focal laces of the Swiss watchmaking industries, had the idea of putting together a collection of old clocks. This resulted in 1902 in a small museum in the same building as the school. The collection gradually grew and the museum was enlarged several times. In 1974, the museum moved in a large, new, modern building, financed by the municipality.

Major collection highlights include: a full size replica of Giovanni de'Dondi's Astrarium, a comprehensive exhibit on the history and chronology of the "Pendule neuchâteloise", outstanding clocks of major master clockmakers, including Abraham Louis Breguet, Antide Janvier, Julien Le Roy, marine chronometers by Ferdinand Berthoud, a musical organ clock by Pierre Jaquet-Droz, a large collection of tower clocks, a significant collection of precision pendulum cocks, automata, a monumental fresco "The Conquest of Time", painted by Hans Erni in 1958 for the Swiss Pavilion at the Universal Exhibition 1958, in Brussels, etc.

Associated with the museum is a first rate conservation workshop, a scientific library (considered the most comprehensive specialised horological library of Europe), and finally "L'Institut l'Homme et le Temps", a research and publishing institution, that studies the role of time and time keeping instruments in society.

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Musée d'Horlogerie du Locle

Rue des Monts 65, CH-2400 Le Locle, Switzerland

Tel.: 41 32 933 89 80

<http://www.mhl-monts.ch/en/>

The watch museum of Le Locle is the offspring of a collection begun in 1849. The objective of this first institution was to gather all the historical and mechanical curiosities of the region. In 1858, these collections moved to the brand new industrial school. The year 1868 marked the opening of the Watchmaking School of Le Locle and the watch collections of the Museum of Le Locle were transferred to the new school, but they were neglected and nearly forgotten...

Finally, in 1951, a small group of enthusiasts decided to revive the museum and succeeded to install the collections into the Château des Monts. The inauguration of the Watch Museum took place in 1959.

The collection is nowadays spread over the historical salons of the castle and new exhibition areas, dedicated to the technical evolution of watches from the Renaissance to our days. The permanent exhibition "The Times of Time" was inaugurated in 1999, and deals with the comprehension and measurement of time. Presented in a modern setting, it not only deals with the industry preoccupation of measuring time, but also with calendars and chronologies and non-mechanical time measurements such as hourglasses and sundials.

Temporary exhibitions focus on specific aspects of watch-making and time-measurement. The Musée de l'Horlogerie of Le Locle organises regularly scientific conferences and other public events and manages a scientific library and achives centre, including the Alfred Chapius archives and Tardy-Lengellé collection.

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UNITED KINGDOM

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Bradford Industrial Museum

Moorsite Mills, Moorside Road, Bradford (West Yorkshire) BD2 3HP, UK

Tel.: 44 1274 435 900

www.bradfordmuseums.org

Bradford Industrial Museum was established in 1974 in Moorside Mills (Eccleshill, Bradford) and specializes in relics of local industry, especially printing and textile machinery, kept in working condition for regular demonstrations to visitors.

The original mill was built in 1875 for worsted spinning. In 1919 the clock tower was built as a war memorial to those lost in World War I. The mill was enlarged with two floors and was later sold to W. & J. Whitehead, who ran the ring spinning machine which is still present in the museum. In 1970, Bradford Council bought the mill and opened four years later the remarkable industrial monument as a museum.

The ground floor galleries present the multicultural history of the area, starting with the immigration of German workers in the 19th century. The exhibition includes old weaving looms (with wooden flying shuttles), hand carders and others pre-industrial textile devices, waterwheels, steam engines (including the Linton engine, one of the last Bradford-made steam engines). Another part of the ground floor gallery presents vintage cars, commercial vans (built by Jowett in Bradford), Scott motor bikes and Baines bicycles, an impressive steam roller from 1928 (owned by Bradford city council), steam locomotives, a unique Bradford tramcar and a trolleybus. The collection of printing machines and equipment is outstanding, including a display of lead glyphs for typesetting, an Arab patent platen machine and a Wharfedale stop cylinder press.

The first floor textile galleries present the industrial phase of textile production in Bradford, well known for its worsted cloth. This extraordinary exhibition (one of the most complete presentations about textile industry in England) presents first of all an impressive spinning gallery, with carding and combing machines, drawing machines and finishers, spinning mules and selfactors, including a 120-spindle flyer spinner, a 122-spindle flyer twister, a 64-spindle cap spinner and a 24-spindle velox spinner. The weaving gallery with domestic looms and a wide variety of power looms is another of the museum's highlights.

Outside the mill building, visitors can discover the Moorside House interior, the Gaythorne Row (Victorian back-to-back workers houses) and the 'Horse Emporium' in the former mill's canteen block, where displays are arranged on the theme of horse power, including a saddler-at-work display, a complete blacksmith and horse-drawn vehicles.

The Bradford Industrial Museum presents a lot of living history events (as the yearly Victorian-style Christmas craft market, workshops in a Victorian school) and organizes each year temporary exhibitions of outstanding quality.

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Saltaire village & Visitor Centre / Museum - World Heritage Site

Salts & Visitor Centre, Victoria Road, Shipley – Saltaire, West Yorkshire BD 18 3LA, UK

Tel.: 44 1274 531 163

<http://saltsmill.org.uk/> // www.saltairvillage.info/

Saltaire is a Victorian model village near the town of Bradford, by the River Aire. In 2001, UNESCO designated the village of Saltaire as a World Heritage Site. Saltaire is of course not a museum, but in the main mill building (called “Salts”), a permanent exhibition “People and Process: a History of Salts Mill” (and another exhibition about the life and work of the artist David Hockney) welcome the visitors. The Visitor Centre is the best place to start the discovery of this open-air museum like old industrial village.

Saltaire was built in 1851 by the Yorkshire industrialist Sir Titus Salt. The name is a combination of the founder’s surname (Salt) and of the river (the Aire). Salt moved his mills from Bradford to the new location to arrange his workers and to settle his large mill nearby the Leeds and Liverpool Canal. The most important buildings were designed by Henry Lockwood and Richard Mawson. Salt built solid neat stone houses for his workers and a lot of social services, including a bath-house, a hospital, a school with a public library, a billiard hall, a concert hall, a gymnasium, a boathouse and much more... The original village is often considered as an important development in the history of 19th century town planning and urbanism.

Sir Titus Salt died in 1876 and was interred in the mausoleum near of the Congregational church. The Saltaire mill was taken over by Sir James Roberts and his partners. Roberts, who working from the age of 11 in textile factories, was a brilliant entrepreneur and, above all, an investor in Russian industries, but he was losing a part of his fortune in the Russian Revolution. Roberts endowed chair of Russian language and culture at Leeds University.

The mill closed in 1986 and Jonathan Silver bought it in 1987, and started renovation works. The village of Saltaire survived remarkably complete and is a conservation area. In the main mill building, different exhibitions about the history of Saltaire and art shows can be visited. The main mill building and the “New Mill” (on the other side of the canal) also presents a wide range of shops, design galleries, restaurants, cafés, offices and residential flats.

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Leeds Industrial Museum at Armley Mills

Canal Road, Leeds LS12 2QF, UK

Tel.: 44 113 263 78 61

www.leeds.gov.uk/museumsandgalleries/Pages/armleymills.aspx

Housed in what was once one of England’s largest woollen mills, Leeds Industrial Museum presents since the opening in 1982 a unique collection mainly focused on textile history and heritage, located in a beautiful canal-side setting. Visitors step back in time to learn about the industrial history of Leeds from manufacturing textiles, garments and clothing to printing,

textile machinery, engineering, steam engines, cranes and locomotives, which the city was world famous for.

Leeds has a very long history of involvement in the wool trade and its position was enhanced by the opening of navigable waterways, the Aire and Calder Navigation, and the Leeds – Liverpool Canal. By about 1838 there were in Leeds 106 woollen mills, employing 10.000 people transforming Leeds into a major city. Textile industry created extremes of wealth and alongside poverty: in 1832 a child died in a Leeds mill when he was not allowed to stop work to go to the toilet. In the second half of the 19th century the woollen industry in Leeds declined in the face of competition from other towns like Bradford. Another textile related industry, ready-made clothing, introduced by John Barran, appeared to take its place. Soon this branch flourished with a number of companies involved who later became household names, such as Burtons and Hepworths.

Armley Mills itself has a long and interesting history. The earliest record dates from the middle of the 16th century when the local clothier Richard Booth leased 'Armley Millnes' from Henry Savile. In the 18th century was in use corn-mill and fulling mill. There are still fulling hammers and stocks (from later periods) in the actual building. In 1788 Armley Mills was bought by Colonel Thomas Lloyd, who turned it into the world's largest woollen mill. The mill was leased to the Thomas' brother Israel Lloyd and John Burrows, who lived in two houses above the canal. These houses are still conserved today. In 1804 Benjamin Gott agreed to buy Armley Mills, but one year later the mill was almost entirely destroyed by fire. Gott rebuilt the mill from fireproof materials, and this building survives largely intact to this day. The sons of Benjamin Gott took over the business in 1840 and introduced steam power to supplement the waterwheels, which continued operating until the 1860's. In 1907 the clothing manufacturers Bentley and Tempest become the sole occupiers. Like many other textile mills, Armley could not cope with the combination of the loss of markets as the British Empire split up, the increased competition of abroad and the use of more synthetic fibres. In 1969, the mill finally closed as a business, was bought by the Leeds City Council, and was re-opened in 1982 as a museum.

A complementary visit is suggested to the Thaitte Mills Watermills Museum, located 4 km south of Leeds city centre, one of the last remaining examples of Britain of a water-powered mill.

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Kelham Island Museum

Alma Street, Sheffield S3 8RY, UK

Tel.: 44 114 272 2106

www.simt.co.uk/kelham-island-museum

Located in one of the city's oldest industrial districts, the Kelham Island Museum is a pioneer of the industrial heritage museums in Britain, and continues today its mission: the lively presentation of Sheffield's industrial story, from light trades and skilled workmanship to mass production. The museum tells the growth of the steel city through the Victorian Era and the 20th century, and how steelmaking forged both the city of today and the world. Kelham Island Museum not only houses and displays objects, pictures and archive material, but also welcomes visitors into interactive galleries, telling what it was to live and work in Sheffield during the Industrial Revolution.

The museum building is a re-used electricity generating power station, erected in 1890 on site of the demolished Kelham Iron Works. The power station provided power for the city's new tram system until the late 1930s, after which the buildings were used as storage space and workshops. In 1982, the Kelham Island Museum was inaugurated. The unique Bessemer convertor, next of the museum entrance, became in no time a new landmark and a symbol of Sheffield as steel city.

Highlights of the collection include the River Don Engine (weight: 400 tons, 12.000 horsepower), built by Davy Brothers of Sheffield in 1905 at Park Iron Works in Sheffield. It was made to drive Charles Cammel's armour plate rolling mill located at his Grimesthorpe Works. Another exceptional object is the Bramah Press, a hydraulic pressing machine made by Joseph Bramah and Co in London in the early 19th century. It was used for flattening paper, cloth and steel.

The three main collection fields are: heavy industries heritage (iron and steel, engineering, extraction and refractoriness, armaments), light industries (cutlery, hollowware and tools) and finally general collections (including relics of scientific and technological research).

Kelham Island Museum is part of Sheffield Industrial Museums Trust. The other two branches are "**Abbeydale Industrial Hamlet**" (a unique 18th century tools factory, once water-powered on the River Sheaf) and "**Shepherd Wheel Workshop**" (a unique working example of Sheffield knife grinding industry, located in the picturesque valley of the Porter Brook).

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Glasgow Transport Museum / Riverside Museum

100 Pointhouse Place, Glasgow G3 8RS, UK

Tel.: 44 141 287 27 20

www.glasgowmuseums.com

www.glasgowlife.org.uk

The multi-award winning Riverside Museum presents outstanding objects that detail Glasgow's rich past from its days as maritime powerhouse to a glimpse into daily Glasgow life in the early to mid 20th century. The Riverside Museum is housed in an exceptional contemporary building, designed by architect Zaha Hadid, who won the contract to design the new museum in 2004. The museum is located on the site of the former Inglis Shipyard, on the north bank of the River Clyde, where it merges with the River Kelvin.

Riverside Museum is home of some of the world's finest cars, bicycles, ship models, trains and locomotives. Interactive displays and the hugely popular historic Glasgow streets scene bring the objects and stories to life. Other display themes are: The River Clyde, Transport and Leisure, Made in Scotland, Looks and Fashion, Crossing the World, Cutting Edge, Disasters and Crashes and Getting There.

The objects on display have increased from 1400 on display in the old Transport Museum to over 3000 at Riverside, including one of the largest locomotives on display in Britain, a huge export South African locomotive designed and made in Glasgow.

An outdoor highlight of Riverside museum is the “Tall Ship”, berthed at Pointhouse Quay, alongside the museum. It is the only floating Clyde-built sailing ship, and is operated by the Clyde Maritime Trust.

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Summerlee Museum of Scottish Industrial Live

Heritage Way, Coatbridge ML5 1QD, Scotland, UK

Tel.: 44 1236 63 84 60

www.northlanarkshire.gov.uk

The Summerlee Museum of Scottish Industrial Life, formerly known as Summerlee Heritage Park, is an industrial and technical museum, located in Coatbridge, North Lanarkshire. The museum opened in 1987 and occupies the site of the old Summerlee Ironworks. Remains of its blast furnaces can be seen from the view pod and parapet at the north-east side of the main exhibition hall. The Summerlee Ironworks, opened in 1836, used the ‘hot blast’ process, patented by James Beaumont Neilson, making the smelting process more efficient and this led to Coatbridge becoming known as the ‘Iron Burgh’ of Scotland by the mid of the 19th century. The main exhibition hall of Summerlee Museum was created in the 1980s from the former Hydrocon Crane Works. It now provides an excellent space for the museum’s displays and working machinery, including a huge winding engine from the former Cardowan Colliery. During an intensive refurbishment of the main hall in 2006-2007, redesigned by North Lanarkshire Council’s inhouse Design Team, the Summerlee Museum reopened in September 2008. In 2012 the museum created a new covered display area for their key items of large engineering equipment. This engineering Pavilion displays some of the highlights of the collection, including historic machine tools, steam engines, boilers, pumping engines, milling and drilling machines, etc. The museum incorporated interactive displays and a children’s “Discovery Zone”.

Outside the museum presents a working tramway, with historic trams taking visitors to the reconstructed mine and to the miner’s cottages. The mine shows the tough conditions in which local miners had to work, and the cottages their living conditions from the 1840s to the 1980s. A short walk up a restored branch of the Monklands Canal completes the visit.

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New Lanark World Heritage Site

New Lanark, South Lanarkshire, Scotland M11 9DB, UK

Tel.: 44 1555 66 13 45

www.newlanark.org

New Lanark, just as Saltaire, described elsewhere in this guide, isn’t a real museum but an exceptional industrial heritage site with a visitor centre and exhibitions, who tell the fascinating history of the cotton village of New Lanark, which was founded in the 18th century and became

an epitome of utopian socialism, as well as an early example of a planned industrial settlement, a milestone in the history of urban planning.

New Lanark, a factory village on the River Clyde, quickly became known under the enlightened management of social pioneer Robert Owen (1771-1858), successor of David Dale, the founder of the textile works in 1786. Owen, Dale's son-in-law, was a Welsh philanthropist and social reformer. In Owen's time some 2.500 people lived at New Lanark, many from the poorhouses of Glasgow and Edinburgh. He provided decent homes, fair wages, free health care, a new education system for villagers, including the 'Institute for the Formation of Character' and the first nursery school in the world.

The New Lanark mills operated until 1968. After a period of decline, the New Lanark Conservation Trust was founded in 1974 to prevent demolition of the nearly deserted village. By 2006 most of the buildings have been restored and this attracted new inhabitants. In 2001, New Lanark has been nominated by UNESCO as a World Heritage Site. Today, the beautifully restored village of New Lanark is a living community, which welcomes nearly yearly 400.000 visitors from all over the world.

The Visitor Centre delivers a "passport ticket" to explore many attractions and exhibition areas, including the "Annie McLeod Experience' Ride" (which takes visitors back to 1820 and to the working girl Annie, who reveals her life and times in New Lanark), Robert Owen's School for Children, millworkers' houses from different periods, Robert Owen's house, a roof garden on top of one of the mills, engine houses, a unique ensemble of working textile machinery in the four-storey "New Buildings", and the brilliant exhibition "People & Cotton".

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Ironbridge Gorge Museum

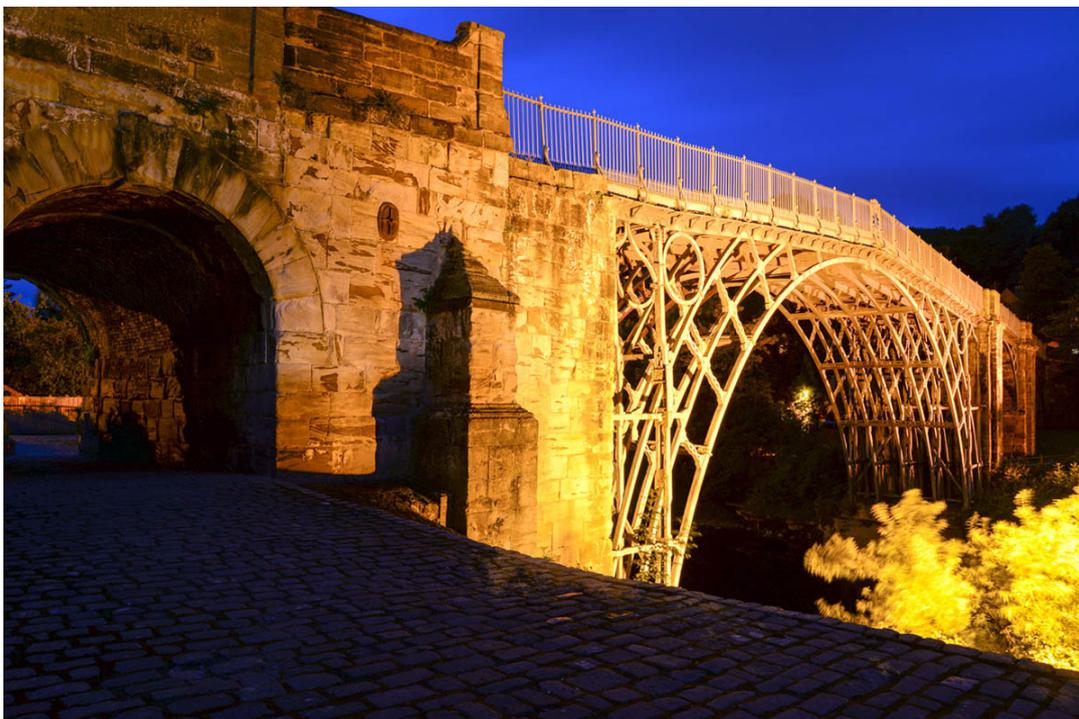
Coach Road, Coalbrookdale, Shropshire TF8 7DQ, UK

Tel.: 44 1952 43 34 24

www.ironbridge.org.uk



Cliché : Bart Vanacker



Cliché : Bart Vanacker

The area around Ironbridge is often described as the “Birthplace of Industrial Revolution”, based on the idea that Abraham Darby I perfected the technique of smelting iron with coke. Of course, this invention by Darby was only one (important) part of this generalised revolution. However, the cast iron bridge over the Severn in Ironbridge, built in 1779 by his grandson, Abraham Darby III, was the first of this kind in the world and is one of the very few which have survived to the present day. This bridge is an important symbol of the dawn of the industrial period. The same is true for the old furnace in Coalbrookdale, where Abraham Darby I perfected the smelting of iron with coke instead of charcoal. The Ironbridge and Coalbrookdale area is since 1986 a UNESCO World Heritage Site and an anchor point of the European Route of Industrial Heritage (ERIH).

Ironbridge Gorge Museum, managed by the industrial heritage organisation Ironbridge Gorge Museum Trust (IGMT), established in 1967, includes ten museums, impossible to described in detail, but well documented on-line: Blists Hill Victorian Town (an open air museum with original brickworks- and blast furnaces-relics, completed with re-localised industrial buildings, a museum-section opened in 1973, and which includes the Hay Canal Inclined Plane), Brosely Pipeworks, Coalbrookdale Museum of Iron, Coalport China Museum, the Darby Houses, Engenuity (an interactive technology centre in Coalbrookdale), the Iron Bridge and Tollhouse, Jackfield Tile Museum (in the former tileworks Craven Dunnill) and the Museum of the Gorge, installed in the Severn Warehouse.

This last attraction, a museum explaining the overall picture of the Ironbridge Gorge sites, visualised with a large diorama, is the best place to start the discovery of the different museum branches and industrial monuments. The IGMT also runs the Ironbridge Institute in Coalbrookdale, a centre offering postgraduate and professional courses in heritage management, in partnership with the University of Birmingham.

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Black Country Living Museum

Tipton Road, Dudley, West Midlands DY1 4SQ, UK

Tel.: 44 121 557 96 43

www.bclm.co.uk/

Black Country Living Museum is an open-air museum with rebuilt historic buildings and occupies 11 hectares of former industrial land, partly reclaimed from a former railway goods yard, old lime kilns and former coal pits. Since the opening year 1978, a lot of buildings and exhibits have completed this outstanding open-air museum.

The Black Country, west of Birmingham, is famous for the innovative iron smelting techniques by Thomas Dudley, and for its range of steel-based products, from nails to the anchor and anchor chain for the Titanic. In the Old Rolfe Street Baths, the museum displays a wide range of industrial products, which were made in the Black Country, including cast iron hollow ware, chains, enamels, locks, weighing scales and fire clay products.

The museum presents also a working replica of a Newcomen atmospheric engine, invented by Thomas Newcomen in 1712 for pumping water from coal mines. This replica was built in 1986 and is housed in a brick machine hall, forming part of the coal mine section.

Other highlights of the Black Country Living Museum include three late 18th and mid 19th century lime kilns alongside Dudley Canal. Metal working technology and heritage is well represented by trap shops, nail shops, a brass foundry, a chain maker's shop, and a machine shop with Oliver hammer. A very popular section is the complete village, included rebuilt houses, shops, a post-office, a chapel and school. These structures, dating from the late 19th and early 20th century, were removed from their original settings, where they were in many cases endangered. A 1930s fairground completes the village.

An interesting section is the museums' boat collection, displayed on the boat dock. The transport collection, one of the most important of England, includes trams, motor buses, trolleybuses, motor cars and attracts numerous fans of historical vehicles and transport heritage.

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Merseyside Maritime Museum

Albert Dock, Liverpool Waterfront, Liverpool L3 4AQ, UK

Tel.: 44 151 478 44 99

www.liverpoolmuseums.org.uk/maritime

Merseyside Maritime Museum is located in the Albert Dock, opened in 1845, the oldest conserved part of the Liverpool harbour. Before, the museum has had different other locations during its history. Much objects of the first collection (including more than 60 model ships and boats) were destroyed during the May Blitz of 1941. Despite this losses, the collection grew substantially. Most of it was kept in storage as it had outgrown its Liverpool Museum gallery. However the opening of History of the Ship gallery (1965), the Port of Liverpool gallery (1971)

and the New Shipperies Exhibition (1974) helped to maintain public interest in the burgeoning collection.

In the late 1970s, work began on the creation of a dedicated maritime museum on the Liverpool waterfront. The museum opened for a trial season in 1980, based around the pilotage building and the former salvage shed, while work began to revive the dock. In 1984 the Piermaster's House was opened. This house was originally built in 1852 for the family of the pier master, responsible for ensuring the safe passage of ships entering and leaving the dock at high tide. The house was the only one of four, who left standing following heavy bombings in the Second World War and in 2003 it was transformed back into "a wartime house". The museum we know today moved in 1986 into 'Block D' of the completed Albert Dock restoration.

The Merseyside Maritime Museum presents a wide range of objects associated with the social and commercial history of the port of Liverpool. Highlights include ship models, maritime paintings, important maritime archives and even some full sized vessels. The first floor presents different exhibitions, as "Life at Sea", "the Battle of the Atlantic" and the brand new presentation "Lusitania: life, loss, and legacy". Major current exhibitions on the second floor are "Builders of Great Ships" and "Titanic and Liverpool: the untold story", explaining the story of Liverpool's links to the ill-fated liner. The museum also houses the International Slavery Museum as well as (in the basement) the Border Force's national museum "Seized! The Border and Customs uncovered" and the exhibition "Emigrants to a New World". The largest object of the museum is the Edmund Gardner, a former pilot cutter, now located in a dry dock opposite the museum. This ship was essentially a base out in the Irish Sea for the Pilotage Service. The Merseyside Maritime Museum is famous because of its rich collections, reflecting the vitality and importance of the port of Liverpool and its role history, and also because of its unique location at Albert Dock, where also other museums (Tate Liverpool, The Beatles Story) welcome visitors.

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National Railway Museum

Leeman Road, York YO26 4XJ, UK

Tel.: 44 844 815 31 39

www.nrm.org

The National Railway Museum (NRM) was established on its present site, the York North locomotive depot, in 1975, when it took over the former British Railways collection (located in Clapham) and the York Railway Museum. The actual museum is forming part of the British Science Museum Group and tells the story of rail transport in Britain and its impact on society. The collection of historically railway vehicles and other related artefacts is the largest of Britain: a collection of over 100 locomotives and nearly 300 other rolling stock items are displayed. The museum welcomes yearly about 750.000 visitors. "Locomotion" is an important branch of the NRM in Shildon (County Durham), opened in 2004 and housed in a new building next to a historic site around the former workshop of Timothy Hackworth (the name of a famous steam locomotive engineer).

The earliest vehicles exposed in York are wagonway vehicles (hauled by horses) of about 1815, which preceded steam-powered railways. The permanent display includes “Palaces on Wheels”, a collection of Royal Train saloons from the 19th and 20th century. Other popular exhibits are the 1846 Furness Railway n° 3 ‘Coppernob’ locomotive, and express passenger steam locomotives “London and Eastern Railway Class A4 N° 4472 Flying Scotsman”, its streamlined sister “Class A4 N° 4468 Maillard” and “London Midland and Scottish Railway Princess Coronation Class N° 6229 Duchess of Hamilton”.

The museum has imported several major vehicles for display, as the Japanese Shinkansen vehicle, donated to the NRM by the West Japan Railway Company. Unique large exhibits are the Stockton and Darlington Railway Gaunless Bridge and stationary winding engines used on railway inclines. Other elements of the NRM collection include signalling equipment, posters, clocks and furniture. A large part of these collections can be researched in an online inventory. The NRM holds a large open library and archive of railway related material, including 25.000 books, 800 journals and magazines, 2 million photographs, and countless locomotive and rolling stock engineering drawings from railway works and independent manufacturing companies. A more recent collection is an ensemble of recordings of former railway staff for a National Archive of Railway Oral History. Since 1995 the museum joined forces with the University of York to create and develop an academic research base, the Institute for Railways Studies and Transport History.

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Museum of Science & Industry

Liverpool Road, Manchester M3 4FP, UK

Tel.: 44 161 832 22 44

www.mosi.org.uk

The Museum of Science and Industry – Manchester (MOSI) is a large museum institution devoted to the history and actuality of science, technology and industry with a focus on the city’s achievements in these fields. The museum originally called the North Western Museum of Science and Industry, when it opened in 1969 in temporary spaces on Grosvenor Street in Chorlton-on-Medlock. The actual MOSI presents extensive displays on the theme of transport (with an outstanding aviation collection, presented in the separate “Air and Space Hall”, opposite the main MOSI-building) and, even more important, on the theme of power (water, electricity, steam and gas engines, displayed in the MOSI “Power Hall”). Unique collection pieces include a beam engine used at Haydock Colliery, the impressive 1907 McNaught engine from Firgrove Mill, engines built by Crossley Brothers and the National Gas Engine Co. Ltd, a Galloways pumping engine and a towering 30-tonne hydraulic accumulator.

A special topic is Manchester’s sewerage and sanitation (an often forgotten aspect of industrial development, outstandingly presented in the “Underground Manchester Gallery”), local textile industry (with thunderous demonstrations of historic mill machinery), communication and computing. “The Making of Manchester Gallery” tells the story of Manchester from Roman Times to the present day. Given city status in 1853, Manchester developed a strong sense of civic pride. Unique items are displays relating to the Manchester Ship Canal, one of the great

British civil engineering achievements of the 19th century. MOSI's newest gallery is the "Revolution Manchester Gallery" (opened in 2011), providing an overview of Manchester's rich legacy of world-changing industrial innovations and scientific discoveries.

The MOSI is an Anchor Point of ERIH (European Route of Industrial Heritage), and is situated on the site of the world's first railway station, called "Manchester Liverpool Road", which was opened as part of the Liverpool and Manchester Railway in September 1830 and was in use until 1975, before being bought and restored by the Greater Manchester Council.

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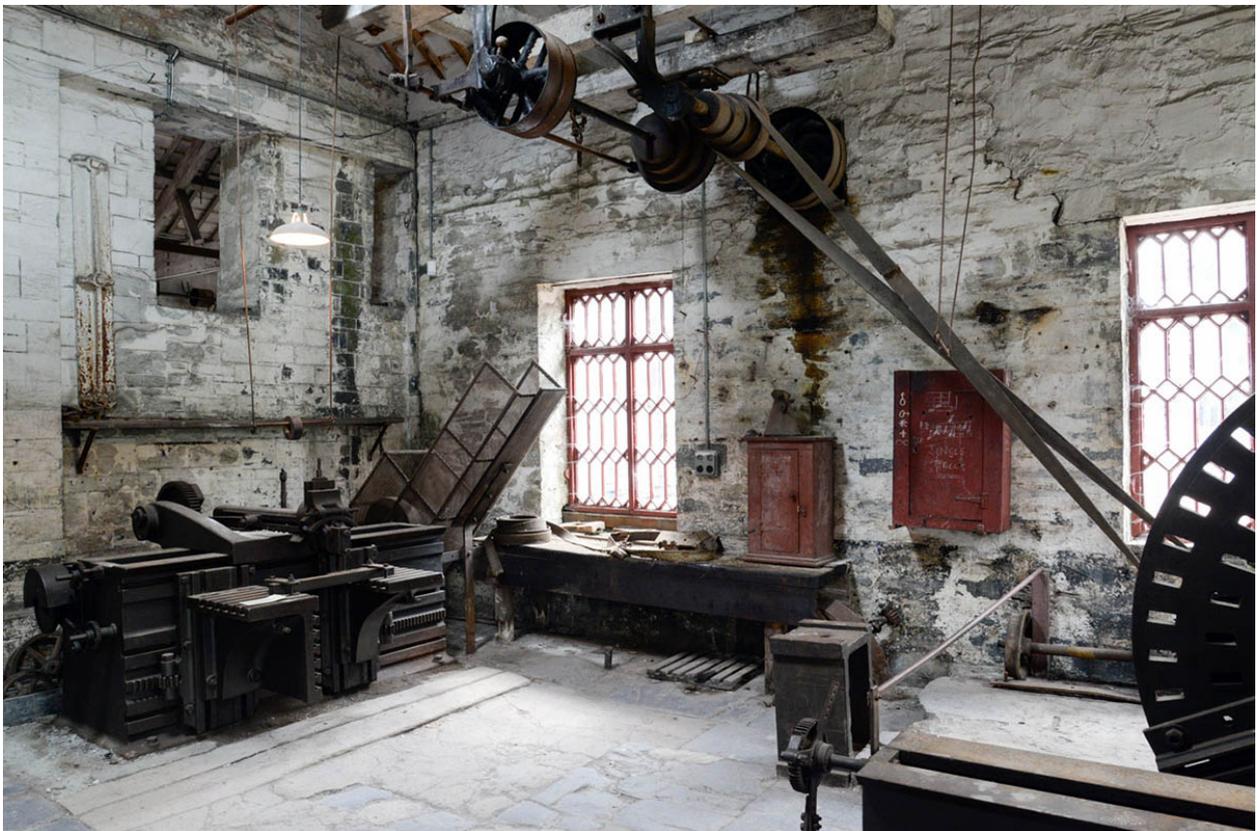
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National Slate Museum Llanberis

Llanberis, Gwynedd, LL55 4TY, UK

Tel.: 44 29 2057 3700

www.museumwales.ac.uk/slate/



Cliché : Bart Vanacker

People have been quarrying slate in north Wales for over 1.800 years. Slates were used to build parts of the Roman fort in Segontium (Caernarfon), and in Edward I's castle at Conwy. With the dawn of the Industrial Revolution in the 18th century, the slate industry really took off. With the growth of many industrial towns, there was an enormous demand for slates to roof the long terraces of workers houses, as well as the factories, mills and foundries themselves.

The National Slate Museum is sited in the Victorian workshops built in the shadow of Elidir Mountain, site of the vast Dinorwig quarry, opened in 1787. By the 1870s Diwornig quarry employed over 3.000 men. It was the time when Wales produced over 80 % of all British slates. In 1882 Caernarfonshire county's quarries produced over 280.000 tons of finished roofing slates

and in 1898 the slate trade in Wales as a whole reached its peak with 17.000 workers producing 485.000 tons of slate. In the late 20th century most of the quarries were closed, included Dinorwig quarry in 1969.

In the National Slate Museum, visitors of today can travel into the past of an industry and a way of life, which has chiselled itself into the very being of north Wales. The workshops and buildings are designed as though quarrymen and engineers have just put down their tools and left the factory courtyard for home. Built in 1870, the workshops are constructed on a pattern similar to an old fort. The central courtyard, clock tower give then a unique character.

Talks and demonstrations including slate-splitting give visitors a real insight into quarry life and reveal the skills and artistry of generations of quarry workers. Also UNA, a Hunslet engine is demonstrated, while blacksmiths create wrought iron objects and talk about their work. A row of four quarrymen's houses recapture significant periods from the slate industry (1860, 1900 and 1960), and a fourth house offers interactive learning facilities for schools, children and their families.



Cliché : Bart Vanacker

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Portsmouth Historic Dockyard & National Museum Royal Navy Portsmouth

Victory Gate, HM Naval Base, Portsmouth, Hampshire PO1 3LJ, UK

Tel.: 44 23 9283 9766

www.historicdockyard.co.uk

The HMS Victory, the oldest commissioned warship in the world (launched in 1765), is probably the most well-known symbol of Portsmouth and the Royal Navy, present since centuries in this legendary harbour town, which has been along with Chatham, Woolwich, Plymouth and Deptford, one of the main dockyards for the Royal Navy throughout its history, known for being the place of the oldest dry docks in the world, built by Henry VII in 1495. Lord Horatio Nelson embarked in 1805 on HMS Victory and left Britain from Portsmouth for the final time before his death at the Battle of Trafalgar, Britain's greatest naval victory. In 1922, the HMS Victory was moved to a dry dock at Portsmouth and preserved as a living museum ship to the Georgian Navy. HMS Victory has been the flagship of the First Sea Lord since October 2012.

In addition of this HMS Victory, a portion of the old Navy base serves as a maritime museum, now called "Portsmouth Historic Dockyard", hosting different old ships. An important old naval heritage object is the wreck of the Tudor carrack Mary Rose, built in 1509 and capsized in 1545, but raised in 1982. The ship is viewable from 2013 in a new Mary Rose Museum building, an outstanding piece of contemporary architecture.

Another important ship is the HMS Warrior, the first ocean-going ironclad and once the proud of Queen Victoria's fleet, built at Blackwall on the River Thames in 1860, and which is moored in the dockyard. Visitors can discover the amazing inside spaces of his iron-hulled ship, powered by steam as well as sail. The Belfast-built HMS M33, a World War I monitor, is on display at Portsmouth since 1999 after being refurbished at Hartlepool. The HMS Alliance, the only remaining World War II era British ocean going submarine has been newly restored.

Portsmouth Historic Dockyard includes the National Museum of the Royal Navy Portsmouth, probably one of the most famous of maritime museums of Europe. The museum, installed in the amazing "Great Naval Storehouses" (1760-1790), tells not only the work and life of leading persons but also numerous amazing stories of ordinary people, who made the Navy's history, from the 19 year old fighting the slave trade off West Africa in the 1820s, to the first women who served at sea in the 1990s. The museum contains different galleries as the Victory Gallery, the Nelson Gallery, the Sailing Navy Gallery, the Jules George Exhibition, etc.

Other sectors of the Historic Dockyard include "Action Stations" (a wide range of interactive displays about the recent history of the Royal Navy, housed in a magnificent old Boathouse, built in 1845), the Museum of Naval Firepower, the Royal Marines Museum, and an interactive exhibition named "The Dockyard Apprentice", telling the story of Dockyard life in 1911, when the great Dreadnought battleships were being constructed.

To visit Portsmouth Historic Dockyard, visitors need several days to enjoy all the attractions proposed on site and experience the extraordinary landmarks of three centuries, including Victory Gate, Boathouses 4, 5, 6 and 7, the Great Ropehouse, and much more heritage elements.

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Science Museum

Exhibition Road, London SW7 2DD, UK

Tel.: 44 870 870 48 68

www.sciencemuseum.org.uk

The Science Museum was founded in 1857 and today is one of London's major tourist attractions, visited by 3,5 million persons annually. The origin of the first collections came from the Royal Society of Arts and surplus items from the Great Exhibition (1851) as part of the South Kensington Museum. It included a collection of machinery which became the museum of Patents in 1858. This collection contained many of the most famous exhibits of what is now the Science Museum. In 1885, the collections of science and technology were renamed "Science Museum" and the art collections were renamed Art Museum, which eventually became the Victoria and Albert Museum. In 1909, the Science Museum, as an independent entity, came into existence.

The present quarters, designed by Sir Richard Allison, were opened to the public in stages over the period 1919-1928. A pioneering Children's Gallery opened in 1931 and the Centre Block was completed in 1961-63. The infill of the East-Block and Lower and Upper Wellcome Galleries were completed in 1980, while the construction of the Wellcome Wing was opened in 2000. The Science Museum now holds a collection of over 300.000 items. Highlights include Stephenson's Rocket, Puffing Billy (the oldest surviving steam locomotive), some the earliest remaining steam engines, the first jet engine, a working example of Charles Babbage's Difference engine, Watson and Crick's double helix (model of DNA), an Apollo spacecraft, etc. The museum has six levels. On the ground floor visitors discover general themes of science, but also energy (with the presentation of the oldest surviving James Watt beam engine), flight and space exploration. The first floor presents development and scientific research in agriculture, time measurement and materials. Upper floors include exhibitions about computing and mathematics, health and the art of medicine and medical history (one of the largest and most important parts of the museum). One of the most popular galleries is the interactive Launchpad gallery, illustrating many different concepts in physical science. The Wellcome Wing focuses on biosciences and on digital technology and "the information age".

The Science Museum has a dedicated library. It holds runs of periodicals, early books and manuscripts, and is used by scholars worldwide.

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Museum of Water and Steam

Green Dragon Lane, Brentford, London TW8 0EN, UK

Tel.: 44 20 85 68 47 57

www.waterandsteam.org.uk

The London Museum of Water and Steam is the new name for the 'Kew Bridge Steam Museum', housed in a magnificent 19th century pumping station, centred around the station's five world famous Cornish Beam Engines.

The pumping station has a long history. In 1820 the Grand Junction Water Works Company (GJWWC) opened a new pumping station at Chelsea taking water from the Thames. The poor quality of the water, polluted with sewage, convinced the company to move its operations to a new site by Kew Bridge. The works started there supplying water in 1838, the Maudsley and Boulton & Watt engine house being built at this time. In 1840 and 1842 the two Boulton & Watt engines, which had worked at Chelsea, were re-erected at Kew Works. The reservoir and filter beds were constructed between 1844 and 1846 and two 'grasshopper' engines transferred water from the Thames to the reservoir. At the same time, the GJWWC built the 'New Engine House'. After the completion of these works the Maudsley and Boulton & Watt steam engines were converted to the more efficient 'Cornish Cycle'. The Metropolitan Water Act of 1852 obliged the GJWWC to build a new intake and technical infrastructures at Hampton. Increased demand was met by the installation of the 100-inch engine in 1871. Following the replacement of the steam plant by diesel and electric powered pumps the beam engines ceased operation in 1944.

The Metropolitan Water Board, who now owned the works, decided to keep the engines as a museum. The present Museum Trust took over the site, and one by one restored the engines to working order, starting with the Boulton & Watt engine in 1975 and lastly with the Bull engine in 2008. The museum underwent a major redevelopment during 2013-2014, rebranding the museum to reflect its heritage works theme. New educational displays bring the history of the pumping station and its engines to life, with a major new gallery exhibition on London's water supply.

Every weekend of the year visitors can see either the Cornish or rotative engines in action, with steam generated by a 1927 Lancashire boiler. Unfortunately, the high cost of gas to operate the boiler raised a lot: therefore, the museum is unable to operate the Cornish engines every weekend. A lot of educational and cultural events are organised in all seasons of the year. The Kew Bridge Pumping Station and London Museum of Water and Steam is one of the most fascinating sites of the Greater London area.

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Derwent Valley Mills World Heritage Site with Masson Mills & Cromford Mill

Masson Mills

Derby Road, Matlock Bath, Derbyshire DE4 3PY, UK

Tel.: 44 1629 58 1001

<http://www.massonmills.co.uk>

Masson Mills houses probably the finest textile historical machinery collection in working condition of Britain. The full name is "Sir Richard Arkwright's Masson Mills – Working Textile Museum". It is located near the village of Cromford, about 25 km north of Derby. The mills, built in 1783, are the finest surviving and best-preserved example of an Arkwright cotton mill, originally powered by a single waterwheel that, by 1801, had been replaced by two, a system which continued until the first turbines were installed in 1928. The mill chimney dates from

1911 and this and the steam engine house were the work of Stott and Sons, the famous mill architects.

The story of Masson Mills did not end when production ceased in 1991. History is a process, which is still going on and the refurbished mills continue life as a working textile museum, shopping village, conference and exhibition centre.

The visitors to Masson Mills Museum can experience the genuine atmosphere of a working 18th century cotton mill and can discover all work floors, including the doubling room, the weaving shed, the spinning and carding sheds, the overseer's office and mechanic's shop, the bobbin room, the turbine and boiler houses but also the site of the former Arkwright paper mill.

The outstanding collection includes, amongst many other items, cotton-doubling machines (some original to Masson Mills), some of the oldest working looms in the world (still producing cloth), pirn winders, cotton "mules" and the largest bobbin collection of the world. In the engine house, visitors can see a W & J Yates Steam Engine (built in 1884), which drove a weaving shed at Jubilee Mill in Padiham and was relocated in Masson Mills in the 1990s. Masson Mills are known as the "Gateway to the Derwent Valley Mills World Heritage Site". The designation by UNESCO in 2001 confirms the outstanding importance of the area as the birthplace of the factory system where in the 18th century water power was successfully harnessed for textile production.

Cromford Mill

Mill Road, Matlock, Derbyshire DE4 3RQ, UK

Tel.: 0044 1629 8232 56

www.cromfordmills.org.uk

Apart from Masson Mills, 'Derwent Valley Mills' - World Heritage Site includes several other exceptional industrial structures, such as Cromford Mill (1771-1779), John Smedley's Mill in Matlock, Strutt's North Mill in Belper (a pioneering 'fire proof' cotton mill of 1804) and the Silk Mill in the centre of Derby (located on the site of John Lombe's Silk Mill of the early 1720s, England's first modern factory). For several reasons Cromford Mill is often considered as the most exceptional of these pioneering industrial sites, described in following text.

Cromford mill was the first water-powered cotton spinning mill developed by Richard Arkwright in 1771 in Cromford (Derbyshire), which laid the foundation of his fortune and was quickly copied by mills in Lancashire, Germany and the United States. It forms the centrepiece of the Derwent Valley Mills. The mill structure is classified as a Grade I listed building, it was first classified in June 1950.

Following the invention of the flying shuttle for weaving cotton in 1733 the demand for spun cotton increased enormously in England. Machines for carding and spinning had already been developed but were inefficient. Spun cotton was also produced by means of the spinning jenny but was insufficiently strong to form the warp of a fabric, for which it was the practise to use linen thread, producing a type of cloth known as fustian. In 1769, Richard Arkwright patented a water frame to use the extra power of a water mill after he had set up a horse powered mill in Nottingham.

He chose the site at Cromford because it had year-round supply of warm water from the Cromford Sough which drained water from nearby Wirksworth lead mines, together with Bonsall Brook. Here he built a five-storey mill, with the backing of Jedediah Strutt (who he met

in a Nottingham bank via Ichabod Wright), Samuel Need and John Smalley. Starting from 1772, he ran the mills day and night with two twelve-hour shifts.

He started with 200 workers, more than the locality could provide, so he built housing for them nearby, one of the first manufacturers to do so. Most of the employees were women and children, the youngest being only 7 years old. Later, the minimum age was raised to 10 and the children were given 6 hours of education a week, so that they could do the record-keeping that their illiterate parents could not.

Initially the first stage of the process with a water frame was hand carding, but in 1775 Arkwright took out a second patent for a water-powered carding machine and this led to increased output and the fame of his factory rapidly spread. He was soon building further mills on this site and others and eventually employed 1,000 workers at Cromford. Many other mills were built under licence, including mills in Lancashire, Scotland and Germany.

Samuel Slater, an apprentice of Jedediah Strutt, took the secrets of Arkwright's machines to Pawtucket, R.I., America, where he founded a cotton industry. But Arkwright's success led to his patents being challenged in court and his second patent was overturned as having no originality. But by the time of his death in 1792, he was the wealthiest untitled person in Britain.

The opening of the Cromford Canal and the associated Cromford Wharf in 1793 linked Arkwright's Mill to the major Midland and Northern cities, although use of the canal was to decline as traffic moved onto the railways.

The gate to Cromford Mill was shut at precisely 6 a.m. and 6 p.m. every day, and any worker who failed to get through it not only lost a day's pay but also was fined another day's pay. The cotton mill finally ceased operation in the 19th century and the buildings were used for purposes, finally a dyeing plant. In 1979, the Grade I listed site was bought by the Arkwright Society, who began the long task of restoring it to its original state. The importance of this site is not that it was the first but that it was the first successful cotton spinning factory. It showed unequivocally the way ahead and was widely emulated.

Today, the mill and museum are open to the public every day, and attracts visitors from all over the world. A major exhibition with working machinery is planned, with the addition of meeting rooms for educational groups, a library and a study centre. The nearby Cromford Canal towpath to High Peak Junction, and onwards towards Ambergate, is listed as a Biological Site of Special Scientific Interest.

Cromford Mill has commissioned a replica water frame which was installed in April 2013.

Considerable problems occurred in obtaining suitable roving which had to be a low twist 0.8 count cotton. There are no companies spinning cotton today in the United Kingdom. Roving was supplied eventually by Rieter in Switzerland, who had some experimental stock. Rieter are the world's largest manufacturer of textile manufacturing machines.

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Geevor Tin Mine and Mining Museum

Pendeen, Penzance, Cornwall TR19 7EW, UK

Tel.: 0044 1736 788 662

www.geevor.com/



Closed as a working mine in 1990, Geevor Mine it is now a preserved mining site and museum managed by Pendeen Community Heritage. Geevor Tin Mine is a tin mine in the far west of Cornwall, United Kingdom, between the villages of Pendeen and Trewellard. It was operational between 1911 and 1990 during which time it produced about 50,000 tons of black tin. It is now a museum and heritage centre left as a living history of a working tin mine. The museum is an Anchor Point of ERIH, The European Route of Industrial Heritage.

Tin and copper have been mined from the general area of Geevor since the late 18th century. It was originally a small enterprise known as *Wheal an Giver*, "a piece of ground occupied by goats". The area was worked under the name of East Levant Mine until 1840 and then as North Levant from 1851 to 1891 when it closed. During the 1880s as many as 176 workers were employed at the mine, but in the ten years after North Levant's closure the site saw only intermittent activity by a few miners. At the turn of the 20th century a group of St. Just miners who had emigrated to South Africa were forced to return by the outbreak of the Second Boer War. They leased the area and conducted more thorough prospecting, being encouraged enough to set up a company called Levant North (Wheal Geevor) in 1901. This was acquired by the West Australian Gold Field Company Ltd. in 1904 which brought together various mines

under the name of Geevor Tin Mines Ltd. in 1911, not long after the price of tin had rapidly risen to £181 a ton in 1906 from a low of £64 in 1896.

The Wethered shaft (named after Oliver Wethered, one of the founders of the mine) was begun in 1909 and initial development occurred around it. By 1919, the works were moving west toward the coastline and the Victory shaft (named to celebrate the end of the First World War) was sunk about 540 metres to the north-west. The mine suspended operations in 1921 and again for 12 months during the tin crisis in 1930 that permanently closed many other Cornish mines. In 1944 working through Wethered shaft was discontinued, but the Victory shaft continued in use.

From the end of World War II until the early 1960s both Geevor and South Crofty found it hard to raise capital and to recruit skilled miners. Both mines took on Polish and Italian miners at this time. New investment, forward-looking management and rising tin prices in the 1960s improved matters and at this time around 270 staff were employed by the mine. During the 1960s there was much underground exploration; this included extending into the undersea workings of the Levant Line that had closed in 1930, work that was complicated by a hole in the seabed that first had to be plugged before the workings could be drained.

By the 1970s Geevor's sett covered an area of about three square miles and included Boscawell Downs mine, Pendeen Consols and Levant mine. In 1985 the International Tin Council failed and there was a dramatic fall in the price of the metal. The mine struggled on for a few years, but closed in 1990, and the pumps were switched off in May 1991 allowing the workings to flood. The mine is not geologically exhausted of tin, but it is exhausted of tin that is recoverable economically.

During the 20th century Geevor drove over 85 miles (137 km) of tunnels from which it produced around 50,000 tons of black tin and made a profit of over £7 million. On average over a million gallons of water, a quarter of which was sea-water, was pumped from the mine daily. Through the commitment of the local community and local bodies, notably Cornwall County Council and Pendeen Community Heritage, the site has remained accessible to the public. Geevor Tin Mine is now a museum and heritage centre, covering an area of 67 acres (270,000 m²) which makes it the largest preserved tin mining site in Great Britain. It is an important part of the Cornwall and West Devon Mining Landscape and was recognised by UNESCO in 2006. It has been the subject of a £3.8 million improvement programme funded by the Heritage Lottery Fund, Objective One, Cornwall County Council and Penwith District Council.

Geevor's new Hard Rock museum is part of the final stage of this improvement programme. The museum tells the story of tin mining in Cornwall and Geevor in particular, showing what happened on the surface and underground and what life was like for those who worked there, including oral history recordings. Visitors can also walk through the mine buildings to see the original machinery and there is a guided underground tour into Wheal Mexico, an 18th-century mine. The site has a souvenir shop and a cafe that overlooks the Atlantic Ocean.

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Beamish, the North of England Open Air Museum

Regional Ressource Center, Beamish, Durham DH9 0RG, UK

Tel.: 0044 191 370 4000

www.beamish.org.uk

Beamish, the North of England Open Air Museum is located near the town of Stanley (County Durham, England). The museum's guiding principle is to preserve an example of everyday life in urban and rural North East England at the climax of industrialisation in the early 20th century. Much of the restoration and interpretation is specific to the late Victorian and Edwardian eras, together with portions of countryside under the influence of industrial revolution. On its 300 acres (120 ha) estate it utilises a mixture of translocated, original and replica buildings; a huge collection of artifacts, working vehicles and equipment; as well as livestock and costumed interpreters.

The museum has received a number of awards since it opened its present site to visitors in 1972 and has been influential on other "living museums". It is a significant educational resource, and helps to preserve some traditional north-country and rare livestock breeds. Beamish is the first English museum to be financed and administered by a consortium of County Councils and it was the first regional open-air museum in England. The museum was first proposed in 1958 and the collections were established on the Beamish site in 1970 under director Frank Atkinson (1924-2014), realising that the region's traditional industries of coal-mining, shipbuilding, and iron and steel manufacture were disappearing along with the communities that served them.

Atkinson said, "It is essential that collecting be carried out quickly and on as big a scale as possible. It is now almost too late." He adopted a policy of "unselective collecting" — "you offer it to us and we will collect it." The people of the region responded with donations of all kinds ranging from small everyday objects to steam engines and shops, filling an entire army camp of 22 huts and hangars at Brancepeth. The first exhibition was held in Beamish Hall in 1971, and the present site was opened to visitors for the first time in 1972 with the first translocated buildings (the railway station and colliery winding engine) being erected the following year. Since 1986, the museum has been quite completely self-funding for some years.

Some important elements of Beamish Open Air Museum:

- The town area, officially opened in 1985, depicts chiefly Victorian buildings in an evolved urban setting of 1913. These include houses, shops, a pub, garage, bakery printshop, cinema, fire and police stations, components of an old gaswork, etc.

- A typical North Eastern Railway Station (with signal box, goods sheds and coal drops) is reconstructed on the edge of the town. The station is dominated by the Regional Museums Store (completed in 2002, and externally disguised as "Beamish Waggon and Iron Works, estd 1857"), which Beamish shares with Tyne and Wear Museums. This houses, amongst other things; railway rolling stock and other vehicles, a large marine diesel engine, and several boats. Adjacent is an events field and fairground with a set of Frederick Savage built steam powered Gallopers dating from 1893.

- Another important section is the Colliery Village. In view of the impact that coal mining has had on its region, the museum has major collections related to this industry. Exhibits include the

museum's Mahogany Drift Mine. The colliery is dominated by the regularly steamed 1855 vertical 'Crowther' winding engine, screens (from Gatedshead) and a waste tip. There are a number of industrial steam locomotives and many chaldron wagons (the region's traditional type of colliery railway rolling stock, and which became a symbol of Beamish Museum).

-Beamish presents many more buildings and collections: "Home Farm" (a complete mid-nineteenth century farm complex, depicting northern rural life in the past), the eastern museum site based around the original 15th-century founded Pockerley Manor farm.

-Of great importance are the transport collections including railway heritage (including the Pockerley Waggonway, opened in 1999, recreating a railway at the transition from wagonway to steam railway in 1825). Visitors to the museum can ride in a carriage behind one of three replica steam locomotives on the railway. Beamish is home to several electric trams, some of which operate daily on the track which makes a circuit of the museum site forming an important element of the visitor transportation system. The museum has also collected a couple of trolleybuses, motor buses and other road vehicles as old cycles, motorcycles, horse-drawn vehicles, etc. Other large exhibits collected by the museum include a tracked steam shovel and a coal drop.

In 2001 a new-build Regional Resource Centre opened on the site to provide accommodation for the museum's core collections of smaller items. These include over 300,000 historic photographs, printed books and oral history recordings. The object collections cover the museum's specialities. Beamish site has been used as the backdrop for many film and popular television productions.

A final consideration about the 'critical reception' of the "Beamish adventure": the unselective collecting policy created a lasting bond between museum and community and the supporting Friends organisation was established in 1968 before the Beamish site had been occupied.

Visitor numbers rose rapidly to around 450,000 p.a. during the first decade of opening to the public. Beamish became "Museum of the Year" in 1986, won the "European Museum of the Year Award" in 1987 and was "Living Museum of the Year" in 2002.

In responding to criticism that it trades on nostalgia the museum is unapologetic. A former director has written: "As individuals and communities we have a deep need and desire *to understand ourselves in time*". It can also demonstrate its benefit to the contemporary local economy. Beamish was influential on other open air museums focussing on the industrial periods and heritage.

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Verdant Jute Mill and Museum, Dundee (Scotland)

Address: W. Henderson's Wynd, Dundee DD1 5BT, UK

Tel.: 44 1382 30 90 60

Website: www.rrsdiscovery.com/index.php?pageID=128

Verdant Works is a former jute mill in the Blackness area of Dundee, Scotland. It was purchased in 1991 by the Dundee Heritage Trust. The Trust restored the buildings and opened them in 1996 as a museum dedicated to textile industry, an industry that once dominated the city's economy.

The Verdant Works was given Category A listed building status by Historic Scotland in 1987. This is the highest category for listing in Scotland, denoting a building of national architectural importance. It is a rare surviving example of a courtyard-type mill, with its original building layout and many original features remaining. It is one of a declining number of industrial premises in Dundee and east-central Scotland remaining little changed from the 19th century.

The Verdant Works are the only dedicated jute museum in the United Kingdom. As a museum, the Verdant Works tell the story of Dundee's textile industries, focusing primarily on the jute and linen industries. The production of textiles was the dominant industry in Dundee for many years, directly employing 50,000 people in the city (half the working population) by the end of the 19th century, as well as many more thousands in associated trades such as shipbuilding, transportation and engineering. At the time Dundee supplied the majority of the world's demand for jute products, meaning it was also of importance for both Scottish and British histories.

The jute collections cover the entire history of the jute industry. It covers topics such as manufacturing, research and development, end products, quality control, textile engineering, the industry's Indian connections, and the lives of the workers. Objects include machinery patterns, jute and flax products, small tools, technical drawings, plans, and quality control and testing equipment.

The archives and photographic records of various mills and their workers have considerable historical research value. As well as the large machinery objects, the collections cover the fields of industrial history, social history, fine art, archives, business papers, photographs, costumes, and numismatics.

Verdant Works is a fully Accredited museum and has won numerous awards, both national and international, as well as being 5 star rated tourist attraction with Visit Scotland. In 2008 the Jute Collection was named as a Recognised Collection of National Significance.

In September 2015 a new section of the museum was opened in the High Mill, after an extensive restoration of this building.

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Chatham Historic Dockyard

Chatham Historic Dockyard, Church Lane, Chatham, Kent ME4 4TE, UK

Tel.: 44 1634 823 800

www.thedockyard.co.uk

Chatham Historic Dockyard is a maritime museum on part of the site of the former royal/naval dockyard at Chatham in Kent, South East England.

Chatham Dockyard covered 400 acres (1.6 km²) and was one of the Royal Navy's main facilities for several hundred years until it was closed in 1984. After closure the dockyard was divided into three sections. The easternmost basin was handed over to Medway Ports and is now a commercial port. Another slice was converted into a mixed commercial, residential and leisure development, comprising the 18th century core of the site, was transferred to a charity called the Chatham Historic Dockyard Trust and is now open as a visitor attraction. It claims to be the world's most complete dockyard of the Age of Sail.

The attraction has seven main elements:

- Historic warships, including the HMS Ocelot (S17) or "O" class submarine, launched 5 May 1962, and preserved in a dry dock at Chatham.

- The ropery (a Grade I listed building, presented a fully equipped Georgian and Victorian rope factory.

- “Wooden Walls”: a recreation of the working life of the dockyard in 1758, centred on the construction of HMS Valiant.

- The section “Steam, Steel and Submarines”, who tells the story of Chatham Dockyard and the Royal Navy's use of the River Medway in the 19th and 20th centuries.

- “Lifeboat”, a museum about the work of the RNLI which has sixteen historic vessels.

- “3 Slip – The BIG Store”: originally a covered slipway, now a display of large objects from the dockyard and the nearby Royal Engineers Museum.

- Finally “No 1 Smithery”: the structure is a Grade II listed building and was formerly used for iron-working. This monument was restored by van Heyningen and Haward Architects and re-opened as a visitor and exhibition centre in July 2010.

The new building provides dedicated storage and curatorial facilities for the National Maritime Museum and Imperial War Museums' 4,000 ship models as well as a regional Touring Exhibition Gallery, and museum quality permanent Exhibition Galleries. The first touring exhibition to be shown was Stanley Spencer's Shipbuilding on the Clyde series.

A new project for 2014 is 'Command of the Oceans'. This is possible due to a generous grant from the Heritage Lottery Fund. Also the project got an important contribution from the Homes and Communities Agency.. A new entrance on the north side of the visitor attraction will be built and a discovery centre linking the former naval base with other significant heritage sites including Fort Amherst, the Great Lines Heritage Park (between Gillingham and Chatham) and Upnor Castle. This all became possible after the remains of the Namur warship was discovered under the floor of the Wheelwrights' Shop in 1995.

Workers at the dockyard performed eight years of restoration work on the MV Havengore, the ceremonial vessel that carried the body of Winston Churchill during his state funeral. In addition the dockyard is acting as custodian of artefacts, masts and rigging from the Cutty Sark and the Medway Queen, while their hulls are being restored elsewhere.

The site is also home to a Dockyard Railway that has a diverse collection of steam and diesel locomotives and rolling stock, some of which can be seen in operation throughout the year.

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STEAM Museum of the Great Western Railway

STEAM, Fire Fly Avenue, Swindon SN2 2EY, UK

Tel.: 44 1793 466 646

www.steam-museum.org.uk/

STEAM – Museum of the Great Western Railway, also known as Swindon Steam Railway Museum, is located at the site of the old railway works in Swindon, England – Wiltshire’s ‘railway town’. The museum opened in 2000 and replaced the former GWR Museum, which was located on Faringdon Road in Swindon, which had opened on 22 June 1962. Apart from the museum itself, the site has become home to the McArthur Glen Designer Outlet and, since 2005, the Head Office of the National Trust.

The museum is housed in a restored Grade II listed railway building. This was part of the old Swindon Works of the Great Western Railway, which was one of the largest in the world and operated from 1843 to 1986. In its heyday, it covered more than 300 acres (120 ha), and could turn out three locomotives per week.

The museum is home to several GWR pre-nationalization-era locomotives, two of which are the first members of their respective classes. The majority of these are part of the UK National Collection.

Apart from many exhibits of interest to **railway engine** and **rolling stock** enthusiasts, it tells the social story of the railway community in Swindon, with recorded personal experiences and film archives. Lifelike exhibits show people at work and human interactions. There are exhibits explaining the construction of **locomotives**, of railway equipment and of the railways themselves.

‘Steam’ also tells the history of the Great Western Railway and the life of **Isambard Kingdom Brunel**, the famous Victorian engineer, who masterminded the Great Western Railway. There are many hands-on exhibits and interactive displays. Enthusiastic ex-railway workers are on hand, to give a personal insight into many of the exhibits.

There is a series of reconstructions of areas of work, such as office, stores, workshop, signal box and foundry. The museum holds a massive archive of books, periodicals, photographs, drawings and plans, relating to the Great Western Railway.

The museum is near Swindon's town centre, adjacent to the McArthur Glen Designer Outlet Village.

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LIST OF MUSEUMS BY COUNTRY

AUSTRIA

- 1 Technisches Museum Wien (Vienna Technical Museum)
- 2 Österreichisches Papiermuseum (Austrian Museum of Papermaking), Steyermühl
- 3 Museum Arbeitswelt Steyr (Museum of the Industrial World)
- 4 Museum Alte Textilfabrik Weitra (Old Textile Factory Museum Weitra)
 - Lebendes Textilmuseum, Gross-Siegharts
 - Erster Waldviertel Webereimuseum, Waldhofen an der Thaya
- 5 Montanhistorisches Museumensemble Vordernberg
(Historical mining Museumensemble Vordernberg)

BELGIUM

- 6 EMABB - Ecomuseum en Archief van de Boomse Baksteen
(Ecomuseum and Archive of the Boom Brickworks), Boom
- 7 La Fonderie – Musée bruxellois de l'Industrie et du Travail
(Brussels Museum of Industry and Labour)
- 8 Le Bois du Cazier, Charleroi
- 9 Ecomusée du Bois-du-Luc, La Louvière
- 10 Museum of Industry, Ghent
- 11 Jenevermuseum (Distillery Museum), Hasselt
- 12 Mijnmuseum Beringen (Mining Museum Beringen)
- 13 Texture – Flax Museum, Kortrijk
- 14 Train World, Brussels

BULGARIA

- 15 National Textile Industry Museum, Sliven
- 16 Interactive Museum of Industry, Gabrovo
- 17 Naval Museum Varna

CROATIA

- 18 National Technical Museum, Zagreb
- 19 Musej Automobila Ferdinand Budicki (Automobile Museum Ferdinand Budicki)

CZECH REPUBLIC

- 20 National Technical Museum, Prague
- 21 Hornický skanzen Mayrau (Mayrau Mining Museum), Kladno
- 22 Michal / Petr Cingr Mine – Ostrava Museum of Industry
- 23 Landek Park - Anselm Mine Museum, Ostrava
- 24 Vitkovice Iron Works – Lower Area Complex, Ostrava
- 25 Pilsner Urquell Brewery and Museum, Pilsen
- 26 Technical Museum Tatra, Koprivnice

DENMARK

- 27 Arbejdermuseet (The Workers' Museum), Copenhagen
- 28 Brede Vaerk - Nationalmuseet (Brede Vaerk – National Museum of Denmark),
Kongens Lyngby
- 29 Danmarks Industrimuseum (Danish Museum of Industry), Horsens
- 30 M/S Maritime Museum of Denmark, Helsingør / Elsinore
- 31 Industrimuseet Frederiks Vaerk (The Frederiks Vaerk Museum), Frederiksvaerk

ESTONIA

- 32 Kohtla Kaevendus Park (Kohtla Mining Park), Kohtla-Nõmme
- 33 Kukruse Pölevkivi Muuseum (Kukruse Oil Shade Museum), Kohtla-Järvi

FINLAND

- 34 Forum Marinum Maritime Centre, Turku
- 35 Työväenmuseo Werstas (Finnish Labour Museum Werstas), Tampere
- 36 Vapriikki Museum Centre, Tampere
- 37 Verla Millmuseum (& Board Museum), Verla

FRANCE

- 38 Centre Historique Minier de Lewarde
- 39 Conservatoire National des Arts et des Métiers, Paris
- 40 Corderie Royale / Centre International de la Mer, Rochefort
- 41 Ecomusée Creusot-Montceau / Musée de l'Homme et de l'Industrie (Museum of Man and Industry)
 - Briquetterie Ciry-le-Noble
 - Musée de la Mine / Puits Sainte-Claude, Blanzay
 - Musée du Canal / Site de la 9e écluse, Ecuisses
- 42 Familistère Godin / Musée du Familistère, Guise
- 43 Musée EDF Electropolis - Mulhouse
- 44 Cité de l'Automobile – National Museum – Schlumpf Collection, Mulhouse
- 45 Cité du Train, Mulhouse
- 46 Musée du Papier peint, Rixheim
- 47 Musée Industriel de la Corderie Vallois (Industrial Museum of Ropery Vallois), Notre-Dame de Bondeville
- 48 Fabrique des Savoirs / Musée d'Elbeuf
- 49 Saline Royale d'Arc-et-Senans (Royal Saltwork of Arc-et-Senans)
- 50 Grande Saline de Salins-les-Bains - Musée du Sel

GERMANY

- 51 Deutsches Bergbau-Museum, Bochum
 - (+ Jahrhunderthalle / Hall of the Century), Bochum & Zeche Hannover, Bochum)
- 52 Nordwolle Museum - Delmenhorst. Nordwestdeutsches Museum für Industriekultur (North-West-German Museum of Industrial Culture)
- 53 Deutsches Museum, München
- 54 Deutsches Schiffahrtsmuseum (German Maritime Museum), Bremerhaven
- 55 Deutsches Technikmuseum Berlin (Museum of Technology Berlin)
- 56 Ruhr Museum – Zollverein, Essen
 - + Landschaftspark Duisburg-Nord (North Duisburg Landscape Park), Duisburg
- 57 Museum der Arbeit - Hamburg
- 58 LWL-Industriemuseum Zeche-Zollern (Westfälisches Landesmuseum für Industriekultur – Westphalian Museum for Industrial Culture), Dortmund (& branches: Zeche Hannover – Bochum, Zeche Nachtigall - Witten, Schiffshebewerk Henrichenburg - Waltrop, Henrichshütte - Hattingen, Textilmuseum in Bocholt, Ziegeleimuseum - Lage, Glashütte - Gernheim).
- 59 LVR-Industriemuseum - Zinkfabrik Altenberg (Zinc Factory Altenberg), Oberhausen (& branches: Gesenkschmiede Hendrichs - Solingen, Paper mill Alte Dombach - Bergisch Gladbach, Power Station Ermen & Engels - Engelskirchen, Tuchfabrik (Cloth factory) - Euskirchen, Textile factory Cromford – Ratingen, St-Antony-Hütte – Oberhausen).
- 60 Rammelsberg Museum & Besuchersbergwerk (Rammelsberg Museum & Visitor Mine), Goslar
- 61 Sächsisches Industriemuseum (Saxonian Museum of Industry), Chemnitz (& branches: West-Saxon Textile Museum, Crimmitschau; Ehrenfriedersdorf Tin Mine and Mineral Museum; Energy Factory Knappenrode, Knappenrode / Hoyerswerda
- 62 Technoseum, Mannheim

GREECE

- 63 Museum of Industrial Olive Oil Production Lesvos (MBEL), Lesvos
- Museum of the Olive and Greek Olive Oil in Sparta
- 64 Technopolis – City of Athens & Industrial Gas Museum

HUNGARY

- 65 Hungarian Museum of Science, Technology and Transport, Budapest (& branches: Aviation Exhibition – Budapest, Technical Studies Stores – Budapest, Foundry Museum - Budapest, Museum of Electrical Engineering – Budapest, Museum of Chemistry and Chemical Industry - Vàrpalota, Aluminium-Industry Museum – Székesfehévár, Metallurgical Museum, Miskolc-Feslöhàmor).

IRELAND

- 66 (The) Steam Museum (& Lodge Park Walled Garden), Straffan (Kildare)

ITALY

- 67 Grande Miniera de Serbariu (Coal Mining Museum of Serbariu)
- Centro Italiano della Cultura del Carbone, Carbonia (Sardegna)
- 68 The Green Train of Sardinia & Montserrat Railway Museum, Montserrat
- 69 Museo del Tessuto (Prato Textile Museum)
- 70 Museo Nazionale della Scienza e della Tecnologia Leonardo da Vinci, Milano
- 71 Museo Fisogni della Stazione di Servizio (Fisogni Museum of the Petrol Station), Paderno Dugnano
- 72 La Via del Ferro e delle Miniere –Valtrompia (Iron and Mining Heritage Route –Valtrompia)
- 73 Museo delle Industrie e del Lavoro del Saronnese, Saronno
- 74 Museo del Patrimonio industriale, Bologna
- 75 Parco Museo Minerario, Abbadia San Salvatore
- 76 Parco archeominerario di San Silvestro, Campiglia Marittima (Livorno)
- 77 Parco Minerario Naturalistico di Gavoranno (Grosseto)

LETTONIA

- 78 Power Industry Museum – Latvenergo, Kegums (and branches: Plavina HES – Aizkraule, Depositories Industry Museum – Riga)

LITUANIA

- 79 Energetikos ir Technikos Muziejus (Energy and Technology Museum), Vilnius

LUXEMBOURG

- 80 Musée de l'Ardoise / Schiefermuseum Uewermaartel (Slate Museum), Haut-Martelange

NETHERLANDS

- 81 Museum Boerhaave, Leiden
- 82 Museum De Cruquius, Cruquius (Haarlemmermeer)
- 83 Nederlands Stoommachinemuseum (Dutch Steam Engine Museum), Medemblik
- 84 Techniekmuseum HEIM (Technical Museum HEIM), Hengelo
- 85 Spoorwegmuseum Utrecht (Railway Museum Utrecht)
- 86 Philips Museum, Eindhoven
- 87 TextielMuseum (Textile Museum), Tilburg
- 88. Industrieel Museum Zeeland, Sas van Gent (Terneuzen)

NORWAY

- 89 Klevfos Industrimuseum - Klevfos Cellulose- & Papirfabrik, Adalsbruk
- 90 Norsk Bergverksmuseum (Norwegian Mining Museum)
- & branches: Kongsberg Vapenfabrikks Museum, Solvgruvene - Museum & Silver mine – Kongsberg
- 91 Norsk Industriarbeider Museum, Rjukan / Vemork (Norwegian Industrial Workers Museum)
- 92 Norsk Vankraft- og Industristadmuseum (Norwegian Museum of Hydropower and Industry), Tyssedal

93 Norsk Oljemuseum (Norwegian Petroleum Museum), Stavanger
94 Roros Museum, Roros

POLAND

95 Centralne Muzeum Wlokiennictwa (Central Textile Museum), Lodz
96 Museum of the Factory – Manufaktura, Lodz
97 Coalmining Museum Zabrze (Historical “Guido” Coal Mine; Open Air Mining Museum “Queen Luise”)
98 Historical Waterworks Zawada & Waterworks Museum, Karchovice
99 Museum of Old Polish Industrial Region / Ironworks Museum, Sielpia Wielka
100 Maleniec Historical Metallurgical Works, Ruda Maleniecka
101 Jan Pazdur Muzeum Przyrody I Techniki (Jan Pazdur Museum of Nature and Technology), Starachowice
102 Museum of Oil and Gas Industry – Bobrka (The Ignacy Lukaszewicz Memorial Museum of Oil and Gas Industry), Bobrka - Chorkowka
103 National Maritime Museum Gdansk (Narodowe Museum Morskie w Gdansk)u
104 Wieliczka Salt Mine

PORTUGAL

105 Museu da Agua de Epal (The Epal Water Museum), Lisboa
106 Museu da Electricidade (Museum of Electricity), Lisboa
107 Ecomuseu Municipal do Seixal (Ecomuseum of Seixal)
108 Museu Maritimo Ilhavo (Maritime Museum of Ilhavo)
109 Museum of Lanificios MUSLAN (Wool Museum of the University of Beira Interior – MUSLAN), Covilha

ROMANIA

110 Muzeul National ul Petrolului (National Museum of Oil Industry), Ploiesti

SERBIA

111 Museum of Weapons, Kragujevac

SLOVAKIA

112 Slovenské plynàrenské museum Bratislava (Slovak Gas Industry Museum Bratislava)

SLOVENIA

113 Technical Museum of Slovenia, Borovina (Vrnika) & branch museum collections: Museum of Post and Telecommunications – TMS, Polhov Gradec; Slovenian Geodetic collection – TMS, Sartno pri Litiji; Soteska open-storage depot, Straza
114 Coal Mining Museum of Slovenia – Velenje

SPAIN

115 La Encartada / Museo de Boinas, Balmaseda (Bizkaia)
116 Museo del Ferrocarril de Asturias (Railway Museum of Asturias), Gijon
117 Museo de la Mina de Arnao (Museum of the Mine of Arnao / Asturias)
118 Museo de la Siderurgia de Asturias – MUSI (Museum of the Siderurgy in Asturias – MUSI), La Felguera – Langreo
119 MUMI Museo de la Minería y de la Industria de Asturias (Museum of Mining and Industry of Asturias), El Entrego
120 Museu de la Ciència i de la Tècnica de Catalunya – MNACTEC
Museum of Science and Technology of Catalonia – MNACTEC, Terrassa
(& branches: Museum of the Colonia Sedo, Esparreguera; Paper Mill of Capellades; Leather Museum, Igualada / “Museu de la Pell d’Igualada i Comarcal de Anoia”; Technical Museum, Manresa; Museum of the Colonia Vidal, Puig-Reig; Mining Museum, Cercs; Forge of Areu; Flour Mill, Castello d’Empuries; Cork Museum, Parafrugell; “Museu de l’Estampacio”, Premià de Mar; Automobile collection Salvador Claret, Sils; Railway Museum, Villanova i La Geltru; Cement Factory Clot del Moro, Castellar de n’Hug).

- 121 Museu Agbar de les Aigües – AGBAR, Cornellà de Llobregat
- 122 Museo de la Reales Fábricas de Riopar, Riopar (Albacete)
- 123 Museo Nacional de la Energía (National Energy Museum), Pontferrada (Leon)
- 124 Museo del Ferrocarril de Madrid (Madrid Railway Museum)
- 125 Museo de la Siderurgia y la Minería Sabero de Castilla y Leon (Castille and Leon Museum of Metallurgy and Mining), Sabero
- 126 Parque Minero de Almadén - Museo del Mercurio (Mining Park of Almadén – Mercury Museum), Almadén (Ciudad Real)
- 127 Parque Minero de Riotinto - Museo Minero (Rio Tinto Mining Park and Museum), Rio Tinto (Huelva)

SWEDEN

- 128 Arbetets Museum (Museum of Work), Norrköpping
- 129 Huskvarna Fabriksmuseum (Huskvarna Industrial Museum)
- 130 Kopparberg Museum Falun (Falu Gruva I Dalarna), Falun
- 131 Ludvika Gammeldag, Gruvmuseum (Ekomuseum Bergslagen), Ludvika
- 132 Stripa Gruva - Lindesbergs Museum, Guldsmedshyttan - Lindesbergs
- 133 Sveriges Järnvägmuseum Gävle (Swedish Railway Museum – Gävle)
- 134 Repslagarmuseet Älvängen (Museum of Rope Making, Älvängen)

SWITZERLAND

- 135 Verkehrshaus der Schweiz (Swiss Museum of Transport), Luzern / Lucerne
- 136 Museums-Spinnerei Neuthal (Neuthal Spinning Mill Museum), Bärentswill
- 137 Industrial Museums in Winterthur
 - Schaubetrieb Schweizerische Nagelfabrik (Swiss Nail Factory Winterthur)
 - Dampfzentrum Winterthur – DZW (Steam Centre Winterthur)
- 138 Horology Museums in the Jura-Region: Musée International d’Horlogerie (International Museum of Horology) & Musée d’Horlogerie du Locle

UNITED KINGDOM

- 139 Bradford Industrial Museum, Bradford (West-Yorkshire)
- 140 Saltaire village - World Heritage Site, Shipley – Saltaire (West-Yorkshire)
- 141 Leeds Industrial Museum at Armley Mills
- 142 Kelham Island Museum, Sheffield (& branches of the Sheffield Industrial Museums Trust: Abbeydale Industrial Hamlet; Shepherd Wheel Workshop)
- 143 Glasgow Transport Museum / Riverside Museum, glasgow (Scotland)
- 144 Summerlee Museum of Scottish Industrial Live, Coatbridge (Scotland)
- 145 New Lanark World Heritage Site, New Lanark (Scotland)
- 146 Ironbridge Gorge Museum, Coalbrookdale (Shropshire)
- 147 Black Country Living Museum, Dudley (West Midlands)
- 148 Merseyside Maritime Museum, Liverpool
- 149 National Railway Museum, York
- 150 Museum of Science & Industry, Manchester
- 151 National Slate Museum Llanberis (Gwynedd, Wales)
- 152 Portsmouth Historic Dockyard & National Museum Royal Navy Portsmouth (Hampshire)
- 153 Science Museum, London
- 154 Museum of Water and Steam (Kew Bridge Steam Museum), Brentford, London
- 155 Derwent Valley Mills World Heritage Site with Masson Mills & Cromford Mill
- 156 Geevor Mine & Museum (Cornwall)
- 157 Beamish Open Air Museum (Newcastle)
- 158 Vernant Jute Mill, Dundee (Scotland)
- 159 Chatham Historic Dockyard (Kent)
- 160 Steam Museum, Swindon