

**Global Strategy Studies**

# **Industrial Heritage Analysis**

**World Heritage List and Tentative List**



**Is Industrial Heritage  
under-represented on the World  
Heritage List ?**

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**15.8.-15.10.2001**

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# **Industrial World Heritage and Global Strategy**

## **Acknowledgement**

I want to thank Ms. Minja Yang for accepting me for this internship at the UNESCO World Heritage Centre and for giving me a lot of space for developing my ideas for this analysis. I want to thank Bernd Paulowitz for his help in generating many of the maps in this presentation, and all members of the World Heritage Centre who had an open ear to me and helped me to find my way through the UNESCO infrastructure.

My special thanks goes to Peter Stott who was a magnificent help in my work, a restless promoter of my interests in Industrial Heritage, and a great friend.

I want to thank as well Eric DeLony of the Historic American Engineering Record of the U.S. National Park Service, who provided an excellent classification system as a key instrument for this work.

## **0. Overview**

The following analysis has been developed during an internship at the World Heritage Center of UNESCO by Michael Falser, an Austrian architect and art historian, in autumn 2001 under the supervision of Minja Yang and Junko Taniguchi.

Being a major task for the World Heritage Center, this analysis is a contribution to the "Global Strategy" - studies for a harmonisation of the World Heritage List and for the identification of under-represented categories.

### **Aim of Work**

After a short introduction of the UNESCO World Heritage structure, its instruments and units, the present state of the World Heritage List and the tentative list with special focus on Industrial Heritage will be discussed.

The main idea of this work is not only to identify Industrial Heritage sites on the tentative list, but to introduce a classification system in order to build sub-themes. Such a system could avoid repetitive nominations for the future and could be an example for other categories such as the heritage of the 20<sup>th</sup> century. It will show the vast variety of industrial sites around the world.

## **1. The UNESCO World Heritage**

### **1.1. The Convention, World Heritage Committee, Advisory Bodies, World Heritage List and Tentative List**

The *UNESCO World Heritage Convention* is one of a group of environmental treaties adopted after the 1972 United Nations Conference on the Human



Environment, held in Stockholm, Sweden. It brought together the conservation of cultural and natural heritage under a single legal instrument. It provides for the protection of those cultural and natural properties considered being of exceptional interest and outstanding universal value.

The Convention defines the kind of natural or cultural sites which can be considered for the inscription in the *World Heritage List*, and sets out the duties of States Parties in identifying potential sites and their role in protecting and preserving them.

Every State Party shall submit an inventory of property forming part of the heritage in its territory as a State Party's *Tentative List*. Sites suitable for inclusion in the World Heritage List are transmitted to the Committee as nominations.

The *World Heritage Committee*, which consists of representatives from 21 of the States Parties to the Convention, meets once a year and examines the States Parties nominations on the basis of technical evaluations.

These independent evaluations of proposed cultural and natural sites are provided by two *advisory bodies*, the *International Council on Monuments and Sites (ICOMOS)* and the *World Conservation Union (IUCN)*, respectively.

The third advisory body, the *International Centre for Study of the Preservation and Restoration of Cultural Property (ICCROM)*, provides expert advice on restoring monuments and organises training courses.

To be included in the World Heritage List, sites must satisfy the selection *criteria*. These criteria are explained in the *Operational Guidelines for the Implementation of the World Heritage Convention*, which, besides the text of the Convention, is the main working document on World Heritage. The criteria are different for cultural and natural sites and mixed sites (with both outstanding natural and cultural values) and have been revised regularly by the Committee to match the evolution of the World Heritage itself.

Equally important are authenticity, integrity, protection and management of the site.

## **1.2. The UNESCO World Heritage Centre and its Mandate**

The *UNESCO World Heritage Centre* was set up in 1992 by the Director-General to assure the day-to-day management of the Convention. It organizes the annual sessions of the *World Heritage Bureau* and the Committee, provides advice to States Parties in the preparation of site nominations, organizes technical assistance upon request, co-ordinates both the reporting on the condition of sites and the emergency action undertaken when a site is threatened. It is also responsible for the administration of the *World Heritage Fund*.

*The mandate of the World Heritage Centre is not about freezing heritage, but to integrate heritage conservation management and preservation with the overall development process and to promote a better understanding and tolerance of cultural diversity.*



## 2. The World Heritage List and Global Strategy

### 2.1. The World Heritage List and Global Strategy

Since the adoption of the World Heritage Convention in 1972, innumerable discussions have been conducted as to the means of ensuring the representative nature of the World Heritage List.

Since 1979 and progressively afterwards, disparities and imbalances have been underlined and the Committee has evoked the need to improve the representative nature of the List.

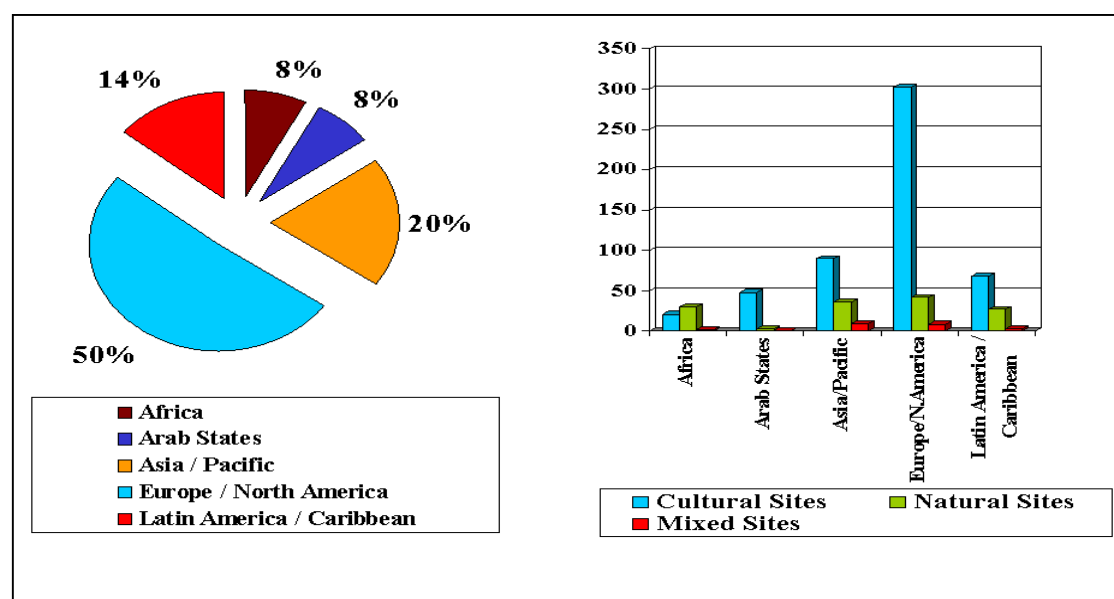
Since 1994, several expert meetings on a “*Global Strategy*” were held and thematic studies for a representative World Heritage List were started.

The Committee adopted the report of the “Global Strategy” expert group at its 18<sup>th</sup> session in December 1994. At its 24<sup>th</sup> session in December 2000 several decisions were taken concerning the Harmonisation of the World Heritage List.

*“The advisory bodies and the World Heritage Centre should proceed with the analysis of sites inscribed on the World Heritage List and the tentative list on a regional, chronological, geographical and thematic basis. [...] The analysis will provide States Parties with a clear overview of the present situation, and likely trends in the short to medium term with a view to identifying under-represented categories.”<sup>1</sup>*

### 2.2. Trends and Issues, Lacuna to address – Global Strategy

In 2001 there are 690 sites inscribed on the World Heritage List. Two charts show the composition of the inscribed sites according to the 5 world regions chosen by the World Heritage Centre.

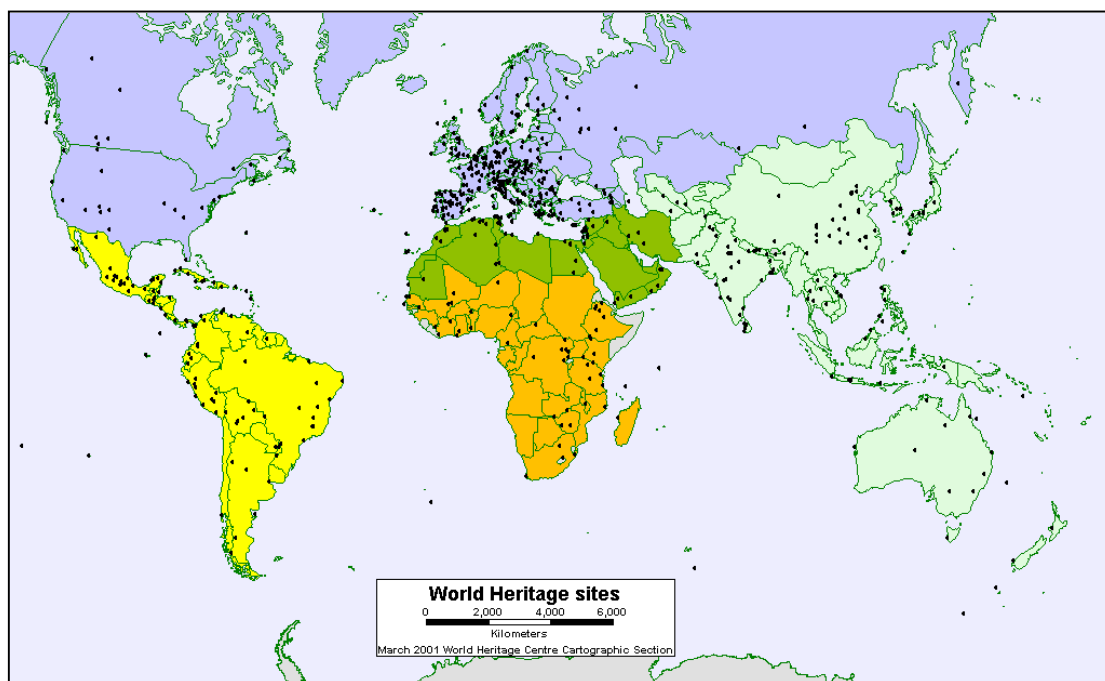


<sup>1</sup> World Heritage Committee, 24<sup>th</sup> session Report; Cairns, Australia December 2000. Under 3.2.ii



*Europe / North America embraces 50% of all World Heritage, Asia / Pacific Region embraces 20%, Latin America / Caribbean 14%. The Arab States region and Africa represent 8% each of all sites inscribed on the List.*

A global map showing all World Heritage Sites indicates the "centralisation" of inscribed sites in Europe.



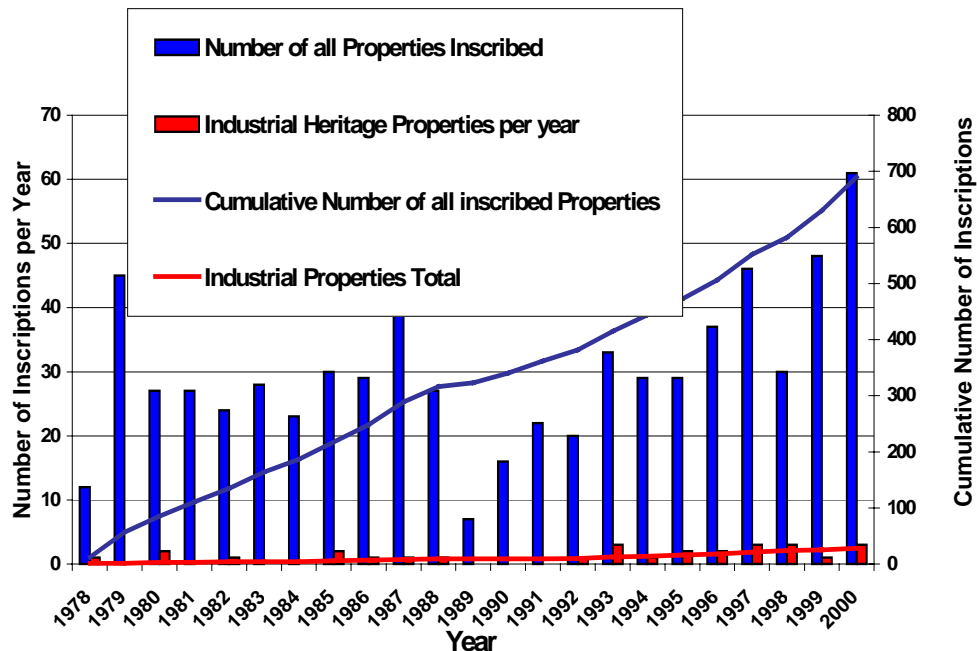
The division in cultural (including industrial), natural and mixed sites shows a large majority of cultural sites in all regions except Africa; the Europe / North America region alone embraces 302 out of all 529 cultural sites.

	<b>Cultural</b>	<b>(Industrial Heritage Site)</b>	<b>Natural</b>	<b>Mixed</b>	<b>Total</b>
<b>Africa</b>	21	0	30	2	53
<b>Arab States</b>	48	0	3	1	52
<b>Asia/Pacific</b>	90	(2)	36	9	135
<b>Europe / North America</b>	302	(22)	42	8	352
<b>Latin America / Caribbean</b>	68	(4)	27	3	98
<b>Total</b>	<b>529</b>	<b>(28)</b>	<b>138</b>	<b>23</b>	<b>690</b>



The development of annual inscribed nominations indicates a rapid increase in the number of World Heritage Sites on the List. The category "Industrial Heritage", as a under-represented category, has increased not nearly as rapidly.

In consequence, the more sites are inscribed, the more under-represented Industrial Heritage will be.



According to an ICOMOS Analysis of the World Heritage List<sup>2</sup> in 1999 there are two major imbalances on the World Heritage List.

- "A bias in favour of certain regions, notably Europe (including the Mediterranean basin and European colonial cultures of the New World), the great Hispanic civilisations of Latin America, and certain Asian cultures, in particular those of China and India."
- "Certain types of cultural property are disproportionately represented on the List: European and "European colonial" historic towns, Christian places of worship and monasteries, and archaeological sites (especially those of ancient Greece and Rome).

*By contrast, the industrial heritage is poorly represented as well as the 20<sup>th</sup> century heritage."*

Considering both the decisions of the World Heritage Committee for the advisory bodies and the results of the ICOMOS analysis, a thematic study about Industrial Heritage as an under-represented category on the World Heritage List will be the aim of this work.

<sup>2</sup> ICOMOS: "Proposals for achieving a more representative sample of the cultural heritage on the World Heritage List" 1999



### 3. Industrial Heritage

#### 3.1. Definition

The Industrial Revolution profoundly modified landscapes and life styles. The massive means employed to extract raw materials and exploit the minerals and agricultural products resulted in great achievements and grandiose constructions, testifying to the creative genius of humankind.

Guardians of the past, industrial sites testify to the ordeals and exploits of those who worked in them. Industrial sites are important milestones in the history of humanity, marking humanity's dual power of destruction and creation that engenders both nuisances and progress. They embody the hope of a better life, and the ever-greater power over matter.

The last 30 years have brought increased awareness of the importance of industrial history in understanding heritage.

*The new discipline of industrial archaeology celebrates the artefacts of the workplace that have as much meaning in our history as the religious and domestic artefacts and architecture to which more attention has been paid throughout the years. Our industrial heritage includes not only the mill and factory, but the social and engineering triumphs spawned by the new technologies: Neolithic flint mines, Roman aqueducts, company towns, canals, railways, bridges and other forms of transportation and power engineering.*

*It is important to note that Industrial Heritage exists in all phases of human development. Therefore it is not only found in the 19<sup>th</sup> and 20<sup>th</sup> centuries, but as well for example in prehistoric, medieval times.*

#### 3.2. Industrial Heritage on the World Heritage List

Rapid technological advances and the stripping of certain deposits have rendered most industrial sites obsolete. To save them from abandonment or destruction, a number of mines, factories, forges and manufactures have been inscribed on the World Heritage List.

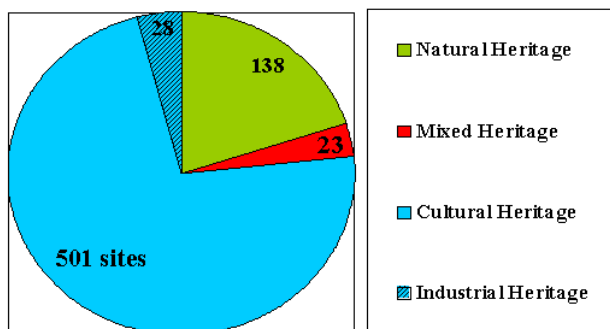
*Out of the 690 inscribed sites there are 28 sites that are considered "Industrial Heritage."<sup>3</sup> Industrial Heritage embraces 5.3% of all cultural sites and 4% of all World Heritage Sites.*

The composition of cultural (including industrial) heritage is very different in each region. Pie charts below give a short overview of the regional differences.

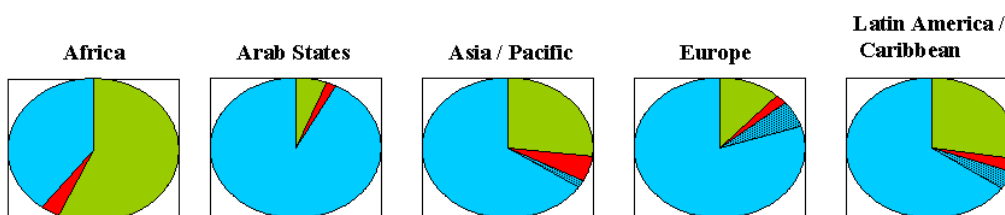
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<sup>3</sup> This classification of World Heritage sites was initially prepared in 1999 by the World Heritage Centre in collaboration with ICOMOS for a World Heritage poster series that included "Industrial Heritage".

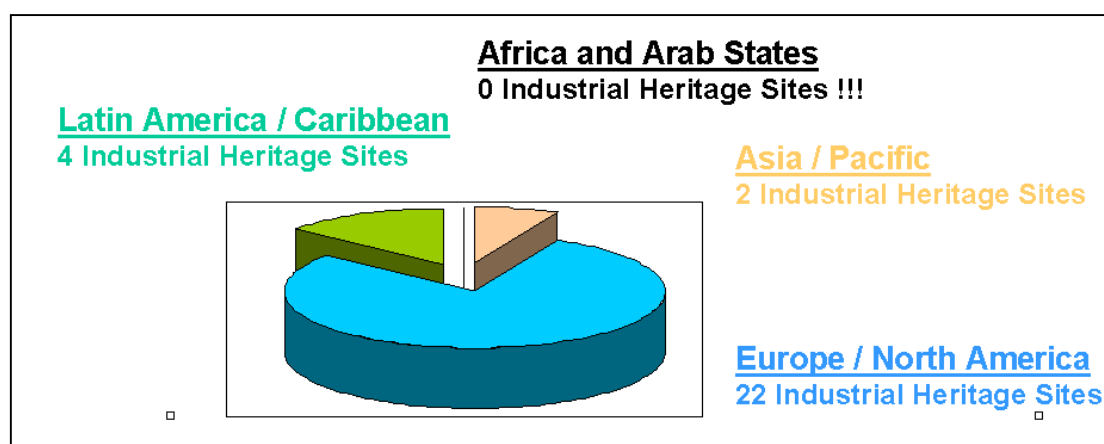




**Industrial Heritage  
embraces 5.3 % of all  
Cultural Sites and  
4 % of all World  
Heritage Sites.**



The 28 inscribed industrial heritage sites are classified by region. 22 Industrial Heritage Sites are found in the Europe / North America region, 4 in the Latin America / Caribbean region, 2 in the Asia / Pacific region. In Africa and the Arab States, there are no Industrial Sites on the World Heritage List.



The list shown below indicates the regional compositions of the World Heritage List.

The first column shows all countries with industrial heritage on the tentative list and shows the total of these countries out of all countries with a tentative list. The second column shows the total number of tentative sites of each country. This number is split into Cultural/Natural/Mixed sites in the third column. The last column names the title of the site, its year of inscription and its number on the World Heritage List .



## African Countries with Heritage Sites and Industrial Heritage

Country	Inscribed sites	<u>C/N/M</u>	Industrial Heritage, Year and Inscription Nr.
<b>0 of 19</b>	<b>53</b>	<b>21/30/2</b>	<b>0 inscribed Industrial Heritage Sites</b>

## Arab Countries with Heritage Sites and Industrial Heritage

Country	Inscribed sites	<u>C/N/M</u>	Industrial Heritage, Year and Inscription Nr.
<b>0 of 12</b>	<b>52</b>	<b>48/3/1</b>	<b>0 inscribed Industrial Heritage Sites</b>

## Asia / Pacific countries with Heritage Sites and Industrial Heritage

Country	Inscribed sites	<u>C/N/M</u>	Industrial Heritage, Year and Inscription Nr.
China	27	19/3/5	<ul style="list-style-type: none"> <li>Mount Qincheng and the Dujiangyan Irrigation System (2000) Nr.1001</li> </ul>
India	22	17/5/0	<ul style="list-style-type: none"> <li>Darjeeling Himalayan Railway (1999) Nr.944</li> </ul>
<b>2 of 21</b>	<b>135</b>	<b>90/36/9</b>	<b>2 Industrial Heritage Sites in Asia</b>

## Europe / North America countries with Heritage Sites and Industrial Heritage

Country	Inscribed sites	<u>C/N/M</u>	Industrial Heritage, Year and Inscription Nr.
Austria	6	6/0/0	<ul style="list-style-type: none"> <li>Hallstatt-Dachstein Salzkammergut Cultural Landscape, 1997, Nr.806</li> <li>Semmering Railway, 1998, Nr.785</li> </ul>
Belgium	8	8/0/0	<ul style="list-style-type: none"> <li>The Four Lifts on the Canal du Centre and their Environ, La Lovière and Le Roux (Hainaut), 1998, Nr.856</li> <li>The Neolithic Flint Mines at Spiennes (Mons), 2000, Nr.1006</li> </ul>
Czech Republic	10	10/0/0	<ul style="list-style-type: none"> <li>Kutna Hora : Historical Town Centre with the Church of St. Barbara and the Cathedral of Our Lady at Sedlec, 1995, Nr.732</li> </ul>
Finland	5	5/0/0	<ul style="list-style-type: none"> <li>Verla Groundwood and Board Mill, 196, Nr.751</li> </ul>
France	26	25/1/0	<ul style="list-style-type: none"> <li>Royal Saltworks of Arc-et-Senans, 1982, Nr. 203</li> <li>Pont du Gard (Roman Aqueduct), 1985, Nr.344</li> <li>Canal du Midi, 1996, Nr.770</li> </ul>
Germany	24	23/1/0	<ul style="list-style-type: none"> <li>Mines of Rammelsberg and Historic Town of Goslar, 1992, Nr.623</li> <li>Völklingen Ironworks, 1994, Nr. 687</li> </ul>
Italy	33	32/1/0	<ul style="list-style-type: none"> <li>Crespi d'Adda, 1995, Nr. 730</li> </ul>
Netherland	7	7/0/0	<ul style="list-style-type: none"> <li>Mill Network at Kinderdijk-Elshout, 1997, Nr.818</li> <li>Ir.D.F. Woudagemaal PumpStation, 1998, Nr.867</li> </ul>

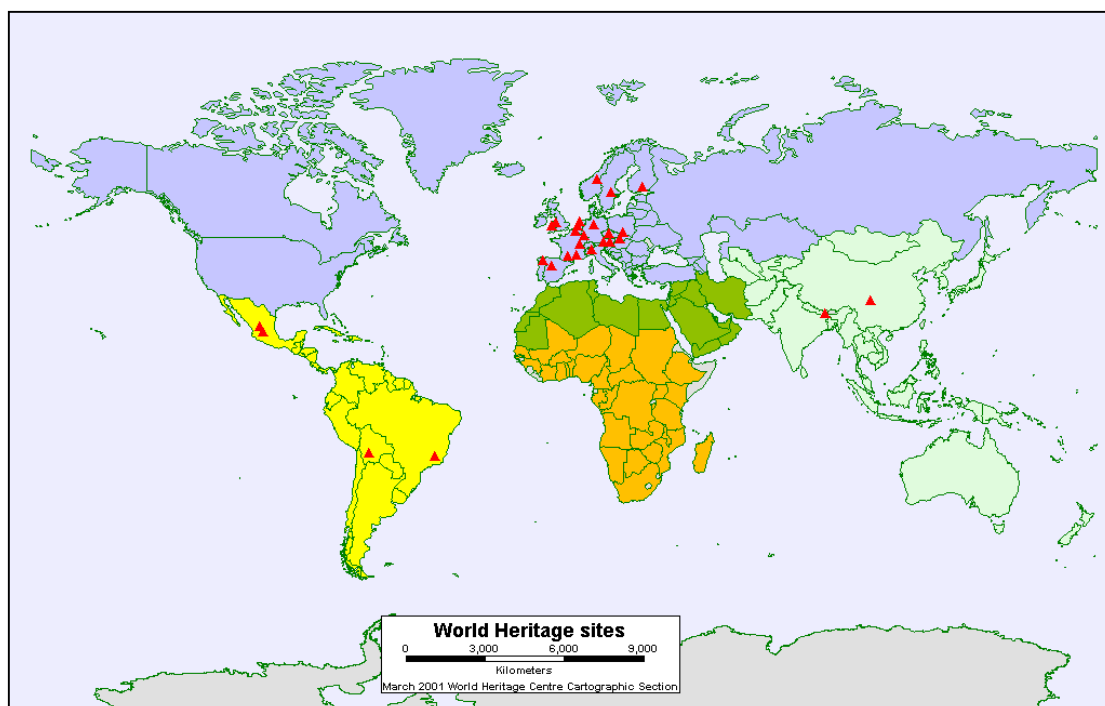


Norway	4	4/0/0	• Roros, 1980, Nr.55
Poland	8	8/0/0	• Wieliczka Salt Mine, 1980, Nr.32
Slovakia	4	4/0/0	• Banska Stiavnica, 1993, Nr.618
Spain	35	32/2/1	• Old Town of Segovia and its Aqueducts, 1985, Nr.311 • Las Médulas, 1997, Nr.1997
Sweden	11	9/1/1	• Engelsberg Ironworks, 1993, Nr.556
UK	20	16/4/0	• Ironbridge Gorge, 1986, Nr.371 • Blaenavon Industrial Landscape, 2000, Nr.984
<b>14 / 43</b>	<b>Total 352</b>	<b>302/42/8</b>	<b>22 inscribed Industrial Heritage Sites</b>

### Latin American / Caribbean countries with Heritage Sites and Industrial Heritage

Country	Inscribed sites	<u>C</u> / <u>N</u> / <u>M</u>	Industrial Heritage, Year and Inscription Nr.
Bolivia	6	5/1/0	• City of Potosi, 1987, Nr.420
Brazil	13	8/5/0	• Historic Town of Ouro Preto, 1980, Nr.124
Mexico	21	19/2/0	• Historic Town of Guanajuato and Adjacent Mine, 1988, Nr.482 • Historic Centre of Zacatecas, 1993, Nr.676
<b>3 / 25</b>	<b>Total 98</b>	<b>68/27/3</b>	<b>4 inscribed Industrial Heritage Sites</b>

A global map concerning the Industrial Heritage Sites shows the same “euro-centralized” composition for Industrial Heritage Sites as indicated by ICOMOS for all Heritage Sites. Different colours indicate the 5 different world regions.





### **3.3. Categories, Sub-themes, Proposed Classification system (HEAR)**

In order to find sub-themes of Industrial Heritage there is a very detailed *classification system* developed by the Historic American Engineering Record (HAER), a sub-division of the United States National Park Service. This system will be used for this analysis.

The Industrial Structures Classification System shows 10 sub-categories:

0. Extractive Industries (e.g. Ore- or Gold-mining)
1. Bulk Products Industries (e.g. Primary Metal Industries)
2. Manufacturing Industries (e.g. Machine Manufacture)
3. Utilities (e.g. Water Supply, Electricity)
4. Power Sources and Prime Movers (e.g. Water wheels, Steam turbines)
5. Transportation (e.g. Railroads, Canals, Harbour)
6. Communication (e.g. Radio, Telephone)
7. Bridges, Trestles, Aqueducts
8. Building Technology ( Roof systems, Fenestration)
9. Specialized Structures / Objects (e.g. Dams, Tunnels, Hydraulic works)

(see complete list: "HAER" classification system, Appendix 6.1)

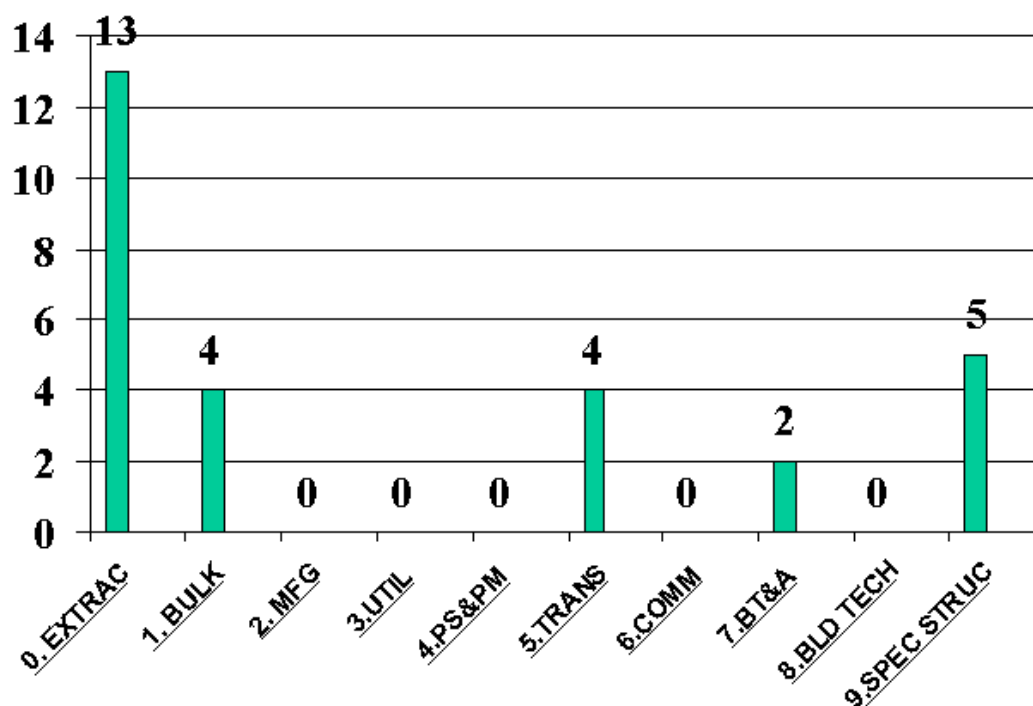


### 3.4. Classification and Introduction of the Industrial World Heritage Sites

For the introduction of the 28 inscribed industrial heritage sites with photos, the classification table above will be used. A short description is given according to the classification number given in the last column.

(Sites with Industrial classification and photos, Appendix 6.2.)

According to the classification system, it is possible to produce a chart with the classification types and the number of sites corresponding to the classification.



- It shows a large majority of “Extractive mine industries (0.)” with 13 sites. There are 4 silver mines and 2 gold mines, most of them in Latin America, in large parts started in the Spanish colonial period.
- “Bulk Products Industries (1.)” has 4 sites and these are very different from each other.
- “Transportation (5.)” shows 2 sites with 2 similar railway lines, both built in the 19<sup>th</sup> century but in different regions of the world.
- The “Special Structures (5.)” section has 5 different types of sites.
- 2 sites correspond to “Bridges, Trestles and Aqueducts (7.)”. Both are Roman aqueducts.
- All other classification types are not found among the Industrial Heritage Sites on the World Heritage List.



An excerpt of the classification list shows some types of sub-themes, a short description of the site and the classification number.

<b>5. TRANSPORTATION</b>					
Asia / Pacific	India	Darjeeling Himalayan Railway	Railway	47	
Europe / North America	Austria	Semmering Railway	Railway	47	
Europe / North America	France	Canal du Midi	Navigable waterways constructions	49.0	
Europe / North America	Belgium	The Four Lifts on the Canal du Centre and their Environs, La Louvière and Le Roeulx	Hydraulic Engineering works, boat-lifts	49.0	
<b>7. BRIDGES, TRESTLES AND AQUEDUCTS</b>					
Europe / North America	France	Pont du Gard	Aqueduct	62.0	
Europe / North America	Spain	Old Town of Segovia and its Aqueduct	Aqueduct	62.0	
<b>9. SPECIALIZED STRUCTURES</b>					
Europe / North America	Netherlands	D.F.Woudagemaal	Steam pump stations	81.0	
Europe / North America	Netherlands	Mill Network at Kinderdijk-Elshout	Hydraulic Works	81	
Asia / Pacific	China	Mount Quincheng and Dujiangyan Irrigation System	Irrigation system	81.3	
Europe / North America	France	Royal Saltworks of Arc-et-Reason	Ideal industrial architecture	87	

This short analysis of the inscribed industrial heritage sites shows that even in an under-represented category such as Industrial Heritage there are repetitive structures, while other classification types are not found at all.



## **4. Analysis of the Tentative List**

### **4.1. Definition of the Tentative List and the Operational Guidelines**

As noted above, every State Party shall submit, according to the *Operational Guidelines*, an inventory of property forming part of the heritage in its territory as a State Party's *Tentative List*. Sites suitable for inclusion in the World Heritage List are transmitted to the Committee as nominations.

The tentative list should be an indicator for nomination trends in each region.

The 24<sup>th</sup> session of the World Heritage Committee asked the World Heritage Centre and advisory bodies to communicate the results of their analyses to the Committee for examination and should be conveyed to States Parties. This will allow them to prepare, revise and/or harmonise their tentative list, taking into account, where appropriate, regional considerations.

### **4.2. Classification of Industrial Heritage on the Tentative List**

In the following section the tentative lists of all State Parties will be analyzed and all potential Industrial Heritage will be classified according to the classification system.

To classify Industrial Heritage two levels of sites are analyzed.

#### *1. Tentative sites with stated Industrial World Heritage Value*

These sites are by the title of the nomination Industrial Heritage, e.g. "Tonglushan ancient copper mine sites" in China.

#### *2. Tentative sites with associated industrial value*

These sites are not industrial heritage by title, but show a significant amount of industrial heritage in the descriptions of the site by the State Party. These sites are particularly interesting for regional comparative studies and potential cluster nominations, e.g. aqueduct structures in Near East archaeological sites.

Both types of sites will be listed separately in the regional lists of industrial heritage attached.



### 4.3. Classification by Area

All countries are listed in the regional analysis attached, including their number of all tentative sites in each State Party (column 2), split into cultural, natural and mixed sites (column 3). Short descriptions are given for the two types of industrial heritage ("stated" and "associative" in column 5 and 7) as given by the States Parties descriptions attached to the lists. Column 8 gives industrial classification numbers for each site.

The classification list shows only the sites relevant for industrial heritage. For every region there is a regional map identifying the relevant sites along with a classification table. Finally the composition of the regional heritage list and the regional tentative list will be compared and trends will be explained. Highlights of regional sites will be listed with available photos.

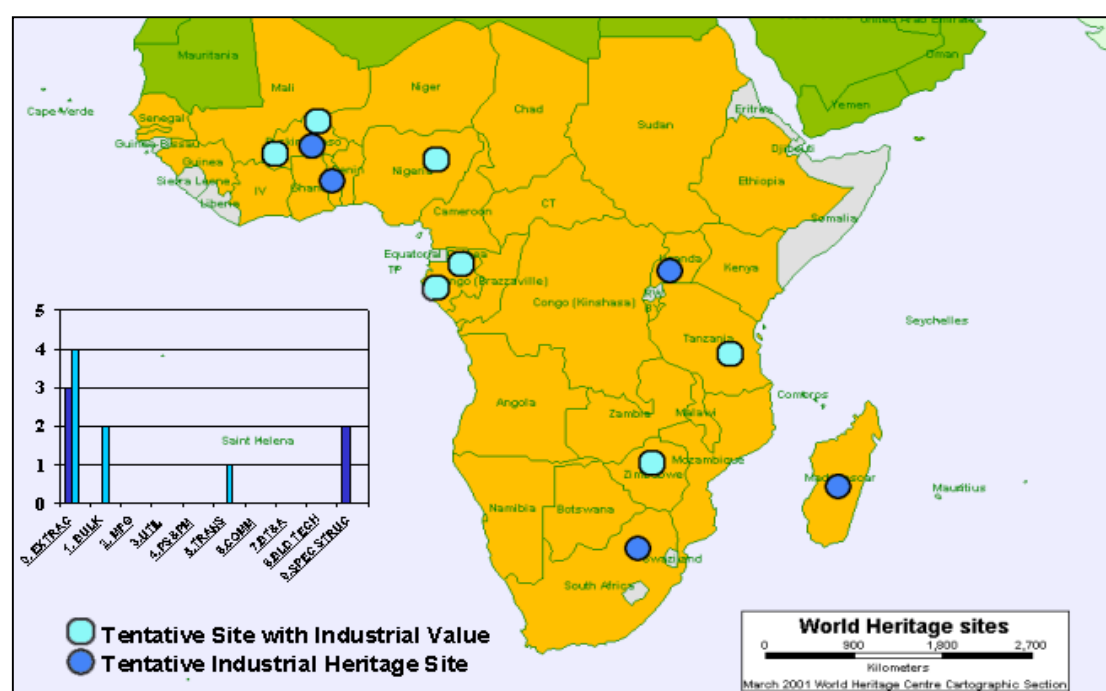
#### 4.3.1. Africa Region

##### 4.3.1.1. Table and Map – Description

For the African region 22 countries have tentative lists with a total of 99 tentative sites. Of this number, 74 are cultural, 16 natural and 9 are mixed. 5 of the cultural sites are industrial value.

(For the list of all sites, see Appendix 6.3.)

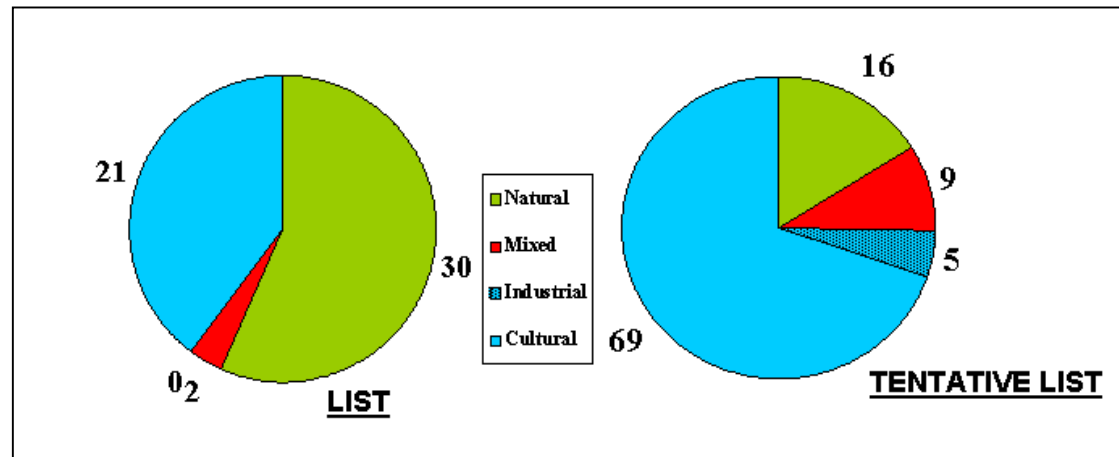
5 Tentative sites with stated Industrial World Heritage value and 7 sites with associated industrial value are identified and shown on a regional map. (Descriptions given by the States Parties are attached to the list of Appendix 6.4.) The chart on the map shows the sub-themes composition.





#### 4.3.1.2. Trend

Comparing the composition of the World Heritage List and the tentative list, there is a large decrease of natural sites from 56% to 16%, an increase of cultural sites from 40% to 70%. Mixed sites increase from 2 to 9 sites.



Since there is no industrial heritage site on the Heritage List, 5 Tentative sites with stated Industrial Value and 7 sites with associated industrial value show an interesting development for potential industrial sites in Africa.

#### 4.3.1.3. Highlights

(Classification chart in Appendix 6.4.)

Out of the 5 Tentative sites with stated Industrial value, there are 3 to classify under “0. Extractive Industries” with an iron ore mine in Burkina Faso, a gold mining village in South Africa and salt processing village in Uganda (photo).



Under “9. Specialised Structures and Objects” there is a rice growing village with a hydraulic canal system in Madagascar and a grotto system for food storage in Togo.

Under associated industrial value sites there is, for example, an industrial harbour city of the former German East African colony in Tanzania.



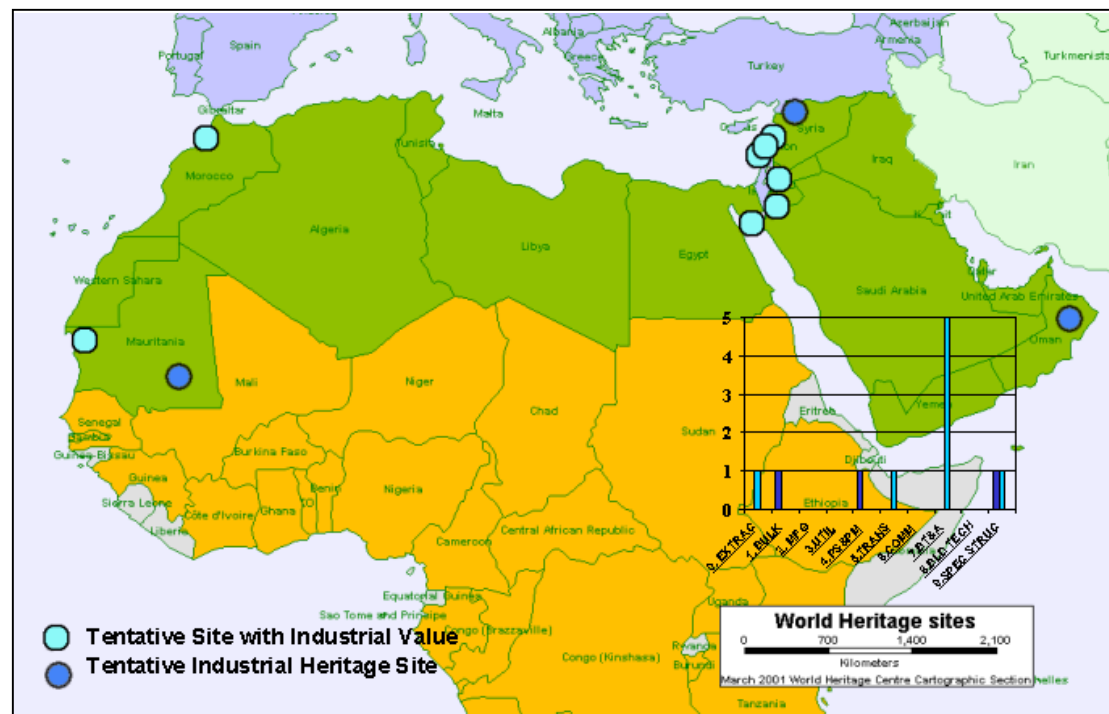
### 4.3.2. Arab States Region

#### 4.3.2.1. Table and Map - Description

For the Arab States region there are 9 countries with tentative lists with 86 tentative sites of which there are 80 cultural (3 industrial), 6 natural and 0 mixed sites.

(For the list of Tentative sites, see Appendix 6.5.)

3 Tentative sites with stated industrial value and 8 sites with associated industrial value are identified and shown on a regional map of the Arab States. (Descriptions given by the States Parties are attached to the list of Appendix 6.6.) The chart on the map shows the sub-themes composition.

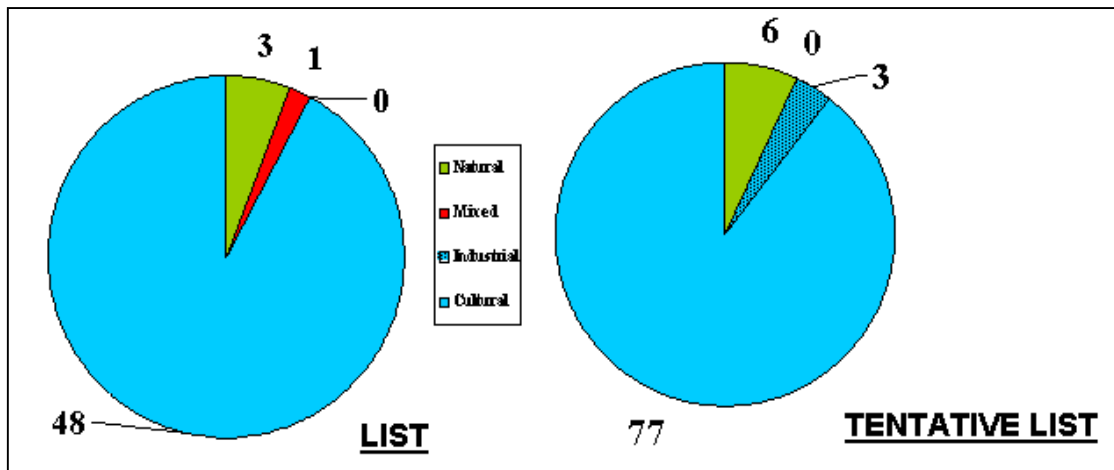


#### 4.3.2.2. Trends

Comparing the composition of the Heritage list and the tentative list, there is no major change in the percentage compositions.

Since there is no industrial heritage on the Heritage List, 3 Tentative sites with stated Industrial World Heritage value with exceptional sites and 8 sites with associated industrial value are well worth being considered as potential sites.





#### 4.3.2.3. Highlights

(Classification chart in appendix 6.6.)

Out of the 3 Tentative sites with stated industrial value there is one classified under “1.Bulk Products Industries” with a commercial centre for metallurgical industry of gold, iron and copper in Mauritania.

Under “4. Power sources and prime movers” there is an exceptional water wheel system in Hama, Syria (photo right).



“9. Specialized structures and objects” shows a “Fajal” ground and subterranean canal system in Oman (photo right).



As associated industrial value sites there are, for example, a number of aqueducts in Jordan and Lebanon and a lighthouse in Egypt.



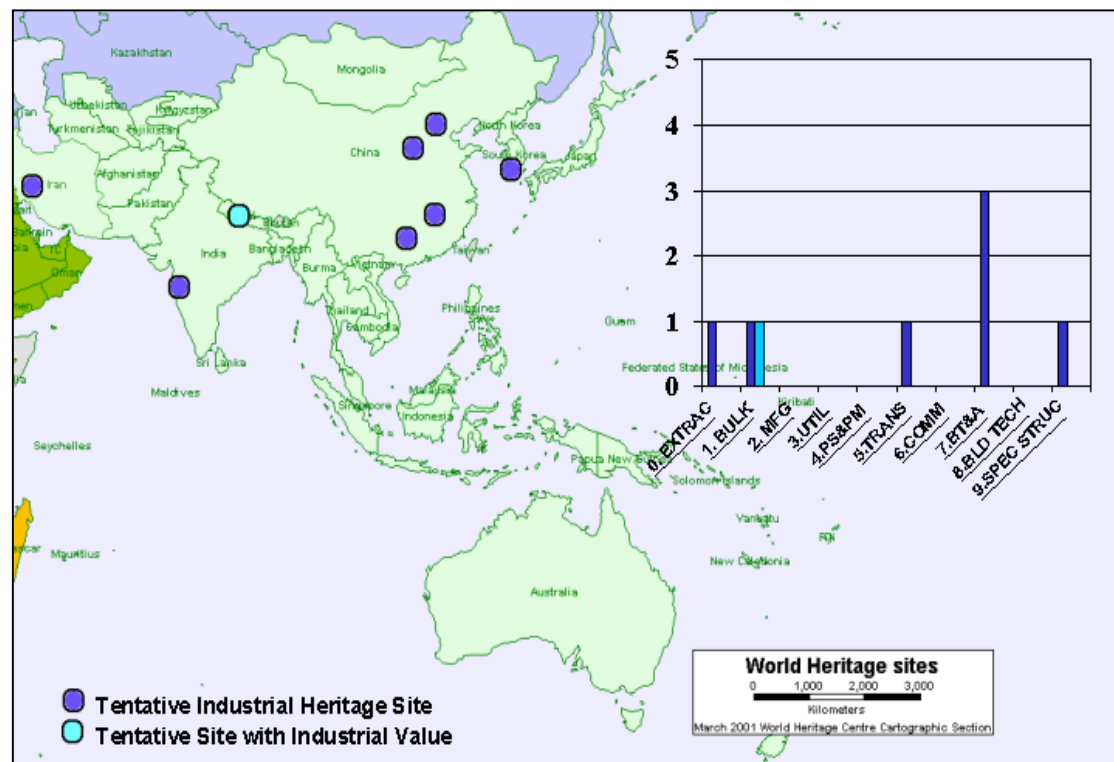
### 4.3.3. Asia / Pacific Region

#### 4.3.3.1. Table and Map

For the Asia / Pacific region there are 23 countries with tentative lists with 218 tentative sites of which 182 are cultural (7 industrial), 21 natural and 15 mixed sites.

(For the list of Tentative sites, see Appendix 6.7.)

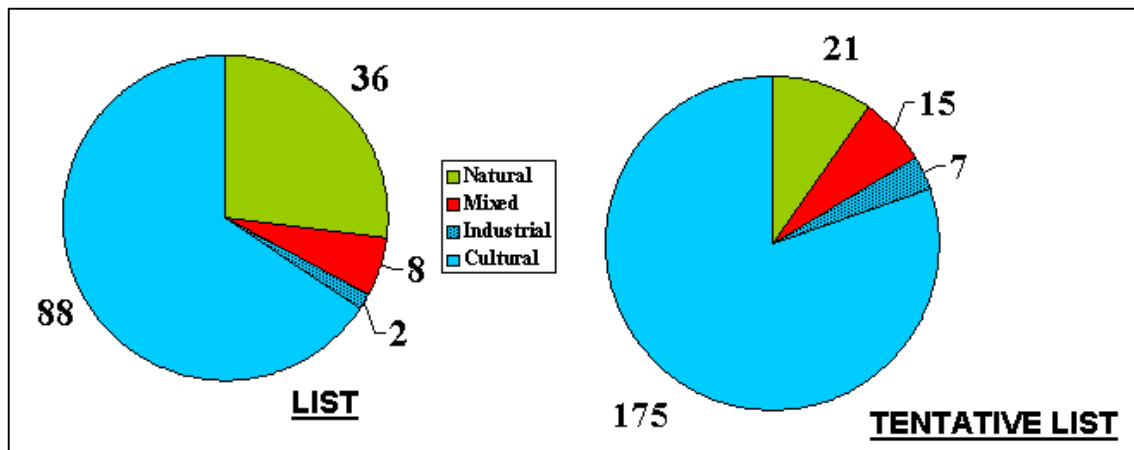
There are 2 Industrial World Heritage sites inscribed in the Asia/Pacific region. 7 Tentative sites with stated industrial value and 1 site with associated industrial value are identified and shown on a regional map of Asia / Pacific. (Descriptions given by the States Parties are attached to the list of Appendix 6.8.) The chart on the map shows the sub-themes composition.





#### 4.3.3.2. Trends

Comparing the composition of the World Heritage List and the tentative lists of the Asia/Pacific region, there is a large decrease in natural sites from 27% to 10%, and an increase in cultural sites from 66% to 80%. Mixed sites increase from 8 to 15 sites.



#### 4.3.3.3. Description and Highlights

(Classification in Appendix 6.8.)

5 out of the 7 Tentative sites with stated industrial value are found in China. 3 of them are bridges (7.Bridges, Trestles and Aqueducts on the classification table).

Under "0. Extractive Industries" there is an ancient copper mine in China. "The category "1.Bulk Products Industries" shows an exceptional celadon kiln site in the Republic of Korea.

The only site under "5.Transportation" is a train station in Bombay, India (photo). This nomination has been deferred by the Committee for a comparative study of railway stations. Under "9. Specialized Structures" there is a hydraulic installation system in Iran.



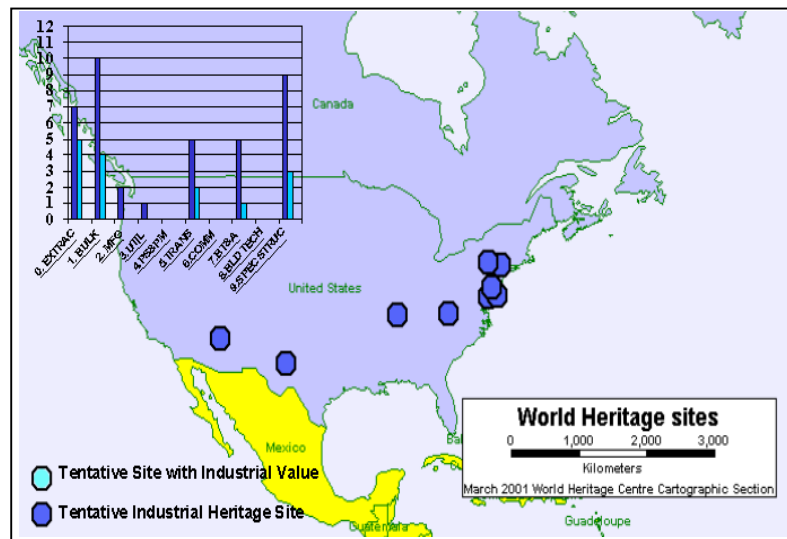
The only site with associated industrial value is a mustard-oil seed producing village in Nepal.



#### 4.3.4. Europe / North America Region

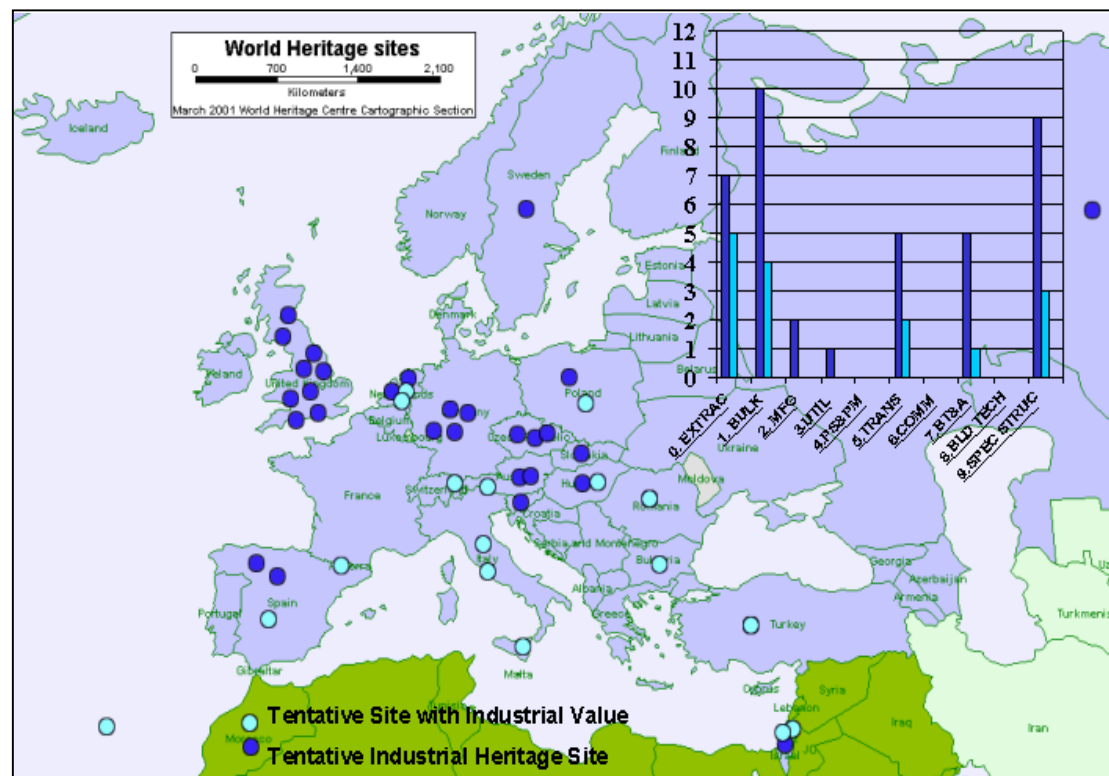
##### 4.3.4.1. Table and Map - Description

For the Europe/ North America region there are 40 countries with tentative lists containing 480 tentative sites, with 352 cultural (38 industrial), 96 natural and 32 mixed sites. The chart on the map shows the sub-themes composition.



(For the list of Tentative sites, see Appendix 6.9.)

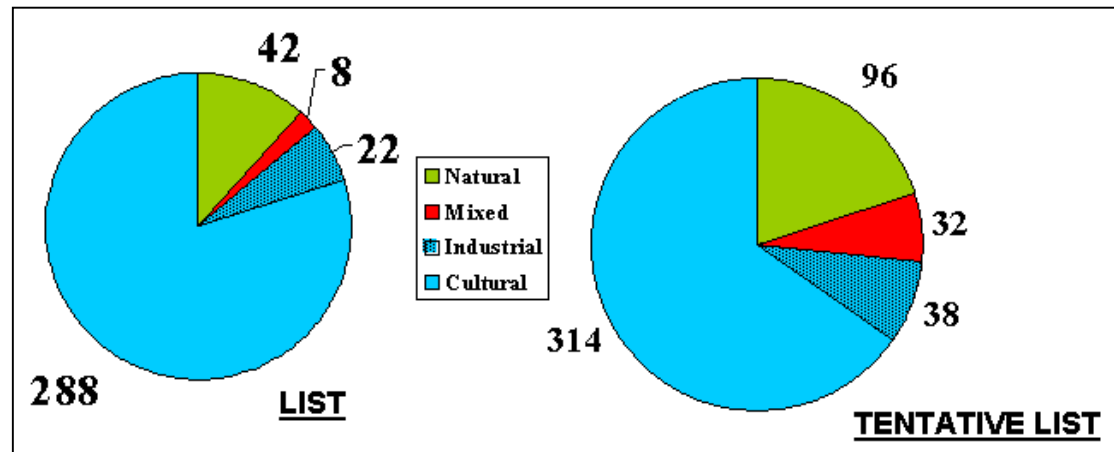
There are 22 Industrial heritage sites on the Heritage List. 38 Tentative sites with States Parties stated Industrial World Heritage and 17 site with associated industrial value are shown on separate maps for North America and Europe. (Descriptions given by the States Parties are attached to the list of Appendix 6.10.) The chart on the map shows the sub-themes composition.





#### 4.3.4.2. Trends

Comparing the composition of the World Heritage List and the tentative list of the Europe/North America region, there is a decrease of cultural sites from 80% to 65% and an increase of natural sites from 12% to 20%. Mixed sites increase from 8 to 32 sites.



It is interesting to see that the largest number of tentative industrial sites in Europe are found in an axis leading from northwest of Europe from England over the Netherlands and Germany to central-eastern Europe such as the Czech Republic, Austria, Slovakia and Hungary. There are no industrial sites on the tentative lists of in France, Italy or countries of south-eastern Europe such as Greece and Turkey.

#### 4.3.4.3. Highlights

(Classification chart in Appendix 6.10.)

Europe shows the largest variety of industrial sites and just a small selection of them is mentioned in the text and described by photos.

Under “0. Extractive Industries” there are 7 sites out of the total of 38 as Tentative sites with stated industrial value.

Exceptional examples are the “Cultural Industrial Landscape Zollverein” in Germany (photo) and a 500-year old mercury mine in Slovenia.





The category “1. Bulk Products Industries” shows a wide range of interesting sites with 10 sites as Tentative sites with stated industrial value. There is a Stud farm in Hungary, a Refining factory in the Netherlands (photo), the spectacular Iron-ore mining mountain Erzberg in Austria (photo below), a textile mill settlement in the UK, as well as a paper mill in the Czech Republic.



Under “2. Manufacturing Industries” there is for example a shoe last factory in Germany.

The category “5. Transportation” with 5 Tentative sites with States Parties stated Industrial World Heritage is represented with railways in Slovakia and UK as well as with commercial docks in Liverpool, UK.



With 5 stated industrial value sites, the category “7. Bridges, Trestles, Aqueducts” is well represented, for example with the Brooklyn Bridge in New York, USA.

The most unusual sites are found in category “9. Specialized Structures and Objects” with 9 stated industrial value sites.

Most are found in the USA with a rocket launching site, telephone and electric research laboratories and even a nuclear device explosion site.





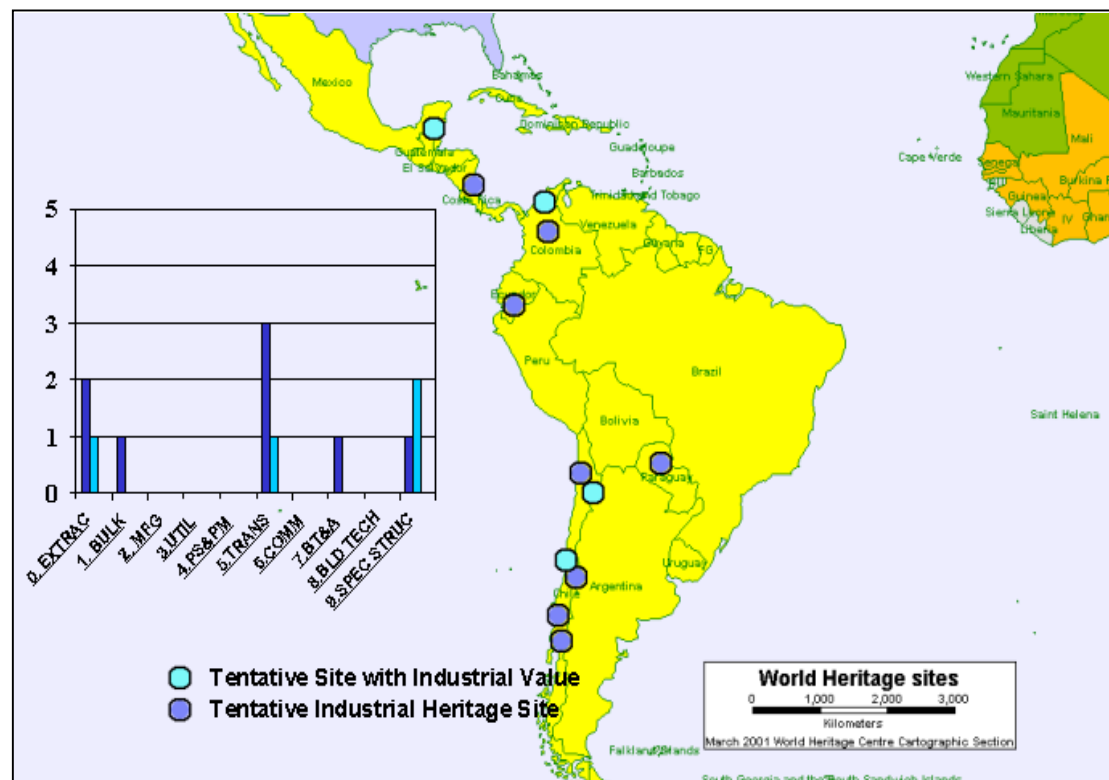
### 4.3.5. Latin America / Caribbean Region

#### 4.3.5.1. Table and Map

For the Latin America/Caribbean region there are 18 countries with tentative lists, with 91 tentative sites of which 59 sites are cultural (8 industrial), 23 natural and 9 mixed sites.

(For the list of Tentative sites, see Appendix 6.11.)

There are 4 Industrial heritage sites on the Heritage List, 8 tentative sites with stated industrial value and 4 sites with associated industrial value identified and shown on a regional map of Latin America / Caribbean. (Descriptions given by the States Parties are attached to the list of Appendix 6.12.) The chart on the map shows the sub-themes composition.

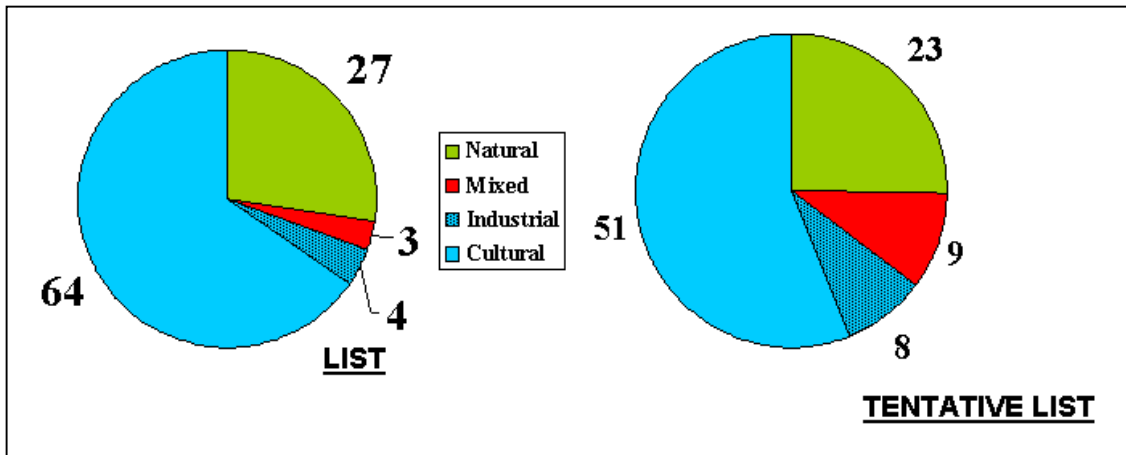


#### 4.3.5.2. Trends

Comparing the composition of the Heritage list and the tentative list of the Latin America/Caribbean region, there is a decrease of cultural sites from 65% to 56%, mixed sites increase from 3 to 9 sites.

There are 4 Industrial heritage sites on the World Heritage List and 8 Tentative sites with stated industrial value on the tentative list.



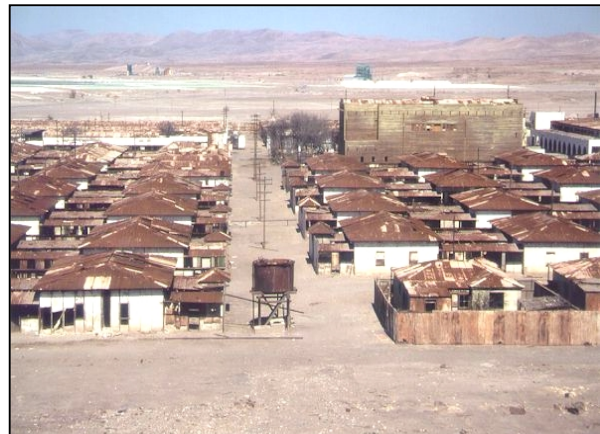


#### 4.3.5.3. Description and Highlights

(Classification chart in Appendix 6.12.)

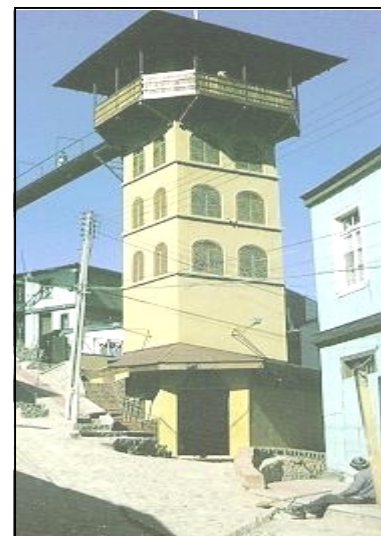
The category “0.Extractive Industries” shows 2 sites with stated industrial value.

The category “1.Bulk products industries” is represented with an exceptional site for sodium nitrate exploitation in Humberstone, Chile (photo).



3 railway systems are found under category “5.Transportation”.

As a site with associated industrial value Valparaiso in Chile should be noted. This site has been withdrawn from the tentative list as a historic city, but could be replaced as an industrial heritage site with its exceptional transportation system using elevators.



The categories “7” and “9” are represented with 1 site with stated industrial value each with a viaduct in Chile and a railroad system in Colombia.



## 4.4. Global Classification of Industrial Heritage

### 4.4.1. Trends

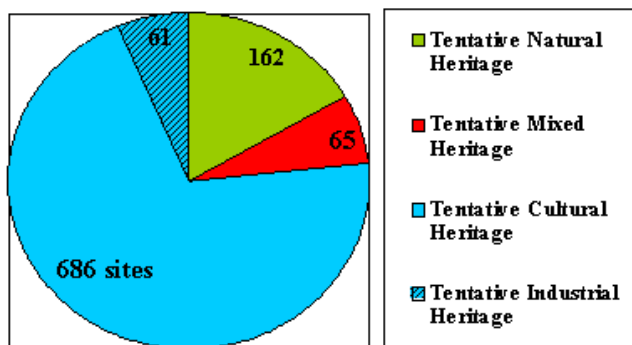
A global table brings all regional trends together.

	Cultural Property	Natural Property	Mixed Property	Tentative Industrial World Heritage Sites (TIWH)	Tentative Sites with Associated Industrial Value (TAIV)	Total
Africa (22)	74	16	9	(5)	(7)	99
Arab States (9)	80	6	0	(3)	(8)	86
Asia / Pacific (23)	182	21	15	(7)	(1)	218
Europe / North America (40)	352	96	32	(38)	(17)	480
Latin America Caribbean (18)	59	23	9	(8)	(4)	91
Total (112)	747	162	65	(61)	(37)	974

- In total there are 974 sites on the global tentative list (sites that are still on the tentative list but actually already inscribed are not counted).
- 747 of them are cultural property including 61 Tentative Industrial Sites and 37 sites with associated industrial value.
- 162 tentative sites are natural property and 65 are mixed properties.
- The largest amount of tentative industrial sites is found in Europe with 38 sites. All other regions have between 3-8 tentative industrial sites.
- **Tentative Industrial Heritage embraces 8.2% of all Tentative Cultural sites and 6.2% of all Tentative World Heritage Sites.**

An overview shows again the regional compositions of the tentative lists with very different characters.

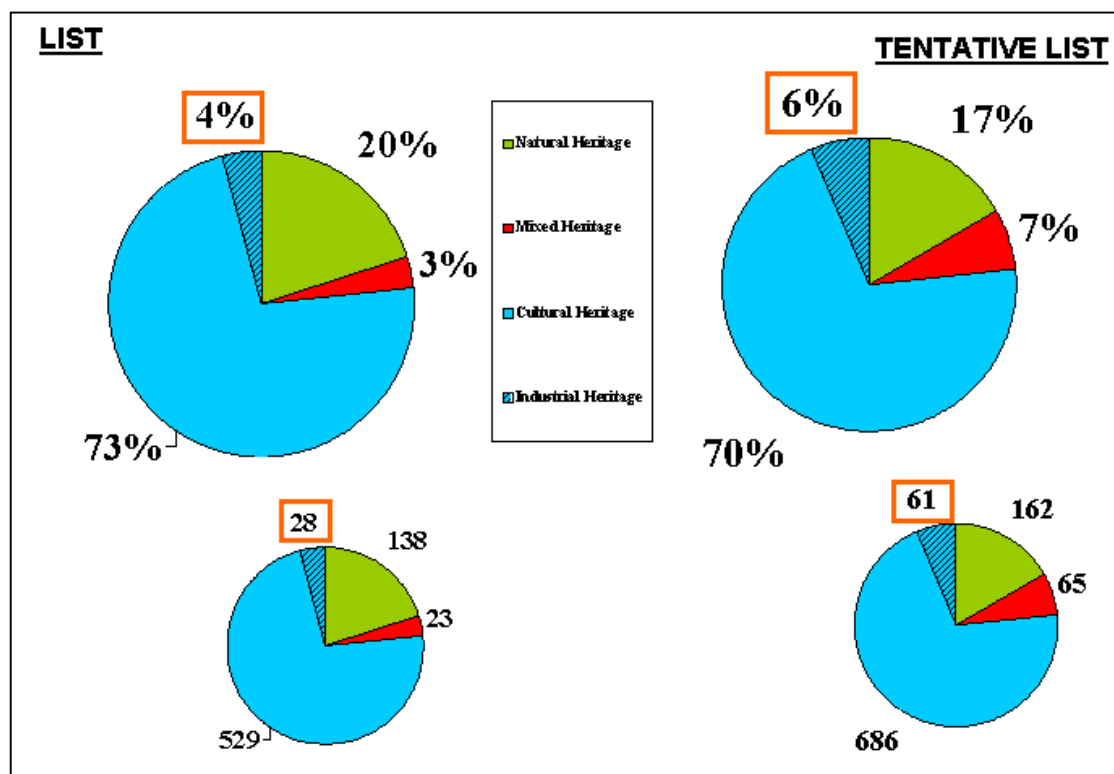




**Tentative Industrial Heritage embraces 8.2 % of all Tentative Cultural Sites and 6.2 % of all Tentative World Heritage Sites.**



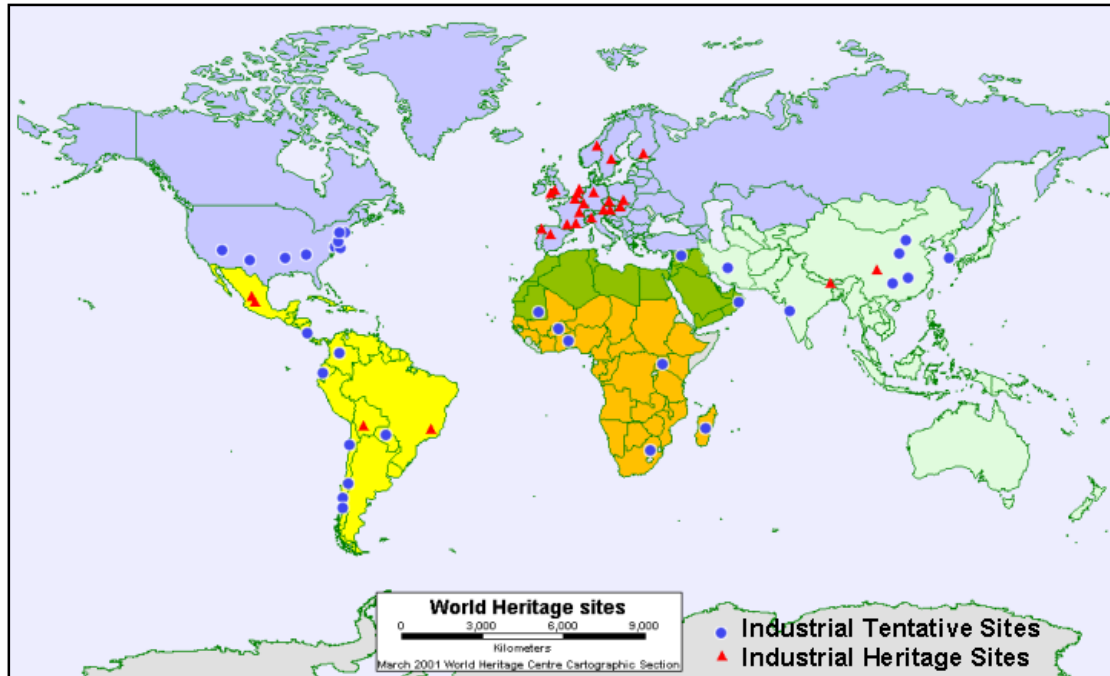
*Comparing the composition of both the World Heritage List and the tentative list, there is an increasing number of Industrial Heritage to be seen. It increases from 28 to 61 sites, that means from 4% to 6%.*





#### 4.4.2. Global Classification List and Global Map

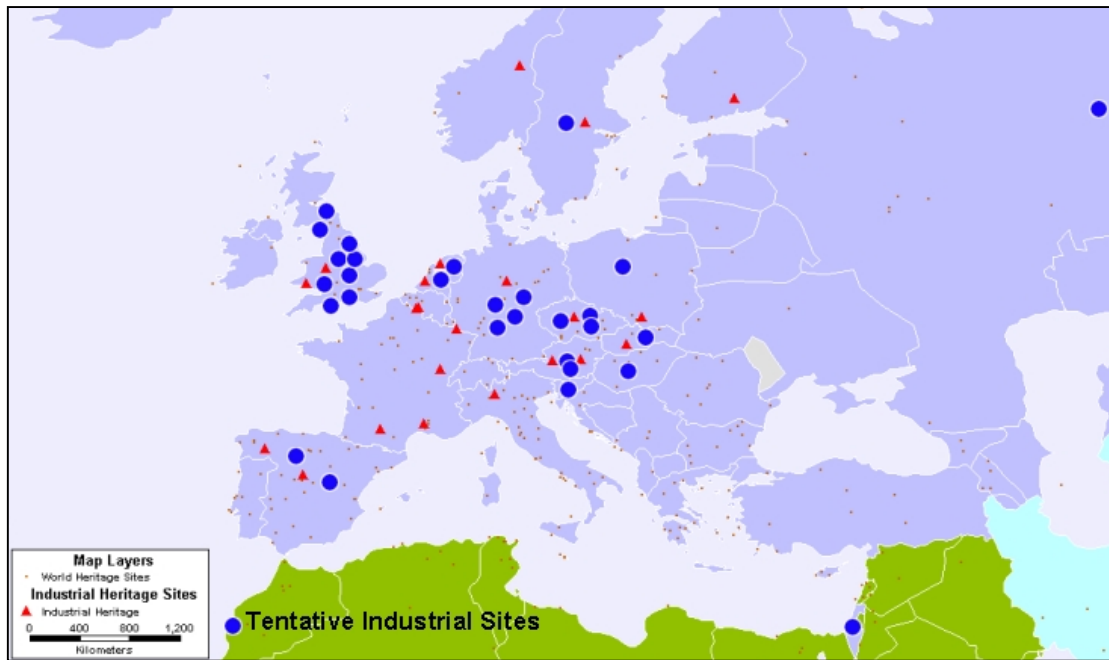
Two maps (one for non-European regions and one with exclusively Europe) include only sites with stated industrial value on the tentative list and already inscribed on the World Heritage List.



The "Europe-concentrated" trend of inscribed sites can be seen as well for Industrial Heritage, but in the thematical search of under-represented sub-themes, there are very important and unique structures of Industrial Heritage in Europe.

It can be clearly seen, that there are a lot of industrial sites on the tentative list that could be selected to harmonize the global net of industrial heritage. Water wheel systems in Syria, celadon kiln sites in Korea, a rocket launching site in North America and sodium nitrate offices in Chile could be exceptional industrial heritage sites of regional and global importance.



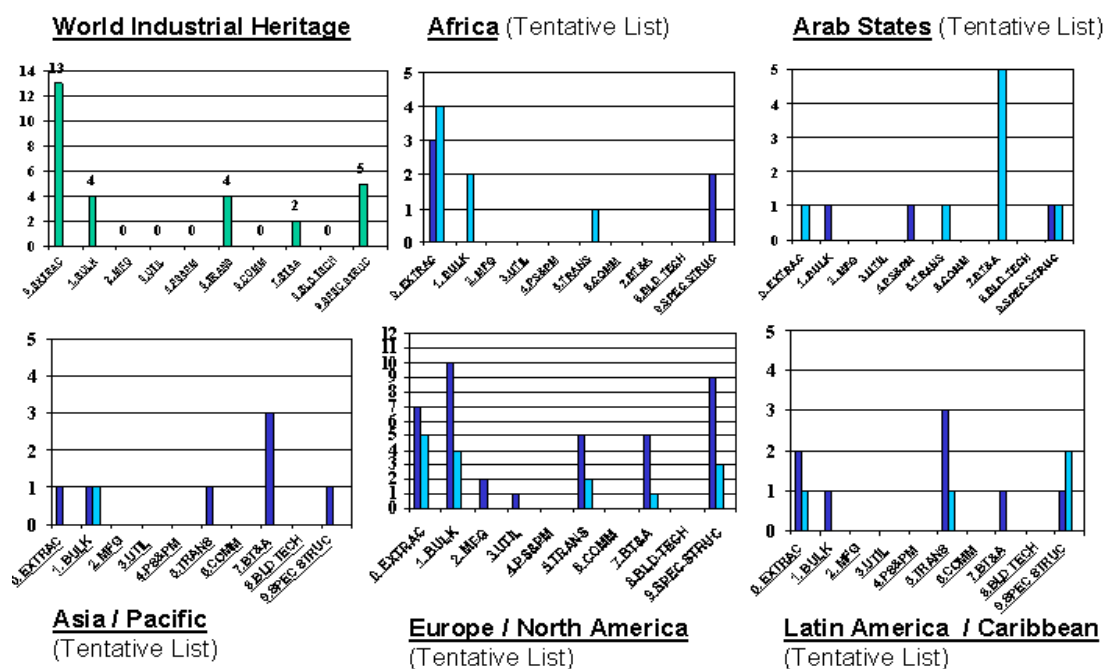


#### 4.4.3. Example of application of the global industrial tentative list

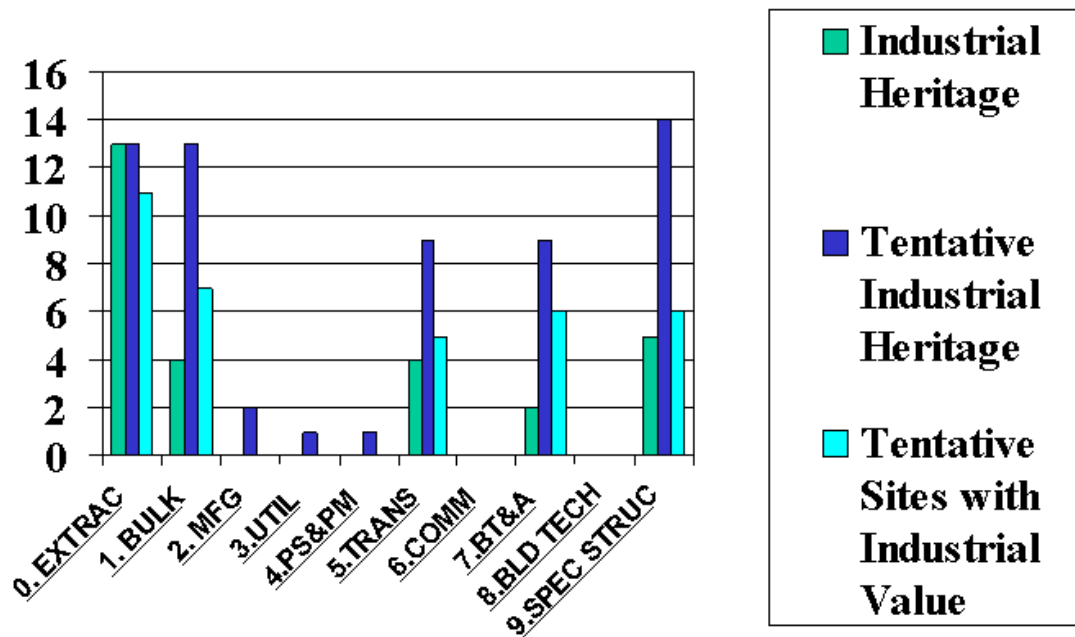
The total global list of industrial heritage on all States Parties tentative lists is an indicator of future sites that may be selected.

(See Global Tentative Industrial Heritage Classification List in Appendix 6.13.)

The classification charts of all regional tentative lists combined with the classification chart of the World Heritage List of Industrial Heritage help to identify over- and under-represented sites according to the classified sub-themes.







Classification categories such as “0. Extractive industries” are well over-represented on both the World Heritage List and the tentative list. On the other hand categories 1, 2, 5, 7 and 9 could be easily “upgraded” with a large number of sites on the tentative list to choose from.

Non-existing sub-themes on the World Industrial Heritage List such as type 2, 3, and 4 (Bulk Products Industries, Manufacturing Industries and Utilities) are found in small numbers on the tentative list and therefore could be interesting sites for future nominations.

Categories “6. Communications” and “8. Building Technology” are neither found on the World Heritage List nor on the tentative list. These are structure types especially represented in 20<sup>th</sup> century architecture, that are an under-represented categories as Industrial Heritage. These classification types are to be identified in future comparative studies.



## 5. Work for the Future - a Martix System

In this analysis a classification system for industrial heritage has been introduced and applied to the World Heritage Tentative List. The result is a global list of sub-themes in order to identify over-represented types of sites and major gaps according to this classification system.

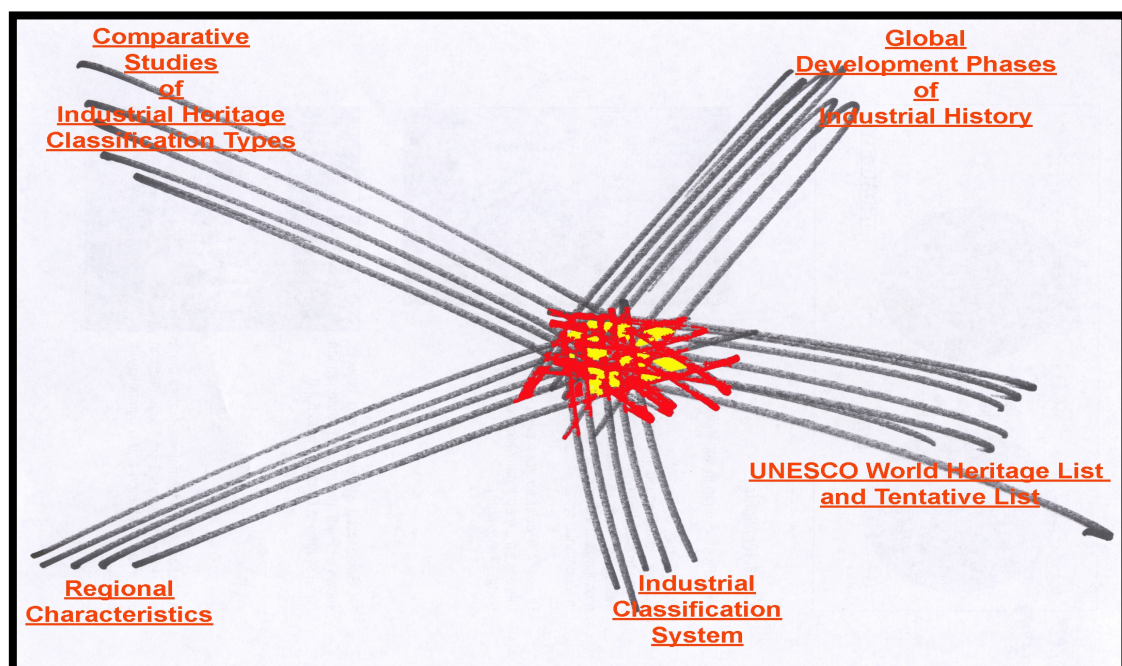
This analysis is far from complete.

**The next step should include a kind of matrix system with several overlapping units concerning industrial heritage.**

Every unit is a list of its own and will be put in relation with the other one. The gaps found in the overlapping centre of all units identify under-represented sub-themes (see sketched diagram below).

The major units could be:

- **Industrial Classification system**
- **UNESCO World Heritage List and Tentative List**
- **Regional and National characteristics of Industrial Heritage**
- **Global major development phases of Industrial History**
- **Comparative Studies of Industrial Heritage classification types (national-regional-global)**





## **6. Appendices**

- 6.1. HAER Industrial Classification System
- 6.2. Industrial Classification List of Industrial Heritage Sites with  
photos
- 6.3. Africa Tentative list analysis and description
- 6.4. Africa Tentative Industrial Heritage Classification
- 6.5. Arab States Tentative list analysis and description
- 6.6. Arab States Tentative Industrial Heritage Classification
- 6.7. Asia / Pacific Tentative list analysis and description
- 6.8. Asia / Pacific Tentative Industrial Heritage Classification
- 6.9. Europe / North America Tentative list analysis and description
- 6.10. Europe / North America Tentative Industrial Heritage  
Classification
- 6.11. Latin America / Caribbean Tentative list analysis and description
- 6.12. Latin America / Caribbean Tentative Industrial Heritage  
Classification
- 6.13. Global Tentative Industrial Heritage list Classification



## 6.1. HAER Industrial Classification System



## **HAER INDUSTRIAL STRUCTURES CLASSIFICATION SYSTEM**

### **0. EXTRACTIVE INDUSTRIES (EXTRAC)**

- 01. Iron Mining (IRON)
- 02. Anthracite & Bituminous Mining (COAL)
- 03. Crude Petroleum & Natural Gas (OIL)
  
- 04. Non-Metalic Minerals (UNEL)
  - 0 Dimension stone
  - 1 Crushed and broken stone
  - 3 Sand & Gravel
  - 4 Chemical and fertilizer minerals
  - 5 Gemstones
  - 6 Salt
  - 9 Other
  
- 05. Non-Ferrous Ores (NON-FER)
  - 0 Copper
  - 1 Lead and Zinc
  - 2 Gold and Silver
  - 3 Bauxite and Aluminum
  - 4-8 (BLANK)
  - 9 Other
  
- 06.0 Surface
- 07.0 Subsurface
- 08.0 (BLANK)
- 09.0 Other

### **1. BULK PRODUCTS INDUSTRIES (BULK)**

- 10. Agriculture and Rural Industries (AGRI)
  - 0 Agriculture engineering
  - 1 Farm buildings and machinery
  - 2-3 (BLANK)
  - 4 Ginning
  - 5 Tobacco products
  - 6-9 (BLANK)
  
- 11. Thermally produced products (THERM)
  - 0 Brick & structural clay works
  - 1 Pottery
  - 2 Glass works
  - 3 Cement plants
  - 4 Charcoal Kilns
  - 5 Lime Kilns
  - 6 Coke ovens
  - 9 Other
  
- 12. Chemical Industry (CHEM)
  - 0 Industrial organic and inorganic chemicals
  - 1 Plastics & synthetics
  - 2 Pharmaceuticals
  - 3 Soaps, detergents, and animal products
  - 5 Paints and varnishes
  - 7 Agricultural chemicals



- 8 Petroleum products
- 9 Other
- 13. Food Processing (FOOD)
  - 0 Meat, fish, and poultry products
  - 1 Dairy and bakery products
  - 2 Grains and cereals
  - 3 Sugar (beet and cane)
  - 4 Beverages (breweries, distilleries, and bottling plants)..
  - 5 Food preservation (refrigeration and canning).
  - 6-8 (BLANK)
  - 9 Other
- 14. Primary Metal Industries (METAL)
  - 0 Stone-based iron furnaces
  - 1 All other iron furnaces
  - 2 Steel works and rolling mills
  - 3 Iron and steel foundries (cast ferrous products)
  - 4 Iron and steel forges
  - 5 Non-ferrous metal smelters & refineries
  - 6 Rolling, drawing, and extruding works (non-ferrous metals)
  - 7 Non-ferrous foundries
  - 8 Non-ferrous forges
  - 9 Other
- 15. Textiles (TEXT)
  - 0 Cotton spinning and/or weaving
  - 1 Wool spinning and/or weaving
  - 3 Silk spinning and/or weaving; man-made fibers
  - 4 Knitting
  - 4-5 (BLANK)
  - 6 Handloom weaving
  - 7 Textile finishing (printing, dyeing, etc.)
  - 8 Twine, cordage, netting, and bagging
  - 9 Other
- 16. Lumber, Timber, and Paper Industries (WOOD)
  - 0 Logging
  - 1 Millwork, veneer, plywood and other wood products
  - 2-3 (BLANK)
  - 4 Paper making
  - 5 (BLANK)
  - 6 Sawmills and/or planing mills
  - 7-8 (BLANK)
  - 9 Other
  - 1. BULK PRODUCTS INDUSTRIES (BULK) cont.
- 17. (BLANK)
- 18. (BLANK)
- 19. (BLANK)
- 20. (BLANK)



## 2. MANUFACTURING -INDUSTRIES (MFG)

- 21. Machine Manufacture (MACH)
  - 0 Engines, turbines, pumps, and compressor manufacturers
  - 1 (BLANK)
  - 2 Agricultural implements and machinery manufacturers
  - 3 Construction, mining, and materials handling equipment manufacturers
  - 4 Metal and woodworking machinery manufacturers
  - 5 Paper making machinery, manufacturers
  - 6 Textile machinery manufacturers
  - 7 Printing trades machinery manufacturers
  - 8 Electrical generating manufacturers
  - 9 Other machinery manufacturers
- 22. Fabricated Metal Products Manufacturers (FABR)
  - 0 Cutlery and handtools
  - 1 (BLANK)
  - 2 Metal containers
  - 3 Plumbing fixtures and equipment
  - 4 Fabricated structural metal products
  - 5 Metal Stampings
  - 6 Wire and screw machine products
  - 7-8 (BLANK)
  - 9 Other
- 23. Transportation Equipment Manufacturers (TEQUIP)
  - 0 Automobiles and trucks
  - 1 Air and space equipment
  - 2 Ships and boats (including repairs)
  - 3 Railroad locomotives and rolling stock
  - 4 Motorcycles and bicycles
  - 5 Carriages, wagons, and accessories
  - 6 Fire engines and equipment
  - 7 Auxiliary and control equipment
  - 8 (BLANK)
  - 9 Other
- 24. Professional, -Scientific, and Precision Instrument Manufacturers (INST)
  - 0 All
- 25. General Manufacturing (GENHFG)
  - 0 (BLANK)
  - 1 Publishing and allied industries
  - 2 Rubber products manufacturers
  - 3 Leather and other animal skin products manufacturers
  - 4 Cooking and heating equipment manufacturers
  - 5 Toys, games, and novelties
  - 6 Paper and plastic consumer products manufacturers
  - 7 Craft industries
  - 8 (BLANK)
  - 9 Other
- 26.0 Ordnance, Munitions, and Explosives (ORDAN)
- 27.0 Finished Wooden Product Manufacturers  
(furniture, spools, barrels, baskets, etc.) (FNWOD)
- 28. (BLANK)
- 29. (BLANK)



30. (BLANK)

**3. UTILITIES (UTIL)**

31. Municipal Water Supply (WATER)  
0 Collection storage  
1 Treatment  
2 Distribution and transportation  
3 Pumping  
4-8 (BLANK)  
9 Other

32. Sanitation (SANI)  
0 Sewage collection  
1 Sewage treatment  
2 Sewage disposal  
3 Storm drainage systems  
4 Pumping  
5-8 (BLANK)  
9 Other

33. Gas (GAS)  
0 Manufacture  
1 Storage  
2 Distribution  
3-8 (BLANK)  
9 Other

34. Electricity (ELEC)  
0 Generation  
1 Municipal distribution  
2 (BLANK)  
3 High-voltage transmission  
4-8 (BLANK)  
9 Other

35. (BLANK)

**4. POWER SOURCES AND PRIME MOVERS (PS&PM)**

36. Human and Animal Power (MUSL)  
0 All types

37. Water Wheels (WW)  
0 Horizontal (tub flutter)  
1 (BLANK)  
2 Undershot-  
3 Overshot  
4 Breast  
5 Pitchback  
6-8 (BLANK)  
9 Other

38. Water Turbines (WTURB) 0 All types

39. Wind (WIND)  
0 (BLANK)



- 1. Smock
- 2-8 (BLANK)
- 9 All other
  
- 40. Steam Reciprocating (STEAM RECIP)
  - 0-5 (BLANK)
  - 6 Industrial/mill
  - 7 Agricultural/portable 8 Marine/pumping
  - 9 Other
  
- 41. Steam Turbine (STEAM TURB)
  - 0-2 (BLANK)
  - 3 All types - vertical
  - 4 All types - horizontal
  - 5-8 (BLANK)
  - 9 Other
  
- 42. Internal Combustion (INT COMB)
  - 0 All types
  
- 43. (BLANK)
  
- 44. Electric Motors. (ELEC)
  - 0 All types
  
- 45. (BLANK)
- 46. (BLANK)

## 5. **TRANSPORTATION (TRANS)**

- 47. Railroads (RR)
  - 0 Construction & engineering: non-sheltering such as cuts, fills, revetments, bridges, and tunnels
  - 1 Structures: sheltering (for maintenance of route & rolling stock)
  - 2 Passenger stations & sheds
  - 3 Freight facilities
  - 4 Objects (such as locomotives, rolling stock, and other mechanical artifacts)
  - 5 Street railways, subways, and elevateds
  - 6 Incline- planes
  - 7-8 (BLANK)
  - 9 Other
  
- 48.. Roads (ROADS)
  - 0 Systems
  - 1 construction
  - 2 Structures
  - 3 Objects: milestones, signposts, etc.
  - 4-8 (BLANK)
  - 9 Other
  
- 49. Canals and Inland Navigation (CANAL)
  - 0 Systems
  - 1 Construction
  - 2 Structures
  - 3 Objects: canal and river boats
  - 4 Navigational aids
  - 5-8 (BLANK)
  - 9 Other



- 50. Marine and Harbor Works (MARINE)
  - 0 Docking facilities and structures
  - 1 Navigational aids
  - 2 Coast protection works
  - 3 Objects: ships and other marine related artifacts
  - 4-8 (BLANK)
  - 9 Other

- 51. Air (AIR)
  - 0 Airport facilities & structures
  - 1 Aircraft
  - 2-8 (BLANK)
  - 9 Other

- 52. Pipelines (PIPE)
  - 0 All

53. (BLANK)

54. (BLANK)

## 6. **COMMUNICATIONS (COMM)**

- 55. Telephone and Telegraph (T&T)
  - 0 All types.

- 56. Radio and Television (R&TV)
  - 0 All types

- 57. (BLANK)

## 7. **BRIDGES, TRESTLES, AND AQUEDUCRS (BT&A)**

- 58. Beam or Girder (BEAM)
  - 0 Wood
  - 1 Stone
  - 2 Cast iron
  - 3 Wrought iron
  - 4 Steel.
  - 5 Mass and reinforced concrete
  - 6 Cast & wrought iron
  - 7-8 (BLANK)
  - 9 Other

- 59. Arched (ARCH)
  - 0 Wood
  - 1 Cast iron
  - 2 Wrought iron
  - 3 Stone
  - 4 (BLANK)
  - 5 Mass and reinforced concrete
  - 6 Steel
  - 7 Brick
  - 8 (BLANK)
  - 9 Other

- 60. Trussed (TRUSS)
  - 0 Wood



- 1 Cast iron
  - 2 Wrought iron
  - 3 Steel
  - 4 Covered
  - 5 Cast & wrought iron
  - 6-8 (BLANK)
  - 9 Other
61. 0 Suspension
62. 0 Aqueducts
63. Viaducts and Trestles (VIAD or TRES)  
0 All types
64. Cantilever (CANT)  
0 All types
65. Movable Bridges (MOVE)  
0 Bascule  
1 (BLANK)  
2 Swing  
3 Vertical lift  
4-8 (BLANK)  
9 Other
66. (BLANK)
67. (BLANK)
68. Miscellaneous (MSC)  
0 Pontoon

## 8. **BUILDING TECHNOLOGY (BLD TECH)**

69. Foundations (FOUND)  
0 All
70. Framed Superstructures (FRAME)  
0 Wood  
1 Cast iron  
2 Wrought iron and steel  
3 Stone and brick  
4 Mass and reinforced concrete  
5 Ferro-vitreous
71. Floor Systems (FLOOR)  
0 All
72. Roof Systems (ROOF)  
0 All
73. Fenestration (FENES)  
0 Cast-iron facades
74. Mechanical and Electrical Systems (IECH)



- 0 All
- 75. Ancillary Components (ANCIL)
- 0 All
- 76. (BLANK)
- 77. (BLANK)
- 78. (BLANK)

## 9. **SPECIALIZED STRUCTURES AND OBJECTS (SPEC STRUC)**

- 79. Dams (DAM)
  - 0 Masonry
  - 1 Earthfill
  - 2 Rockfill
  - 3 Arch
  - 4 Flat slab or Anberson
  - 5 Multiple-arch
  - 6 Tainter (movable)
  - 7 Rolling (movable)
  - 8 Gravity
  - 9 Other
- 80. Tunnels (TUNLS)
  - 0 Cut & cover
  - 1 Rock-cut
  - 2 Earth-cut
  - 3 Subaqueous
  - 4-9 (BLANK)
- 81. Hydraulic Works (HYDRA) See also 31: Water Supply, and 49: Canals
  - 0 Flood-control works
  - 1 Drainage works
  - 2 Power canals
  - 3 Irrigation works
  - 4-8 (BLANK)
  - 9 Other
- 82. Specialized Construction (CONST)
  - 0 Underground structures
  - 1 Rocket launch facilities
  - 2 Facilities for reactors and particle accelerators
  - 3 Fortifications
  - 4 Towers
  - 5 Observatories
- 83. Thermal Structures (HEAT)
  - 0 Chimneys and smokestacks
  - 1 Ovens
  - 2 Kilns
  - 3 Furnaces (see also 14.0)
  - 4 Glass cones
  - 5 Refrigeration plants
  - 6-8 (BLANK)
  - 9 Other
- 84. Materials Handling and Equipment (MMH)
  - 0. Excavating and dredging machinery.



- 1 Lifting and hoisting
  - 2 (BLANK)
  - 3 Conveyor systems
  - 4 Combined systems
  - 5 Processing, screening, and separating equipment
  - 6 Aerial tramways
  - 7-8 (BLANK)
  - 9 Other
85. Materials Storage (MATS)
- 0 Elevators & Silos
  - 1 Tanks & towers
  - 2 Gas holders
  - 3 Warehouses
  - 4 Reservoirs
  - 5-8 (BLANK)
  - 9 Other
86. Power and Energy Transmission (P&ET)
- 0 Mechanical
  - 1 Electrical
  - 2 Hydraulic
  - 3 Pneumatic
  - 4 Steam
87. Workers Housing, Communities, and Other Related Artifacts (HOUS)
- 88.. Adaptively Used Industrial and Engineering Works (ADAPT)
89. Museums of Technology (MUSEUM)
90. Land Surveying Landmarks (LAND)
91. Amusements
92. (BLANK)
93. (BLANK)




## 6.2. Industrial World Heritage Sites with Industrial classification and Photos



## Industrial World Heritage Sites

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### Industrial Classification

Photos	Area	Country	Industrial World Heritage Site	Description	Industrial Classification	
0. EXRACTIVE INDUSTRIES						
	Europe / North America	Germany	<b>Mines of Rammelsberg and Historic Centre of Goslar</b>	Metallic ore mines	1	
	Europe / North America	Slovakia	<b>Banska Stiavnica</b>	Ore-Mining, Settlement	1.0	87
	Europe / North America	UK	<b>Blaenavon Industrial landscape</b>	coal and ore mines, quarries, a primitive railway system, furnaces, settlement	1	87
	Europe / North America	Austria	<b>Hallstatt-Dachstein Salzkammergut</b>	Salt deposit exploitation	4.6	


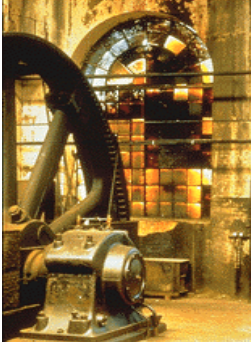

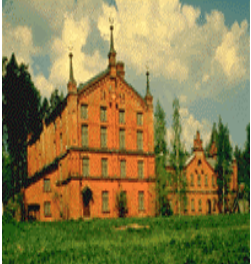


	Europe / North America	Poland	<b>Wieliczka Salt Mine</b>	Salt mine	4.6
	Europe / North America	Belgium	<b>Neolithic Flint Mines at Spiennes (Mons)</b>	Flint Mines	4.9
	Europe / North America	Norway	<b>Roros</b>	Copper mines	5.0
	Europe / North America	Czech Republic	<b>Kutna Hora</b>	Silver mines	5.2
	Europe / North America	Spain	<b>Las Medulas</b>	Gold Mining	5.2
	Latin America / Caribbean	Bolivia	<b>City of Potosi</b>	Silver mine	5.2







	Latin America / Caribbean	Brazil	<b>Historic Town of Ouro Preto</b>	Gold mine	5.2
	Latin America / Caribbean	Mexico	<b>Historic Town of Guanajuato and its Silver Mines</b>	Silver mine	5.2
	Latin America / Caribbean	Mexico	<b>Historic Centre of Zacatecas</b>	Silver mine	5.2







1. BULK INDUSTRIES						
	Europe / North America	UK	<b>Ironbridge Gorge</b>	Blast furnace and metallic bridge	14.0	59.1
	Europe / North America	Germany	<b>Völklingen Ironworks</b>	Ironworks	14.2	
	Europe / North America	Sweden	<b>Engelsberg Ironworks</b>	Ironworks	14.2	
	Europe / North America	Finland	<b>Verla Groundwood and Board Mill</b>	Industrial settlement, pulp-paper- board production mills	16	87






5. TRANSPORTATION					
	Asia / Pacific	India	<b>Darjeeling Himalayan Railway</b>	Railway	47
	Europe / North America	Austria	<b>Semmering Railway</b>	Railway	47
	Europe / North America	France	<b>Canal du Midi</b>	Navigable waterways constructions	49.0
	Europe / North America	Belgium	<b>The Four Lifts on the Canal du Centre and their Environs, La Louvière and Le Roeulx</b>	Hydraulic Engineering works, boat-lifts	49.0



7. BRIDGES, TRESTLES AND AQUEDUCTS					
	Europe / North America	France	<b>Pont du Gard</b>	Aqueduct	62.0
	Europe / North America	Spain	<b>Old Town of Segovia and its Aqueduct</b>	Aqueduct	62.0
9. SPECIALIZED STRUCTURES					
	Europe / North America	Netherlands	<b>D.F.Woudagemaal</b>	Steam pump stations	81.0
	Europe / North America	Netherlands	<b>Mill Network at Kinderdijk-Elshout</b>	Hydraulic Works	81



	Asia / Pacific	China	<b>Mount Quincheng and Dujiangyuan Irrigation System</b>	Irrigation system	81.3
	Europe / North America	France	<b>Royal Saltworks of Arc-et-Senans</b>	Ideal industrial architecture planning project	87
	Europe / North America	Italy	<b>Crespi d'Adda</b>	Industrial Settlement	87



### 6.3. Africa Tentative list analysis and description



# African Countries with Tentative Lists

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## Analysis of Industrial World Heritage Values

Country	Pot. Sites	C/N/M	Site name with stated Industrial WH	Description	Site name with Assoc. Industr. Value	Description	Industrial Classification
<b>Angola</b>	11	11/0/0	0		0		
<b>Benin</b>	5	4/1/0	0		0		
<b>Botswana</b>	5	5/0/0	0		0		
<b>Burkina Faso</b>	4	4/0/0			<b>Les gravures rupestres de Pobe-Mengao</b>	Rock art drawings in <u>metallurgical iron extraction ruins with furnace ruins, necropolis</u>	1
					<b>Les necropoles de Bourzanga</b>	2 different necropolis types, partly in <u>metallurgical ruin sites</u>	1
			<b>Les sites d'extraction de fer Kindiba</b>	4 metallurgical sites with furnaces and mines of the Dogons and the Moagas			1
<b>Dem. Rep. of Congo</b>	3	0/0/3			<b>Grottes de Dimba et Ngovo</b>	Ca. 18000 BC, stone age grottoes with <u>archaeological finds of early food production</u>	13
					<b>Grottes de Matupi</b>	Ca. 40000 BC, <u>one of oldest stone industry sites</u>	4.0
<b>Ethiopia</b>	2	1/0/1	0		0		
<b>Gambia</b>	3	3/0/0	0		0		
<b>Ghana</b>	6	4/2/0	0		0		
<b>Kenia</b>	7	4/3/0	0		0		
<b>Madagascar</b>	6	2/0/4	<b>Paysage culturel rizicole et hydraulique de Betafo</b>	Rice growing village surroundings with complexe hydraulical net with canals			81.3
<b>Malawi</b>	3	1/1/1	0		0		
<b>Mali</b>	4	4/0/0	0		0		
<b>Mozambique</b>	3	3/0/0	0		0		



<b>e</b>							
<b>Niger</b>	7	3/4/0			<b>La route du Sel de l’Air au Kaouar</b>	Desert oasis since stone age with great beauty, stone inscriptions, <u>expooited salt beds</u>	4.6
<b>Nigeria</b>	7	4/3/0	0		0		
<b>Senegal</b>	2	2/0/0	0		0		
<b>South Africa</b>	4	4/0/0	<b>Pilgrim’s Rest Historic Village</b>	Historic village, site of first major gold rush in South Africa, alluvial mining, gold field, 1881 first gold mining company			5.2
<b>Togo</b>	3	3/0/0	<b>Les Greniers des Grottes de Nok et de Mamproug</b>	Beautiful mountain area, autochtone peopulations refuges between 17 <sup>th</sup> and 19 <sup>th</sup> c., big caverns with cylindrical or semi-spheric storage volumes hewn in stone			85.9
<b>Uganda</b>	5	5/0/0	<b>Kibiro (Salt producing village)</b>	Unique example of industry for 900 years, salt producing process in pottery and later metallic vessels, archaeological and ethnographical value			4.6
<b>Un. Rep. of Tanzania</b>	4	3/1/0			<b>Bagamoyo Stone Town and Kaole Ruins</b>	2 fishing villages, commercial port, slave market, <u>first harbor and first industrial establishment</u> and capital of German East Africa	50.0
<b>Zambia</b>	3	3/0/0	0		0		
<b>Zimbabwe</b>	2	1/1/0			<b>Ziwa National Monument</b>	Stone age to historical time archaeological finds. Stone age deposits, rock art sites, early farming settlements, <u>field systems, hill forts, pit structures, iron smelting and forging furnace, house structures</u>	14.0
<b>22 countries</b>	<b>99 pot. sites</b>	<b>74/16/9</b>	<b>5 Tentative Sites with stated potential Industrial World Heritage (TIWH)</b>		<b>7 Tentative World Heritage Sites with Associated Industrial Value (TAIV)</b>		



# **African Countries Tentative List**

## **Tentative Industrial World Heritage Sites (TIWH)**

### **And**

## **Tentative Sites with Associated Industrial Value (TAIV)**

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### **Brief description on the sites**

#### **Burkina Faso**

##### **Les gravures rupestres de Pobe-Mengao (#)**

Département de Pobe Mengao  
(Province du Soum)

(i)(ii)(iii)(vi) C

Le site de Pobe, presente une association de plusieurs types de vestiges. Les plus spectaculaires sont les gravures rupestres auxquelles sont associées des buttes anthropiques, des vestiges métallurgiques, des nécropoles, des meules dormantes et mobiles, des jeux de "walé" et de l'industrie lithique. La région offre un paysage de domes granitiques qui ont servi de support à la réalisation des gravures. Parmi ces domes, le "rocher principal", long de 7,20m et haut de 2,70m, présente "les gravures les plus spectaculaires". Sept autres rochers dans un axe Nord-Sud portent des gravures ou des cupules et meules dormantes. C'est entre ces domes et notamment au sud du "rocher principal" que l'on rencontre les buttes anthropiques et les restes de réduction du fer, tandis que les tumuli connaissent une plus forte concentration vers le nord. Les gravures ont été obtenues par "une même technique de frottement et de martelage, qui a permis d'aboutir à un relief en creux correspondant aux formes représentées... Partout les gravures sont patinées mais elles apparaissent encore plus claires que le granite constituant la roche support..

En général les contours manquent de précision et cela rend très difficile les relevés. Le travail de l'artiste a été parfois gêné par les nombreuses vénules de quartz qui sillonnent le granite. Exécutées sur les pentes et parfois sur le sommet, les gravures ne répondent pas à une orientation particulière et le style est très schématisé. Cinq types de représentations peuvent être identifiées. "Des cavaliers, des hommes à pied avec ou sans armes, des chevaux sans cavaliers, des animaux (sauvages), des figures géométriques". Les cavaliers sont les plus abondants et on en distingue deux groupes. Les grands, présents surtout sur le rocher principal atteignent 20cm de haut et 25cm de long. Ces dimensions sont respectivement de 10cm et 15cm pour les plus petits et les plus nombreux. Les buttes anthropiques au nombre de 16 se concentrent surtout dans la partie sud du site. Elles sont de dimensions modestes et souvent très arrassées. Les principaux vestiges qu'on y rencontre en surface sont la céramique et de l'industrie lithique et parfois des scories de fer. La production métallurgique est également attestée par la présence "d'une base de fourneau équipée de 10 tuyères et de ferrières, dans une dépression au sud-ouest du "Rocher principal".

Sans présager d'une contemporanéité stricte entre tous ces éléments, ils témoignent incontestablement d'une dynamique d'occupation de l'espace qui en attendant d'être mieux étudiée, mérite d'être protégée des agressions de la nature et des hommes.

##### **Les nécropoles de Bourzanga**

Bourzanga, Département dudit /  
province du Bam

(iii)(vi) C

L'ensemble que constitue les nécropoles de Bourzanga comprend deux groupes de site appartenant chacun à un groupe de population: les nécropoles à jarre dogon et la nécropole royale à stèles kurumba.

I - Les nécropoles à jarres - cercueils dogon

Les matériels archéologiques sur les sites comprennent la céramique et du matériel lithique. La céramique est la plus abondante, la plus visible et la plus présente. On distingue la céramique domestique caractérisée par la présence de fragments de cruches, de bols, de couvercles, etc. La céramique funéraire est composée de jarres funéraires plus ou moins fragmentées. L'érosion et l'action des hommes ont mis à jour deux types de jarres - cercueils à Bourzanga: les jarres-cercueils en position verticale et celles en position horizontale.

I.1) Les types de jarres - cercueils de Bourzanga

Les deux types sont en associations sur les deux nécropoles. I.1.a) Les jarres - cercueils verticales. Elles se présentent de la façon suivante: une jarre est posée verticalement sur son fond et reçoit le corps replié sur lui-même. Une seconde jarre servant de couvercle est utilisée pour recouvrir l'ensemble. La deuxième jarre est plus grande et ses bords se retrouvent sur la panse de la jarre «réceptrice». Des moellons de latérite sont utilisés pour le blocage de la partie externe du fond de jarre principale.

I.1.b) Les cercueils - jarres horizontales

Les sépultures horizontales sont constituées de deux jarres accolées par les bords dont la principale reçoit le corps. La deuxième jarre servant de couvercle.



I.1.c) Les caractéristiques des jarres funéraires de Bourzanga. On note très souvent la combinaison de jarres ovoïdes et de terrines ou de jarres sphériques et de terrines. Les dimensions des jarres - cercueils horizontales sont sensiblement égales. L'examen des fragments permet de distinguer les décors créant un effet de relief et ceux de couleur réalisés avant, pendant ou après cuisson. Les décors créant un effet de relief sont réalisés par impression ou par modelage. L'engobe et le trempage ont été les modes de production d'effets de couleur sur les poteries. Les différents procédés de décoration ont été très souvent combinés. La céramique de Bourzanga présente un décor très riche qui se traduit par une combinaison de motifs en figures géométriques plus ou moins complexes et distinctes.

#### I.2) L'environnement des jarres - cercueils

A Bourzanga il existe bien d'autres nécropoles à jarres funéraires. Ces nécropoles sont associées à d'autres vestiges archéologiques tels que les buttes anthropiques et les sites métallurgiques. Les buttes anthropiques sont des éminences relativement modestes d'une hauteur n'excédant pas 0,50 m et de forme circulaire ou ovale. Il est pour le moment difficile de différencier les buttes d'habitats et les buttes funéraires. Aux nécropoles et aux buttes sont associées des vestiges d'une activité métallurgique importante. On repère les sites de production métallurgique aux scories éparses, aux morceaux de tuyères et aux bases de fourneaux.

#### 1.3) Les jarres funéraires en Afrique sub-saharienne

L'usage de la jarre dans les rites funéraires est très répandu en Afrique au sud du Sahara. Le phénomène comporte des variantes: - les jarres couvercles qui ont servi simplement à fermer l'ouverture de la tombe (absence à Bourzanga) - les jarres - cercueils verticales ou horizontales - les urnes cinéraires. En Afrique sub-saharienne la zone d'usage de jarres funéraires s'étend dans la bande soudano-sahélienne, du Mali au Tchad et comprend trois grands ensembles:

- le complexe de la plaine péri tchadienne.

- le complexe du delta intérieur

- et le complexe voltaïque auquel appartient les nécropoles de Bourzanga. Au Burkina Faso le complexe voltaïque couvre les provinces du Yatenga, du Soum, du Sanmatenga et du Bam.

#### 1.4) Contenu des nécropoles dogon de Bourzanga Nécropole I

Elle est située à 200 m au Sud-ouest de la mission catholique et à proximité d'une concession. Elle est peu étendue avec environ 180 m<sup>2</sup> de superficie, orientée est-ouest suivant sa longueur, et se présente sous la forme de butte arasée reposant sur une cuirasse latéritique. Elle est transformée en carrière de brique par la population. On a noté sur le site: - des tessons de 13 paires de jarres; - une jarre sans couvercle - une jarre à fond détruit - de gros fragments issus de la fracture de différentes jarres. L'orientation des jarres se présente comme suit: - 7 sépultures en position verticale - 8 paires de jarres-cercueils en position horizontale.

#### Nécropole II

Elle est située entre le lac et le village à 200 m du dispensaire. Le site est marqué par un bosquet de balanites aegyptiaca et d'autres épineux. Son étendu

est d'environ 225 m - orientée nord-sud dans le sens de la longueur. On y a retrouvé: - 6 sépultures horizontales - 10 sépultures verticales. La concentration des jarres verticales est plus lâche côté Est.

#### II) La Nécropole à stèles kurumba

1) Identification. La nécropole est située en hauteur par rapport au niveau général du village, sur l'une des collines de l'ère birrimienne. Elle est orientée Nord-Est-Sud-Ouest avec des dimensions de 51 m x 53 m. Le couvert végétal se compose d'arbustes. Les vestiges funéraires rencontrés sont la céramique et le matériel lithique. La céramique composée de tessons des objets utilisés pour l'évacuation de la terre des fosses. Le matériel lithique comprend les moellons de latérite ayant servi à délimiter les tombes et à caler les stèles.

#### II.2) Caractéristiques des stèles

Les stèles sont imposantes en nombre et en taille sur le plus haut niveau de la colline; elles deviennent lâches sur la partie intermédiaire et rares et éparpillées au bas. Les stèles sont au nombre de 109, de taille, de matière et de forme variables. La plus grande a 1,51 m de hauteur. Elles sont en granite porphyroïde à gros grains sauf deux stèles qui sont en cuirasse latéritique. Les stèles de Bourzanga sont sans inscription ni représentation anthropomorphe ou zoomorphe. Elles sont en forme de dalle ou de plaque avec des épaisseurs variables de 5 à 20 cm. Les formes sont très irrégulières et vont du trapézoïdal au quadrangulaire mais sans précision. Si elles n'ont pas été sculptées, elles ont cependant subi des aménagements pour permettre leur transport. C'est ce qui explique la présence sur certaines stèles, des traces de coups dans le but d'émousser les parties tranchantes ou pointues. Et pour des raisons esthétiques, on a poussé l'aménagement de façon à arrondir les angles et à homogénéiser les formes. Elles sont en majorité blanches mais certains ont jauni; les noires sont au nombre de quatre. Elles ont été toutes initialement dressées sans orientation précise. Elles sont plantées seules, doublées, triplées ou même quadruplées pour répondre à un besoin de résistance aux intempéries.

#### II.3) Utilisation de l'espace constitué par la nécropole

Dans le village comme sur la nécropole rien n'est laissé au hasard. Sur la nécropole la partie la plus élevée est réservée aux chefs, à tous ceux qui ont régné à Bourzanga. Chaque quartier a un côté de la colline où ses chefs et dignitaires sont enterrés. Il n'y a pas de délimitation visible et précise des aires.

#### II.4) Environnement de la nécropole

Au pied de la colline, à ses côtés Sud et Nord, sont disposées des tombes dites musulmanes qui s'orientent

Nord-Sud. L'usage des stèles à Bourzanga est liée à la pratique des hypogées. Les stèles sont fixées sur des tombes de ceux qui ont droit à la "tombe royale" ou hypogée.

A Bourzanga l'hypogée est de forme quadrangulaire avec trois niveaux. Le premier constitué d'une fosse rectangulaire d'environ deux mètres de profondeur. Deux couloirs circulaires creusés sur l'une des longueurs constituent le deuxième niveau. Ces couloirs débouchent sur le troisième niveau qui est en fait la chambre mortuaire de forme rectangulaire et assez grande. Tous les notables et tous les chefs enterrés sur la colline ont bénéficié de ce type de tombe et une stèle plantée sur chaque tertre de recouvrement.

En Afrique sub-saharienne l'aire des hypogées se localise dans la savane arbustive avec de hautes herbes, des baobabs, des kapokiers, etc. (Mali, Guinée, Burkina Faso). Elle correspond à la zone comprise entre les isohyètes 600 mm et 1350 mm. Au Burkina Faso on rencontre cette pratique depuis le nord du pays jusqu'aux frontières méridionales. Elle est donc très largement répandue.



## Les sites d'extraction de fer de Kindiba (#)

Kindiba, département de Tougo,  
Province du Yatenga

(iii)(v) C

Le site métallurgique de Kindiba se décompose en quatre ensembles dont trois rapprochés: il s'agit de l'aire des trois fourneaux dogon encore debout au milieu des scories, de la mine dogon et de l'espace des fourneaux moose dont un seul est assez bien conservé. Le quatrième ensemble est la mine moaga, contemporaine et éloignée du village du côté Est. ce quatrième élément n'est pas proposé au classement.

Les trois fourneaux dogon occupent la partie Nord du site. Ils ont été édifiés dans une dépression bordée par des collines au nord-est et au Sud. Celle du nord-est est un lieu de culte où officient les prêtres dogon. Les trois fourneaux de forme tronconique, ont environ deux mètres de hauteur et un mètre de diamètre à la base où on compte cinq larges ouvertures. Ils ont construits en argile et à mi-hauteur une petite ouverture est décelable du côté Ouest. L'intérieur de deux des trois fourneaux est occupé par des termitières encore vivantes. Cela contribue à leur préservation. Le troisième est menacé par un Balanites Aegyptiaca. Des scories émiettées ou en gros blocs parsèment l'espace autour des fourneaux. Elles ont dû être remaniées car la dépression a jadis porté des champs de cultures.

Trois cent mètres au sud des fourneaux dogon se trouve la mine qui s'étend dans un quadrilatère d'environ 50 mètres de côté. On y dénombre une dizaine de puits circulaires d'environ un mètre de diamètre et dont les profondeurs actuelles ne dépassent pas 2,50 mètres. Ils ont été partiellement comblés. Des amorces de galeries sont visibles sous le niveau de la cuirasse épaisse de plus d'un mètre. Des encoches dans les parois permettent une circulation entre l'extérieur et le fond des puits. Aujourd'hui, puits et galeries sont des repaires d'hyènes, de porcs-épics et de serpents.

L'atelier des métallurgistes moose s'étend cinq cent mètres au Sud de la mine. A son extrémité méridionale s'élance sur 3,50m le dernier des fourneaux moose de Kindiba construit avant la dernière guerre mondiale. De forme tronconique comme les fourneaux moose dogon, il s'en distingue par sa taille, le nombre et la forme en U des ouvertures à la base. Démoli sur près de 2m de hauteur côté Est ce fourneau est en danger de disparition. Suite à une visite de sensibilisation de la secrétaire d'Etat à la culture en 1989, les forgerons l'avaient restauré avec du torchis. Mais le matériau n'ayant pas subi de cuisson s'est détaché de la vieille paroi dès les premières pluies d'hivernage. Il convient donc d'imaginer un autre mode de conservation avant qu'il ne soit trop tard.

## DEMOCRATIC REPUBLIC OF THE CONGO

### Grottes de Dimba et Ngovo

Province du Congo Central

(not specified)

#### DIMBA

La grotte de Dimba a livré la plus longue séquence archéologique du Bas-Congo (ex-Bas-Zaïre). Les dépôts à l'entrée ont été datés de 18.000 ans avant notre ère: 18.050 ~ 650 bc (Hv 6255). Des restes de faune et un outillage lithique de l'Age de la Pierre Récent sont associés à cette datation par radiocarbone.

Le sondage qui a livré ces résultats a été interrompu à une profondeur de -3,2 m, mais il existe la possibilité de niveaux archéologiques encore plus anciens au-delà. Les niveaux supérieurs de l'entrée et un grand talus situé à plus d'un kilomètre de l'entrée ont livré une abondante céramique dite du Groupe VI ou Groupe de Ngovo, caractéristique de la période de transition qui, à la fin de l'Age de la Pierre, voit apparaître les débuts de la production de nourriture. Des outils polis ont également été découverts associés à cette céramique qui est datée à Dimba du dernier siècle avant notre ère (85 - 130 bc - Hv 6257).

Dans l'entrée, en surface et sur les premiers 15 cm, on trouve mêlés de nombreux fragments de poterie de l'Age du Fer, remontant principalement aux 16<sup>e</sup> - 17<sup>e</sup> siècles.

#### NGOVO

Un dépôt archéologique de 2 à 15 cm situé à quelque 210 m de l'entrée a livré en abondance de la poterie dite du Groupe VI ou Groupe de Ngovo, ainsi que des outils polis. Daté des deux derniers siècles avant notre ère (Hv 5258: 195 ± 45 bc, Hv 6258: 85 ~ 65 bc), ce site archéologique est le site type de l'industrie de transition entre l'Age de la Pierre et l'Age du Fer qui s'étendait sur une bonne partie du Bas-Congo

### Grottes de Matupi

Province Orientale

(not specified)

La grotte de Matupi est un des sites archéologiques majeurs de l'Afrique subsaharienne. Il a livré une séquence d'occupation s'étendant sur plus de 40.000 ans.

Les niveaux les plus profonds sont datés entre 32.000 et > 40.700 avant le présent. Ils ont fourni une des plus vieilles industries microlithiques du monde.

Les niveaux inférieurs (entre c. 140-185 cm) sont relativement pauvres en vestiges lithiques. Ils sont datés entre 21.000 et 32.000 avant le présent.

Les niveaux moyens (entre c. 65-140 cm) sont datés entre 12.000 et 21.000 avant le présent. Très riches en matériel lithique, ils ont aussi livré une pierre percée "Kwé" décorée.

Les niveaux supérieurs livrent une industrie microlithique de l'Age de la Pierre Récent daté de 3.000 à 12.000 avant le présent, surmonté par des niveaux de l'Age du Fer.



## MADAGASCAR

### **Paysage culturel rizicole et hydraulique de Betafo**

La région de Betafo est située dans la partie centrale du pays, dénommée Vakinankaratra, plus précisément à 25 km à l'ouest de la ville d'Antsirabe sur la route de Morondava

C (iii)(iv)(v)

La zone proposée est la campagne de la petite ville de Betafo marquée par un paysage rizicole et hydraulique original et d'une grande beauté. Il s'agit d'un paysage comprenant une vallée rizicole (I), des versants de collines occupés par des rizières en terrasses (II) et un réseau hydraulique complexe (III), fruit d'un savoir-faire séculaire transmis de génération en génération, d'un équilibre social délicat et où se lit l'harmonie entre l'homme et l'environnement.

(I) La vallée rizicole située en amont et en aval de la localité d'Ambohiambo s'insère entre deux chaînons montagneux et exploite aux moindres détails la topographie du terrain tout en bénéficiant d'un système d'irrigation bien conçu.

(II) Dans certains secteurs et particulièrement de part et d'autre d'une rivière encaissée existent de nombreuses rizières en terrasses épousant les courbes de niveau.

(III) Le réseau hydraulique complexe desservant la vallée et les versants est un témoin de la domestication de l'eau sur sa réglementation pour un partage équitable vers toutes les rizières, d'abord entre les lignages, ensuite entre les familles. Le réseau comprend entre autres des prises traditionnelles par barrages assez lâches de pierres sèches des canaux parallèles et superposés creusés sur les flancs nord des gorges de la rivière encaissée, une bonne douzaine de canaux dérivés parallèles pour les lignages et de petits canaux pour les familles avec des répartiteurs en pierres volcaniques. Ces derniers canaux peuvent être souterrains - passant sous des rizières - lorsque l'espace manque.

## NIGER

### **La Route du Sel de l'Air au Kaouar**

Lat. 18°00 - 20°00 N Long. (ii)(iii)(iv) C  
12°20' - 14° E  
1300 km au nord-est de Niamey,  
dans le dept. d'Agadez,  
arrondiss. de Bilma.

Le Kaouar est une zone de falaises alignées nord-sud, faisant la jonction entre l'immense zone sableuse du Ténéré à l'ouest et le grand erg de Bilma à l'est. Cette région a été habitée, depuis le Néolithique, et conserve des inscriptions rupestres. Elle est actuellement le siège de petites oasis qui sont parmi les plus isolées du Sahara. Elles survivent de façon traditionnelle grâce au maintien d'une activité caravanier. Le site abrite des gisements de sel, objet principal du commerce. D'importantes étendues d'eau douce et saumâtre naturelles déterminent des milieux biologiques (faune et flore) exceptionnels au Sahara. C'est aussi une des régions que l'addax est susceptible d'utiliser au cours de sa nomadisation. La beauté des paysages de cette région est universellement connue.

## SOUTH AFRICA

### **Pilgrim's Rest Historic Village** 24° 54' S, 30° 45' E C (ii) (iv)

The historic village of Pilgrim's Rest is situated on the eastern escarpment of the Transvaal Drakensberg on Portion 42 of of plants and animals which were present at the time it was inhabited by the San people. The Drakensberg is part of the Poniesskrantz 543, Registration Division KT Transvaal.

Great Escarpment which is the most prominent physiographic feature on the southern African sub-continent. It is a most outstanding and spectacular example of an escarpment mountain differing from other escarpment mountains found elsewhere in the world in terms of the geomorphological processes by which it was formed. The Drakensberg is the only

place where one can view the concordant Karoo geological sequences in situ from the oldest Beaufort Group In 1873 rich gold deposits were discovered in the Pilgrim's Creek, a tributary of the Blyde River, close to where the village sandstones of the Triassic (about 258 Ma) to the basalts of the late Jurassic (after 190 to 140 Ma) of Pilgrim's Rest was established. The news of this rich strike triggered the first major gold rush in South Africa. Pilgrim's Rest was declared a gold field on 22 September 1873 and by the end of that year there were some 1500 diggers working 4000 claims in and around Pilgrim's Rest. It is estimated that R2 million worth of gold was mined during the first seven years of alluvial mining in the Pilgrim's Rest valley. This gold field cannot be the first of its kind in Africa. By 1875 Pilgrim's Rest had become the social and commercial centre of the diggings and gradually more permanent buildings



were replacing the diggers' tents. By the 1880's alluvial gold deposits began to dwindle and diggers were steadily leaving to prospect elsewhere. In 1881 the first gold mining company amalgamated with several other smaller companies to form the Transvaal Gold Mining Estates (TGME) which became the sole owners of Pilgrim's Rest and the farm Ponieskrantz on which it is situated until 1972. The history of this company and Pilgrim's Rest were inseparably linked as both shared the fluctuating fortunes of the mines.

## **TOGO**

### **Les Greniers des Grottes de Nok et de Mamproug**

N 10° 39, 613'; E 0° 8,836'

C (iv)(v)(vi)

Dans la région des Savanes, et plus précisément dans la Préfecture de Tandjouaré à une trentaine de kilomètres de la ville de Dapaong

De hautes falaises, dont les parois sont orientées au nord, dominant de leur à-pic la savane de cette partie septentrionale du Togo. Elles sont les derniers reliefs élevés avant cette immense étendue de savane qui se prolonge au Burkina. Cette formation appelée communément grès de Boumbouaka présente des escarpements de falaises d'âge protérozoïque supérieur d'une rare beauté avec à la base une alternance de pellites (argilites) et de psammites, l'ensemble reposant sur un socle cristallin daté du Birrimien.

Des anfractuosités horizontales s'ouvrent au dernier quart supérieur de leur hauteur ; d'accès difficile, elles ont servi, de très longue date, d'abri et de refuge aux populations autochtones lors des périodes d'insécurité diverses qui ont sévi dans la région du XVIIe au XIXe siècle.

Ces cavernes contiennent des greniers : cent trente-quatre à ?ôk, cent treize à Mamproug et soixante-dix à Bopak et dans les autres grottes périphériques. De forme cylindrique, oblongue ou semi-sphérique, ils s'ouvrent vers le haut ; leur hauteur est généralement de deux mètres et demi, leur diamètre de trois mètres. Avant que ces grottes n'aient été pillées, des armes traditionnelles telles que des arcs, des flèches et leurs carquois, y ont été trouvées. Les greniers, taillés dans le même style architectural traditionnel à partir des matériaux locaux (pierres, argile et paille) contenaient les récoltes et les grottes offraient un refuge aux populations menacées. Elles y avaient des vivres, de l'eau et leurs fétiches . Elles pouvaient donc y soutenir un véritable siège.

Dans cette région de migrations et d'affrontements divers, les Konkomba, les Moba, les Mamprussi se combattirent, puis s'installèrent. Ils sont encore aujourd'hui les habitants de la région et furent, semble-t-il, les bâtisseurs des greniers. Sur le trajet d'un grand axe commercial dit Route de la cola, les populations du nord du Togo étaient assujetties à des ethnies dominantes telles les Anufom auxquelles ils versaient tribut. Devant l'alourdissement des charges et la répétition des exactions, ils organisèrent leur résistance et se réfugièrent dans les grottes de ?ôk et de Mamproug. Du moins le récit qu'en font les habitants actuels.

## **UGANDA**

### **Kibiro (Salt producing village)**

Kigoroby sub-county, Hoima District  
Lat. 1°41' N ; Long. 31°15' E

C (i)(iii)(iv)(v)

Kibiro salt producing village demonstrates a unique example of an industry which has sustained its people for eight to nine hundred years ago and continues to do so perhaps for posterity from fishing on Lake Albert, the people of Kibiro have depended on the production of ash salt which is obtained by recycling residual earth with fresh soil which is spread on salt gardens for the salty water to get absorbed by capillary system. Through repeated scraping, spreading and heaping of the salty soil over a seven days period, it is leached and the scam is boiled to crystallisation point to produce the ash salt. The residual soil from leaching is then mixed with fresh soil to repeat the salt production process. Salt production was and is a female hereditary occupation. Before the introduction of metallic vessels, pottery ware was used during the leaching and boiling processes and this is evidenced by the rich archaeological depositions of potsherds throughout the village going as deep as 4 metres and dating to between eight and nine hundred years to the present. Kibiro village is a sandy beach along Lake Albert where food does not grow. The Kibiro population therefore have depended for its livelihood on the exchange of salt and fish for food through time with farming communities on the plateau above the Ugandan side of the Western Rift Valley. The village therefore forms an important cultural site which has combined both archaeology and ethnography through time in the production of ash salt.



## UNITED REPUBLIC OF TANZANIA

### **Bagamoyo Stone Town and Kaole Ruins**

Lat. 6°25' South    Long. 38°55'    (ii)(iii)(vi) C  
East

The town of Bagamoyo grew out of two fishing villages, Mwanamakuka and Pumbiji. The town grew in importance after the establishment of the headquarters of the Sultanate of Oman at Zanzibar in 1832. Thereafter Bagamoyo grew to an entry port for Indian, Arabic and subsequently European for merchandise and ware. It was the outlet of ivory, slaves and other merchandise from the interior of present day Tanzania, Uganda, Rwanda, Burundi, Zaire and Zambia. The town is best known to be made as being the main source of slaves to Zanzibar slave market. The town was also the starting point of Sir Henry Stanley's expedition (1872) in search of Dr. Livingstone; Site of first Christian Church in Tanzania Mainland, the first colony of freed slaves, first multiracial and non-denominational school, and the first trade school, first harbour, first industrial establishment and the capital of German East Africa.

## Zimbabwe

### **Ziwa National Monument**

Long. 32°38' E ; Lat. 18°08' S    (iii)(iv)(v) C  
Map reference: 125000 S.E.  
36.10 Mutare  
1:50000 1832.B. Nyanga

Ziwa national monuments bear evidence of human occupation for all the major archaeological periods identified in Zimbabwe's archaeological sequence. That is from hunter-gatherer periods of the Stone Age to the historical times. 3337 hectares of land comprise : Stone Age deposits, rock art sites; early farming communities settlements; a landscape of later farming communities marked by terraces and field systems, hill forts, pit structures and stone enclosures (100+), iron smelting and forging furnaces and numerous remains of daub-plastered housing structures.



6.4. Africa Tentative Industrial Heritage Classification



## African Countries with Tentative Lists

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### Analysis of Industrial World Heritage Values

Country	Site name with stated Industrial WH	Description	Site name with Assoc. Industr. Value	Description	Industrial Classification
<b>0. EXTRACTIVE INDUSTRIES</b>					
<b>Burkina Faso</b>			<b>Les gravures rupestres de Pobe-Mengao</b>	Rock art drawings in <u>metallurgical iron extraction ruins with furnace ruins, necropolis</u>	1
<b>Burkina Faso</b>			<b>Les necropoles de Bourzanga</b>	2 different necropolis types, partly in <u>metallurgical ruin sites</u>	1
<b>Burkina Faso</b>	<b>Les sites d'extraction de fer Kindiba</b>	4 metallurgical sites with furnaces and mines of the Dogons and the Moagas			1
<b>Dem. Rep. of Congo</b>			<b>Grottes de Matupi</b>	Ca. 40000 BC, <u>one of oldest stone industry sites</u>	4.0
<b>Niger</b>			<b>La route du Sel de l'Air au Kaouar</b>	Desert oasis since stone age with great beauty, stone inscriptions, <u>expooited salt beds</u>	4.6
<b>Uganda</b>	<b>Kibiro (Salt producing village)</b>	Unique example of industry for 900 years, salt producing process in pottery and later metallic vessels, archaeological and ethnographical value			4.6
<b>South Africa</b>	<b>Pilgrim's Rest Historic Village</b>	Historic village, site of first major gold rush in South Africa, alluvial mining, gold field, 1881 first gold mining company			5.2



Country	Site name with stated Industrial WH	Description	Site name with Assoc. Industr. Value	Description	Industrial Classification
<b>1. BULK PRODUCTS INDUSTRIES</b>					
<b>Dem. Rep. of Congo</b>			<b>Grottes de Dimba et Ngovo</b>	Ca. 18000 BC, stone age grottoes with <u>archaeological finds of early food production</u>	13
<b>Zimbabwe</b>			<b>Ziwa National Monument</b>	Stone age to historical time archaeological finds. Stone age deposits, rock art sites, early farming settlements, <u>field systems, hill forts, pit structures, iron smelting and forging furnace, house structures</u>	14.0
<b>5. TRANSPORTATION</b>					
<b>Un. Rep. of Tanzania</b>			<b>Bagamoyo Stone Town and Kaole Ruins</b>	2 fishing villages, commercial port, slave market, <u>first harbor and first industrial establishment and capital of German East Africa</u>	50.0
<b>9. SPECIALIZED STRUCTURES AND OBJECTS</b>					
<b>Madagaskar</b>	<b>Paysage culturel rizicole et hydraulique de Betafo</b>	Rice growing village surroundings with complexe hydraulical net with canals			81.3
<b>Togo</b>	<b>Les Greniers des Grottes de Nok et de Mamproug</b>	Beautiful mountain area, autochtone peopulations refuges between 17 <sup>th</sup> and 19 <sup>th</sup> c., big caverns with cylindrical or semi-spheric storage volumes hewn in stone			85.9



## 6.5. Arab States Tentative list analysis and description



**Arab States with Tentative Lists**

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**Analysis of Industrial World Heritage Values**

Country	Pot. Sites	C/N/M	Site name with stated Industrial WH	Description	Site name with Associated Industrial Value	Description	Industrial Classification
<b>Egypt</b>	12	12/0/0			<b>Dahab</b>	South Sinai, Great fort with byzantine foundations, rooms, storages, <u>lighthouse</u>	50.1
<b>Iraq</b>	7	7/0/0	0		0		
<b>Jordan</b>	11	11/0/0			<b>Abila City (Modern Qweilbeh)</b>	Historic city, tombs, theatre, <u>Roman bridge, basilica etc.</u> , <u>2 aqueducts</u>	59.3, 62
					<b>Al Qastal (Settlement)</b>	Oldest and most complete Umayyad communities in Near East, palace, mosque, cemetery, etc, <u>substantial agricultural dam, reservoir, cistern. 400 m stone dam, quarry</u>	79, 4.0
<b>Lebanon</b>	9	8/1/0			<b>Valley of Nahr el Kelb</b>	Natural site, fauna, grottoes, churches, <u>medieval bridge, church, roman aqueduct</u>	59.3, 62
					<b>Valley of Nahr Ibrahim</b>	Natural site, fauna, grottoes, 2 storeys aqueduct	62
					<b>Valley of Oronte</b>	Natural site, fauna, monastery, <u>ruins of aqueduct, church,</u>	62
<b>Mauritania</b>	3	3/0/0			<b>Paysage culturel d'Azougui</b>	Oasis, ruins, palm plantations, <u>traditional canalisation system</u>	62
			<b>Site archéologique de Tegdaoust</b>	Commercial center for metalurgical industry of gold, iron and copper, 8-11 <sup>th</sup> c.			14.5
<b>Morocco</b>	16	11/5/0			<b>Ville de Lixus</b>	One of the first western mediterranean cities, 8 <sup>th</sup> BC – 6 <sup>th</sup> c., temples, pre- and roman settlement, <u>important salt producing industry</u>	4.6
<b>Oman</b>	5	5/0/0	<b>A Falaj System</b>	Network of canal, on the ground and subterranean, masterpiece of technical work			81.3
<b>Sudan</b>	8	8/0/0	0		0		



<b>Syria</b>	15	15/0/0	<b>Noréas de Hama</b>	226 km N of Damaskus, ruins of ancient lakes, reservoirs, aqueducts, bridges, irrigation systems, noreas are water lifting round installations			37, 81.3
<b>9 countries</b>	<b>86 pot. sites</b>	<b>80/6/0</b>	<b>3 Tentative Sites with stated potential Industrial World Heritage (TIWH)</b>		<b>8 Tentative World Heritage Sites with Associated Industrial Value (TAIV)</b>		



# Arab States Tentative List

## Tentative Industrial World Heritage Sites (TIWH)

### And

## Tentative Sites with Associated Industrial Value (TAIV)

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### Brief description on the sites

#### EGYPT

##### **Dahab**

South Sinai

[missing]

El Mshraba hill far from North Dahab 5 Km. In Aqaba Gulf.

The excavations beginning 1990 until 1993 discover of Lighthouse inside a great fort with bezantine foundation surround a great wall, many used rooms, well passing and stores rooms from outside there are anchorage in the old part Dahab at 6th-5th century.

#### Jordan

##### **Abila City (Modern Qweilbeh)**

Utm East:769100 - Utm  
North:3619800  
UTM Zone:36

C (i)(iii)(iv)

The site is located about 25km.east of the Sea of Galilee(Tiberias)and about 4km. south of Wadi Yarmouk river. It surmounts the Trans Jordanian Plateau at an elevation of 440m.above sea level. The annual rainfall averages about 350-450mm.and the area has been served over its history by a perennial spring ,Ain Quweilbeh , located in the wadi at the S end of the south tell (mountain),Um el Amad. The site is well situated ,guarded by wadis(valleys) on the N,E and S., graced with plenty of agricultural land all around and blessed with plenty of agricultural land all around and blessed with being on well traveled trade routes connecting with other Decapolis cities ,both N-S and E-W.

The territory of Abila is large,c.1.5km.N-S by c.600m.E-W, extended probably to the Yarmuk in the north and the Wadi Shallalah on the east. On the west it would have stopped short of el-Khureibah where the city aqueduct of Gadarda began. To the south, Abila controlled Capitolias until it became a separate city in A.D.97 .

Tell Abil and Khirbet Um El'Amad are the location of the central part of the city. The surrounding hillsides are honeycombed with tombs , and some evidence of occupation has also been found at North Abila. Megalitic columns greet the visitor at Um el-'Amad (the mother of columns). The columns are possibly a part of an earlier building that had been turned into a basilica. The decorated capitals evidence Christian usage. This building would have been very beautiful with alliterating columns of basalt and limestone. The floor used bituminous and hematitic limestone pavers In a checkerboard pattern .A huge cistern associated with this building lies north. Wall lines of buildings are evident all over the Khirbet . A variety of remains come into view as one walks north along an olive grove into the saddle area between the khirbet and the tell. To the east one looks across the steep cavea of the theatre , a paved street, baths, a basilica, and a Roman bridge across the Wadi. At the west side, the west gate of the city could be seen, with its viaduct joining the khirbet and the tell , are in view . Straight ahead to the north is the very steep slope of Tell Abil . A three apsed basilica is being excavated on the summit of the tell. In the central apse of the basilica a fragmentary inscription bearing the city's name has been found. Architectural fragments abound. A large portion of the defensive wall (some 4 m. high ) has been exposed on the northeast corner of the tell.

A variety of tombs have been discovered , which include simple cist-graves, a columbarium , sarcophagi, and painted tombs . The site was supplied with a water system while additional water was brought to the area by the Khureibah aqueduct. From the spring, two aqueducts traveled along the west side of the Wadi Qweilbeh and brought water into the center of the city .

Coinage from Abila indicated the existence of a unique temple. Pagan deities, such as Herakles , Tyche, and Athena , were worshiped at Abila. Terra-cotta figurines found in a tomb suggest also the worship of Dionysus



## History

Quweilbeh /Abila is Known in literary history as belonging to that group of cities called the Decapolis ,along with such other cities as Damascus,Philadelphia (Amman),Scythopolis(Beisan), Gadara(Um Qeis), Hippos,Pella, Canatha,etc. A stone inscription in Greek with the name Abila was excavated in the Byzantine strata on Tell Abila.

The site was inhabited , in the beginning, from the Neolithic times on down through Umayyad and ,to a limited extent ,into the Abbasid /Fatimid and Ayyubid/Mamluk periods. Extensive habitation was in the Middle Bronze /Late Bronze ,Iron Age and Hellenistic,Roman, Byzantine and Umayyad periods.

### Al Qastal (Settlement)

Utm East:778300 - Utm  
North:3516200  
UTM Zone:36

C (i)(iii)(iv)

An Umayyad, 25 kilometres south of the Capital d complex (settlement) at the modern village of Qastal ( Amman) and 100 metres west of the airport Highway .It is one of the oldest and most complete Umayyad provincial communities in the Near East. It retains nearly all the structures that comprised a typical Umayyad settlement: a main residential palace, a mosque, a cemetery, a bathhouse, domestic dwellings, a substantial agricultural dam, a main reservoir and dozens of smaller cisterns.

Qastal had always been viewed as a small Roman fort, largely because of its fort-like shape and the assumption that its Arabic

name Qastal derived from the Latin word "castellum", or small castle. Surface examinations by the German scholar Heinz Gaube and excavations by a French team headed by Dr Patricia Carlier and Frederic Morin have shown Qastal to be a virtually complete Umayyad complex, with the standing remains of what may be the earliest known Umayyad residential palace and minareted mosque.

The palace, nearly 68 metres square, had its main entrance hall, decorated with fine carved stonework, in a tower in the east wall. The palace had four circular corner towers and 12 semi-circular interval towers. The excavated south-east corner tower retains some of the original internal rooms, which were modified when the building was re-used in the Mamluke period (13th-15th Centuries AD). The entrance hall led into a vestibule which opened on to the central courtyard with a large underground cistern and surrounded by six "suites"; another six suites comprised the upper storey, reached by twin staircases within the thick flanking walls of the entrance hall.

Above the entrance, on the second floor, was the lavishly decorated, triple-apsed Audience Hall, similar to the one on the Amman Citadel. The palace was richly decorated with carved stones, stucco and glass and stone mosaics; its floors, even its latrines, were virtually all paved with mosaics, whose geometric, floral and animal motifs recall the fine mosaics at Qasrel-Hallabat

Immediately north of the palace (across the small paved road) is the rectangular mosque, oriented off-axis from Mecca. Its original rectangular mihrab (prayer niche) was later replaced by a more typical semi-circular mihrab, and its circular minaret is one of the earliest surviving minarets from the first days of the realm of Islam. South-west of the palace is the only known early Islamic cemetery in Jordan with some of its earliest tombs oriented towards Jerusalem, and with at least 17 inscribed tombstones dated to the Umayyad and the Abbasid periods. The tombstones are on display at the Madaba archaeological museum, along with fragments of Qastal's mosaics.

Over a kilometre to the east, across the airport highway, is the 400-metre-long, 4.3-metre-thick stone dam built by the Umayyad inhabitants of Qastal to store nearly two million cubic metres of rainwater for irrigation. About a kilometre north-west of the palace, at the edge of the modern village of Qastal, is the large reservoir measuring 30x22 metres and 6.5 metres deep, with a capacity of 4,000 cubic metres. It was formed from the quarry which supplied Qastal's building stones for the palace, mosque and dam. In the centre of the reservoir is the lower section of its original water gauge. Over 70 smaller cisterns within two square kilometres of the palace provided the settlement's year-round water needs. West of the palace are some faint remains of Qastal's Umayyad baths.

Traces of an ancient road from the Roman/Byzantine period have also been identified about a kilometre south-west of Qastal, passing adjacent to the archaeological mound of Zabayir el-Qastal, which seems to have been settled during the Iron Age and the Nabataean, Roman and Byzantine periods.

## HISTORY

The palace is thought to have been built by the Umayyad Caliph Abd el-Malik ibn Marwan (685-705 AD), one of early Islam's greatest builders, who was also responsible for the construction of the Dome of the Rock in Jerusalem. Qastal's early date also explains why it was completed and inhabited unlike some other Umayyad desert complexes in Jordan which were never finished. It is probably the oldest known Umayyad settlement in this area. It seems to have been used throughout the Umayyad period, and was probably used by the Calip Walid II (743-44 AD) while Mushatta was being built just five

kilometres to the east. The Umayyad poet Kuthayyir 'Azza, who was at the court of Yazid II at Muwaqqar in 723 AD, mentioned it by the name "Qastal el-Balqa". The site was used well into the Abbasid period (750-969 AD), as we know from the tombstone inscriptions. After a brief abandonment, it was re-used as a less grandiose residential area during the Ayyubid/Mamluke period (1171-1516 AD). Many of the poorly built but still standing walls within the central courtyard represent Ayyubid/Mamluke domestic structures.



## **Lebanon**

### **Ensemble du site naturel de la Vallée du Nahr el Kelb avec les monuments et les sites archéologiques qui s'y trouvent**

Vallée orientée Est / Ouest (iv) C  
située à 30 km au Nord de Beyrouth. Elle s'intègre au Caza (division administrative) de Kesrouan. Elle descend vers la mer le long du Mont Liban.

L'environnement est bien préservé tout le long de la vallée. La flore comprend une grande variété d'espèces locales. En plusieurs endroits se dressent des rochers dolomitiques gris assez spectaculaires, uniques au Liban. Sites naturels: Grottes de Jeita (domaine de l'Etat) fameuses pour leurs stalactites et stalagmites aux formes extraordinaires et leur rivière souterraine. Pont naturel de Kfar Zeibian qui figure sur la Liste Officielle Libanaise des Monuments Classés et Inscrits Monuments Historiques et Sites).

Monuments: Stèles commémoratives gravées sur le promontoire rocheux qui domine la mer. Les plus anciennes datent du XII<sup>ème</sup> siècle av. J.-C. tandis que la plus récente est de 1946. Toutes témoignent du passage de différents conquérants et des cultures qui se sont développées sur la côte levantine. (Classées par Décret n° 506 du 5 Mars 1937). Temple de Qalaat Fakra (domaine de l'Etat): vestiges d'un temple romain prostyle à 6 colonnes corinthiennes datant du II<sup>ème</sup> siècle ap.J.-C. Une partie du temple est formé par un aménagement des rochers dolomitiques entourant le site. Jouxant le temple il reste les vestiges d'une petite ville byzantine qui comprend une petite chapelle à plan basilical avec trois nefs. Couvents des XVIII<sup>ème</sup> -XIX<sup>ème</sup> siècles de Mar Abda de Mouchamar, de Notre Dame de Lou-zei et de Tamish, lequel est construit sur les ruines d'un temple dédié à Artémis (Liste Officielle Libanaise des Monuments Classés et Inscrits Monuments Historiques et Sites). Pont médiéval (Classées par Décret n° 506 du 5 Mars 1937). Aqueduc romain (Liste Officielle Libanaise des Monuments Classés et Inscrits Monuments Historiques et Sites). Abris sous roche avec évidences d'occupation humaine aux périodes du Paléolithique moyen, Chalcolithique, et de l'Age du Bronze (Liste Officielle Libanaise des Monuments Classés et Inscrits Monuments Historiques et Sites).

### **Ensemble du site naturel de la Vallée du Nahr Ibrahim avec les monuments et les sites archéologiques qui s'y trouvent**

Vallée orientée Est / Ouest (iv) C  
située à 30 km au Nord de Beyrouth. Elle s'intègre au Caza (division administrative) de Kesrouan. Elle descend vers la mer le long du Mont Liban.

L'environnement est bien préservé tout le long de la vallée. La flore comprend une grande variété d'espèces locales. Sites naturels: Grotte d'Afqa dans laquelle le fleuve d'Adonis prend sa source (classé par décret présidentiel n° 15 617 du 14/07/49). La caverne immense est ouverte sur un à-pic de 200 m. E. Renan aurait déclaré que c'était l'un des plus beaux endroits du monde!

Monuments: A proximité s'élevait un temple dédié à Astarté dont il ne reste plus que le plan au sol. Temple Mar Giorgis el Azrak (décret d'expropriation n°8801 du 2918174), Temple de Machnaka et stèles funéraires sculptées dans le rocher, Abris sous roche d'Asfourie contenant des sites préhistoriques (Travaux Publics par décret n° 506 du 5 Mars 1937), Aqueduc de Zouboida à deux étages, remanié à l'époque de l'Emir Bechir Chehab (Liste Officielle Libanaise des Monuments Classés et Inscrits Monuments Historiques et Sites).

### **Ensemble du site naturel des sources et de la Vallée de l'Oronte avec les monuments qui s'y**

Au Nord de la Plaine de la Beeka, (iv) C  
à plus de 700 m. d'altitude, à 144 Km au Nord / Est de Beyrouth. Il appartient au Caza -division administrative- d'Hermel.

Secteur naturel bien préservé, dans un impressionnant paysage au sol caillouteux. La terre est très fertile mais par manque d'irrigation la région est désertique. La guerre a conduit à un abandon progressif de la zone. La vallée de l'Oronte est, par contraste, très verte. Les eaux sourdent de plusieurs sources et se transforment en un torrent qui s'est taillé un passage abrupte et sinueux dans le rocher. Monuments: Couvent de Mar Maroun (classé par Décret n° 6 du 31/12/1969), Pyramide d'Hermel (peut-être le tombeau d'un prince daté du II<sup>ème</sup> ou du I<sup>er</sup> siècle av.J.-C.), Tronçons de l'aqueduc de Zénobie (reliant Laboué à Palmyre), les basiliques byzantine aux sols recouverts de mosaïques de Ras Baalbeck et de Nabha, les stèles et les mosaïques de Brissa. Compte tenu de l'importance du Bassin de l'Oronte qui, dans sa partie basse traverse des sites historiques très importants (Antioche, Apamée), la protection de ses sources ouvre la voie à un programme plus vaste portant sur l'ensemble de la vallée et susceptible d'intéresser plusieurs états.



# **MAURITANIA**

## **Paysage culturel d'Azougui**

Adrar (environ 450 km au nord de Nouakchott)

C (iii)(iv)(v)(vi)

Le paysage culturel d'Azougui se compose de plusieurs structures culturelles dont l'existence est étroitement liée au milieu, et ce dernier est également soit une production culturelle soit un phénomène naturel qui porte maintenant les empreintes de toutes les valeurs culturelles qu'il abrite. Les composantes essentielles de ce paysage sont:

### L'Oasis

L'apparition du phénomène des Oasis est étroitement lié à la création d'Azougui, dont les vestiges témoignent de ce passé florissant, dans un milieu de plus en plus désertique n'acceptant plus les autres formes d'agriculture. Cette activité économique est devenue rapidement une forme culturelle de la vie quotidienne des populations ; ces dernières ont créé autour de l'oasis l'essentiel de leur mythes et légendes qu'ils continuent d'enraciner dans leur mémoire collective et de vivre sous forme de festivités liées à la saison annuelle des dattes.

Cette palmeraie, la plus ancienne de la région, compte maintenant plus de vingt mille palmiers et conserve encore le système traditionnel de canalisation et d'exploitation. Ce dernier constitue un véritable métier traditionnel qui risque de disparaître sous l'effet de la modernisation.

### Le site archéologique

Le site archéologique d'Azougui : Première capitale des Almoravides, c'est une forteresse construite en pierre sèche comportant un mur d'enceinte et plusieurs concessions. Cette forteresse a été agrandie au fil des temps, ce qui se justifie par l'urbanisation à l'intérieur du mur de l'enceinte sur un périmètre de plusieurs kilomètres. Le site a été signalé en 1068 par El Bekry et plusieurs autres chroniqueurs arabes l'ont mentionné, nous citons à titre d'exemple Ibn Said, El Kalakshandy et Ibn Khaldoun.

Le Mouvement almoravide est une formation politique très importante qui naquit au sein des tribus Sanhaja de Lemtouna et Guedala en Adrar Mauritanien, sous l'autorité d'un chef spirituel d'une rigueur religieuse extraordinaire, Abdullah Ibn Yassin. Ce mouvement a pu unifier l'Afrique occidentale, le Maghreb et la Péninsule Ibérique pendant plusieurs siècles, après avoir investis l'Empire du Ghana, les Idrissides et le royaume de Bourghouata.

En 1860, Azougui a été reconnu par Vincent et en 1922 Modat le visite mais c'était TH. Monod (1 948) qui a établi un premier plan du site qui sera détaillé par Mauny plus tard.

Les fouilles du site commencèrent en 1979 et se poursuivent actuellement, permettant ainsi de dégager plusieurs concessions et le mur d'enceinte. Les objets archéologiques exhumés fournissent une information éloquent sur le rôle que jouait le site dans le commerce transsaharien à travers la céramique et le verre, tous importés d'horizons différents, notamment le Maghreb, la Péninsule Ibérique et le proche Orient.

En outre la tradition orale fournit des témoignages cohérents et concordants sur le rôle de l'Imam El Mejdoub, personnalité mythique et religieuse d'envergure et son adepte l'Imam El Hadramy El Morady dont la tombe se situe au cœur du site et dont l'œuvre manuscrite « El Ichara-Vy Tadbiri El Imara » fut la première en politique dans la région.

La falaise est, en effet, un élément naturel important qui a favorisé l'installation humaine dans ce paysage. Elle forme un îlot quasi fermé dont les passages sont contrôlables, permettant ainsi aux populations de se maintenir à l'abri des invasions éventuelles, phénomène très répandu dans l'histoire de la région.

Ce milieu fermé a pu être prospère à la vie humaine grâce à la sécurité qu'assure la falaise et à l'oued fertile qui l'entoure et qui traverse le paysage en question.

## **Site archéologique de Tegdaoust**

Environ 750 km à l'est de Nouakchott

C (iii)(v)

Tegdaoust fut une étape incontournable du commerce et de l'industrie métallurgique de l'or, le fer et le cuivre ; elle était certainement la première étape sur la route liant le Maghreb et le pays soudanais.

Cette cité a connu un commerce florissant de l'or et des activités socio-économiques très aisées pendant plusieurs siècles. Le site archéologique date du 8<sup>e</sup>,e siècle, mais il a connu plusieurs périodes d'occupation qui perdurent dans le temps jusqu'au 13<sup>e</sup>,e siècle. Entre 1050 et 1070, le site, qui jusqu'à cette date était sous l'autorité de l'Empire du Ghana, a été conquis par les Almoravides.

Les fouilles du sites ont montré l'évolution de l'architecture et de la vie humaine dans un milieu qui connaît une croissance de l'aridité et, elles ont dégagé des objets très significatifs dans le commerce et l'industrie de l'or, dont une balance vraisemblablement la plus ancienne de la région.



# MOROCCO

## Ville de Lixus

Environs de Larache

(ii) (iii) (iv) C

La ville de Lixus est d'après de nombreux auteurs anciens l'une des premières cites de l'occident méditerranéen. Elle est située à l'embouchure de l'oued Lukkos, en face de la ville moderne de Larache. Les fouilles qui y ont été entreprises ont montré que le site a été occupé depuis le VIII<sup>ème</sup> siècle avant J.C jusqu'au XIV<sup>ème</sup> siècle après J.C. Les secteurs fouillés ont touché un quartier religieux constitué de nombreux temples, un quartier d'habitat préromain et romain, un complexe industriel de salaisons (l'un des plus importants du bassin méditerranéen)... La stratigraphie du site comprend 5 grandes phases: phénicienne, punique, mauritanienne, romaine et post-romaine et une dernière phase islamique.

# Oman

## A Falaj System

(not specified)

The term -falaj- (plur. aflaj) is used to describe any type of canal, on the ground or subterranean. Underground falaj networks are of paramount importance in the agricultural settlements of Oman, and can certainly be considered as masterpieces of technical work. Several of them are still active all around the country. They have only been partly surveyed (Costa and Wilkinson 1987) and the Ministry of National Heritage and Culture will select the most representative and best preserved example of these systems.

# SYRIAN ARAB REPUBLIC

## Noréas de Hama

Hama à 226 km au Nord de Damas sur la rivière Oronte.

C (i)(iv)

La rivière Oronte, de son nom assyrien « Aranton », conserve de part et d'autre de son parcours à partir de la région montagneuse de Baalbek au Liban où elle prend naissance jusqu'à la Méditerranée à 30 km en aval de la ville de Latakia, les vestiges d'un nombre considérable d'anciens petits lacs, retenues d'eau, barrages canaux, aqueducs, ponts, terres irriguées, cités disparues ou encore vivantes et noréas dont seule la ville de Hama, traversée par la rivière détient encore quelques importants spécimens (au nombre de dix sept) qui font désormais partie intégrante de son paysage urbain et qui consacrent sa renommée mondiale.

Le nom arabe de l'Oronte « El- c Assi » qui signifie « le rebelle » est expliqué au XIII<sup>ème</sup> siècle par Yaqut al-Hamoui ( de Hama) du fait que cette rivière, contrairement à la plupart des rivières, circule dans le sens Sud-Nord et par Abu'l Fida du XIV<sup>ème</sup> siècle par l'usage de la roue pour faire monter l'eau a rebelle » et la distribuer dans la ville et la campagne.

Dans la campagne, sur les deux rives de l'Oronte, se trouvent en effet les a Azwar », terres très fertiles plantées de divers arbres fruitiers et irriguées jadis par le système des noréas, une, deux ou plus pour chaque a zûr » selon la superficie du terrain et les besoins en eau. Malheureusement, il ne reste plus grand chose des noréas des Azwar, ce qui ajoute à la valeur de celles de Hama qui demeurent uniques, pas seulement sur l'Oronte et en Syrie, mais probablement dans le tout monde.

La noréa est en effet un mécanisme qui permet d'élever l'eau de la rivière grâce à une roue en bois plus ou moins grande installée au bord de la rivière et dotée de caissons en bois qui se remplissent d'eau chaque fois que la roue s'enfonce dans le liquide et qui se vident quand ils se trouvent au sommet, en déversant leur contenu dans un bassin ou un aqueduc qui véhicule l'eau aux endroits désirés.

A Hama les noréas ont un diamètre qui varie entre 10 et 12 mètres; certaines peuvent atteindre les 22 mètres. On leur attribue souvent des origines médiévales arabes (en arabe na' ùra), mais il est aujourd'hui certain qu'elles ont existé bien avant comme l'atteste une mosaïque de 469 J.C. trouvée à Apamée sur laquelle est dessinée une noréa dont la ressemblance est des plus frappantes avec celles de Hama.

Mue par la puissance hydraulique du cours d'eau, les noréas de Hama se distinguent de celles qu'on voit encore dans plusieurs régions du monde où la force de rotation est soit animale ( boeuf, chameau...) soit humaine, et où les godets en terre cuite ou en cuir remplacent les caissons en bois; elle se distinguent surtout par leur gigantisme et par le complexe système hydraulique qu'elles entraînent: bassins, aqueducs, canaux d'irrigation souterrains, barrages, ponts...

Les noréas de Hama continuent à fonctionner d'une manière saisonnière (elles s'arrêtent pendant la saison sèche quand la rivière est au plus bas de son niveau). Plusieurs sont datées et attribuées à des princes ou des gouverneurs qui les ont aménagées pour l'irrigation de leurs propriétés ou pour l'approvisionnement des palais, demeures, mosquées, hammams, caravansérails... Celle appelée la Ma ~muréyya est datée de 1453, a un diamètre de 21 mètres et porte sur son extrados 120 caissons en bois. Elle était destinée à alimenter plusieurs jardins et parcs, neuf mosquées, quatre hammams et cent puits. La Muhammadiya est la plus anciennement datée (elle date de 1361), et la plus grande de Hama (22 mètres). Elle



était destinée à alimenter la Grande Mosquée, le hammam ad-dhahab, des jardins et des habitations du quartier. Le mot dūlab ( roue) remplace parfois celui de na' ūra dans certaines inscriptions de fondation.



## 6.6. Arab States Tentative Industrial Heritage Classification



## Arab States with Tentative Lists

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### Analysis of Industrial World Heritage Values

Country	Site name with stated Industrial WH	Description	Site name with Associated Industrial Value	Description	Industrial Classification	
0. EXTRACTIVE INDUSTRIES						
Morocco			Ville de Lixus	One of the first western mediterranean cities, 8 <sup>th</sup> BC – 6 <sup>th</sup> c., temples, pre- and roman settlement, <u>important salt producing industry</u>	4.6	
1. BULK INDUSTRIES						
Mauritania	Site archéologique de Tegdaoust	Commercial center for metalurgical industry of gold, iron and copper, 8-11 <sup>th</sup> c.			14.5	
4. POWER SOURCES AND PRIME MOVERS						
Syria	Noréas de Hama	226 km N of Damaskus, ruins of ancient lakes, reservoirs, aquededucts, bridges, irrigation systems, noreas are water lifting round installations			37	81.3
5. TRANSPORTATION						
Egypt			Dahab	South Sinai, Great fort with byzantine foundations, rooms, storages, <u>lighthouse</u>	50.1	
7. BRIDGES, TRESTLES AND AQUEDUCTS						
Jordan			Abila City (Modern Qweilbeh)	Historic city, tombs, theatre, <u>Roman bridge, basilica etc.</u> , <u>2 aqueducts</u>	59.3	62
Lebanon			Valley of Nahr el Kelb	Natural site, fauna, grottoes, churches, <u>medieval bridge</u> , church, <u>roman aqueduct</u>	62	59.3
Lebanon			Valley of Nahr Ibrahim	Natural site, fauna, grottoes, 2 storeys aqueduct	62	
Lebanon			Valley of Oronte	Natural site, fauna, monastery, <u>ruins of aqueduct</u> , church,	62	
Mauritania			Paysage culturel d'Azougui	Oasis, ruins, palm plantations, <u>traditional canalisation system</u>	62	



9. SPECIALIZED STRUCTURES AND OBJECTS						
<b>Jordan</b>			<b>Al Qastal (Settlement)</b>	Oldest and most complete Umayyad communities in Near East, palace, mosque, cemetery, etc, <u>substantial</u> agricultural dam, reservoir, cistern, 400 m stone dam, quarry	79	4.0
<b>Oman</b>	<b>A Falaj System</b>	Network of canal, on the ground and subterranean, masterpiece of technical work			81.3	



## 6.7. Asia / Pacific Tentative list analysis and description



# Asia-Pacific Countries with Tentative Lists

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## Analysis of Industrial World Heritage Values

Country	Pot. Sites	C/N/M	Site name with stated Industrial WH	Description	Site name with Assoc. Ind. Value	Description	Industrial Classification
<b>Bangladesh</b>	5	5/0/0	0		0		
<b>Cambodia</b>	10	10/0/0	0		0		
<b>China</b>	40	33/7/0	<b>Anji Bridge</b>	Zhao County, Hebei Prov., built ca.600 AD, giant open-body stone single-arched bridge, 64 m length, 9 m width			59.3
			<b>Chengyang Yongji Bridge</b>	1912-1924, bridge piers in stone, body in timber, 78 m long, 20m high, with corridor with 5 pavillions with 19 rooms with central passage			58.0
			<b>Lugou Bridge</b>	1189, bridge, exquisite stone sculpurs, multiarched stone bridge, 266 m long, historical war monument			59.3
			<b>Tonglushan Ancient Copper Mine Sites</b>	2 sq km, oldest and biggest ancient copper mine in China, drifts, smelting furnaces 8 <sup>th</sup> c			5.0
<b>DPR Korea</b>	7	3/2/2	0		0		
<b>India</b>	13	13/0/0	<b>Victoria Terminus</b>	1888, Great Penensula Raiway, late Italien Medieval Gothic style, still in use, one of the finest station buildings in the world			47
<b>Indonesia</b>	16	16/0/0	0		0		
<b>Iran</b>	17	16/0/1	<b>Shushtar (Mian-Ab) hydraulic installations</b>	Shushtar ; Irrigation system for agricultural, urban and industrial purposes, dams, water distribution dikes, manually dug channels, water distribution tower, urban ventilation using gratuitous energy			81.3
<b>Japan</b>	6	6/0/0	0		0		
<b>Kazakhstan</b>	10	4/0/6	0		0		
<b>Kyrgyzstan</b>	6	4/0/2	0		0		
<b>Laos PDR</b>	3	3/0/0	0		0		
<b>Malaysia</b>	1	1/0/0	0		0		



<b>Mongolia</b>	9	4/3/2	0		0		
<b>Myanmar</b>	8	8/0/0	0		0		
<b>Nepal</b>	6	6/0/0			<b>Khokana, vernacular village and its mustard-oil seed industrial heritage</b>	Latitpur District, Bagmati Zone, unique village of medieval settlement pattern with <u>system of drainage and chowks</u> . Mustard-oil seed industry	13.9, 81.3
<b>New Zealand</b>	1	1/0/0	0		0		
<b>Pakistan</b>	8	8/0/0	0		0		
<b>Philippines</b>	10	5/5/0	0		0		
<b>Rep. Korea</b>	6	4/2/0	<b>Kangjüngun Kiln Sites</b>	918-1392 Koryŏ-period, earthenware and celadon kiln sites, 400 kilns discovered in this area			11.1
<b>Tajikistan</b>	11	11/0/0	0		0		
<b>Turkmenistan</b>	3	3/0/0	0		0		
<b>Uzbekistan</b>	18	18/0/0	0		0		
<b>Vietnam</b>	4	0/2/2	0		0		
<b>23 countries</b>	<b>218 pot. sites</b>	<b>182/21/15</b>	<b>7 Tentative Sites with stated potential Industrial World Heritage (TIWH)</b>		<b>1 Tentative World Heritage Site with Associated Industrial Value (TAIV)</b>		



# Asia-Pacific Countries Tentative List

## Tentative Industrial World Heritage Sites (TIWH)

### And

## Tentative Sites with Associated Industrial Value (TAIV)

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### Brief description on the sites

## China

### Anji Bridge

Zhao County, Hebei Province  
Long. 115°10' East      Lat.  
37°40' North

(i)(ii)(iii)(iv) C

Zhaozhou Bridge is another name of Anji Bridge. Anji Bridge was designed by Lichun, a craftsman in Sui Dynasty, and built from the later period of Kaihuang to the early days of Daye (593 - 605 A.D.), so the bridge has a history of 1400 years. Anji Bridge is a giant open-body stone single-arched bridge, with 64,6 meters in length, 9 meters in breadth, 37,02 meters in net main-arched span and 7,23 meters in height; it is constructed with 28 arches side by side. There are 2 smaller built separately on both side of the main arch. Anji Bridge initiates the structure of the open-body arch bridge and occupies a very important place in the world bridge building history.

### Chengyang Yongji Bridge

Long. 109°38' East  
Lat. 24°54' North

(i)(ii)(iii)(iv)(v) C

Yongji Bridge was built by the Dong people of Bazhai Village between 1912 and 1924. The piers of the bridge is made of stone and the body of bridge is made of timber. The Bridge is 77,76 meters long, 3,75 meters wide and 20 meters high. There are five piers sustaining the bridge and the span of the four openings is 14 meters. On the bridge there is a corridor with five pavilions, each of which has three layers. The corridor contains nineteen rooms with a central passage through the bridge. On both sides there are timber benches and banisters. The five pavilions are linked by the corridor, and all these make the bridge a well-formed architecture. In addition, the eaves are decorated with all sorts of traditional designs of Dong nationality, and the top of pavilions and corridor are decorated with vermilion calabashes.

### Lugou Bridge

Long. 116°03' East  
Lat. 39°52' North

(i)(iii)(iv) C

Lugou Bridge was built in the Dading period of Jin Dynasty (1189). Lugou Bridge is a representative bridge work in ancient China. The exquisite stone sculptures of Lugou Bridge are well known throughout the world. It is a multiarched stone bridge which is 266,5 metres long and 7,5 metres wide. It has 11 arches. The span of the biggest arch is 13,42 metres. The bridge has 279 parapet stone slabs and 281 sculptured balusters on its both sides with a stone lion figure carved atop each one. There are 492 lions carved elegantly and vividly in various poseurs. On July 7, 1937, the Japanese army shelled Lugou Bridge and Wanpin town to the east of the Lugou Bridge, the Chinese garrison rose in self defense. Lugou Bridge is a precious historical monument.

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## **Tonglushan Ancient Copper Mine Sites**

Huangshi city, Hubei Province

Long. 114°56' East      Lat.  
30°05' North

(iii)(iv)(v) C

The Tonglushan Ancient Copper Mine Sites which is scattered over two square Km has the longest history and biggest scale of exploitation among the found ancient mines in China. The slag left over from the ancient time on the surface is more than 400000 tons.

Archaeological excavations in No.1,2,4,7,11 ore bodies since 1974 have discovered so far several hundred drifts with different structures and timbering methods used from the 11th century BC to 1st century AD, and a number of smelting furnaces built at the time of the Spring and Autumn period (770-476 A.D.) The mining and smelting tools of production made of copper, iron, bamboo, wood and stone have also been unearthed at the same time. All these discoveries serve as a record of the long history and remarkable achievements of the development of the mining and smelting industry of China and supply a number of valuable reference materials in kind for further study of mining industry in ancient China.

## **India**

### **Victoria Terminus**

Victoria Terminus is situated in the city of Mumbai on the Western Coast of India. It is located at latitude 18 deg 55 min North and Longitude 72 deg 50 min East.

C (I) (ii) (iii) (iv)

Victoria Terminus Station Building (now known as Chhatrapati Shivaji Terminus) was constructed in 1888 by the Great Indian Peninsula Railway under the guidance of Mr. F.W.Stevens, Consulting Architect. This building which took 10 years to complete is in late Italian Medieval Gothic style, and was named Victoria Terminus in view of the Queen's Golden Jubilee on June 20, 1887. This building is still being used as a Railway Station utilised by lakhs of commuters daily and also serves as the administrative headquarter of the Central Railway.

Architecture in Italian Gothic is essentially a structural style, and this building which has received worldwide appreciation on account of its series of well proportioned and ornamental arches and its spires and domes also has the dignity of a Cathedral. Nevertheless, the ornamentation to the main facade, which is towards the west, is despite the numerous base reliefs and is effected by the presentation of a series of well proportioned and delicately ornamented run of arches and friezes as far as horizontal effect is concerned. The crowning point of the whole building is the central main dome carrying at its apex, a colossal 16'6" high figure of a lady pointing a flaming torch upwards in her right hand and a spoked wheel low in the left hand symbolizing "PROGRESS". This dome is the first octagonal ribbed masonry dome that was adapted to an Italian Gothic style building.

There are a large number of other embellishments in statuary, which the architect has introduced in decorating the large frontage and these are gargoyles, grotesques and figures of animals carrying standards and battle axes etc. In addition, there are a large number of base reliefs and ornamental friezes, which to a general observer, are more attractive than the statuary, which decorates the facade. On the facade are also in very prominent position, base reliefs in large size busts of 10 Directors of the Old Great Indian Peninsula Railway Company. Two of them were Sir Jamshedji Jijibhoy and Sir Jagannath Shankarseth. The entrance gates to Victoria Terminus carry two columns which are crowned, one with a Lion (representing the United Kingdom) and the other with a Tiger (representing India) both sculptured in porbunder sand stone.

Victoria Terminus station building has been considered as one of the finest station buildings of the world and architecturally one of the most splendid and magnificent late Italian Medieval Gothic edifices existing today.

## **Iran**

### **Shushtar (Mian-Ab) hydraulic installations**

Shushtar, Khuzestan province

(not specified)

Irrigation system for agricultural, urban and industrial purposes, comprising dams (Shadurvan, Gargar, Mahi Bazan, Khak, Lashkar, Ayyar, Qir), water distribution dikes, manually dug channels (Dariun), aqueducts and water-mills. Covering 350 sq. km, this ensemble was created and put into service on the banks of Karun river in various periods. Another feature of this site is the Salasel water distribution tower, whose construction was followed by the formation of the historic fabric of Shushtar, with its system of public and private urban ventilation using gratuitous energy.



# Nepal

## Khokana, the vernacular village and its mustard-oil seed industrial

Lalitpur District , Bagmati Zone

(i)(iii)(iv)(v) C

Khokana is a unique village which can be taken as a model of a medieval settlement pattern with a system of drainage and chowks. It houses chaityas and a Mother Goddess temple. The mustard-oil seed industry has become the living heritage of the village.

# Rep. of Korea

## Kangjington Kiln Sites

Taegu-Myon, Kangjin-Gun,  
Chollanam-Do  
Long.126°26'--47' East Lat.  
34°29'--31' North

(ii) (iii) (iv) (v) (vi) C

During the Koryo period (918-1392), there existed two groups of earthenware and celadon kiln sites: Kangjin-gun in Chollanam-do and Puan-gun in Chollabuk-do. To date, about 400 kiln sites have been discovered in these two areas. In particular, some 188 kilns, the highest record in Korea, are distributed in the region of Yongun-ni, Kyeyul-li, Sadang-ni, and Sudong-ni of Kangjin-gun. Well-conserved, 98 of them were designated as historic sites by the Korean government.

Some 37 kilns remain in Yongun-ni today in generally good condition. Most of the kilns are early kilns established from the 10th century through the 11th century. Fragments that are considered to be related to the ancient Chinese kilns have been found in the kiln sites of this region.

Some 29 kilns remain in Kyeyul-li. Although some fragments of the same style as those found in Yongun-ni were also discovered in Kyeyul-li, most of the kilns date from the 11th to the 13th centuries. Many fragments of conventionalized inlaid celadon ware were found here.

Some 27 kilns remain in Sadang-ni. Of those, kilns of Tangion village dating from the early 12th century to the 13th century are representative of the Koryo ceramic kilns which were used when Koryo celadons, known for their superior kingfisher color and inlay technique, were at their peak. Some five or six kilns remain in Sudong-ni dating from the 14th century. Most have been destroyed through river erosion and farming.



## 6.8. Asia / Pacific Tentative Industrial Heritage Classification



# Asia-Pacific Countries with Tentative Lists

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## Analysis of Industrial World Heritage Values

Country	Site name with stated Industrial WH	Description	Site name with Assoc. Ind. Value	Description	Industrial Classification	
0. EXTRACTIVE INDUSTRIES						
China	Tonglushan Ancient Copper Mine Sites	2 sq km, oldest and biggest ancient copper mine in China, drifts, smelting furnaces 8 <sup>th</sup> c			5.0	
1. BULK PRODUCTS INDUSTRIES						
Rep. Korea	Kangjingun Kiln Sites	918-1392 Koryo-period, earthenware and celadon kiln sites, 400 kilns discovered in this area			11.1	
Nepal			Khokana, vernacular village and its mustard-oil seed industrial heritage	Latitpur District, Bagmati Zone, unique village of medieval settlement pattern with <u>system of drainage and chowks</u> . <u>Mustard-oil seed industry</u>	13.9	81.3
5. TRANSPORTATION						
India	Victoria Terminus	1888, Great Penensula Raiway, late Italien Medieval Gothic style, still in use, one of the finest station buildings in the world			47	
7. BRIDGES, TRESTLES, AQUEDUCTS						
China	Chengyang Yongji Bridge	1912-1924, bridge piers in stone, body in timber, 78 m long, 20m high, with corridor with 5 pavillions with 19 rooms with central passage			58.0	
China	Anji Bridge	Zhao County, Hebei Prov., built ca.600 AD, giant open-body stone single-arched bridge, 64 m lenght, 9 m width			59.3	
China	Lugou Bridge	1189, bridge, exquisite stone sculpurs, multiarched stone bridge, 266 m long, historical war monument			59.3	
9. SPECIALIZED STRUCTURES AND OBJECTS						
Iran	Shushtar (Mian-Ab) hydraulic installations	Shushtar ; Irrigation system for agricultural, urban and industrial purposes, dams, water distribution dikes, manually dug channels, water distribution tower, urban ventilation using gratuitous energy			81.3	



## 6.9. Europe / North America Tentative list analysis and description



## Europe and North American Countries with Tentative Lists

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### Analysis of Industrial World Heritage Values

Country	Pot. Sites	C/N/M	Site name with stated Industrial WH	Description	Site name with Assoc. Ind. Value	Description	Industrial Classification
<b>Albania</b>	4	4/0/0	0		0		
<b>Andorra</b>	2	2/0/0	0		<b>Eglises romanes d'Andorra</b>	Historic churches, villages, <u>Graining mills with hydraulic energy</u> , <u>Water reservoir</u> , <u>canals</u>	13.2
<b>Armenia</b>	4	2/0/2	0		0		
<b>Austria</b>	12	12/0/0			<b>Bregenzer Wald</b>	Farming landscape, <u>farmstead villages</u> , <u>textile workshops</u>	15.1
					<b>Old part of Hall in Tirol</b>	Salt historic town, historic buildings, <u>salt works</u>	4.6
			<b>Old part of Steyr including Wehrgrabenviertel</b>	Symbiosis of well-preserved medieval houses with adjacent industrial settlement, iron industry, hydraulic power reservoirs			87, 14
			<b>Styrian Erzberg and Eisenstrasse (Iron Road)</b>	Erzberg most prominent ore mining example of Central Europe, smelting industry, wheelworks once biggest charcoal furnace on the continent, Bronze Age copper extraction, standard-gauge cogwheel railway, historic villages			14, 11.4
<b>Azerbaijan</b>	7	3/4/0	0		0		
<b>Belgium</b>	5	4/0/1	0		0		
<b>Bosnia/Herzegovina</b>	2	2/0/0	0		0		
<b>Bulgaria</b>	11	5/6/0			<b>Two neolithic dwellings with preserved interior</b>	6 <sup>th</sup> mill. B.C., preserved dwelling with furnishing and household, <u>furnaces</u> , hand-grinders	14.4
<b>Canada</b>	8	0/8/0	0		0		
<b>Croatia</b>	7	6/1/0	0		0		
<b>Cyprus</b>	2	2/0/0	0		0		
<b>Czech Republic</b>	13	12/1/0	<b>Fish pond Network in Trebon Basin</b>	1518, fishpond network, manmade water ditch, dams			13.0, 81.3



<b>Czech Republic</b>			<b>Paper Mill at Velké Losiny</b>	16 <sup>th</sup> c. handmade paper mill, paper work shops, Francis turbine, water wheel			16.4
			<b>Industrial Complexes at Ostrava</b>	19 <sup>th</sup> c., Coal mines, coking plants, blast furnaces, complete concentrated technology of anthracite-based production of iron, coal mining, ironworks, railroad network, shaft 671m, electrification machines, blast furnace, settlement			2, 11.6, 14.2
<b>Denmark</b>	7	7/0/0	0		0		
<b>Estonia</b>	5	0/5/0	0		0		
<b>Finland</b>	6	6/0/0	0		0		
<b>France</b>	16	11/4/1	0		0		
<b>Georgia</b>	6	5/0/1	0		0		
<b>Germany</b>	21	20/0/1	<b>Mine of Rammelsberg and historic town of Goslar - Extension by the "Oberharzer Wasserwirtschaft", i.e. the "Upper Harz Water Management System"</b>	Medieval water management system, dam, drainage channel 1150, water ducts network, aqueduct 953m, historic mining landscape			81, 2
			<b>Ore Mountains: mining and cultural landscape</b>	800 years ore mining			1
			<b>Shoe last factory Carl Benscheidt, Fagus-Werk</b>	1914 Shoe last factory, sawmill, production machines			21
			<b>The Cultural Industrial Landscape of the "Zollverein Mine"</b>	Biggest industrial conurbation for one century, mining industry, 1930 masterpiece of engineering and design, workshop hall, compressor halls, cooling towers, etc			2
<b>Greece</b>	4	4/0/0	0		0		
<b>Hungary</b>	12	9/2/1	<b>State Stud-farm Estate in Mezöhegyes</b>	1784 center of horse-breeding and animal husbandry, large-scale farm, buildings			10
					<b>Tokaji Wine Region Cultural landscape</b>	7248 km2, grape vine cultivation, settlements, vine houses and vaulted or carved cellars, <u>multileveled, network</u>	13.4
<b>Ireland</b>	8	3/3/2	0		0		
<b>Israel</b>	23	15/1/7			<b>Caesarea</b>	Mediterranean port city since hellenistic period, city buildings, <u>high-level aqueduct</u> ,	50, 62
					<b>Shivta</b>	Late Roman desert city, buildings, <u>remains of canals, dams, drainage system</u>	81



<b>Israel</b>			<b>Timna</b>	Ancient mineral mining and smelting, copper ore, mine working shafts and galleries, 11 mining camps late Bronze Iron Age to early Arab			5.0
<b>Italy</b>	<b>62</b>	<b>45/10/7</b>			<b>Fascia costiera da Castellammare del Golfo a Trapani, con Erice, Mozia e la Isole Egadi</b>	Costal Sicily landscape, <u>saline and its milled-system</u>	4.6
					<b>Parco Archeologico Urbano e colline metallifere (Volterra)</b>	8 <sup>th</sup> c. BC city, cultivated landscape, Colline Metallifere metallurgical tradition, mining since Etruscan times	1
					<b>Porto di Roma</b>	Unique blend of historical late Roman and archaeological values, ruins of great harbour city, <u>two artificial docks</u>	50.0
<b>Latvia</b>	<b>5</b>	<b>5/0/0</b>	<b>0</b>		<b>0</b>		
<b>Lithuania</b>	<b>2</b>	<b>2/0/0</b>	<b>0</b>		<b>0</b>		
<b>Luxemburg</b>	<b>2</b>	<b>2/0/0</b>	<b>0</b>		<b>0</b>		
<b>Malta</b>	<b>7</b>	<b>5/2/0</b>	<b>0</b>		<b>0</b>		
<b>Netherlands</b>	<b>12</b>	<b>12/0/0</b>			<b>Historic center of Amsterdam</b>	Middle Ages historic center, <u>17<sup>th</sup> c. concentric, half-moon shaped ring of canals</u>	49.0
			<b>Nieuwe Hollandse Waterlinie (New Dutch Inundation Line)</b>	Building projects 19 <sup>th</sup> c., 3-5 km inundation zone, defence system with 6 basins regulated by dikes, culverts, canals, fan locks, dams, sluices			81.0
					<b>Noordoostpolder (North East Polder)</b>	Reclaimed farming zone, <u>1940 3 pumpsstations</u>	31.3
			<b>Van Nelle Fabriek (Van Nelle Factory)</b>	1925 factory for refining and packing of coffee, tea and tobacco			13.5
<b>Poland</b>	<b>8</b>	<b>8/0/0</b>	<b>Krzemionki Opatowski. Neolithic flint mine</b>	Archaeological reserve containing several thousand Neolithic mining units 4 <sup>th</sup> m. BC, different mining techniques			4.9
					<b>The valley of the Pradnik river in the Ojcowski National Park</b>	Cultural landscape, human settlements for 8000 years, castles, <u>early gunpowder factory, mills, saw-mills, fulling mills, fauna</u>	26, 16.6
<b>Portugal</b>	<b>7</b>	<b>2/2/3</b>	<b>0</b>		<b>0</b>		
<b>Romania</b>	<b>13</b>	<b>9/4/0</b>			<b>L'ensemble rupestre de Basarabi</b>	Monastic monuments in <u>ancient stone mine</u> , paintings	4.0
<b>Russian Federation</b>	<b>17</b>	<b>13/3/1</b>	<b>Railway Bridge Over Yenisey River</b>	Eastern Siberia, Siberian railroad, 1896 1 km long Railway bridge			60



<b>Slovakia</b>	8	5/3/0	<b>The Kysuce - Orava narrow-gauge railway</b>	1915, 110km, 218 m heights difference, narrow-gauge railway			47
<b>Slovenia</b>	4	4/0/0	<b>The Mining Town of Idrija</b>	500 years mercury mining, mining shaft system 700 km, well preserved installations			5.9
<b>Spain</b>	28	22/4/2	<b>Colonias industriales de los ríos Cardener y Llobregat</b>				87
			<b>El Canal de Castilla, Castilla-León</b>				49.0
					<b>La Ruta de la Sal (Canarias)</b>		
					<b>Marismas del Odiel</b>	Characteristic drainage system	81.3
<b>Sweden</b>	3	2/0/1	<b>Copper mine of Falun</b>	12 <sup>th</sup> century still running copper mine, most buildings 18 th c.			5.0
<b>Turkey</b>	16	16/0/0			<b>Güllük Dagi-Termessos National Park</b>	Ancient city of Termassos, 1050 m high, building remains, <u>cisterns and drainage system</u>	81.3
<b>Ukraine</b>	6	3/1/2	<b>0</b>		<b>0</b>		
<b>UK</b>	23	17/4/2	<b>Cornish Mining Industry</b>	Cluster of 7 areas representing metal mining for 4000 years, tin and copper largest producer in 1th to 19 th c., mining landscapes, buildings, mineral railway and mineral ports, tin and copper smelters, foundries, drill manufacturers, gunpowder, explosives, ropewalks, candle factories, brickworks			5.0, 14
			<b>Derwent Valley Mills</b>	Narrow, 24 km long stretch of Derwent Valley, textile mills 18 <sup>th</sup> and 19 <sup>th</sup> c., water power for cotton spinning, watercourses network, North Midway Railway, aqueduct			15.0
			<b>Liverpool Commercial Centre and Waterfront</b>	from 1th c. to WW I, 1.4 ha commercial docks by 1715, hydraulic towers, pumphouses, warehouses			50.0
			<b>Manchester and Salford (Ancoats, Castlefield and Worsley)</b>	Archetype of industrial revolution, Britain's first industrial true canal with aqueduct, first intr-city passenger railway and first industrial suburb on steam power, system of underground canals,			49, 47, 86.4, 15.0



				individual cotton mills, skew-arched masonry railway bridge, oldest mainline station in the world			
			<b>New Lanark</b>	Pioneering cotton-spinning village of late 18 <sup>th</sup> and 19 <sup>th</sup> c., most important woodland complex in Scotland, industrial settlement, Robert Owen social plannings, mill village			15.0, 87
			<b>Pont-Cysyllte Aqueduct</b>	1800 cast iron, highest canal aqueduct, 313 m long			49.2, 62
			<b>Saltaire</b>	1850, Saltaire preparatory process, textile mills and utopian mill settlement			15, 87
			<b>The Forth Rail Bridge</b>	1890, first major steel bridge in Europe			60.3
			<b>The Great Western Railway: Paddington-Bristol (selected parts)</b>	1841, railway, tunnels, viaducts, bridges, station buildings			47
<b>USA</b>	<b>72</b>	<b>42/30/0</b>	<b>Brooklyn Bridge</b>	New York City, One the world's first wire cable suspension bridges, main span 1595 feet			61
			<b>Eads Bridge</b>	St.Louis, Illinois, first major bridge with steel employment			61
			<b>General Electric Research Laboratory</b>	Schenectady, New York, Laboratory, 3 building complex as first industrial research facility in USA, 1900			92
			<b>Goddard Rocket Launching Site</b>	Mass., 1926, launched the world's first liquid propellant rocket			82.1
			<b>Lowell Observatory</b>	Arizona, Astronomical Observatory, 1896 original			82.5
			<b>McCormick Farm and Workshop</b>	Virginia, 19 th c., mechanical reaper 1834, well preserved			21.2
			<b>Original Bell Telephone Laboratories</b>	New York, 1898-1967, America's largest industrial research laboratory, pioneering telecom technology			92
			<b>Pupin Physics Laboratories</b>	Columbia University, New York, second Uranium atom split place 1939, intact and original			92
			<b>Trinity Site</b>	New Mexico, world's first nuclear device explosion, 1945			92
<b>40 countries</b>	<b>480 pot. sites</b>	<b>352/96 /32</b>	<b>38 Tentative Sites with stated potential Industrial World Heritage (TIWH)</b>		<b>17 Tentative World Heritage Sites with Associated Industrial Value (TAIV)</b>		



# Europe / North American Countries Tentative List

## Tentative Industrial World Heritage Sites (TIWH)

And

## Tentative Sites with Associated Industrial Value (TAIV)

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### Brief description on the sites

#### ANDORRA

##### **Eglises romanes d'Andorra**

Tous ces monuments historiques (not indicated)  
sont répartis dans l'ensemble du  
pays (468 km<sup>2</sup>)

This site is composed by the following monuments:

- Sant Joan de Caselles
- Sant Miquel d'Engolasters
- Ensemble historique de Pal
- Ensemble historique de la Cortinada
- Ensemble historique de les Bons
- Sant Serni de Nagol
- Clocher et porche de Santa Eulàlia d'Encamp
- Clocher de Sant Julià i Sant Germà

....

#### BLOC 2

Mola del Mas d'en Solé

Installation industrielle réhabilitée (XVIIe siècle), utilisée pour moudre le grain et fabriquer de la farine. Elle appartenait à un particulier. Les meules fonctionnent à l'énergie hydraulique.

Mola i serradora de cal Pal

Installation industrielle réhabilitée (XVIe-XVIIe siècle), utilisée pour moudre le grain, fabriquer de la farine et débiter les troncs de bois en planches. Les meules et la scie fonctionnent à l'énergie hydraulique.

Village traditionnel

On conserve, à cet endroit, un village rural peu modifié qui témoigne de l'architecture traditionnelle et des techniques constructives locales des villages de haute montagne. Cet ensemble historique fait l'objet d'un plan spécial de protection qui est en cours.

Réservoir d'eau (traditionnellement nommé Bain de la Reine maure) et canalisation

L'ensemble historique comprend un réservoir d'eau et une canalisation creusée dans le rocher qui amenait l'eau aux terres cultivées et probablement à la résidence seigneuriale). Cette canalisation a une longueur de 200 mètres, elle met en relation le bassin avec le torrent le plus proche.

Village traditionnel

On conserve, à cet endroit, un village rural peu modifié qui témoigne de l'architecture traditionnelle et des techniques constructives locales des villages de haute montagne. Cet ensemble historique fait l'objet d'un plan spécial de protection qui est en cours.

Sant Serni de Nagol

Eglise de style roman dont l'acte de consécration remonte à l'an 1050. Une partie du cycle pictural qui ornait l'intérieur du bâtiment à l'origine y a été conservé. Le style est archaïsant, influencé par l'esthétique et les formes de la miniature des Beatus



## Austria

### **Bregenzerwald (Bregenz Forest)**

Vorarlberg

(iv)(v) C ; (i) N

An impressive landscape on the north side of the Alps, the Bregenzerwald has largely maintained its traditional farming structure including the specific types of farmstead buildings. In the long-stretched linear or nucleated villages many of the characteristic Bregenzerwald farmsteads of the 18th and 19th centuries have been conserved. They reflect in their shapes and styles the economic history of the country, the regional agricultural conditions, but also the early onset of industrial development in Vorarlberg which is embodied in the rural architecture of the time. Many small textile processing workshops in the farming milieu are a testimony to this development. A number of villages, such as Thal, Schwarzenberg, or Schoppernau, still have some fine examples of original "Walderhauser" (Forest Houses) to illustrate this largest and most uniform housing landscape of Vorarlberg. The wooden buildings covered by characteristic shingle roofing determine the appearance of the cultural landscape, and their various types and shapes document the economic and cultural development of the region.

### **Old part of Hall in Tirol**

Tirol

(i)(iii)(iv) C ; (i) N

As indicated by its German name, the town has been closely linked with salt production since medieval times.

Great merchants and ship masters, townsmen and craftsmen lived from it. Seat of the sovereign's mint, Hall at times outdid today's provincial capital Innsbruck.

The former riches are illustrated by the preserved secular (Castle Hasegg, salt works, hospital, town hall, private houses) and ecclesiastical (parish church, religious institution for ladies) building substance. The original design of the town has hardly been spoiled and is clearly separated from the remaining settlement area by the town wall. A special feature of the old town are the topographically separate entities of an upper and a lower town, each having its own town square. Also notable the revitalised former spa, which is situated to the north of the old town and dates from the times between the wars. It is now used for meetings and events. Hall was one of the first towns to benefit from the facade restoration action. In over 20 building phases it has restored the street zones of almost the entire old town in an exemplary manner.

### **Old part of Steyr including Wehrgrabenviertel**

Upper Austria

(i)(ii)(iii)(iv) C ; (i) N

The old town of Steyr and the Wehrgrabenviertel, or moat quarters, form a unique symbiosis of well-preserved medieval houses with adjacent industrial settlement ("Steyrdorf" merging into the rural suburbs).

Situated at the confluence of the Enns and Steyr rivers the castle and the surrounding city, which controlled the river crossings, originate in 990. The rivers served both as traffic routes and as hydraulic power reservoirs for the iron industry flourishing since medieval times owing to the rich ore deposit in the hinterland. Steyr is one of the most significant historic industrial towns in Austria. In the 20th century, the economic importance of the Wehrgrabenviertel declined, a fact that helped preserve the quarter in its entire substance. Since the Middle Ages a number of outstanding Renaissance and Baroque buildings were added to the old town which has maintained its prospect of a complete ensemble to date: a large main square is lined with magnificent houses and dominated by the beautiful Late Gothic parish church on the hill above.

### **Styrian Erzberg and Eisenstraße (Iron Road)**

Styria

(iii)(iv) C ; (i) N

The Erzberg/Eisenstraße region between the towns of Leoben and Hiefalau in Styria has been coined in terms of architecture and landscape by its iron mining, smelting and trading activities since the Middle Ages.

The Erzberg represents the most prominent ore mining example in Central Europe. The formerly preferred and now exclusive open pit mining process with its imposing worked terraces has resulted in a stepped shape of the entire mountainside. The former ore smelting industry in Eisenerz featured 19 ironworks dating back to the 16th century. In Vordernberg, there were 14 so-called "wheelworks". Essential parts of these three works, which were renewed in the 19th century, have been preserved, especially in the latter town: the large roasting plant near the medieval Laurenzikirche, the wheelwork IV of 1846 complete with all its technical equipment, parts of the wheelworks I, III, X, XI and XIV, a hammer mill and the former mining school (1840-49, today the mining university in Leoben), as well as numerous miners houses in both Eisenerz and Vordernberg. Leoben's townscape is characterised by the houses of rich iron merchants. The same applies to Trofaiach where you also find the remains of the once biggest charcoal furnace on the continent. Radmer still shows traces of Bronze Age copper extraction, as well as remains of later copper production and ore mining done until recently, 19th century Hiefalau, too, had a furnace plus the large "timber rake" in the Enns river with the adjacent "charcoal burning ground" where the timber transported by the river was charred to become charcoal to be delivered to Eisenerz. Of the former haulage systems the most notable are the roadside structure of the former rail line from Erzberg to Vordernberg, the water ton lift at the Erzberg mountain and the standard-gauge cogwheel railway over the Prabichl mountain opened in 1891. A number of other auxiliary facilities of the once exclusive ore mining and smelting region complement its appearance. 700 years of extensive industrial activity have shaped the area into an exceptional and impressive cultural landscape.



## **Bulgaria**

**Two neolithic dwellings with their interior and household furnishings and utensils completely preserved.**

City of Stara Zagora, in the district of the Higher Institute of Medicine

(iii)(iv) C

They are located in the city of Stara Zagora, in the district of the Higher Institute of Medicine. The two dwellings stand side by side. They date back to the 6th millennium before our era. They were discovered in the course of excavations. By a rare chance, all the furnishings and household utensils have been preserved intact since discovery. At present, they are the best preserved dwellings of that period found in Bulgaria or in any other country. The furnaces, hand-grinders, the numerous ceramic vessels, stone implements, ornaments and the like are in very good condition. The dwellings offer a complete idea of the life of a neo-lithic family - its number, economic life and everyday occupations, the nature of home furnishings and utensils, the manner of building, maintenance, the preparation of food, etc. The neo-lithic dwellings of Stara Zagora are a unique monument of culture in Europe and Hither Asia from that early era. They have been declared monuments of culture. All findings have been preserved and conserved in the exact position in which they were discovered. A special museum has been built above them. The public has access to the archaeological monument through a roundabout corridor. An exhibition room and other rooms attached to the museum, have been built as well.

## **CZECH REPUBLIC**

**Fishpond Network in the Trebon Basin**    49°00'10" N / 14°45'52" E    C (i)(ii)(iii)(iv)(v)

The Trebon Basin is a world-famous area of Southern Bohemia. Its marvelous nature and landscape arising from sophisticated man's waterworks are multiplied by numerous and top-quality cultural monuments. There, we can also still admire important historical technical works that transformed the originally forbidding forests and marshland into a prosperous region.

The advanced fish farming, which had developed from the Middle Ages, culminated in works of Renaissance masters ? fish-pond builders ? Stepanek Netolicky, Ruthard of Malešsov, and Jakub Krcin of Jelcany. The most important technical works in the region of Třeboň include fish ponds of the Rozmberk fish-pond system along the so-called Golden Canal and the New River ? man-made rivers built in the 16th century. Predominant in the fishpond network are two ponds. The Rozmberk Pond, currently the largest fish-pond in the Czech Republic, and the Svet Pond that, being part of the historical entrenchments of the town of Třeboň, is still an important monument of both historical and technical significance.

The name of the region derives from its natural administration and economic center ? the town of Třeboň, which had developed since the 12th century along the trade link between the towns of Jindřichův Hradec and České Budějovice. Prosperity of the town started after 1366 when the town was acquired by the dynasty of Rozmberk, one of the most powerful Czech royal families of the high Middle Ages. It was just the dynasty of Rozmberk that went in for fish-farming, supported the building of fish-ponds and systems of fish-ponds. The town of Třeboň experienced its rise in the 16th and early 17th centuries and that period is still characteristic for the development of the historical downtown. Close to the town of Třeboň, the two largest fish ponds of the region were built ? Svet (the World) Pond and the Rozmberk Pond.

The Golden Canal (Zlata. stoka) ? the work of fish-pond builder ttepanek Netolický ? is a man-made water ditch that was designed to supply the system of fish ponds with fresh flowing water, which is necessary for fish-farming. The Golden Canal does not go through fish ponds; water is supplied to fish ponds by short races. Water from partial fish pond systems then flows off to the "mother river" of Lužnice. The work concept was created in 1506 and the complete ditch finished in 1518. The ditch used to be for a long time the longest man-made line waterworks in Central Europe. We can still admire the sophisticated design of the technical work, which reaches with its length of almost forty-five kilometers the total gradient of mere 31 meters, i.e. less than 0.7 meters per kilometer of length. Part of the Golden Canal was also connected to the entrenchment system of the town of Třeboň, in the picture of which it still appears. The New River

(Nova reka) is a unique waterworks deflecting part of the Lužnice River to the Nezárka River. The New River was designed to secure the dam of the largest fish pond in the region ? Rozmberk ? against seasonal torrential rain. This other Renaissance canal was not only a canal with utility function, but due to the sensitive laying out it is an actual river, the riverbed of which is perfectly integrated in the landscape. Water from the original Lužnice River is separated by a cross dam with weirs and a sluice dividing it as necessary either to the original riverbed or to the New River.

The Roimberk Pond is in fact a historical reservoir on the Lužnice River. Its dam is an exceptional piece of technical work built in 1585 through 1589. The dam long 2.5 kilometers is wide almost 50 meters at the foundations, 13.5 meters at the crest and almost 10 meters at the main outlet. The dam top is reinforced with four rows of oak trees. Some of them are considered to be original trees. The pretentious construction of the fish pond was the zenith of work of fish-pond master Jakub Krcin of Jelcany, administrator of Rozmberk's estate of Třeboň. At that time the Rozmberk pond was the largest fish pond in the Czech Kingdom and entire Central Europe, and still today it is a functional work with esthetic, historical and use values.

The Svet Pond was established in the suburbs of Třeboň and, in addition to its fish-farming function, it became part of the town defense system. Its builder Jakub Krcin did not hesitate to relay for the sake of his concept one of Třeboň suburbs, partially modify the course of the Golden Ditch and transform the town defense system. The liberally founded dam has outlasted for centuries and even today it is a respected axis, protected as a technical monument within the broader



Rožmberk system of fish ponds, as well as by the townplanning protection of the town of Trebon. The unique network of Třeboň Basin fish ponds, still functional due to their ingenious line works ? the Golden Canal and the New River ? features the character of a natural lakeland, although it is the outcome of the technical genius of fishpond masters in the 16th century.

## Paper Mill at Velké Losiny

50°01'43" N / 17°02'05" E

C (ii)(iv)

Being still a functional historical set of buildings associated with the manufacture of paper from the late 16th century up to the present, the handmade paper mill at Velké Losiny is a unique technical monument. The paper mill is situated in the broad valley of the Desna River near the main road passing through the North Moravian town of Velké Losiny.

According to archive sources, the paper workshop was founded there after 1591.

The present premises of the paper mill consist of eight buildings, most of which are interconnected as required by the technical operation. The oldest part of the plant is the water mill race, since the paper mill was reconstructed from an older corn mill.

The main historical building is a rectangular two-storied object with vaulted rooms in the first floor. Its present form is from the period of the most extensive building reconstruction of the paper mill after 1823. Facades are articulated by a molding dividing storeys, the ground floor walls are decorated with a plaster stripping. Windows in the second floor are stressed with a massive plaster voussoir dividing the chambrane in the middle of the lintel. The main building feature is the high mansard roof with four rows of continuous ventilating louvre openings. The openings provided for ventilation of the loft where sheets of handmade paper were dried.

The main building is joined with a lower object of the plant proper, the southernmost bay of which is arched above by the mill race. The layout of the plant contains premises with hollanders ? the driving device for the entire technique. This object is also roofed by a stepped mansard structure with ventilating windows.

The other related objects contain additional production functions; these have a simple, rather service character. Their appearance corresponds to the period following the largest building adaptation and development of the premises in the first part of the 19th century. Late in the 19th century, a heating room was erected in front of the entrance to the paper mill proper, the high stack of which became since that time another characteristic dominant of the entire production area.

The heating room was used for steam heating. A Francis turbine was installed in 1911 in place of the original water wheel and all paper mill machinery started to be driven by a central transmission. The generator was expanded in 1913 and the paper mill started to supply electricity also to part of households at Velké Losiny. After the WWII the paper mill went through a difficult period when a liquidation of the enterprise was even considered. Thanks to the interest of its employees of that time and support from important visual artists, production of handmade paper at Velké Losiny managed to be maintained. The stressed historical and cultural significance of the paper mill that was included in 1974 in the list of cultural monuments protected by the state was a considerable contribution. Commencing from 1987 part of the plant houses the Museum of the Paper ? an only museum with such specialization in the Czech Republic.

## The Industrial Complexes at Ostrava

Anselm Mine: 48°52'09" N /

C (i)(iv)(v)

18°15'55" E

Michal Mine: 49°50'25" N /

18°20'45" E

Hlubina Mine: 49°50'39" N /

18°16'53" E

Vrbice V. Shaft: 49°52'32" /

18°18'21" E

The industrial complexes in Ostrava are quite unique in the international context since they comprise, in a single locality, coal mines, coking plants and blast furnaces, thus representing the complete and concentrated technology of anthracite-based production of iron.

The Ostrava industrial heritage is an integral part of the picture of this regional administrative centre. It is a historic document of the economic development of Ostrava which, in the course of the 19th and 20th century, has turned from a stagnating town with a ring of satellite villages and emerging mining colonies into a large industrial city. For decades, the Ostrava-Karviná Coal Mining District had been one of the most important centres of coal mining and heavy industry in Europe. The industrial complexes had become its symbol and even at present they are a dominant element of the city.

The original impulse for the building of the industrial complexes was the intention to supplement the mines also with ironworks which would produce rails for the developing railroad network of the former Austro-Hungarian Monarchy.

The combination of a rich fuel base and an efficient transport system allowed the development of mining, metallurgy, related branches of chemical industry, and, later, power engineering. The unusually rapid growth of production called for new labour force, and the increase in labour force subsequently gave birth to typical working class colonies and, at the end of the 19th century also to progressive urbanist concepts accompanied by well thought-out welfare programmes.

On the territory of Ostrava there is a wide variety of preserved technological heritage documenting methods of mining and metallurgy, as well as chemical and power engineering industry and including coherent urban complexes whose origin was directly connected with the industrial development of the area. The nominations for putting in the World Heritage List include the most characteristic complexes documenting the various development stages of mining and metallurgical industry from the late 19th century, up to recent times.

The Anselm-Eduard Urš Mine and the remains of the first coal extraction in its immediate environment are connected with the beginnings of mining in the Hlučín part of the coal district. In the area of the former mine, over the confluence of Ostravice and Odra rivers, there are outcrops of carbon seams in several places. In the neighbourhood, on the Landek hill, one can find traces of the deliberate human use of coal in the fireplace of the primeval man which date from the



period of approximately 23 000 years ago. The oldest phase of human use of coal is presented and commented on by the educational boards placed along the tourist track.

The beginnings of the sinking of the vertical shaft and the related complex of mine works date approximately from 1830. The name Anselm which the mine eventually acquired is derived from the name of Anselm Salomon Rothschild who, in 1855, took the mine over after his father, the Viennese banker Salomon Mayer Rothschild, who bought it together with the Vitkovice ironworks in 1843.

The present appearance of the surface structures dates from the period of the late 19th and early 20th century when the whole complex was rebuilt. The buildings are characterized by a plastic articulation of the facing brickwork. The architecturally most interesting element is the engine house of the mining machine situated on a steep slope. It was built during World War 1 in the spirit of the geometric pre-modern style with a segmented front in the shape of a roof truss.

The complex of the Anselm/Eduard Urz mine is presented to the visitors as a museum. The core of the exhibition consists of the surface structures of the mine and the original tunnels in the Albert and František seams which are accessible from the basement of the former engine hall. The Museum of Mining includes also simulated mining sites with the demonstration of manual and mechanized mining. The purpose of the museum is to lead the visitors along the same route and take them through the same routine as was that of the miners coming to work, including the lowering of the cage to the seam level of the mine.

The Michal-Petr Cingr Mine in Ostrava-Michalovice bears the name of a counsellor Michael Laier who had significantly contributed to the development of coal mining in Austrian Monarchy. The mine was founded in 1843 and in 1856 it was bought by the Exclusively Privileged Society of Emperor Ferdinand's Northern Railway in whose ownership it remained until the 1945 nationalisation. The mining activities were terminated in 1993 and in the year 2000 the complex was opened to the public.

The mine had gone through gradual technological and constructional development. Between the years 1913 and 1915, its surface was rebuilt with the aim to concentrate in the same location also the work going on in the nearby smaller mines Jan, Josef a Petr and Pavel, including the preparation and distribution processes. The reconstruction, carried out under the project of the prominent architect František Fiala, was based on complete electrification of all surface engines, which were concentrated in a single large abundantly glazed engine hall. The concentration of the local mining industry was reflected also in the large number of employees for whose comfort the mine was provided with dressing rooms and bathrooms. The maximum achieved depth of the shaft was 671 m. Till the termination of its operation in 1993, the whole complex including technical facilities, had not undergone any substantial changes and it now represents a unique series of electrical haulage machines and compressors, mostly by the Siemens-Schuckert company, which were manufactured in the pioneering times of electrification and are conserved in the original place of their operation. The exceptionally well-preserved surface structures of the mine (dressing rooms, the check room and the engine hall) were presented to the public in the same condition in which they functioned till the last working day. The educational tour around the complex, extraordinarily well-conserved from the architectural viewpoint, enables the visitors to experience an authentic work environment. For greater authenticity it is possible to put into operation electrical piston compressor and electrical converter. With regard to the exceptional technological and historic significance of the heritage, the overall architectonic quality of the complex and the authentic preservation of the objects and technical facilities, the Michal Mine was granted the status of a national cultural monument.

The Hlubina Mine, the coking plant and the blast furnaces of Vitkovice Ironworks make up the characteristic industrial panorama of Ostrava. In 1836, first coke blast furnace in the Austrian Monarchy was put into operation here, and in 1852 the sinking of the Hlubina shaft started in its neighbourhood. The complex thus included, in its immediate order of succession, the whole technological process of coal mining and preparation, coke production, ironworks and later also electricity production. The unique spatial coherence of the whole technological process and the one hundred and fifty years of the continuous production of iron on the basis of stone coal thus places the Hlubina mine locality with the blast furnaces of Vitkovice Ironworks side by side with the most important industrial complexes preserved in Europe.

The complex of the coal mine, coking plants and blast furnaces documents in a coherent form and at a single place the whole technology of the production of iron on the basis of stone coal. The authenticity and compactness of the whole area is enhanced by the preserved stacks, technical bridges and pipelines from various periods, as well as individual pieces of technical equipment and other single objects. The most significant and valuable pieces of equipment from the historic point of view are the vertical-tube boilers of the Garbe system from the period between 1914 and 1916, a turbo-compressor from 1922, a Kodá mining engine, the gas-driven blowers of the blast furnaces, the shaft station with tub circulation and the so-called old miners' bathrooms.

The Vrbovice ventilation shaft was built by the Exclusively Privileged Society of the Emperor Ferdinand's Northern Railway after a project from 1911 as a representative complex situated directly next to the main railway from Vienna to Cracow. The shaft building with ventilation rooms and a head frame therefore did not serve only utilitarian purposes, but it was also a visually impressive object. The shaft ensured the draught degasification of the mine field.



# GERMANY

## **Mine of Rammelsberg and historic town of Goslar - Extension by the "Oberharzer Wasserwirtschaft", i.e. the "Upper Harz Water Management System"**

Lat. 52° N ; Long. 10°20' E

C (i)(ii)(iii)(iv)

Preserved from medieval times, the water management system of the UNESCO world heritage monument Rammelsberg Mine, consisting of the aHerzberger Dam" from 1561, the Sandersche Radstubensystem" from the 16'h century, the "Roeder-Stollen-System" with its four underground water wheel chambers and two original water wheels of 1805 as well as the "Rathstiefsten Stollen", a water drainage canal from 1150, is of eminent importance to monument conservation.

However, this Rammelsberg water management system represents only a fraction of that developed by the miners of the Upper Harz Mountains, i.e. of the "Oberharzer Wasserregal".

The Oberharzer Wasserregal" consists of a unique system of integrated water dams and ducts; which in the 16'h century was initiated by the miners as a source of energy for mining activities. The objective of this water management system was to catch water and supply it continuously to the water wheels, installed on the surface as well as underground, which drove the machinery of the mines. A large number of these water wheels were installed in especially constructed underground rooms, of which - besides those at the Rammelsberg - a few examples still exist in the Upper Harz, as e.g. the unique "Rosenhofer Radstube" in Clausthal of 25 meters height or the "Radstube des 19 Lachter-Stollens" in Wilbermann. Because of the rough climate the above ground water wheels were housed in especially designed buildings, of which some are still totally preserved, as e.g. at the Samson Mine in St. Andrevéerg or at the Kneisebeck Schacht in Bad Grund, however, many can only be found in traces around the former mines.

A network of water ducts with a very gentle slope (1: 400 to 1: 1000) served for catching water at the highest elevation possible and for feeding the water to the dams, while discharge ditches, so called "Aufschlaggraben" built from natural stone without mortar, lead the water from the dams to the mines, processing plants, metallurgical works etc..

Of the numerable still existing examples of engineering works within the "Oberharzer Wasserregal" here only the most important one, the "Sperberhaier Damm" will be mentioned, which was built by the miners of the Upper Harz in the years 1732 to 1734. The aqueduct is 953 m long with a maximum height of 14 m and crosses a valley to link water catchment areas of the Brocken mountain with the Clausthal plateau, where it was needed to drive the water wheels.

As mining extended to ever increasing depths it became more and more difficult to get rid of the natural water intake of the mines and also of the water used for driving the water wheels, so that in the Upper Harz the miners in the 14th century commenced with artificial water drainage. This was done by driving water drainage adits from within the mines to the nearest mountain slopes, as e.g. the 12 km long "Sieberstollen" in St. Andreasberg (1716 -1756), the 13 km long "Tiefe-Georg-Stollen" with an engineered outlet portal in Bad Grund (1777 - 1799) and the 26 km long "Ernst-August-Stollen" with a portal in Gittelde, just to mention a few.

The "Oberharzer Wasserregal", which was developed as a "production - support - factor" exclusively as a source of energy for the mines of the Upper Harz, is with its network the all important linking element of the historic mining landscape of the Upper Harz with its old mines, processing plants and metallurgical works, dumps and fault pits, forests of fir and meadows as well as numerous other relicts of mining.

## **Ore Mountains: mining and cultural landscape**

East part of the free State of Saxony. Border with Bohemia.

(not indicated)

For more than 800 years and still recognizable today in numerous technical monuments as well as in the physical landscape it has helped transform, mining has not only created a cultural landscape but also influenced the development of mining sciences (e. g. establishment of the Mining Academy in Freiberg). The unity of mining and steel, art and culture and the science of mining - as well as their influence on other countries - marks the historical importance of the Ore Mountains.



## Shoe last factory Carl Benscheidt, Fagus-Werk

Lower Saxony, Alfeld (Leine),

(not specified)  
Hannoversche Str. - 50km south  
of Hannover

Between 1911 and 1914, the architect's offices of Edward Werner and Walter Gropius in conjunction with Adolf Meyer erected a new building for a factory belonging to the Alfeld industrialist Carl Benscheidt directly to the east of the Hannover-Göttingen railway line, in the centre of the German shoe last industry.

From north to south, the asymmetrical arrangement consists of a more or less informal group of production-linked buildings with sawmill, storage and drying building, production hall, forwarding department, machine building, office block and, at a slight distance from the rest, the locksmith's shop and the porter's building with access road.

The task of Gropius' office was to use purely architectural means to achieve a distinctively modern design for the building complex, whose cross-section and spatial programme were already defined. The solution aimed at by the owner was, in competition to the existing shoe last factories in the town, also to be a symbol of technical progress and social commitment.

## The Cultural Industrial Landscape of the "Zollverein Mine"

7°2'38" E / 51°5'8" N C (i)(ii)(iii)(iv)

North Rhine-Westphalia has a history which dates back more than 2000 years, and the diverse cultural legacies of which are often of international importance. In the centre of the Federal Land, there is the Ruhr Area which has been Europe's biggest industrial conurbation for one century. This region owes its prominent position at the intersection of the most important central European traffic routes, in particular to its hard coal deposits, their extraction and the industries dependent upon these.

The tangible expression of the culture of this mining industry with its rich tradition is, in particular, the concrete legacy of excellent achievements of engineering and architecture. From this monument landscape, which is so characteristic of the Ruhr Area, the Zollverein Mine XII in Essen-Katernberg stands out like an architectural revelation. Between 1927 and 1932, the architects Fritz Schupp (1896-1974) and Martin Kremmer (1894-1945) created here a masterpiece in terms of engineering and design, whose function related grouping of the individual buildings is also extraordinary impressive with respect to its composition in terms of urban development.

Visible from far away with the perfectly shaped expression of an equally distinct and symbolic landmark, the markedly symmetrical headgear forms a bridge above the pithead building which opens an axis of the complex drawn by buildings at the end of the representative entrance area. It interfaces with the tub roundabout and, at the end of this, to the enormous coal-washing plant and the refuse bin which are arranged crosswise on both sides.

From the generous free space in front of the pithead building, a second axis develops at right angles and towards the right. As a wide path flanked by long workshop halls which, after a crossroad, is laterally continued with slightly higher compressor halls it architecturally finds its arranged point de vue in the stepwise walled boiler house and the slim stack which rises behind it to a height of 109 meters in the centre (which, unfortunately, had to be torn down because of considerable deformations in 1979). Cooling towers installed lateral to this, of which only the eastern one was built, were intended to provide a flanking dignified shape as a plastic, large element, despite all its technological purpose.

The impressive powerfulness of the Zollverein XII colliery is, in particular, based on the conciseness of the architectural language invented and conclusively phrased in form and material by Schupp and Kremmer. With the exception of the double-frame hoisting gear, the individual building consist, for the most part, of a uniformly checkered steel framework construction with a uniform brick infill and horizontal wiredglass panels, which are flush with the wall, to admit daylight.

## Hungary

### State Stud-Farm Estate of Mezöhegyes

N 46°21' - E 38°29

C (iii)(iv)

The Stud-farm Institute, later Stud-farm Estate founded by Emperor Joseph II. in 1784 has been a major centre and organisational example of the highest standard horse-breeding and animal husbandry.

The first buildings of the estate were built in a short time. Eventually they developed into a unique architectural and agricultural complex. Besides the value of the species of horses (Nonius breed, Gidran, Mezohegyes halfbred) bred there, the architecture of the complex is also of exceeding value.

The layout of the large-scale farm which incorporates all the complementary branches necessary in horse-breeding as well as the urban appearance of the headquarters of this institution of military character is an original, definitive landscape-forming construction. Its most important architectural elements: old stud-farm yard 1785, two horse-herder cottages 1785, two old barracks 1786, bailiffs' houses, horse-herders' inn 1800, management building 1786, glass granary; in Újmezohegyes: construction stores 1860-70, new barracks 1790, miller quarters – dry mills 1790, bailiffs'



house. Three stud yards, headquarters of commander, covered riding-hall, North and South arches, gates, fence posts, animal hospital, oat storage towers, granaries, barns and several more buildings and structures.  
The landscape has been reshaped by forest plantations and farm buildings.

## **Tokaji Wine Region Cultural Landscape**

Region: Borsod-Abaúj-Zemplén  
County  
N 48°4'11"-48°16'32" ; E  
21°10'20"-21°28'23"

C (iii)(v) + CL (ii)

The proposed property and its buffer zone are located in the northeastern corner of Hungary, in the area, of Borsod?Abaúj?Zemplén County. The chief?town of the county is Miskolc. The buffer zone borders upon the Slovakian Republic in a short distance. The area of the county is 7248 square kilometres, the population is 735000.

Geological, relief and hydrographic characteristics

Geographical borders of the nominated property and buffer zone: inner areas of Zempleni Mountains in the north, Hungary?Slovakian border and the River Bodrog in the east, a short part of the River Tisza and Taktakoz in the south and Hemad?valley in the west.

The eastern part of the area under investigation is situated on the Szerencsi hills. Its surface is composed of ridges of a hill in an approximately north?south oriented strike, the average height of which is 250 metres above sea level. The average value of the relative relief is 70 metres per square?kilometre. More than 80% of the surface is covered by sarmatian rhyolite tuff. Its elevations are bare rhyolite and riodacite cones. Its precious mineral substances are zeolite, kaolin, hydroquartzite and bentonite. At the foot of the hills, in a south?southeastern direction from the Tokaj mountain, we can find a 150 metres deposit layer of gravel, sand, warp and fresh water burden. In the upper layers the soil is composed of brown soil developed on lymph?like clay, while in the lower layers it is characterised by chemozem with patches of lime.

The core of the Tokaj hill, which constitutes the southern peak of the Zemplén mountains, is made up of andesite, rhyolite and rhyolite tuff. The foothill slope is covered by loess up to the height of 250 metres in a cone?like way. At lower parts its thickness can reach up to 30?40 metres. The average relative relief of the hill is 117 metres per square?kilometre. Its natural substances are andesite and rhyolite tuff. Its determining soil type is the acidic brown soil developed on lymph?like clay.

The average height of the slope ranges exposed to the southeast, north and westnorthwest direction from the Tokaj hill is 514 metres above sea level. More than 80% of the surface is endangered by soil erosion. The degree of the annual erosion reaches 1 to 3 centimetres. Under the surface the product of the volcanic postactivities can be found, the surface is covered by solifluctional deposit or at some places by loess. Among the natural substances zeolite, kaoline and bentonite are substantial. It is also possible to find andesite, flint and hydroquartzite here. 55% of the soil is brown forest soil developed by clay infiltration and 34% is brown soil. The proportion of the barren stony areas is only 4%.

Bodrogköz is situated between the wave band of the Bodrog and Tisza, beneath the above mentioned slope range. The little region is a flat area between 95 and 128 metres high above the sea level. The average relative relief is 4 metres per square?kilometre. The 90% of the surface is dominated by Neoholocene casting formations, such as meadow clay and marshy deposits. Its soil is mainly determined by chemozem as well as marsh soil and to a smaller extent sodic soil.

The most significant water resources are the Bodrog and the Tisza rivers as well as the backwaters and oxbows created after their regulation. The water reservoir at Tiszalok made the Bodrog navigable, too. Other significant, but smaller water flows in the area are the Szerencs brook, the Gilip brook (dammed to a 39 hectare water surface next to Monok), the Tatka channel, the Fennsik channel (created by the confluence of Furdo and Madi?brook), and the Ronyva, Hercegkuti, Szarkakuti, Tolcsvai and Benyei brooks, respectively, flowing into the Bodrog. Most of them are seasonal or abate during the summer.

Local climatic characteristics

Higher areas are situated at the border of the moderately wet zone, the lower areas belong to the moderately hot and dry climate. The amount of sunshine is around 1900?2000 hours per year, in summer the average is between 750 and 790 hours, while in winter it is 200 hours on average. The annual mean temperature is between 9.6 and 9.9 °C, during the vegetation season it is around 16.3?16.9 °C. The daily mean temperature is over 10 °C over about 184 days a year, namely between 14th April and 14' October. On average the daily mean temperature does not go below freezing for 180 days but on the southern slopes this period may last longer than 190 days. Between 20th April and 15th October the temperature is above freezing. The mean of the highest degrees within a year is 33°C and the lowest is ?16°C. The annual amount of rain is around 600?620 mm out of which 370?390 mm arrive in the vegetation season. Its climate makes it possible to grow cultivated plants that require hotter climate. The Tokaji Wine Region is perfect for cultivating grapevines, while the flatter areas provide perfect conditions for growing plants on tillage and at places with high subsoil water level grazing and grassland farming would be preferable.

Flora and fauna

The area according to plant geography classification can be ranked among Tokajense flora locality of the larger North?Hungarian mountains flora area (Matricum) within the Hungarian flora land (Pannonicum). Hornbeam and Turkey oaks (*Quercus petraea*?*Carpinetum*, *Quercus petraea*?*cerris*) form the climatic associations on the less typical slopes exposed to the north and in the more fresh valleys. On the south?facing slopes the thermophil oak (*Corno*?*Quercetum pubescenti*?*petraea*) is peculiar. *Corpus mas* (Cornelian cherry), *Crataegus monogyna* (singleseed hawthorn), *Viburnum lantana* (Wayfaring tree) and *Amygdalus nana* (dwarf almond), which can be found in large number in some places, are the most remarkable among the shrubs. Mostly in warmer location it is more frequent to find soft?stalked plants such as *Iris variegata*, *iris graminea* ssp. *pseudocyperus*, *Aster cinereus*, *Lathyrus pisiformis* and *Stipa stenophylla*. 17 species of orchid live on Kopasz mountain. .

Forests mostly consist of non?native pine? and locust?trees. The damaging effect of the former one is changing the chemical properties of the soil: the fallen pine needles sour the soil strongly. The latter one consumes the nutritives of the soil, practically exploiting it, while forming an ineradicable polycormon colony. Both have the effect of totally thinning out their undergrowth because of the deep shadow (pine) and allelopathical features (locust), and they do away with the territory of valuable soft?stalked populations.

The most typical cultivated plant of this area is grape?vine, but in southern locations there is also peach, plum, and rarely



almond. The most typical ploughland grain is wheat, but we can also mention maize, rye and sunflower.

Regarding the animal population, the regions of Tokaj-Bodrozug Landscape Protection Area has the most important role. It is a significant nesting and brooding place for birds and rich in fish. The most typical and precious species are the night heron, spoonbill, common heron, cormorant, white stork, Short-toed Eagle, Imperial Eagle, Lesser Spotted Eagle. Two of the seven or eight pairs of stock owl known in Hungary live on Nagy-Kopasz.

In the stock of game there are big populations of rabbit, deer and wild boar living in the forests above vine-lands and meadows. Animal keeping is not considerable. Tokaj-Bodrozug Landscape Protection Area is quite prominent among nature conservation territories, and also the examined parts of the Landscape Protection Area of Zemplén, but we can mention some nature conservation areas with local importance protecting the same value and the individually, protected species of different plant and animal.

Areas of protected nature: Tokaj-Bodrozug (District of landscape protection; partly covering the property only), Bodrogszegi Varhegy (Protected area), Tallyai Patocshegy (Protected area), Zempléni District (District of landscape protection; partly covering the property only), Erdőbénye woody pasture (Protected area)

(see map 4. in Annex),

Cultural property

Settlement-related and architectural values

The settlement system and the settlement forms of the Tokaj Wine Region are inseparable from the morphological and hydrographical features of the area.

One of the frames of the interrelationships between settlements and of the settlement system of the region is the Bodrog, and the other one is the Stream Szerencs and the River Hernád at the western border.

There is a chain of settlements along the Bodrog. These settlements are located on the right bank of the river meandering at the foot of the Zemplén mountain range. Bodrog is one of the water-catchment rivers of the mountain range, and there are further settlements to be found in the valleys of the smaller streams falling into the Bodrog. The Bodrog is emptying into the Tisza at Tokaj, marking one of those ancient passing-places which provide the settlements between the two banks of the Tisza with connection.

The Szerencs is falling into the Takta through a broad mouth, having settlements on its both sides. The extremely valuable capabilities of the area, and its aptitude for being a good place to settle down had already been recognised by the first Magyar settlers of Hungary. The name Tokaj itself, coming into Hungarian as an Armenian loanword meaning 'grape' at around the 10th century, is an evidence for the early origin of the settlement, its system of ethnical relationships and the fact that viticulture was known at that time. The changing of the area into wine region deeply influenced the thinking and culture of the local population. However, by the conversion of the area into wine region, we do not only mean regal regulations, but rather the uniformed environmental culture typical of Tokaji Wine Region, that can be identified even these days.

In the built environment of the region, the architectural cultures of many centuries are intertwining in a unique way: there can be found Catholic churches of medieval origin, Orthodox churches from the 18th-19th century, monuments of the and Jewish sacral architecture, documentaries of the princely architecture of castles, castles and mansions of the aristocracy as well as dwelling-houses, wine houses and cellars of the people.

An important monument of the early settlement of the area is the Roman style Catholic church in Bodrogolaszi from the 12th century, situated in the buffer zone.

In every settlement of the nominated property there can be found a gothic Roman Catholic church from the Middle Ages. In Tokaj and in Tallya, there are ruins of castles from the 14th century, and among settlements in the buffer zone, it is Monok, Sarospatak and Szerencs where there are Medieval castles.

The noble castles and mansions are the emblems of the wealth gained from viticulture, from which four of them are standing in Tarcál, and another nine are in the buffer zone. These buildings were built in the 18th-19th century, in the glory of the Tokaj Wine Region.

The synagogues and other sacral buildings in Tarcál, Tokaj and Mad, the Orthodox and Roman Catholic churches of Tokaj, and the Orthodox churches of Abaujszántó, Bodrogkeresztúr, Bodrogolaszi, Sarospatak, Satoraljaújhely and Szerencs, all protected by the Ancient Monument Act were also built at this time.

The density of monuments is marked by the protected areas of monuments, of which one happens to be in Tokaj and the other one in Tallya, and another ten are situated in the settlements of the buffer zone.

The most typical establishments of Tokaj are the cellars. The cellar of King Kalman in Tarcál was already mentioned in 1110.

The two basic cellar types preferred in Tokaj were the vaulted and the carved varieties. The vaulted was basically a space underneath a residential building, both with an identical floor plan. The cellar was usually dug when the house itself was built, and mainly accessed from the porch. In this set-up, the grapes were processed in a room to the rear of the house, just above the cellar.

The other version, the carved cellar was not directly linked with the building. On the surface level, only a stonework entryway with a latticed gate made from wood or steel was visible. The cellars carved in volcanic tuff did not need to be reinforced with vaults because the rock was strong enough to support the ceiling. In Tokaj, 80-85 percent of all the cellars were made this way.

The most interesting type is the multi-level cellar labyrinth with a jumbled floor plan. Created over the centuries by horizontally and vertically linking cellars carved near each other, these mazes appeared in the commercial centers of the Foothills of the Tokaji Wine Region, in Erdőbénye, Mad, Tallya and the town of Tokaj. Their most famous example is the cellar network in the Ungvári district of Satoraljaújhely, which evolved through, interconnecting 27 separate cellars side by side and one on top of another. This labyrinth has the capacity to hold 13000 casks of the Gonc and Szerednye type.

This cellar labyrinth, the Ungvár Cellar in Satoraljaújhely is part of the nomination. The historically unique and attractive Rakóczi Cellar in Sarospatak, that has several kilometres long ways, is also part of the nominated property. Within the nominated property, there are several similar and valuable cellars like that.

Archaeological values

A geological/archaeological celebrity is the *Vitis Tokaiensis* that is one of the finds that date back to the Miocene flora and was found here, in Erdőbénye. This ancient grape-leaf, which can be regarded as the ancestor of each and every grape type, proves that the grape is a pre-historic endemic plant in Tokaj.

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Archaeological values

## **ISRAEL**

### **Caesarea**

Lat. 32°30' N / Long. 34°53' E

C (ii)(iv)(v)(vi)

Caesarea is situated on the Mediterranean coast alongside bays and shallow inlets that were formed by wave erosion. These unique bays were utilized throughout history for the anchorage of sea-going vessels and made Caesarea a major port of call in the Mediterranean.

During the Persian rule, the Phoenicians built a settlement on the shoreline of one of the bays, where the ground water level was high. The village flourished in the Hellenistic period and is first mentioned under the name of Straton's Tower.

In the year 30 BCE the village was awarded to Herod, who built a large port city at the site, and called it Caesarea in honor of his patron Octavian Augustus Caesar. In Josephus' Jewish War it says: "And he chose on the coast one forsaken town by the name of Straton's Tower...which thanks to its favorable location was suitable for carrying out his ambitious plans. He rebuilt it entirely out of white stone and adorned it with a royal palace of unique splendor, displaying...the brilliance of his mind".

Caesarea was a planned city, with a network of crisscrossing roads, a temple, theater, amphitheater, markets and residential quarters. It took 12 years to build, and great festivities were held to mark its completion. The city transformed rapidly into a great commercial center, and by the year 6 BCE became the headquarters of the Roman government in Palestine.

Since Caesarea had no rivers or springs, drinking water for the prospering Roman and Byzantine city was brought via a unique high-level aqueduct, originating at the nearby Shuni springs, some 7.5 km northeast of Caesarea. The aqueduct consists of three canals, two of which were added in the course of its use. In low lying areas, sections of the aqueduct were carried on arches (arcadia).

Caesarea served as a base for the Roman legions who quelled the Great Revolt that erupted in 66 BCE, and it was here that their commanding general Vespasian was declared Caesar. After the destruction of Jerusalem, Caesarea became the most important city in the country

Pagans, Samaritans, Jews and Christians lived here in the third and fourth centuries CE. Among its famous citizens were Rabbi Abbahu, and the church leaders Auregines and Eusebius.

During the Byzantine period the city flourished, and extended over some 400 acres. Toward the end of the sixth century a perimeter wall was built, making Caesarea the largest fortified city in the country. It was re-fortified again in the ninth and 13th centuries by conquering Arab and Crusader armies.

The late 19th century marked the start of the first scientific exploration of the site, noting the Crusader city, the theater, hippodrome and aqueducts. Extensive explorations from 1959-1964 further revealed details of the theater, parts of the city's fortifications, and the upper aqueduct; while subsequent study uncovered additional parts of the Crusader city, the Jewish quarter and sections of the aqueduct.

Caesarea is an outstanding example of main city planning of the Herodian period as well as part of a series of Crusader fortresses constructed in the Holy Land.

### **Shivta**

Lat. 30°55' N / Long. 34°36' E

C (ii)(iii)(v)(vi)

Shivta, a town in the central Negev desert, is situated about 40 km southwest of Beersheba. It was founded in the Middle Nabatean-Early Roman period and flourished mainly in the Late Nabatean-Late Roman and Byzantine periods. Within Shivta's walled enclave is a comprehensive example of a city plan and housing complex. The city is also a supposed stop on the Spice Route between Egypt and the port of Gaza.



Occupation at Shivta began in the Middle Nabatean period. The settlement was founded on a road that links Oboda, Sobata and Messana by way of a chain of small, as yet unidentified settlements. Shivta enjoyed a period of prosperity in the Late Nabatean period when the Nabateans began to engage in desert agriculture and horse breeding. Near the city, in Nahal Lavan, remains of large plantations and several individual farms were discovered. Additional information about the production and management of those farms is provided by the archaeological finds at Oboda and Nessana papyri, many of which deal with water rights and distribution.

Shivta also seems to have been an important monastic center in the Byzantine period, as well as the site of regional Christian pilgrimages in the sixth century. Shivta reached its prime during the Byzantine period as a transit city for trade caravans from Egypt northwards and from Eastern countries to the Mediterranean shores and Europe along the Spice Route.

At the time of the Arab conquest, the Christian population of Shivta, as in Nessana, was not harmed. It seems that the existing Christian community lived side by side in peace with the new Muslim population. The settlement at Shivta probably did not exist longer than that of its neighbor, Nessana - which was abandoned in the eighth or ninth century CE. Due to its relative isolation, the city's stones were not plundered and thus preserved better than other ancient Negev cities.

Its pattern reflects the Byzantine form and ruins, restored since 1958, include: three churches: in front of the northern church - a square with the ruins of a monastery alongside, a hostel and bathhouse; near the southern church - a ninth century Moslem mosque; streets lined with houses, each with a central courtyard and many two-storeyed; slanted paved roads for utilization of rainwaters flowing into private and public pools. Around the city were found remains of canals, dams and terraces for collecting rainwaters and for farming; in the fields - flint stone mounds cleared to enable a better water flow along the tilled slopes.

Though most of Shivta's explorers believed that the town was built without a definite plan, others see the layout as intentional: the town's builders limited the number of streets that would open into the area outside the town, where their fields and some cisterns were located. Inside the built-up area, numerous lanes led to all parts of the town and ended at the doors of the houses at the edge of the town. The town planners chose to use some of the streets for conveying rainwater to the two large reservoirs in the center of the town and to the numerous cisterns scattered through it. The layout of the streets seems to have been adapted to this need, and in this matter the builders of the Byzantine town probably followed Nabatean planning: using the gentle slope to collect rainwater in reservoirs. The Byzantine streets thus ran along the course of the ancient channels.

## Timna

Lat. 29°46' N / Long. 34°57' E

C (iii)(iv) N (i)

The Timna Valley, north of the Gulf of Eilat/Aqaba, within the Rift Valley, is a large semicircular erosion formation containing four wadis that run from the Timna Cliffs into Nahal Arava.

Timna provides a remarkable example of industrial archaeology, as it was the site of ancient mineral mining and smelting. Along the foot of the Timna Cliffs are mainly copper carbonate ore nodules that consist of malachite and chalcocite mixed with azurite, cuprite, paratacamite. A second type of copper ore, of the chrysocolla group, is located in the Timna Formation of the Lower Cambrian and was therefore more difficult to reach by ancient mining methods. However, both types of ore, the copper carbonates and copper silicates, were exploited in antiquity. Numerous mine workings, including shafts and galleries, as well as mining tools from various periods, were found in this part of the Timna Valley.

Eleven camps are located in the center of the valley, several containing substantial slag heaps, testimony to the existence of intensive mining activities. These remains belong mainly to the 19th and 20th dynasties of the Egyptian New Kingdom (Late Bronze Iron Age). There is only one smelting site in the mining area of the Timna Valley. All other early smelting sites were located outside the Timna Valley, along the western fringes of the Arava. North of the Timna Valley, an Early Bronze Age II copper-smelting site was excavated, as were an Early Bronze Age IV smelting site and mine at the estuary of Wadi Timna. South of the Timna Valley, the center of Roman and Early Arab copper smelting in the western Arava was located at Be'er Ora.

Beginning in 1845 numerous explorations identified copper-smelting slag in Timna, the remains of dwellings, and copper-smelting sites. Pottery found at Timna was dated to the Iron Age I and II. In 1940 N. Glueck attributed copper-smelting in Timna to King Solomon, calling the area King Solomon's mines. Between 1959 and 1961 B. Rothenberg explored the Timna Valley and in 1962 published, with Y. Aharoni and B.H. McLeod, a detailed description of its ancient mines and smelting camps. King Solomon's mines were dated to several widely separated periods, from the fourth millennium to Roman times.



# ITALY

## **Fascia costiera da Castellammare del Golfo a Trapani, con Erice, Mozia e la Isole Egadi**

Province: Trapani

Region: Sicilia

N (iii) ; CL (ii)

This area is located in Western Sicily and stretches from the Gulf of Castellammare (north-east) to Trapani and the Egadi Islands (north-west). The central part of the territory is characterised by high coasts with narrow beaches limited by escarpments. The most jutting territory is the Capo San Vito. On the contrary, the extremities of the area are characterised by flat coasts and some ancient salines that are located near Trapani.

The Egadi Islands have great geomorphologic, botanical and faunistic importance and their landscape is earmarked by small bays and caves that were inhabited in Palaeolithic.

The coast going from Castellammare to Trapani is one of the most breathtaking coastal stretches of Sicily. It is a typical Mediterranean landscape with small bays and cliffs that follow on; at the back of the coast, there are the towering mountains with Mount Speraclo and the suggestive Cape of Erice.

The Gulf of Castellammare is typified by overhanging limestone rocks that progress towards flat sandy beaches and characteristic isolated crags, or faraglioni emerging from the sea like, for example the Faraglioni di Scopello. On the contrary, the hinterland is characterised by waving clayey hills.

As regards the flora, this area houses a sort of blend of steppe and maquis; it has a rich vegetation of endemic species growing on rocky outcrops. The most striking fauna example is the so-called Palma nana (*Chamaerops humilis*) that is located, above all, in the so-called Area dello Zinguro.

Coastal farming is geographically limited but is particularly important because of several Vineyards, olive-groves and almond trees. Furthermore, this rural landscape is scattered by a lot of bogli, the typical Sicilian rural inhabited centres dating back to the first half of 1600.

The saline and its milled-system has always played a very important role in the history of Sicily testifying, above all, how the man has succeeded in exploiting Mother Nature for various necessary purposes without spoiling its beauty.

The island of Mozia mirrors in the lagoon called "Stagnone di Marsala". This island was an ancient Phoenician settlement that was transformed into a naval base by Carthaginians about in 360 B.C. The historic remains and natural landscape of Mozia are notable universal heritage. Furthermore, researchers have proved that its coastal caves were inhabited already in the Palaeolithic era.

Without any doubt, the most impressing aspects of the region are the defending towers built in the XVth, XVIth and XVIIth centuries and the world-wide famous tonnare (tunny-fishing nets) such as the ones of San Cusumano, Bonagia and Secco).

The urban settlements are very ancient indeed: Castellammare del Golfo was the ancient harbour of Segesta and witnesses today Arab and Norman civilisations; San Vito Lo Capo is a typical fisherman's village enriched by its fortified-church; Trapani is a historic city with an important harbour; Erice's ancient built-up area and cobbled alleys show perfect harmony between man and the environment.

## **Parco Archeologico Urbano e colline metallifere (Volterra)**

Province: Pisa

Region: Toscana

C (i)(iv) ; CL (iii)

Situated on the top of a harsh plateau (552 metres above sea level) towering over the valleys of rivers Cecina and Èra, the first inhabited nucleus of Volterra settled in the area of the Piano di Castello, that is to say the present city acropolis, very late in the Iron Age. (at the end of the VIIIth century B.C.) This inhabited centre is supposed to be the union of at least two different villages datable to the Villanovian Age. These villages had developed in several areas of the plateau and were certainly linked to the necropolis of Ripaie and Guerruccia.

In the history, Volterra underwent several architectural and town-planning modifications and developments. Today, the medieval city-walls are completely restored and can be visited together with the town and its several medieval towers. Volterra was completely constructed in grey stone between the XIIth and XIIIth centuries; today, the town is strongly characterised by its nearly integral historic centre around the Piazza dei Priori and its looming thirteenth-century towers. In the Renaissance and Seicento, no modification was performed to the original urban framework of Volterra. except the construction of few austere Florence-like palaces.

The territory is rich in important architectural structures such as the medieval Camaldolensian Abbey which was restored and transformed according to Ammannati's plans and the medieval estate of Spedaletto that Lorenzo de' Medici wanted to be modified.

The landscape and environment characteristics of the territory are unchanged, with its cultivated winding hills housing some Renaissance documents, such as the Medici Fortress which was built in 1472 and the reconstruction of the façades of the greatest urban palaces witnessing urban life between the XVth and XIXth centuries.

The urban archaeological park of Volterra houses evidence of the city life in the Early Iron Age, Villanovian Age, Roman Age (both Republican and Imperial Periods), Oriental Period, Middle Ages, Renaissance and Modern Age.

By and large, the natural boundaries of this area are the valleys of three rivers: Cecina, Pecora and Cornia.

The site called Colline Metallifere (Metalliferous Hills) is typified by ore deposits deriving from phenomena of intrusion of metalliferous fluids through sedimentary formations.

The entire area is hence characterised by an old tradition of metallurgical and ore-activities dating back to the Etruscan



### Age and surviving in our times thanks to intensive mining.

This activity developed mostly in the Roman Age and the Middle Ages exploiting the tin, copper, galena, argentiferous lead, alum and iron ore deposits which were a pivotal economic resource of Rome and Etruria.

As to copper mining, the most important municipality in the province of Pisa is today Montecatini Val di Cecina.

### **Porto di Roma**

Region - Lazio  
Province - Roma

(iii) (iv) (v) C - (ii)  
27

The area of Porto is today a unique blend of historical and archaeological values, only partly embodied in the impressive ruins of the great harbour city that served the capital of the Roman Empire, and of naturalistic and environmental values, deriving from the great effort of land reclamation in the early 1900s, with the drainage of the marshes that were created in the Late Empire by the advancement of the coast and the forming of swamps at the river's mouth. The issue was also a great naturalistic park rich in vegetation of the Mediterranean coast. The park is also the result of the reclaiming activities of the great landowners Princes Alessandro and Giovanni Torlonia between the late 1800s and the early 1900s, as G. Lugli and G. Filibeck witness in the book "The port of Imperial Rome and its territory", published in Rome in 1935. The outstanding importance of the city of Portus becomes self-evident when its close bonds with Rome are considered. The founding of Portus under the emperors Claudius and Trajan is the result of the careful planning of an efficient landing-place for all kinds of supplies coming to Rome from all over the world. The role of defence of Rome in its output on the sea was also considered.

The harbour was composed of two artificial docks. The former was a vast (over 90 hectares) basin of circular shape, built under Claudius and Nero between 46 and 64 A.D. . The latter, a smaller harbour (31 hectares), shaped as a hexagon, was built by Trajan in 112 A.D. as an inner and safer haven, surrounded by new functional warehouses and other services. The whole site was enclosed by a city wall. The present wall is the result of the later expansion of this long-lived city at the time of emperor Constantine, and in some places even later, in the Middle Ages.

## **Netherlands**

### **Historic centre of Amsterdam**

Province of Noord-Holland  
Coord. 120000-124000 /  
485500- 489000 (+)

(i) (ii) (iv) C

The historic centre of Amsterdam consists of two sections: the heart, which dates back to the late Middle Ages, and the 17th century ring of canals. It stretches from the waters of the IJ to the current Singel canal.

The medieval city (populated since the 13th century; city rights late 13th century) was built on both sides of the River Amstel which flows into the IJ. It includes the area around the mouth of the Amstel (now Damrak, Dam (a dam built in the Amstel around the year 1270) and Rokin, and parallel to that, the Oude Zijds Voorburgwal and the Nieuwe Zijds Voorburgwal built somewhat later.

The concentric, half-moon shaped ring of canals includes the Herengracht, the Prinsengracht and the later Plantage built along the eastern side. The Jordaan quarter was built in the 17th century on the western side. The contours of the current Singel canal mark the location of the 17th century star-shaped circumvallation.

The city was expanded in the 14th century by acquiring land along the river and on the land side, intersected by the Oudezijds Voorburgwal and the Nieuwezijds Voorburgwal and provided with new ramparts, i.e., the Oudezijds Achterburgwal and the Nieuwezijds Achterburgwal (now Spuistraat). The city was expanded again after 1425 (up to Geldersekaade, Kloveniersburgwal, Singel). Fortification by means of a city wall of stone (1488) with St. Anthonispoort (1488) and Schreierstoren (ca. 1485). Another expansion during early 16th century (1515). Late 16th century (after 1585) new defence works were built (earth rampart with bastions) from Haarlemmerdijk up to the Amstel, behind which the city was expanded, bordered by a part of the current Herengracht, Reguliersdwarsstraat, Rembrandtsplein, Amstelstraat, Nieuwe Amstelstraat and Rapenburgerstraat; the Lastage district (including wharves) was incorporated into the city; the water between the islands of Uilenburg, Valkenburg and Rapenburg and the mainland was filled. The medieval city wall was torn down after 1601 because of the rapid development of Amsterdam into the most important city of Holland and of the Republiek der Zeven Verenigde Nederlanden (Republic of the Seven United Low Countries). It became a trade metropolis, a city of trade and traffic, with international connections (Scandinavia, Russia, England, France, Spain) and interests over the whole world as it was then known (Verenigde Oostindische Compagnie (VOC), (United East India Company), established 1602; Westindische Compagnie (WIC), (West India Company), established 1621), and thus became the most powerful trading centre of North Europe for some time. The city had a population of 50,000 around the year 1600, but grew to 100,000 around 1625 and approximately 139,000 around 1640. In 1609 the Staten van Holland (States of Holland) gave permission to expropriate over 3,000 houses, situated outside the city circumvallation. for further city expansion. Plans to develop the area situated between newly built fortifications and the old city - from the harbour district to the west up to the Heiligoweg - were implemented in 1613. They affected three areas: western harbour district with three man made islands (ca. 1610); first part of the ring of canals (two new ramparts, the Keizersgracht and the Prinsengracht (1614), and the Lijnbaansgracht respectively) outside the Herengracht excavated in 1585; the Jordaan (quarter between Brouwersgracht, Prinsengracht, Passoedersgracht and Lijnbaansgracht) with its systematically laid out side-streets and small canals.

In 1655 land was granted on the new islands to the east for building wharves. 'sLandszeemagazijn [National Maritime Warehouse] (Daniel Stalpaert, 1656) was built on Kattenburg.

Further population growth and expanding harbour activities necessitated the next city expansion. Approximately 1660, plans for a new fortification plan and further urban development of the area between the Heiligoweg and the IJ. 1662, plan approved (design: Cornelis II Danckerts de Rij, who plotted streets and canals together with city architect Daniël Stalpaert and engineer Coeck); 1663-1668, land grants along Herengracht.



Late 17th century building in the area on the other side of the Amstel came to a halt, however charitable institutes were established there. In 1682 the city council decided to turn the remaining area into a Plantage, a promenade and recreation area.

The ramparts and bastions were demolished mid-19th century. Next plans for expanding Amsterdam outside the Singel canal are dated 1867. Canals filled in (including Nieuwezijds Achterburgwal, 1867; Nieuwe Zijdsvoorburgwal, 1884; Rozongracht, 1895).

The city had an open view of the IJ until the Central Station was built (1870-1889). A central axis was developed in the 19th century from the Central Station, to Damrak, Rokin (filled in 1937), Vijzelstraat (widened 1914-1927), along which a number of large buildings were built (including the Beurs (Exchange/Bourse) designed by architect H.P. Berlage, 1898-1903).

Description of Urban development:

- The medieval structure of Amsterdam was determined mainly by the pattern of earlier peat cultivation (parcels, ditches, dikes, roads);

- 17th century ring of canals, linear, radial and concentric plan - no relation with the earlier polder structure - with strict measurements (parcel size 30 feet, depth 90 feet). Representative houses along the canals belonging to, e.g., aristocratic merchants (Herengracht, eastern side), for the upper classes, and warehouses; modest houses with shops and small businesses in the side-streets.

The block-patterned spacial structure of the Jordaan is typified by following the earlier polder structure; with small building blocks (average lot size 20 feet; depth 50 to 60 feet and approximately 100 feet near the canals);

- On the six man-made islands in the IJ, on the eastern and western sides: wharves and warehouses, houses for labourers and shipbuilders. VO C- buildings on O ostenburg;

- Near the Zuiderkerk (1603, architect Hendrick de Keyser), a concentration of Spanish, Portuguese, German-Polish Jews (Portuguese Synagogue, 1671-1675, architect Elias Bouman; German Synagogue late 17th century, 18th century). 211 houses along the southern border of what is termed 'Noortse Bosch', designed by Philips Vingboons (1607-1678), mainly occupied by Huguenots;

- Charities east of the River Amstel (Luthern Diaconiehuis (house for church social welfare work) (1769-1772), design Coenraet Hoeneker), homes for elderly people ((Diaconie old women's home (Amstelhof), 1681-1683); orphanages, almshouses (Corvershof, 1723); Van Brant's Rushofie, 1733, architect Daniël Marot), and such;

- Open spaces for markets: Nieuwmarkt (Oostermarkt) (1612), Herenmarkt, Noordermarkt or Prinsenmarkt, Westermarkt or Keizersmarkt (after 1613), after 1663 Koningsplein and Reguliersplein (Botermarkt).

## Nieuwe Hollandse Waterlinie (New Dutch Inundation Line)

Provinces of Noord-Holland,

(i) (ii) (iv) C  
Utrecht,Zuid-Holland.....  
Coord. 118000- 142500 /  
420500- 480000

The Nieuwe Hollandse Waterlinie was built in the course of various building projects (1815-1824, 1840-1860, 1867-1870, 1871-1881) between 1815 and 1885. It was a 3 to 5 kilometre wide inundation zone stretching approximately 70 kilometres from Muiden (situated on the Zuiderzee, currently IJsselmeer), past the city of Utrecht towards the east, down to the large river district (the Nieuwe Merwede) and the Biesbosch. Up until 1940 it was the main defence line of the Dutch defence system aimed at defending the western part of the country against any attacks coming from the east and the south.

After 1883 and starting at Fort Nigtevecht (municipality of Abcoude), the Stelling van Amsterdam (Defence Line of Amsterdam, built between 1883 and 1914) was linked up to the Nieuwe Hollandse Waterlinie. An inundation line consists of a cleverly linked chain of inundation fields (approximately 35 to 50 centimetres high) and natural waters.

The system consisted of 6 what is termed inundation basins, which could be regulated by dikes, culverts, canals, fan locks, dams and sluices. A system of defences, such as forts (covering 2 hectares to 32 hectares) was located at the accesses to the inundations, e.g. near higher roads, or where the inundations could be traversed via existing dikes, lakes or rivers and wherever it was necessary to protect the inundation facilities. There were more than 60 defences of varying types in this Inundation Line. Civil and military roads (available for civil use during peacetime) were also a part of the Inundation line. Planting of the defences was strictly regulated. The permanent defences varied from simple earthworks without permanent buildings to earth defences with brick turrets, 'turret forts', bomb-proof barracks, guardhouses, casemates and bomb-proof shelters for artillery.

A few older fortified towns (Muiden, Naarden, Weesp, Gorinchem, Woudrichem) were also a part of the Nieuwe Hollandse Waterlinie. They had been provided with fortifications as early as the 16th and 17th centuries. They were modified during the 19th century to fit into the Nieuwe Hollandse Waterlinie. Many hundreds of what are termed concrete group shelters, typified by three bevelled walls (so that bombs and grenades would only graze them), were built during 1939 and 1940.

## Noordoostpolder (North East Polder)

Province of Flevoland

(i) (vi) C  
Coord. 169000- 195500 /  
513500- 539000

New land, reclaimed from the Zuiderzee (now IJsselmeer), a former inland sea which originated in the Middle Ages. This, together with Oostelijk and Zuidelijk Flevoland of recent date - polders which were successively drained - is Flevoland, The Netherlands' new, twelfth province.

The Noordoostpolder was drained between 1937 - 1942 by means of three pumping stations (Buma (1940) near Lemmer, Vissering (1942) near Urk, Smeenge (1941) near Voorst). The former island of Urk has been included in the dike system; the former island of Schokland is now part of the southern section of the new polder land. Polder ground level: varying



between minus 0.5 metres Mean Sea Level (N.A.P.) in the east and minus 4.5 metres Mean Sea Level in the west (N.A.P.).

The Noordoostpolder covers approximately 48,000 hectares, 24x20 kilometres, of which 37,000 hectares was reserved for agriculture and pasture-land, 2,000 hectares for forestation (between Lemmer and Kuinre and near De Voorst), 2,300 hectares for fruit and vegetable culture (near Marknesse, Luttelgeest and Kraggenburg) and 200 hectares for bulb-growing and cultivation under glass (near Ens). A distribution plan was drawn up in 1947 for establishing approximately 1,500 farms. Standard parcel size: 24 hectares (800x300 metres) with a derivative size of business of 12, 24, 36 hectares; minimum size 12 hectares; average size 25 hectares. A typical feature is farms located in groups of 2 to 4 with windbreaks.

The polder is triangular of shape, the structure of which is extended into the star-shaped route of the canals running from the middle of the polder to the pumping stations. It can be reached from the 'old land' - the Provinces of Overijssel and Friesland - and from Flevoland via six towns (Ketelbrug, Rampspol, Vollenhove, Blokzijl, Kruinre, Lemmer).

Based on sociographical research, it was decided at the time of land settlement to establish 10 settlements, all within cycling distance of each other, counting 2,000 future residents, with Emmeloord as its capital (1941-1947 plans, Granpré Molière, Verhagen and Kok agency, later plans by Ir. J.C. Pouderoyen) around which the villages of Ens (started 1948), Marknesse (started 1943, final plan 1949), Kraggenburg (started 1948), Bant, Luttelgeest and Creil (founded 1950/1951), Tollebeek (finished 1954-1957), Espel (building started 1957) were projected. The town planning and architecture of these villages are traditional of structure ('Delft School'). The initial settlement plans were drawn up by the Granpré Molière, Verhagen and Kok agency and later detailed by Ir. P. Verhagen (1882-1950). The town planning of the village centres is typified by an intersection of roads and waterways, a through road with an open central space, a 'village green' (grass, trees, bordered by shops, public buildings, houses, opened up by a separate service road) with nonparallel walls, by scattered elements such as churches and schools which sets the scene, and by the absence of straight angles and parallel alignments. When the village of Nagele was built (1954) a group of architects ('De Acht' (The Eight) and 'De Opbouw' (The Structure)) stood out and contributed (theoretically) to the 7th CIAM (Congrès Internationaux d'Architecture Moderne) in Bergamo (1949). This group included Gerrit Rietveld, Mart Stam, Aldo van Eyck, Mien Ruys. A cultivate on plan for the reclaime d land was drawn up in the early 1940 s , according to which the main roads (coordinate system Lemmer-Rampspol and Urk-De Voorst) as well as the ring-road connecting the villages, are planted in two rows. The general plan is that the countryside will overgrow behind the ring-road towards the IJsselmocr and that the landscape will be more open on the inner side of the ringroad.

The former island of Schokland is accentuated by a screen of trees; the island of Urk is emphasised by the afforested Urkerbos. Because of a modification of the planting plan (1960), the western part of the Noordoostpolder mainly has linear planting, while in the eastern part a gradual transition to the 'old land' has been made. At the time, planting schemes for the layout of back gardens, for corner lots, for green belts, for the choice of hedges, trees, bushes and village woods were designed for the villages, with the exception of Nagele, as well as for the farm lots. The increasing mobility is changing the infrastructure vis-à-vis the original planning. New highways, fitting in the polder plan, are being laid, existing roads are being widened and separate cycle tracks are being laid.

## Van Nelle Fabriek (Van Nelle Factory)

Van Nelleweg 1, 3044 BC

(ii) (iv) (vi) C  
Rotterdam  
Land registry location :  
Rotterdam: AC, 179

The Van Nelle Factory, built in 1925-31 for the refining and packing processes of coffee, tea and tobacco, is the result of a thorough analysis of technical functions of this specific factory (raw products were taken to the top floor of the factory buildings to move down a floor after each stage of processing) and of improving the social aspects ('human element') of working in a factory and also of an intensive co-operation between the principal (C.H. van der Leeuw, a confirmed theosophist) and the architects J.A. Brinkman (1902-1949) & L.C. van der Vlugt (1894-1936), assisted by architect Mart Stam (1899-1986) and contractor J.G. Wiebenga (1886-1974), all dedicated to the 'Nieuwe Bouwen' (the Dutch branch of the international Modern Movement).

The block of buildings consists of a curved office block, a descending factory building (eight levels for the tobacco section, crowned by a circular tearoom (a reception room) and expanded at the back by a shed-roofed warehouse; five levels with a double-height entresol for the coffee section; three levels for the teasection), linked by glazed elevated transport bridges, diagonally crossing over the factory street, with expedition and warehouse buildings opposite; an L-shaped workshops/garage-building; a boilerhouse with an almost freestanding, profiled chimney. All buildings are constructed of reinforced concrete, steel and glass. Typical technical features are mushroom-shaped columns with the floors without beams, the curtain wall of steel-framed glass and the (originally mobile) glazed elevated transport bridges. Most of the original functionalism furnishing and parts of the original outdoor sporting and leisure facilities for the workers still exist.



## Poland

### **Krzemionki Opatowskie. Neolithic flint mine**

C (iii)(v)

Ostrów Swietokrzyski administrative district (powiat) Swietokrzyski vojvodship.

Archaeological reserve containing several thousand Neolithic mining units. From the second half of the fourth millennium BC, the scene of the exploitation of decorative banded flint from which the polished flint blades of axes was manufactured. Several different mining techniques were in use: simple pit shafts, open shafts with niches, mines with underground chambers (the latter the most characteristic and best documented). The area of the reserve retains in many places the original prehistoric structure, including the above-ground traces: mine spoilheaps, flintknapping workshops, the remains of camps and mining facilities, communication tracts.

### **The valley of the Pradnik river in the Ojcowski National Park**

district (powiat), Malopolskie vojvodship, 20km north of Cracow

The Cracow administrative C (iv)(v)

The valley of the Pradnik is one of the most valuable areas of cultural landscape in central Europe. It is a unique example of the continuity of layers of human settlement going back 80000 years, and developing in harmony with unique forms of the living and non-living environment. In the local landscape, which is characterised by remains of nearly all geological and paleontological epochs, traces of historic human utilisation of the landscape, from agriculture, through defensive constructions, industry, and also use as a health resort and tourist attraction. In the restricted area of the 17 km of the length of the valley, there is a high concentration of unique geological forms (including some 200 caves) and many unusual karstic formations of the limestone rocks. The cultural landscape contains two Early medieval strongholds, two Medieval and Renaissance castles, a hermitage, a health resort, an early gunpowder factory, mills, saw-mills and fulling-mills. The protected fauna and flora includes 1000 species of plants (including many relict ones), about 1200 species of fungi. The protected fauna includes 2645 species, including many species of bats. The valley of the Pradnik, an especially effectively protected area on a micro and macro-scale, forms the centre of the Ojcowski National Park covering 1400ha.

## ROMANIA

### **L'ensemble rupestre de Basarabi** Dobroudja

(not specified)

Ensemble des monuments rupestres situe une ancienne carriere de " craie du IXe-Xe siecle, amenee comme etablissement monastique (Xe-XIIe siecle). Une eglise principale avec trois nefs soutenue par des colonnes; une autre eglise avec la division rituelle specifique orthodoxe, couverte d'une coupole semicilindrique, le sanctuaire avec abside semicirculaire couvert d'une semicalotte; deux paraklession, diverses chambres annexes, galeries et chambres funeraires composent l'ensemble. Des representations figuratives chretiennes et d'autres motifs symboliques stylises, incises : dragons qui se tordent, le labyrinthe, l'arbre de la vie, le pigeon, le chevalier, aussi que divers animaux et navires. Inscriptions en plusieurs langues et ecritures grecque, runique, glagolithique, cyrillique - y compris une glosse roumaine du Xe siecle.

## Russian Federation

### **Railway Bridge Over Yenisey River**

Long. 92° 20'00"/ Lat. 55° 38'00"

C (i)(ii)(iv)

The city of Krasnoyarsk, administrative center of the Krasno yarskiy Region, the biggest industrial and cultural center of the Eastern Siberia.

Through the city of Krasnoyarsk lie s the Trans siberian Railroad, which construction started in 1891 and on the 6th of December 1895 to Krasnoyarsk arrived the first train from the West. But here, on the bank of the Yenisey river, rails ended. Steam-engines and cars had to be ferried across the Great Siberian river. On the 30~ of August 1896 the foundation-stone ceremony of the railroad bridge across Yenisey took place. The project of the upper construction of the Bridge has been carried out by pro£ L.Proskuryakov, and the piers and the methods of stone and caisson constructions has been elaborated in the Middlesiberian Railroad Department. The length ofthe Bridge - 1000 m, width - 7,5 m, height of trusses - 20 m, width of trusses - 8 m. Length of bigger spans - 137 m., smaller - 20 m. The principal manager of the construction was appointed engineer prof. E.Knorre, who for the first time in the world used the wooden



caissons. The Bridge was put into operation in the beginning of 1899. The model of the Bridge with 7.32 m. in length and 1.83 m. in width and the model of wooden caisson were exposed at the Paris exhibition in 1890, where the Bridge was awarded a golden medal as a recognition of high level engineer and technological innovation, originality of construction.

By putting the Railway Bridge across the Yenissey river into operation the Eastern and Western parts of the Siberian railroad were connected, which was recognized as the World's outstanding event after discovery of America and construction of the Suez Canal. Noting the historic and economic role of Transsiberian Railroad the Paris exhibition also awarded Grand Prix to the Siberian Railroad Committee and the Russian Ministry of Railroad Communication.

During the Bridge construction the best Italian specialists in granite methods of treatment and other foreign experts took part, this is why the Bridge appears to be the multinational human creation.

It is supposed to fit out the Bridge for organizing a Museum of Transsiberian Railroad with a rolling-stock, used on Transsiberian Railroad, as well as exposition of photo documents, schemes of construction of Transsiberian Railroad and the Bridge over the Yenissey river.

## **SLOVAKIA**

### **The Kysuce - Orava narrow-gauge railway**

Central Slovakia, regions of

(i) (iii) C  
Kysuce and Orava

A forest narrow-gauge railway built in 1915-18 in a very pretentious terrain. The central connecting part built in 1926 overcomes the difference between the lowest and the highest points - 218 m by means of dead centres/ deflected bends. On the main line the max length in 1927 was almost 110 km steam engines were used. One section was in 1969, 1972 declared a state technical monument and the part with dead centres 8 km has been preserved.

### **The Mining Town of Idrija**

The town is situated in the west of Slovenia at an altitude of 331 m above sea level, at a Long. 14° Est - Lat. 46° North, it is 38 km away from the capital Ljubljana

(i) (ii) (iii) (iv) C

A mining town for over 500 years with extremely well preserved monumental technical installations and machinery which have passed on early industrial procedures to the present civilisation in a compact urban centre surrounded by an exceptionally well preserved cultural landscape with various natural sights and a diversified technical heritage related to mining, forestry and log driving.

Mercury mining in Idrija dates back to 1490 and was first mentioned in written records in 1494. Amid a geologically diversified hilly landscape the mining industry has been preserved to the present day and at the same time with exceptional technical skill unique systems of working methods, equipment, machines and devices have developed. A number of technical devices have also been preserved, including some which are unique or very rare, and because of their dimensions, outstanding examples. The mining shaft system was developed to a depth of 400 m below sea level and the length of the entire system amounts to over 700 km. When mining was at its peak special types of water power were developed; and a special system of log driving on the Idrijca, Belca, Zala and Ovcjak or Klavzarica with the aid of water barriers called "klavze". With the continuous modernisation of machinery, miners with a high degree of awareness for the preservation of tradition managed to save many machines from decay. These machines have been restored or are being prepared for restoration.

The mine has gradually been closing down since 1978, therefore even greater care has been taken to preserve the outstanding mining tradition. Planned conservation of older machines and equipment has an outstandingly long tradition in Idrija - over ninety years. Systematic legal protection was introduced in 1952. Today the conservation of the technical heritage is included in the planned development of the town and this makes it possible to hand down a tradition dating back centuries to the new generation.

Mining in Idrija was of outstanding universal significance due to the rarity of mercury. The technical procedure for the extraction of ore has always been at the height of mining technology. Important individuals working in Idrija made major contributions to the development of European natural sciences. Their activity was reflected in the early development of schools, culture, natural sciences, etc. Mining in the region influenced the development of the unique culture of the inhabitants, contributed to the development of forestry, introduced a special type of building tradition, and influenced the development of quality lace-making which used to be an important supplementary economic activity of the local women. The former rich economic activity of the mine, the level of technical knowledge, tradition and genuine new ideas successfully continue in the form of numerous activities, some of which again rank among the best in the world.



## Spain

### Colonias industriales de los ríos Cardener y Llobregat

#### El Canal de Castilla, Castilla-León

### La Ruta de la Sal (Canarias)

#### **Marismas del Odiel**      Huelva      (not specified)

Paysage de marais au bord de la mer, a l'embouchure des fleuves Tinto et Odiel, doté d'un réseau de drainage caractéristique qui a donné lieu à une activité économique traditionnelle, de grande valeur ethnographique et culturelle

## Sweden

#### **Copper mine of Falun**

Province of Västmanland.  
Dalarna  
X6720 Y1490

(iii) (iv) C

This is an industrial site with mining starting in the 12th century and still running. The mining area has several preserved buildings mostly from the 18th century. The mine passages are kept intact by pumps. The mine and the museum connected to it are both open to the public.

The Falu Copper Mine is a monument of international value. Legal protection according to the Cultural Heritage Act is under consideration.

## TURKEY

#### **Güllük Dagi-Termessos National Park**

37°00' N – 30°30' E  
Located within the provincial  
boundaries of Antalya.

N (ii)(iii)(iv) C  
(ii)(iii)(v)

Gulluk Dagi National Park is located within the province of Antalya in a valley hidden between mountains. There is the ancient fortified city of Termessos rising 1050 m above the sea level. The ancient city of Termessos was found by the Solims who lived in the Psidia Region. Although there are no facts available about Termessos and Solims, they are named by Homer in the Iliad in connection with the legend of Bellerophon.

The most significant remains of the site are the city walls, Towers, King's Road, Hadrian's Gate, Gymnasium, Agora, Theatre, Odeon, Richly, Decorated Tombs, cisterns and drainage system.

Other features of the Natural Park are the step rocks of Gulluk Dagi and the Mecine Canyon with its 600 m high walls along with the typical Mediterranean vegetation sheltering such endangered wild creatures as Mountain Goats, Fallow Deer and Golden Eagle.

## UNITED KINGDOM

#### **Cornish Mining Industry**

long. 4°43'21" W / Lat. 50°28'22"  
N  
Cornwall and Devon, England

(ii)(iii)(iv)(v) C

The proposed World Heritage Site is a cluster of seven detached areas which collectively represent the many facets of metal mining in the south western peninsula of England and have a significance far beyond Britain itself. For substantial periods over the last 4,000 years this area was the principal source of tin and copper in the western world, while during the 1st and 19th century it was, for a time, the world's greatest producer of tin and copper. Whilst the mining area of the Cornubian orefield covers West Devon, the major technical innovations and the overwhelming preponderance of mines were in Cornwall. The proposal is therefore termed 'Cornish Mining'. This term would have been well understood throughout the mining world in the 19th century.

The proposed Site includes all those mine sites and relict mining landscapes where there is exceptional survival of the physical remains. These are largely late 18th century, 19th century and, in a few instances, pre-1914 mining remains. The relict mining landscapes defined do not include those widespread areas of tin streaming that survive in Cornwall and



West Devon, associated with a pre-Industrial Revolution technology and therefore not considered representative of the 19th century boom years.

— In the 150 years after 1760, the economy and society in the region developed from being largely agricultural to that of (between 1800-1850) complete dominance of the hard rock mining world. By 1900, and more definitively, by the First World War, the shattered remains of this truly massive industry lay almost totally abandoned. The mining economy virtually ceased to exist, and a substantial percentage of the mining population (perhaps two thirds) emigrated to all corners of the mining world. The twin disadvantages of peripherality from national centres of population and the geological based nature of the mineral resource, helped ensure that no significant industry replaced mining and its related industries in Cornwall and West Devon. The physical remains of the mining boom are therefore largely with us today.

The case for World Heritage Site status is based upon five characteristics:

The extraordinary suite of minerals in the Cornubian orefield, with 440 species out of a worldwide total of some 8000.

The crucial part played by Cornish miners, adventurers, and Cornish engineers between 1800 and 1860 in the development of steam technology and mining technology throughout the world, including Trevithick's steam engines, the use of coal gas for lighting, Davy's safety lamp and Bickford's mining safety fuse.

The outstanding survival of the mining landscape and its associated industrial concerns, urban development, rural settlements and miners' smallholdings, great houses, parks and gardens, mineral railways and mineral ports.

— The comprehensive character of the statutory protection, conservation and long term management measures covering this wider historic mining landscape now in place or presently in progress.  
The existence still, of a well documented Cornish mining diaspora of mining sites (physically so similar to mine sites in the region) and Cornish people. This is particularly well represented today in South Australia, and the United States of America. In addition there are particularly well preserved mining sites in Mexico, the Virgin Islands and Spain.

Throughout the mining districts of Cornwall and West Devon there are large pre-Industrial Revolution relict landscapes of tin streaming works, and 19th century mine sites with the ruined engine houses, arsenic works and associated buildings. The mining towns and villages with their characteristic terraced miners' houses, mining institutes, technical schools and Methodist chapels are a reminder of past activity. Significant remains of closely associated and related industries such as tin and copper smelters, foundries, drill manufacturers, gunpowder, explosives, and fuseworks, ropewalks, candle factories and brickworks survive today. Almost all the mineral ports, and the mineral railways and tramways that served them, can be seen today. Of great significance is the good survival of the great

houses, parks and gardens of the great mining and industrial families of Cornwall and Devon, as well as the widespread pattern of miners' agricultural smallholdings taken out of moorland in the first half of the 19th century.

Mining was reflected in the shaping of a distinctive social and cultural identity in Cornwall of which Methodism was a central element. The spread of nonconformist religion and the creation of an international Cornish identity were both results of the mass emigrations in the 16th century. The history of a region at the forefront of the Industrial Revolution, known throughout the mining world, has left a permanent cultural legacy in the hearts and minds of Cornish people.

#### Boundaries

Seven areas have been identified as best representing the many different facets of Cornish Mining. The areas differ greatly from one another in character but each has a core area that is quite distinct and complements the other core areas.

#### Camborne/Redruth

Focused on the Great Flat Lode and its adjacent settlements, this is the archetypal Cornish landscape of engine houses and mine complexes served by urban settlements of terraced houses, with chapels, mining exchanges, engineering works, fuse factories etc. The Ordnance Survey maps of 1907 define the historic topography which is essentially 19th century. The area includes several preserved steam engines and the core area of the Mineral Tramway Project.

#### Caradon

This south east corner of Bodmin Moor is the most impressive upland mining landscape in the region. Centred on the settlement of Minions and bounded to the south and east by the road from Crows Nest to Upton Cross, it contains the remains of the Phoenix Mines to the north, the Marke Valley mines to the east and the Caradon Hill mines to the south.

#### Godolphin/Tregonning

This area, encompassing Tregonning and Godolphin Hills and Wheal Vor, represents the earliest phase of the Cornish Mining technological spectrum. The Godolphin estate benefited greatly from mining revenues in the 16th and 17th centuries and the area, notably Wheal Vor, pioneered the introduction of steam pumping in the 18th century. It is possible that the first mining use of a Newcomen engine occurred in this area circa 1710, and certainly there were several such engines in use by the end of the century. It is probable that the overgrown area of disused mine workings around Carleen contains the foundations of these engine houses and is therefore of great significance archaeologically. Godolphin House and its parkland represent an important cultural element of Cornish Mining landscape as, in common with other grand houses in the region, it is founded on the fortunes made out of mining.

#### St Agnes

This area of coastal mining stretches from Porthtowan in the south to Cligga in the north. It encompasses both dramatic headlands and steep sided valleys each with their very different type of mining remains.



St Day/Gwennap

This area complements the Camborne/Redruth area. Its dispersed settlements are much less urban, while minehead complexes such as Great Wheal Busy are amongst the finest in the region.

St Just

The stretch of coastline from Cape Cornwall to St Ives contains some of the most dramatic mining landscapes in the world, especially in the St Just area. The St Just mines such as Bottallack, Levant and Geevor pioneered mining below the sea bed and several are now managed as tourist attractions. The stretch of coast from Morvah to St Ives was less intensively mined but its surviving engine houses are linked by the Coast Path and by National Trust ownership.

Tamar

The Tamar Valley, for long an outlet for the tin mines of east Cornwall and west Devon served by river ports such as Calstock, Gunnislake and Morwellham, in the 19th century witnessed the most intensive mining of copper in England. For a time it was Europe's principal source of copper and arsenic causing the further development of the ports and the construction of smelt works and arsenic calciners at places such as Weir Quay and Gawton. The tin mines around Kit Hill and Callington have fine surviving remains, while the restored George and Charlotte Copper Mine has public access via a tramway from Morwellham. The river ports, and especially Morwellham with its restored quays, are amongst the finest examples of mineral ports in the country.

## Derwent Valley Mills

Long. 1°29'59" W / Lat. 51°01'13"

(ii)(iii)(iv) C, N  
Derbyshire, England

The proposed World Heritage Site is a narrow 15 mile (24 km) stretch of the lower Derwent Valley embracing the historic textile areas of Cromford, Belper, Milford, Darley Abbey and Derby, and focusing on the theme of the pioneer development of the textile factory system. This phenomenon witnessed innovations in the harnessing of power, the marshalling and housing of the labour force and, above all, in the scale and structure of manufacturing buildings. Over the following century it was to transform economies and landscapes far beyond the Derwent Valley itself.

The River Derwent, from its source in the Peak District to its confluence with the River Trent south of Derby, has powered successive generations of pioneer textile mills through the 18th and 19th centuries creating a cultural landscape of international significance. The lower valley from Cromford to Derby witnessed the two seminal events in British textile history - the introduction of water powered silk throwing and the application of water power to cotton spinning. These events, and the subsequent experiments in the fire-proofing of mill buildings and provision of industrial housing, gave rise to the factory system that was to mature around Cromford, Belper and Derby. and was recognised by contemporaries as the model English Mill system. This was exported not only throughout the country but around the world.

At Cromford, most of Richard Arkwright's 18th century mills survive on his original site in. Mill Lane, powered by an intricate network of small watercourses contrasting vividly with his nearby Masson Mill where 12 years later he had the confidence to harness the River Derwent itself. Founded to serve the mills is Arkwright's village of workers housing, hotel, market, corn mill, canal wharf, his manager's and his own house and, at some remove, Willersley Castle, his second much grander house.

At Belper, scene of Jedediah and William Strutt's pioneer developments of harnessing water-power, fire-resistant structures and social housing, the Horseshoe Weir, the 1804 fire-proof North Mill with its defensive overbridge, the streets of distinctive workers dwellings, a chapel, the Market Square relocated by the Strutts, and the innovative farmsteads supplying the settlement constitute an unique socio-industrial landscape. In 1839, the North Midland Railway bisected the settlement with a dramatic cutting occasioning curved retaining walls and graceful overbridges.

Downstream at Milford further elements of the Strutts' enterprise survive, including two weirs, terraces of industrial housing and fire-proof mill and farm buildings, while at Darley Abbey, heartland of the Evans family cotton empire, there is an impressive complex of mills displaying further advances in fire-proof construction along with squares and terraces of associated housing, the Church of St Matthew (1819), an 1826 school and the Evans's emparked estate.

In Derby, where water-powered silk throwing was first introduced to England by Thomas Cotchett in 1704, and spectacularly developed by Thomas Lombe from 1718 onwards, the original watercourse arches survive of the eminent engineer George Sorcold's power system. The Strutt family was also very much involved in Derby. Although their mills have gone, the magnificent Grade I Listed St Helens House, built in 1767 to designs by Joseph Pickford and purchased in 1808 by William Strutt, survives.

For two centuries the textile industry developed throughout the valleys of the River Derwent and its tributaries, with a final flourish in the early 20th century, generating, as it did so, canals, early railways and engineered turnpike roads, as well as planned industrial settlements. The valley as a whole, therefore, exhibits all the characteristics of both pioneer and maturing industrialisation.

Boundaries

The extreme northern end of the proposed Site is the existing Cromford Conservation Area which is closely focused on the Arkwright mills, contemporary industrial housing, the owners' houses, and associated buildings and water-courses. The boundary then follows the eastern bank of the River Derwent and the Cromford Canal to the west, broadening at the wharf of the High Peak Junction, until the Wigwell Aqueduct over the River Derwent where a short spur follows the



branch canal to Lea Bridge Mills to take in the wharf, mills and Nightingale's terraces of housing. South of the aqueduct the proposed Site is bounded by the western bank of the river and the eastern bank of the canal south to Whatstandwell, where only the river itself is included until Ambergate where the Site broadens to embrace the Stephenson railway bridges over the main highway and the river.

The railway and the river, which criss-cross, provide the boundary until the Belper Conservation Area is reached. The boundary of the Conservation Area to the mills at Bridgefoot and as far south as the Park appropriately includes the Strutt property holdings and buildings, and the townscape which the Strutts moulded so significantly for over a century. The Strutt Dalley and Crossroads farms with their innovative model farmsteads, are included in a westwards extension all of which was originally Strutt owned land

The River Derwent itself resumes the proposed Site from its junction with the mill stream, south to the Milford Conservation Area where it includes the whole central area with, to the east, the Hopping Hill Terraces and as far south as Makeney where the farm and Hall have Strutt connections. To the west of the river it includes the area encompassing the terraces of Banks Buildings, the northern portal of the Milford Tunnel, the nucleus of the village and the weirs and mill lades either side of Milford Bridge and south to Moscow farm, another Strutt model farm. Southwards it follows the river banks to Darley Abbey Conservation Area, where it includes the mills to the west of the river and the eastern part of the Area south to Poplar Row and the Hill, and westwards up New Road to include the early terraced housing at Brick Row, Lavender Row and Mile Ash Lane. The river then forms the eastern boundary with the Evans' landscaped Park to the west and at the southern end of the Park. The Derwent itself continues the proposed Site into Derby where it broadens to include Silk Mill Island and terminates immediately south of the Silk Mill. St Helen's House is included as a separate outlier to the north west.

## **Liverpool Commercial Centre and Waterfront**

Long. 2°59'57" W / Lat. 53°24'15"

(ii)(iii)(iv) C

N

Merseyside, England

Liverpool is the supreme example of a commercial port developed at the time of Britain's greatest global influence - from the late 15th century through to World War I. Throughout the 15th century it was the greatest Trans-Atlantic port in Europe and by the end of the century some 120 ha. of wet docks were enclosed by 10km of fortress-like dock walls. These served a commercial district with offices and exchanges unrivalled outside London, with the three buildings of Pier Head as its showpiece.

The proposed World Heritage Site focuses on the earlier surviving docks, with the magnificent Albert Dock and Pier Head at their centre, and the immediate commercial hinterland comprising the western part of the Castle Street Conservation Area and the area to the east and south east to include the historic town warehouses around Duke Street and Hanover Street. It encompasses sections of the waterfront from Salisbury Dock (1848) in the north to Wapping Dock (1855) in the south.

The development of commercial wet docks was pioneered at Liverpool with a 1.4 ha. dock in operation by 1715 and a further five docks in use by the end of the century. These early docks were very much associated with the slave trade but little of their fabric survived the great 19th century remodelling of the docks when they became Britain's Atlantic gateway and the great emigration port for much of northern Europe. The earliest structure, the brick section of 1821 Dock Wall, is post-Abolition and is attributed to John Foster while the grandest, historic structures are the work of Jesse Hartley who was Dock Engineer from 1824 to his death in 1860. Hartley designed the great fire-proof warehouses at Albert, Stanley and Wapping Docks, and fanciful hydraulic towers and pumphouses, and enclosed the dock system by impressive granite walls with turreted gate entrances. His work was continued by the Lysters - father and son who were Dock Engineers until 1897 and 1915 respectively and were responsible for many of the North Docks and the remodelling of the South Docks.

For a century before the Docks were enclosed, most of the warehouses in Liverpool were privately owned and many were located in the town close to the merchants' houses in the streets focussed on the Old Dock some distance inland from the Mersey. Some of these warehouses survive in the Duke Street area while commercial offices, banks and exchanges replaced most of the residential properties in the second half of the 19th century. These now comprise one of the finest commercial districts in Britain with massive ornate office blocks such as Tower Building and innovative buildings such as Oriel Chambers. The expression of commercial activity culminated in the magnificent trio of buildings on Pier Head the Offices of the Mersey Docks and Harbour Board (1907), the Royal Liver Building (1910) and the Cunard Offices (1916).

### **Boundaries**

In the north the proposed Site starts with the proposed Stanley Dock Conservation Area. This is bounded by the River Mersey to the west and to the east it follows the Dock Wall on the west side of Regent Road. It includes Salisbury and Collingwood Docks, and at the Collingwood gate it crosses the road to encompass the Stanley Dock (1849) complex bounded by Walter Street, the Leeds and Liverpool Canal locks and Docks on Street before returning to the Dock Wall. It then follows the Wall itself, omitting the former Sandon and Trafalgar Docks and broadens to take in the water space at Waterloo Dock and Warehouse, narrowing back to the early brick section of wall around Princes Dock until St. Nicholas Place, where it broadens back to the river and eastwards into Chapel Street where it comprises much of the western part of the Castle Street Conservation Area to Old Hall Street. The boundary then follows along behind the Dale Street properties to Crosshall Street, Victoria Street and Mathew Street. A detached section takes in the town warehouses of Hanover and Duke Street.



## Manchester and Salford (Ancoats, Castlefield and Worsley)

Long. 2°18'53" W / Lat. 53°27'88"

(ii)(iii)(iv) C

Greater Manchester, England

Manchester is the archetype city of the Industrial Revolution. It witnessed the creation of Britain's first industrial 'true' canal, Britain's first mainline, inter-city passenger railway and the country's first industrial suburb based on steam power: it is on these three themes that the proposed World Heritage Site designation concentrates. Thus, the city centre itself, which is arguably the finest expression of a Victorian commercial district in England, complements the present nomination but is not included within the boundary of the proposed Site.

The areas proposed for inclusion focus on these three themes and are linked to each other by the Bridgewater and Rochdale Canals. The proposed Site comprises the hillside of Worsley Delph and the western half of the Worsley Village Conservation Area focussed on the Bridgewater Canal, and then follows the canal to the Barton Swing Aqueduct in the Bartonupon-Irwell Conservation Area, before looping round Stretford to enter the Castlefield Conservation Area, much of which is included in the Site. It then follows the Rochdale Canal from Castlefield Basin to Ancoats, widening to include the two canal warehouses east of Dale Street and the south western part of Ancoats Conservation Area.

Industrial canals, as opposed to strategic canals in continental Europe, were pioneered in Britain. The Bridgewater Canal, which opened to Manchester in 1765, was the first true industrial canal cutting across country and, with an aqueduct at Barton, James Brindley, its engineer, carried it spectacularly over the area's main existing navigation, the River Irwell. The Canal's success in bringing cheap coal to fuel the emerging industries in Manchester was widely recognised at the time, and over the next 30 years led to the development of a national network of such canals.

The Basin at Worsley Delph gave access through two entrances in the quarried face to a system of underground canals, which at their peak totalled 46 miles (74 kms) on three levels and was the most extensive such underground system in the country. The surface expression of this system is limited to the basin at Worsley and the immediate landscape above the core of the mine. Worsley is the centrepiece of the "Steam, Coal and Canal" project which seeks to create a Linear Industrial Heritage Park along the Bridgewater Canal from Leigh to Castlefield.

The Manchester terminus - the Castlefield Basin with its warehouses pierced by bargeholes for covered loading - became a model for canal basins across the country. After a period of dereliction, the area of canal arms and basins, criss-crossed by a wonderful landscape of soaring railway viaducts, has been restored under an urban regeneration programme, and with its converted warehouses has now become a focus for leisure and entertainment.

The Rochdale Canal, which connects with the Bridgewater Canal at Castlefield, was the first canal to cross the Pennines, opening throughout in 1804. Its line through Manchester was festooned with branches serving wharfs and individual cotton mills, and some of the largest of these branches served the industrial suburb of Ancoats which had developed from 1794 in expectation of the arrival of the canal. The industrialisation of Ancoats was intense and dramatic even by Manchester's own standards, so that by 1849 it was stated that "Ancoats...is to Manchester what Manchester is to England". Some very important cotton mills, demonstrating significant advances in the use of constructional iron, survive in the Ancoats Conservation Area and they are being restored under an area regeneration partnership.

The third element in the development of Castlefield was the arrival of the Liverpool and Manchester Railway in 1830. George Stephenson's line crossed the River Irwell by an impressive skew-arched masonry bridge to the north of the canal basin and its terminus, the oldest mainline station in the world, survives in Liverpool Road backed by the impressive ranges of the earliest custom-built railway warehouses in the world. The Grade I Listed station building, with its quasi-domestic appearance, contrasts strongly with later, grander, mainline termini emphasising the pioneer nature of its design. Nevertheless, it introduced the concept of separate facilities for different classes of passenger and the internal layout of the Museum of Science and Industry in Manchester preserves the distinctions. The Liverpool and Manchester Railway was a spectacular commercial success which served as a model for railway entrepreneurs throughout Europe and in North America. Locally, it was soon followed by other lines, and many of these cross the Castlefield area on impressive metal viaducts which, when they are reflected in the canal basins below, impart a spectacular aspect to the area.

Contemporary notice of the Liverpool and Manchester Railway focussed on the structures at either end and on the Sankey Viaduct where it crossed the St Helens Canal. The termini and the Sankey Viaduct became icons for the new method of transport and thus, as much of the Liverpool end has gone, the features at the Liverpool Road Station and its approaches in Manchester, with the Sankey Viaduct, encapsulate the line.

### Boundaries

The proposed Site starts at The Delph, Worsley where the Bridgewater Canal emerges from the underground colliery canal system. It includes the southern part of the Conservation Area bounded by the southern side of Worsley Road to include the Green and its associated houses, and south to where the Canal leaves the Conservation Area. It then follows the southern bank of the Canal and its western arm to join the western boundary of the Area.

The proposed Site then comprises the Bridgewater Canal itself, broadening at Barton to include that part of the Conservation Area to the east of Barton Road containing the Swing Aqueduct with its island and swing bridge, the canal cottages south of the aqueduct and the surviving abutment of Brindley's original aqueduct, and thence on to Manchester where it enters the Castlefield Conservation Area. It broadens to include the canal arms and basins bounded by the River Medlock to the north west and Egerton Street to the west picking up the Conservation Area boundary to the east of the church and thence to Deansgate. To the north west it follows the railway viaduct, over Water Street to the River Irwell,



includes the railway bridges over the Irwell. The railway structures in the Castlefield area are included, but the track itself and related operational infrastructure such as signalling, cabling etc is excluded. The boundary continues along the eastern bank of the river past the canal entrance lock and the warehouses converted into an hotel to New Quay Street, back along the east side of Water Street broadening to take in the Grape Street Railway Warehouse, the 1830 Liverpool Road Warehouses and Station, continuing behind the warehouses over Lower Byrom Street, along Tonman Street to meet the Conservation Area boundary at Deansgate.

## New Lanark

Long. 3°46'84" W / Lat. 55°39'89" (ii)(iv) C  
N  
South Lanarkshire, Scotland.

New Lanark has survived little changed from the period of the early Industrial Revolution in the late 18th and early 19th centuries. It comprises an outstanding natural and cultural ensemble, centred on a pioneering cotton-spinning village and surrounded by an incomparable natural and designed landscape, including the most important woodland complex in Central Scotland.

The village was founded in 1785 by the enterprising Glasgow banker, David Dale, as a new industrial settlement on the banks of the River Clyde. Built to exploit the water power offered by the Falls of Clyde, the mills were in operation from 1786 to 1968. Lying just 37 km south of Glasgow and 55 km west of Edinburgh, New Lanark has from its conception aroused, and capitalised upon, an international recognition born of its considerable architectural, technological and historic interest and the sublime majesty of its setting.

David Dale's son-in-law, Robert Owen, became manager in 1800 and under his enlightened management New Lanark was to achieve lasting international fame as a model community. Between 1800 and 1825, Owen set about improving and expanding the business, and he used the profits to finance a series of social and educational reforms to improve the quality of life for the workers. Owen believed environment to be the most important factor in the formation of human character, and that social co-operation should be the model for society rather than competition. His goal was the formation of a co-operative and harmonious society, based on mutual dependency, supported by education and improved working conditions. These theories, widely disseminated and embodied at New Lanark, held a particularly broad appeal in the years of unrest following the Napoleonic Wars. Owen established progressive schools for the village children - including the first infant school in the world - and introduced free medical care, reduced working hours and a Village Store, which sold food and household goods at almost wholesale prices. The social and economic systems that Owen developed were considered radical in his own time but are now widely accepted in modern society.

The mill village is made up of industrial, residential and community buildings, dating predominantly from between 1786 and the 1820s. The mill buildings (originally with four 5-7 storey mills, now reduced to three) sit on the natural terrace to the east of the River Clyde in this deeply incised, wooded river valley. The complex is covered by near-blanket listing in recognition of the outstanding importance and physical form of its entirety. Elements of sophisticated early town planning are evidenced in the orchestration of the various components in the village, from the mill weir, its lade and tunnel to the south, to the channels and sluices leading off to the individual mills, the generous circulation spaces, gardens, tailored walks and viewing points realised from the start. Technology was always at the forefront in Owen's drive for efficiency and both the 3rd and 4th mills were designed to house Crompton's Mule (a new design, which improved on existing capabilities). The model housing was arranged to maximise density on the site, in its 3- and 4-storey blocks.

Owen's new Institution for the Formation of Character (1816) and the new school (1817) sit on ground which could otherwise have been given over to manufacturing.

In the wider landscape, four neighbouring estates (Bonnington, Braxfield, Corehouse and Castlebank) dictated the form of the harnessed parklands of the late 18th and early 19th centuries and ensured that the sublime natural phenomenon became a tourist attraction well punctuated by buildings, chained walkways and bridges. The extensive, dramatic scenery focused on the Falls of Clyde, the Corra Linn and Bonnington Linn waterfalls, and the series of lower waterfalls at Dundaff Linn. As early as 1708, the owners of the Bonnington estate built a mirrored view house to maximise their views of the Corra Linn. By the time Paul Sandby had sketched his views of the area in the late 1740s, the Falls of the Clyde were already part of a well-worn tourist trail for those in search of the sublime and picturesque. There followed a whole series of paintings by artists such as, Jacob Moore and J M W Turner, and the area was also visited by well-known writers and travellers such as William and Dorothy Wordsworth and Sir Walter Scott.

The natural landscape was romantically articulated by significant man-made additions, most of which are still extant, such as the artificially excavated Wallace's Cave, the Bonnington View House and Lady Mary's Walk.

The Site is in the care of the New Lanark Conservation Trust, set up in 1975 to restore

and preserve the historic village. The majority of the housing and mill buildings are now restored and in use. New Lanark continues as a thriving community where people, live, work and visit. Some 180 people live there on a permanent basis and the universal heritage value of the site is protected by a range of cultural and natural heritage designations.

### Boundaries

The proposed boundary follows that of the New Lanark Conservation Area. It safeguards the views from the village both up to the brow line of the gorge and up and down stream. It includes the upstream falls and takes in those parts of the designed landscapes which run up the steep riverbanks. The intention of the Conservation Area is to protect the sylvan setting of the village and its valley and the boundaries thus seek to protect the skyline of the valley too. As such, the Conservation Area effectively includes the necessary buffer zones, though further considerations will be given to whether even broader buffer zones may be justified.



## Pont-Cysyllte Aqueduct

Long. 3°10'22" W / Lat. 52°57'62"

(i)(ii)(iv) C

N  
Denbighshire, Wales

Pont-Cysyllte Aqueduct is one of the world's most renowned and spectacular achievements of waterways engineering. Built as part of the improvement of transport to provide the arteries of industrialisation, the structure was a pioneer of cast iron construction and was the highest canal aqueduct ever built. As such, it is one of the heroic monuments which symbolise the world's first Industrial Revolution and its transformation of technology.

The aqueduct was built between 1795 and 1805 to carry the Ellesmere Canal over the Dee valley in North Wales. The approaching levels of the canal on either side required a crossing at 38m above the River Dee. An earlier plan to carry the canal lower by incorporating locks on either side of the valley was rejected as impractical in its water consumption, and the decision was taken to build an aqueduct of unprecedented height. The resident surveyor responsible was Thomas Telford, working under William Jessop, the most prolific canal engineer of the period.

The height necessitated the introduction of novel methods to replace the heavy construction of earlier aqueducts which had double skins of masonry and puddled clay fill. The spans were instead made of cast-iron plates bolted together into a trough, with cast-iron arch ribs supporting them from beneath. Altogether, 19 spans were built, comprising an overall length of 313m. The towpath was supported on iron braces above the 3.6m wide trough, allowing water to move freely as boats passed. All the iron members for the aqueduct were cast by William Hazledine, one of the leading iron founders of the Industrial Revolution, at the nearby Plas Kynaston Ironworks, established in order to carry out the contract. The tapering masonry piers were built hollow in their upper sections to reduce their weight.

The embankment to the south is itself one of the largest canal earthworks ever constructed. Three original over-bridges, to the north and south of the aqueduct, are important examples of the composite use of cast-iron and masonry, having shallow segmental masonry arches supported by curved cast-iron ribs. To the north of the aqueduct lies Trevor Basin, where the navigable water feeder from Llangollen meets the terminus of the main line of the Ellesmere Canal as completed. The terminal basin contains a wharf for primitive railways from adjacent coal mines and the Plas Kynaston Ironworks, and there are ancillary buildings including two dry docks, a canal hotel, a former warehouse, and a lengthsman's house.

### Boundaries

The Site is defined as a continuous section of the original Ellesmere Canal extending for 1.5km with the aqueduct near its centre. The linear extent of the Site is from the top of the terminal basin at the north to the canal at the village of Froncysyllte in the south, with a further stretch of the Llangollen water feeder as far as the first over-bridge to the west. The Site is bounded by the historical land boundaries of the Ellesmere Canal. These consist of fences along the foot of the embankments at both ends of the aqueduct, walls and fences around the boatyard terminal basin to the north, and fences and hedges on either side of the canal.

## Saltaire

Long. 1°48'15" W / Lat. 53°49'73"

(ii)(iii)(iv) C

N  
Shipley, West Yorkshire,  
England

Saltaire Mills and settlement is the finest example in England of an integrated textile mill with its associated housing and public buildings. It was the most complete model village to be built in the textile industry and has survived better than any of its peers.

Developed from 1850 onwards, Saltaire represents the culmination of a process that began in the Derwent Valley in Derbyshire a century earlier. At Saltaire, the Factory System, based on mechanised textile production pioneered first by Lombe with his Silk Mill at Derby and greatly developed by Richard Arkwright and his associates at Cromford and numerous other sites in the Derwent Valley and elsewhere, achieves its apogee as regards the integration of processes and transport, the utilisation of steam power, the provision of housing and social amenities, all dignified by unified architectural treatment. The proposed Site comprises the area designated as the outstanding Conservation Area of Saltaire and includes the Mills, terraces of hierarchically arranged employees' dwellings, shops, almshouses, a former hospital and school, a magnificent Congregational chapel, an institute, a college and a landscaped park.

Saltaire is named after its creator, Titus Salt, and the river it is built beside - the River Aire. Salt had made a fortune through exploiting the use of alpaca and mohair in worsted manufacture, and by 1850 was Bradford's biggest employer of labour, running six mills in the city. From 1850 onwards he employed the leading local architectural practice, Lockwood and Mawson and the greatest mill engineer of the era, William Fairbairn, to build a massive new mill on the southern slopes of the Aire valley some three miles (5 kms) north of Bradford. Its massing and the use of Italianate style was intentionally impressive as it was designed to be the perfect illustration of planned integration, comprehending not only the processes within the complex but also the relationship between the mill and its surroundings. The new settlement was part of the original plan and the mill was situated to take advantage of the river for water and the canal and railway for transport.

The mill opened in 1855 and was seen as the epitome of technological advance. The fire-proof, five-storey ranges (some 60 bays long) housed spinning, sorting and warehousing, while the two single-storey blocks housed other preparatory processes, warping and weaving. The two pairs of beam engines were designed by Fairbairn and working together were considered capable of producing 1,250 horse power. They were supplied by a rank of low subterranean boilers and drove the complex by a combination of underground shafting, upright shafts and belting. A range of offices was set on the western side of the complex and incorporated a private suite for Salt himself who lived some distance away. It



was extended by the addition of a New Mill with campanile chimney in 1868 and dyeLouses in 1871.

Once the mills had been built, construction started immediately on the settlement and amenities. By the end of the following year a large dining room had been built across the road from the mill and 168 houses and boarding houses - accommodation for about 1,000 people - was complete. By 1861 there were 447 houses, increasing to 824 houses a decade later, by when the population had risen to 4,300. Construction of the village was also the responsibility of Lockwood and Mawson and continued until 1876. Its layout was on a grid pattern with streets named after Queen Victoria and her consort, Salt's family and latterly the architects themselves. The houses, which were all built for rent, were intended for the various grades of the mill workforce, and although this was reflected in their style, size and situation, tenancies indicate that the division was not rigid. The overlookers' houses were better appointed than the workmens' houses, and in the case of some of the later large examples in Albert Street were occupied by senior executives.

Salt provided a wide range of facilities - 14 shops were ready for-occupation in 1854, and the Dining Room was also used at first for religious services and as a schoolroom and public meeting hall, while a baths and wash house, incorporating a Turkish bath, was built in 1863. The magnificent Congregational Church was built in 1856-9 and a site gifted for a new Wesleyan Methodist Chapel in 1866. A new school opened in 1868 along with 45 almshouses and a small hospital and dispensary.

An Institute which included a reading room, library, games rooms, lecture halls for 800 and 200 people, a school of art, a drill room, gymnasium and armoury, was built in 1869. Saltaire Park north of the river was provided for recreation and games in 1870.

Titus Salt died in 1876, his vision of a utopian mill settlement largely complete but restrictions on trade to America, imposed by the McKinley tariff, caused the Company to be wound up in 1892. Under new ownership the mills were in full production by 1895 with further-sheds being built to the east, while another change in ownership in 1918 saw more expansion and the provision of additional recreational facilities. The Depression of 1929, however, was followed by the sale of the village severing the close social link between mill and settlement. Textile production finally ceased in 1986 and the following year the freehold of the mill was purchased by the entrepreneurial business developer, Jonathan Silver. Under Silver's vision, Saltaire Mill became a flagship regeneration project, combining in the main mills a mix of art galleries, restaurants and retail shopping with micro electronic production. The success of this venture encouraged rehabilitation of the derelict mills north of the canal for offices and apartments. The settlement, under a town scheme established in 1989, has also preserved its character and now the village and its public buildings, like the mill, are experiencing levels of interest comparable to that experienced as a model mill and village under Titus Salt.

#### Boundaries

The proposed Site comprises the existing Conservation Area which encompasses the mills, ancillary and public buildings, Robert Park, and successive phases of planned housing, all within a tightly delineated area in the valley of the River Aire.

## The Forth Rail Bridge

Long. 3°23'23" W / Lat. 56°00'04"  
N  
Fife and Edinburgh, Scotland

(i)(ii)(iv) C

The Forth Rail Bridge, which was opened in 1890, is an internationally recognised symbol of the achievements of late 19th century engineering. Its robust and original design took account of the lessons on the effect of wind on exposed bridges learned from the Tay Bridge disaster of 1879. It was the first major steel bridge in Europe. It is certainly the best known Rail Bridge in the world, and one of the most renowned civil engineering feats of all time.

The Bridge provides a rail link across the River Firth between the Lothians and Fife. It is located on the site of the historic crossing point on the river between what are now the towns of South and North Queensferry. (The name Queensferry refers to Saint Margaret's crossing to the then royal capital of Dunfermline in 1070 for her marriage to King Malcolm Canmore).

Features such as ferry piers by John Rennie, related inns and leading lights, fortifications ranging in date from medieval to Second World War, batteries and coastguard stations perched around quarries in Fife, all point to the narrowing of the Firth at the point that dictated the location of the Bridge.

A road bridge has since 1964 shared the same isthmus as the Rail Bridge. Designed by Mott, Hay and Anderson, it is just longer than the Severn Bridge (1966) and remained the longest suspension bridge in the UK until the Humber Bridge opened, as the world's largest, in 1981.

Long views of the Rail Bridge invariably now include the Forth Road Bridge either in front or behind it. Happily the road bridge is of a completely different form and colour, and there is no possibility of confusing the two. Indeed they make a complementary group.

#### Boundaries

The Bridge spans an isthmus on the River Forth, linking the towns of North and South Queensferry. The proposed World Heritage Site encompasses the Bridge and the Conservation Area designated in each of these towns. It is proposed that the North Queensferry Conservation Area will be enlarged to take in the Fife pier of the bridge, shore defences and the railway pier.



**The Great Western Railway:** Long. 1°07'85" W / Lat. 51°30'91" (i)(ii)(iv)(vi) C  
**Paddington-Bristol (selected parts)** N  
London - Bristol, England

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The Great Western Railway between London and Bristol was authorised by Parliament in 1835, and was opened in stages from both ends from 1838 onwards. The detail of its construction was entirely the conception of Isambard Kingdom Brunel and was to be, in his own words, 'the finest work in the kingdom'. It was opened throughout in 1841 with the completion of Box Tunnel, the greatest engineering feat of early railway construction. Built to Brunel's broad gauge of seven foot, its engineering works achieved a grandeur at that time unmatched elsewhere in the country and, as they were suited to high speed running, most of these structures have survived and are in daily use.

The Great Western Railway is represented by its magnificent termini at Paddington and Bristol Temple Meads, by the portals of Box and Middle Hill Tunnels, by the river bridges over the Avon in its western section and over the Thames at Maidenhead, by the Swindon Railway Works and Village, by the cutting at Sydney Gardens, Bath and by the viaduct at Hanwell. The survival of these, and many other lesser structures such as the station at Bath, combine to make the Great Western Railway the most complete railway of its date in the world. Regarded among other important early UK railways, including the Stockton and Darlington Railway, Liverpool and Manchester Railway and the London and Birmingham Railway, as best representing the primary phase of world railway development, the Great Western is the best preserved of this group.

The structures and buildings along the line were designed to reflect the character and geology of the areas through which the line passed and, at the western end of the line, introduce the theme of the approaching city. Thus from Chippenham to Bath the architecture of the tunnel portals, viaducts and bridges is grandly classical in keeping with Bath's Georgian image, while to the west of the city the detail becomes gothicised reflecting Bristol's historic role as England's second city.

The first element of the proposed World Heritage Site is the complex of first generation buildings at Brunel's Grade 1 Listed Temple Meads Station. The offices and boardroom at Temple Meads are currently being converted into a museum, the engine shed has been turned into The Exploratory, while the train shed is exhibition space. The 1865 front block of the later station is the main reception area for the present mainline station. The original line then sweeps north over the Floating Harbour, and then east on an embankment over the Feeder canal to the River Avon which it crosses by a masonry Gothic arched bridge (Grade I Listed) where the first element concludes.

The proposed Site recommences at Bath. It enters the World Heritage city of Bath via the turreted Twerton Tunnels and a long viaduct with infilled arches. These arches, whose facades are dignified by drip moulds over the window and door openings, were originally let as dwellings in order to recoup some of the engineering expenses of this section of line. The railway approaches the station by a battlemented masonry viaduct which crosses the Avon at a very oblique angle, the original wooden spans having been replaced in brick. Bath Spa Station has lost its roof over the track and has been extended, but the handsome central section of its Jacobean facade is as designed by Brunel. The line then recrosses the Avon with a fine classically detailed three arched masonry bridge with a central 88 feet span before proceeding to Bathwick on a masonry viaduct. The section of line to the east of Bathwick Hill through Sydney Gardens, with its swept retaining walls and cast iron and masonry bridges, is perhaps the most graceful railway townscape in the country. The proposed Site closes beyond the Warminster road bridge.

The next section comprises the portals of the two tunnels at Box where the refined classical portals of the short Middle Hill Tunnel complement the massive western portal of the 3195 yard long Box Tunnel. East of Box Tunnel the railway passes through Chippenham on a long embankment, pierced by an underbridge accommodating the former Great Western Turnpike, leading to the town itself where a impressive viaduct straddles the town centre. The station at Chippenham retains much of its original appearance and there is a handsome masonry outbuilding which, reputedly, was the engineering works office for this section of line.

At Rodbourne Road in Swindon, the proposed Site recommences and broadens to encompass the historic core of the former Railway Works and Village. Many of the industrial buildings of the Works date in part to Brunel's involvement with the Site and have been or are currently being restored for retail, heritage and office uses. The original office building with its later additions now houses the National Monuments Record Centre, Brunel's 1846 Fitting Shop is being converted into a railway heritage centre, while ranges of his wagon shops are incorporated in the Great Western Designer Outlet Centre. The Village was designed by Brunel and largely completed by 1850. In addition to the rehabilitated terraces of masonry cottages which contain a variety of dwelling layouts, it has shops, public houses, a church and rectory, a park, a barracks block for single men (converted to a chapel and then a museum), a Drill Hall (converted to a cottage hospital and now a community centre) and an impressive Mechanics Institute. It is without doubt the finest surviving example in the country of a planned railway town. The proposed Site ceases at the station which, although a sorry remnant of its former glory, is a very historically important site in relation to the railway and the development of Swindon.

East of Swindon the gradient of the line becomes very gentle and there are fewer engineering structures other than bridges, with those over the Thames at Basildon and Goring being particularly fine. The small complex at Didcot has Listed structures and at Steventon a surprisingly grand house was built as a temporary terminus and for a short time housed the GWR boardroom. The core of the station at Reading is also of note, while Sonning cutting to the east of Reading was one of the major engineering works on the eastern half of the line and though comprised by recent development retains much of its original aspect.

The proposed Site restarts to encompass a single structure - the magnificent bridge over the Thames at Maidenhead. Opened in 1838 the twin elliptical central arches of 130ft span were the flattest brick arches built in the country up to that date.



The proposed Site recommences where the line is carried over the valley at Hanwell by the impressive Wharncliffe Viaduct which is on the section of line opened in 1838. Built in brick by Messrs Grissel and Peto in a vaguely Egyptian style, the viaduct is 500 feet long with eight arches of 70ft span and carries the armorial bearings of Lord Wharncliffe in the centre of the southern elevation. The Viaduct was originally 30ft between parapets but was widened in the late 19th century in like style.

East of the Viaduct the proposed Site terminates as the original line becomes lost in the multiplicity of lines carrying suburban as well as mainline traffic. It re-emerges at Paddington Station with its superb trainshed roof designed by Brunel, with architectural embellishment by Sir Digby Wyatt, and the railway hotel and offices. This comprises the final element of the proposal.

#### Boundaries

The proposed Site comprises seven outstanding individual elements and is restricted to the line of the original GWR railway and the structures associated with I K Brunel; it does not include present day track and operational infrastructure.

The first element commences in the west with Temple Meads Station including Brunel's Company Offices, Boardroom, Trainshed on the northwestern side of the present station forecourt, and his Bristol and Exeter Offices on the opposite side of the forecourt. It then follows the line of original bridges over the Floating Harbour, the Feeder and the River Avon.

The second element is within Bath (Twerton Tunnel and Viaduct and Bath Station, St James Bridge, Sydney Gardens), and the third is at Box (Middle Hill and Box Tunnels). The fourth is within Swindon where it broadens out to include, to the north, the Railway Works bounded by Rodbourne Road, Kemble Drive and the Gloucester railway line, and to the south the area of Railway Village bounded by Rodbourne Road, Faringdon Road and East Street and along the line to the station.

## United States of America

### **Brooklyn Bridge**

New York . Lat.40°42' N. ;Long. (iv) C  
73°57' W

Brooklyn Bridge, New York. Built by John A. and Washington A. Roebling, the Brooklyn Bridge was one of the world's first wire cable suspension bridges. The technical problems faced in its construction were solved by solutions that established precedents in bridge building. The cables themselves are supported by two massive Gothic pylons, each with two pointed arches. The main span is 1595 feet.

### **Eads Bridge**

Illinois - St.Louis, Missouri (iv) C  
Lat.38°40' N. ; Long. 90°10' W

Eads Bridge, Illinois-St. Louis, Missouri. The first major bridge in the world in which steel was employed in the principal members. The secondary members and the tubes enveloping the steel staves forming the arch ribs are of wrought iron.

### **General Electric Research Laboratory**

Schenectady , New York (vi) C  
Lat. 42°50' N. ; Long. 73°55' W.

General Electric Research Laboratory, Schenectady, New York. A three-building complex recognized as the first industrial research facility in the United States. Since its construction in 1900, work at the laboratory has made many contributions to scientific knowledge, especially in the areas of physics and chemistry.

### **Goddard Rocket Launching Site**

Massachusetts . Lat.42°12' N. ; (vi) C  
Long. 71°50' W.

Goddard Rocket Launching Site, Massachusetts. At this site, on March 16, 1926, Dr. Robert H. Goddard launched the World's first liquid propellant rocket, an event that set the course for future developments in rocketry.

### **Lowell Observatory**

Arizona . Lat. 35°12' N. ; Long. (vi) C  
111°40' W.

Lowell Observatory, Arizona. Astronomical research conducted at this observatory, founded by Dr.Percival Lowell, has greatly enhanced man's knowledge of the universe. Most significant of the observatory's discoveries was the first observable evidence of the expanding universe, made by Dr. V.M. Slipher in 1912. The observatory is also noted for intensive studies of Mars, the discovery of Pluto, and research in zodiacal light and sunspot phenomena. The 24-inch Lowell refracting telescope, installed in 1896, is in operation in its original housing.



**McCormick Farm and Workshop** Virginia . Lat. 37°40' N.; Long. (vi) C  
79°35' W.

McCormick Farm and Workshop, Virginia. Of the inventions that revolutionized agriculture during the first half of the 19th century, the mechanical reaper (1834), was probably the most important. The well-preserved farmhouse and workshop of Cyrus McCormick, its inventor, are included within this property.

### **Original Bell Telephone Laboratories**

New York . Lat. 40°45' N. ; Long. (vi) C  
74°0' W.

Original Bell Telephone Laboratories, New York. From 1898 to 1967, America's largest industrial research laboratory, responsible for numerous contributions to pure science and pioneering work in telecommunications technology.

**Pupin Physics Laboratories** Columbia University , New York (vi) C

Pupin Physics Laboratories, Columbia University, New York. Enrico Fermi conducted his initial experiments on the fission of uranium in these laboratories. In addition, the uranium atom was split here on January 25, 1939, 10 days after the world's first splitting in Copenhagen. The cyclotron control room contains the table which held the instruments used on that night. The United States would consider nominating this site only if the Copenhagen location is no longer extant.

**Trinity Site** New Mexico . Lat.33°45' N.; (vi) C  
Long. 106°25' W.

Trinity Site, New Mexico. The world's first nuclear device was exploded here in July 1945.



#### 6.10. Europe / North America Tentative Industrial Heritage Classification



## Europe and North American Countries with Tentative Lists

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### Analysis of Industrial World Heritage Values

Country	Pot. Sites	C/N/M	Site name with stated Industrial WH	Description	Site name with Assoc. Ind. Value	Description	Industrial Classification
<b>0. EXTRACTIVE INDUSTRIES</b>							
Germany			Ore Mountains: mining and cultural landscape	800 years ore mining			1
Italy					Parco Archeologico Urbano e colline metallifere (Volterra)	8 <sup>th</sup> c. BC city, cultivated landscape, Colline Metalifere metallurgical tradition, mining since Etruscan times	1
Germany			The Cultural Industrial Landscape of the "Zollverein Mine"	Biggest industrial conurbation for one century, mining industry, 1930 masterpiece of engineering and design, workshop hall, compressor halls, cooling towers, etc			2
Romania	13	9/4/0			L'ensemble rupestre de Basarabi	Monastic monuments in <u>ancient stone mine</u> , paintings	4.0
Austria					Old part of Hall in Tirol	Salt historic town, historic buildings, <u>salt works</u>	4.6
Italy	62	45/10/7			Fascia costiera da Castellammare del Golfo a Trapani, con Erice, Mozia e la Isole Egadi	Costal Sicily landscape, <u>saline and its milled-system</u>	4.6
Spain					La Ruta de la Sal (Canarias)		4.6
Poland	8	8/0/0	Krzemionki Opatowskie. Neolithic flint mine	Archaeological reserve containing several thousand Neolithic mining units 4 <sup>th</sup> m. BC, different mining techniques			4.9
Israel			Timna	Ancient mineral mining and smelting, copper ore, mine working shafts and galleries, 11 mining camps late Bronze Iron Age to eraly Arab			5.0



Sweden	3	2/0/1	Copper mine of Falun	12 <sup>th</sup> century still running copper mine, most buildings 18 <sup>th</sup> c.			5.0	
UK	23	17/4/2	Cornish Mining Industry	Cluster of 7 areas representing metal mining for 4000 years, tin and copper largest producer in 1 <sup>th</sup> to 19 <sup>th</sup> c., mining landscapes, buildings, mineral railway and mineral ports, tin and copper smelters, foundries, drill manufacturers, gunpowder, explosives, ropewalks, candle factories, brickworks			5.0	14
Slovenia	4	4/0/0	The Mining Town of Idrija	500 years mercury mining, mining shaft system 700 km, well preserved installations			5.9	
<b>1. BULK INDUSTRIES</b>								
Hungary	12	9/2/1	State Stud-farm Estate in Mezöhegyes	1784 center of horse-breeding and animal husbandry, large-scale farm, buildings			10	
Czech Republic	13	12/1/0	Fish pond Network in Trebon Basin	1518, fishpond network, manmade water ditch, dams			13.0	81.3
Andorra	2	2/0/0	0		Eglises romanes d'Andorra	Historic churches, villages, <u>Graining mills with hydraulic energy, Water reservoir, canals</u>	13.2	
Hungary					Tokaji Wine Region Cultural landscape	7248 km2, grape vine cultivation, settlements, vine houses and vaulted or carved cellars, <u>multileveled, network</u>	13.4	
Netherlands			Van Nelle Fabriek (Van Nelle Factory)	1925 factory for refining and packing of coffee, tea and tobacco			13.5	
Austria			Old part of Steyr including Wehrgrabenviertel	Symbiosis of well-preserved medieval houses with adjacent industrial settlement, iron industry, hydraulic power reservoirs			14	87
Austria			Styrian Erzberg and Eisenstrasse (Iron Road)	Erzberg most prominent ore mining example of Central Europe, smelting industry, wheelworks once biggest charcoal furnace on the continent, Bronze Age copper extraction, standard-gauge cogwheel railway, historic villages			14	11.4
Czech Republic			Industrial Complexes at Ostrava	19 <sup>th</sup> c., Coal mines, coking plants, blast furnaces, anthracite-based production of iron, coal mining, ironworks, railroad network, shaft 671m, electrification machines, blast furnace, settlement			14.2	2



UK			Derwent Valley Mills	Narrow, 24 km long stretch of Derwent Valley, textile mills 18 <sup>th</sup> and 19 <sup>th</sup> c., water power for cotton spinning, watercourses network, North Midway Railway, aqueduct			15.0	
UK			New Lanark	Pioneering cotton-spinning village of late 18 <sup>th</sup> and 19 <sup>th</sup> c., most important woodland complex in Scotland, industrial settlement, Robert Owen social plannings, mill village			15.0	87
UK			Saltaire	1850, Saltaire preparatory process, textile mills and utopian mill settlement			15	87
Austria	12	12/0/0			Bregenzer Wald	Farming landscape, <u>farmstead villages</u> , <u>textile workshops</u>	15.1	
Czech Republic			Paper Mill at Velké Losiny	16 <sup>th</sup> c. handmade paper mill, paper work shops, Francis turbine, water wheel			16.4	
Poland					The valley of the Pradnik river in the Ojcowski National Park	Cultural landscape, human settlements for 8000 years, castles, <u>early gunpowder factory</u> , <u>mills</u> , <u>saw-mills</u> , <u>fulling mills</u> , fauna	16.6	26

## 2. MANUFACTURING INDUSTRIES

Germany			Shoe last factory Carl Benschmidt, Fagus-Werk	1914 Shoe last factory, sawmill, production machines			21	
USA			McCormick Farm and Workshop	Virginia, 19 th c., mechanical reaper 1834, well preserved			21.2	

## 3. UTILITIES

Netherlands					Noordoostpolder (North East Polder)	Reclaimed farming zone, <u>1940 3 pump stations</u>	31.3	
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5. TRANSPORTATION								
Slovakia	8	5/3/0	The Kysuce - Orava narrow-gauge railway	1915, 110km, 218 m heights difference, narrow-gauge railway			47	
UK			The Great Western Railway: Paddington-Bristol (selected parts)	1841, railway, tunnels, viaducts, bridges, station buildings			47	
Netherlands	12	12/0/0			Historic center of Amsterdam	Middle Ages historic center, 17 <sup>th</sup> c. concentric, half-moon shaped ring of canals	49.0	
Spain			El Canal de Castilla, Castilla-León				49.0	
UK			Manchester and Salford (Ancoats, Castlefield and Worsley)	Archetype of industrial revolution, Britain's first industrial true canal with aqueduct, first intr-city passenger railway and first industrial suburb on steam power, system of underground canals, individual cotton mills, skew-arched masonry railway bridge, oldest mainline station in the world			49	15.0
Italy					Porto di Roma	Unique blend of historical late Roman and archaeological values, ruins of great harbour city, two artificial docks	50.0	
UK			Liverpool Commercial Centre and Waterfront	from 1th c. to WW I, 1.4 ha commercial docks by 1715, hydraulic towers, pumphouses, warehouses			50.0	
7. BRIDGES, TRESTLES, AQUEDUCTS								
Russian Federation	17	13/3/1	Railway Bridge Over Yenisey River	Eastern Siberia, Siberian railroad, 1896 1 km long Railway bridge			60	
UK			The Forth Rail Bridge	1890, first major steel bridge in Europe			60.3	
USA	72	42/30/0	Brooklyn Bridge	New York City, One the world's first wire cable suspension bridges, main span 1595 feet			61	
USA			Eads Bridge	St.Louis, Illinois, first major bridge with steel employment			61	
Israel	23	15/1/7			Caesarea	Mediterranean port city since hellenistic period, city buildings, high-level aqueduct,	62	50
UK			Pont-Cysyllte Aqueduct	1800 cast iron, highest canal aqueduct, 313 m long			62	49.2



9. SPECIALIZED STRUCTURES AND OBJECTS							
Israel					Shivta	Late Roman desert city, buildings, <u>remains of canals, dams, drainage system</u>	81
Netherlands			Nieuwe Hollandse Waterlinie (New Dutch Inundation Line)	Building projects 19 <sup>th</sup> c., 3-5 km inundation zone, defence system with 6 basins regulated by dikes, culverts, canals, fan locks, dams, sluices			81.0
Spain					Marismas del Odiel	Characteristic drainage system	81.3
Turkey	16	16/0/0			Güllük Dagi-Termessos National Park	Ancient city of Termessos, 1050 m high, <u>building remains, cisterns and drainage system</u>	81.3
USA			Goddard Rocket Launching Site	Mass., 1926, launched the world's first liquid propellant rocket			82.1
USA			Lowell Observatory	Arizona, Astronomical Observatory, 1896 original			82.5
Germany	21	20/0/1	Mine of Rammelsberg and historic town of Goslar - Extension by the "Oberharzer Wasserwirtschaft", i.e. the "Upper Harz Water Management System"	Medieval water management system, dam, drainage channel 1150, water ducts network, aqueduct 953m, historic mining landscape			81, 2
Spain	28	22/4/2	Colonias industriales de los ríos Cardener y Llobregat				87
USA			General Electric Research Laboratory	Schenectady, New York, Laboratory, 3 building complex as first industrial research facility in USA, 1900			92
USA			Original Bell Telephone Laboratories	New York, 1898-1967, America's largest industrial research laboratory, pioneering telecom technology			92
USA			Pupin Physics Laboratories	Columbia University, New York, second Uranium atom split place 1939, intact and original			92
USA			Trinity Site	New Mexico, world's first nuclear device explosion, 1945			92



#### 6.11. Latin America / Caribbean Tentative list analysis and description



## Latin America /Caribbean Countries with Tentative Lists

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### Analysis of Industrial World Heritage Values

Country	Pot. Sites	C/N/M	Site name with stated Industrial WH	Description	Site name with Associate Industrial World Heritage	Description	Industrial Classification
<b>Argentina</b>	1	1/0/0	0		0		
<b>Brazil</b>	18	7/9/2	0		0		
<b>Chile</b>	19	17/2/0	<b>Humberstone and Santa Laura Nitrate Offices</b>	1810, Sodium Nitrate Exploitation, grinding and crushing installations, nitrate railway network,			12.0
			<b>Locomotive depot of Temuco Railroad Station</b>	1920, Locomotive depot, workshops, coal elevator			47
			<b>Malleco Viaduct</b>	1890, highest railroad bridge, one of largest metal engin. works in Chile			63
					<b>San Pedro de Atacama</b>	Desert cultural town since 10000 B.C., tombs, relicts, town of San Pedro, Copper mine, salt mine	5.0, 4.6
			<b>Sewell Mining Camp</b>	1904, Copper mine, concentrating camp, hydroelectric plant, ore cableways, 1909 sulphuric acid factory, railroad line 1911, settlement			5.0, 12.0, 87
					<b>Valparaiso</b>	Spanish Settlement 1599, commercial port, boom 1930, complicated traffic network, elevators, funiculars	47.9
<b>Colombia</b>	9	4/3/2			<b>Buritaca 200, Ciudad Perdida – Sierra Nevada de Santa Marta</b>	Historic settlements, 9 <sup>th</sup> c., <u>drainage systems</u>	81.3
			<b>Sistema Hidraulico Prehispanico del Rio San Jorge</b>	Prehispanic artificial channel system 20000 ha, artificial drainage system			81.3



<b>Costa Rica</b>	1	1/0/0	<b>San José-Lomon Region</b>	1176m culture natural beauty, important net of railways, tunnels, bridges, technological heritage 19 <sup>th</sup> and 20 <sup>th</sup> c.	0		47
<b>Cuba</b>	1	0/1/0	0		0		
<b>Ecuador</b>	5	3/1/1	<b>Cuidad de Zaruma</b>	Hispanic settlement, 2100m, important center for mining industry	0		
<b>El Salvador</b>	6	3/0/3	0		0		
<b>Guyana</b>	4	3/1/0	0		0		
<b>Mexico</b>	10	10/0/0	0		<b>Antique cité maya, Calakmul</b>	3 Maya construction ensembles, <u>important system of reservoirs, irrigation system</u>	81.3
<b>Nicaragua</b>	5	1/3/1	0		0		
<b>Panama</b>	1	0/1/0	0		0		
<b>Paraguay</b>	3	1/2/0	<b>Sistema Ferrocarril Pte. Carlos Antonio Lopez</b>	1861, Elevator system, steam locomotives	0		47
<b>Peru</b>	2	2/0/0	0		0		
<b>St. Christopher and Nevis</b>	2	2/0/0	0		0		
<b>Suriname</b>	2	2/0/0	0		0		
<b>Uruguay</b>	1	1/0/0	0		0		
<b>Venezuela</b>	1	1/0/0	0		0		
<b>18 countries</b>	<b>91 pot. sites</b>	<b>59/23/9</b>	<b>8 Sites with stated potential Industrial World Heritage (IWH)</b>		<b>4 potential World Heritage Sites with Associated Industrial Value (AIV)</b>		



# Latin American and Caribbean Countries Tentative List

## Tentative Industrial World Heritage Sites (TIWH)

### And

## Tentative Sites with Associated Industrial Value (TAIV)

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### Brief description on the sites

#### CHILE

##### **Humberstone and Santa Laura Nitrate Offices**

Long. 69°49' W ; Lat. 20°12' S

C (ii)(iii)(v)

The sodium nitrate exploitation started around 1810. Its first use was as explosive, and its first market, Peru. Later on, its fertilizing properties were discovered. The first shipments to Europe and the United States were sent in 1830, for being use as fertilizer in agriculture. Starting from that year, the demand for nitrate showed an explosive increase. The only productive areas were the pampas extending from the Tarapaca area to Antofagasta on the south. The entire area became peopled with European, Chilean and Peruvian investors and workers. The stress caused by the strong Chilean presence in a territory under the Peruvian and Bolivian sovereignty, provoked the so called Pacific War (1789-1884), resulting in the incorporation of the area to the Chilean territory.

Nitrate was a fundamental element for the development of agriculture at a world-wide level. Its exploitation constituted a paramount activity regarding Chile's economic, social and political development. This activity, carried out in the solitude of the desert, gave birth to a unique way of life and productive system, characterized by creativeness, tenacity and effort.

The Humberstone Nitrate Office, originally called La Palma, was built in 1872 by the Peruvian Nitrate Company. By 1889, it was one of the largest nitrate companies in Tarapaca. The Great Depression caused the paralysation of works, which were resumed by 1933, once the Office became property of the Tarapaca and Antofagasta Nitrate Company. On being reopened, it was given the name "Santiago Humberstone Office", in honor of the English chemical engineer who adapted the so called "Schanks" productive system to the nitrate industry.

Between 1933 and 1940 it reached its maximum development, to the point of housing a population of 3,700 people. The Tarapaca and Antofagasta Nitrate Company fell into an acute crisis in 1958, which ended in its liquidation. Humberstone was definitively closed. The office, along with the others of the so called Nebraska Group -Santa Laura, Nebraska, Pena Chica, Keryma- was sold at auction in 1962, and its property adjudged to a private.

The Santa Laura Nitrate Office was built in 1872 by the Barra and Riesco company, being awarded to the Foelsch and Martin firm in 1897. The office paralyzed its activities in 1913, yet resumed works in 1915 after replacing the old machinery with other of the Schanks system that improved productivity. Santa Laura had 450 inhabitants by 1920. The office paralyzed during the Great Depression, being purchased by the Tarapaca and Antofagasta Nitrate Company, sharing Humberstone's fate.

Both Humberstone and Santa Laura operated with the Schanks system for nitrate processing. The process started with the open-cut extraction of saltpeter from the pampa's deposits. The ore was then transported to the grinding and crushing installations; then it went through "cachuchos", iron tanks provided with serpentines heated by steam boilers. Inside these tanks the dissolution of saltpeter or leeching took place. The resulting solution, saturated of sodium nitrate, was clarified in iron tanks called "chulladores", where the sediment decanted. The resulting broth was pumped into crystallization washing pans, thus obtaining the sodium nitrate; a new crystallization produced the potassium nitrate. The uncrystallized product was used in the elaboration of other salts, such as borax, iodine, etc. The left-over material of leeching -rubble-, was transported in carts to the so called "rubble cake".

Santa Laura still keeps the characteristic industrial structures of a Schanks nitrate office. There is the grinding facility, built of stone, Oregon pine and zinc, inside which three grinding and crushing machine remain. There is also the large structure of Oregon pine pillars and beams, housing the "cachuchos" and leeching tanks, and a well preserved tall chimney 40 meters high and 1 meter in diameter. This chimney is the characteristic installation of Santa Laura and a landmark within the pampa's arid landscape. The so-called "Casa de Yodo" (Iodine House) keeps part of the implements used for processing this element. Also standing up are an office building, seven constructions corresponding to workshops and machine shops, and the huge rubble cake which occupies a surface of about 300,000 square meters.

There are still remains of the railway connecting Santa Laura and Humberstone with the nitrate railroad network. The Santa Laura encampment is practically dismantled, with only part of the school and a small houses area still standing up. There are traces of the square and of some sports fields. The Management House with an adjoining park still exist.

With regard to Humberstone, although the industrial area has been dismantled and is very deteriorated, the office's urban area still evokes the nitrate pampa way of life, and its planning and design reflect the concepts developed by the architectural schools of the Industrial Revolution.

Nowadays, it is possible to appreciate the office's social, commercial and public areas, with its restored chapel, the white arches of the store, the magnificent theater built in wood, the hotel and the social club, the large swimming pool with its flight of steps, the school and square. It is worth mentioning that these buildings still have good part of its furnishing: the



theater has its seats, the store its counter and shelves, the hotel its large iron stove, etc.

Humberstone's Management House, built in 1883, is of great interest. This building is characteristic of the English nitrate offices, being only two of its kind still in existence: this one and that of the Iris office. At the entrance to Humberstone is the residential area for workers and employees. Although its state of conservation is not ideal, the group, built in adobe and wood partitions and following a criss-cross pattern, is a fine example of the pampa encampment. The huge rubble cake, evocative of the great richness created by the work of Humberstonets energetic inhabitants, rounds off these constructions.

### **Locomotive depot of the Temuco Railroad Station**

38°44' S

Temuco: Long. 72°37' W ; Lat. C (iv)

Railroad officially arrived at Temuco the very first day of 1893. It is believed that the first locomotive depot was located a few meters to the north of the present one, in lots handed over to the State Railroad Company by mapuche people.

Temuco turned into an important railroad center, where long-run trains changed locomotives. That depot also housed the locomotives of the trains covering the branch lines to towns such as Carahue, Cunco and Cherquenco. During the first decades of this century, complex locomotive repair and maintenance works were performed in the Temuco locomotive depot. After the San Bernardo Machine Shop started operating in 1920, the Temuco depot kept on doing uncomplicated repairs.

By 1930, the insufficiency of the original depot became ever so evident, so the construction of a new one -that existing at present- was decided. The construction was made in two stages, between 1937 and 1941; at first, the new depot complemented, without replacing, the old one. Until 1954, only steam locomotives were serviced in Temuco; from that year on, diesel machines started being repaired. By 1980, the permanent allocation of the complex consisted in two type 56 steam locomotives, eleven type 57, one type 58, nine type 70, and fourteen type 80.

In 1982, the State Railroad Company's management ordered the constitution of a steam-drive reserve fleet with base in Temuco. On account of this, during the following years, tens of locomotives there housed were repaired. The fireboxes of the last locomotives went out definitively by the end of 1983, fact which, in turn, signaled the end of the locomotive depot's normal operation. The precincts kept on being used for doing minor repairs and for the remarshal of diesel locomotives, type D-16000 and others, and as operational base for tracks maintenance works. The Temuco depot was the steam locomotives operational base that ceased to operate later in the country.

The locomotive depot and the rolling stock it houses are property of the State Railroad Company. It occupies an area of about 19 hectares, one kilometer to the north of the Temuco Railroad Station. It is a railroad complex whose essential component is the round, roofed depot

made of concrete. It has 34 tracks surrounding a 27 meters long turntable, capable of rotating a type 80 locomotive, with tender, weighing over 160 tons. Near to the round depot there are a repair workshop, administrative offices, dressing rooms for the personnel, a large coal elevator for charging fuel into the locomotives' tenders, a coal deposit, and a coach repair shop.

### **Malleco Viaduct**

Collipulli: Long. 72°27' W ; Lat.  
37°58' S

C (i)(iv)

The Malleco Viaduct was in its time considered the highest railroad bridge in the world. It is one of the largest works of metal engineering in Chile. It was built within the setting of an ambitious state program to extend the railroad network, which President José Manuel Balmaceda deemed fundamental for the economic future of the country.

The work was part of the construction of the railroad line between Angol and Traiguén, made by the Chilean State through a public bidding. The passage through the Malleco River valley presented the main problem for the layout, since the riverbed runs 110 meters below the level of the plains. This difficulty put the engineers in the dilemma of whether to get round it or to overcome it by means of a frontal attack. The latter approach was chosen. The bridge would be laid out over the Collipulli narrow defile.

In 1885, the Chilean government put its ambassador in France, Alberto Blest Gana, in charge of contacting the best renowned European firms and ask their advice for the construction of the viaduct, according to the designs made by the Chilean chief engineer of the Arauco railroad, Victorino Aurelio Lastarria. Three French companies presented projects: Gustave Eiffel, the Société Anonyme des Anciens Etablissements Cail, and Schneider et Cie. O Le Creusot. The work was awarded to the latter.

Between 1886 and 1888, the firm built in its workshops in Europe the iron frameworks, which were transported to its destination first by ship and then by railroad. The foundations were gradually ready, and the viaduct was completed between February 1889 and the middle of the following year. The work was formally opened by President José Manuel Balmaceda, the 26th. of October of 1890.

The total weight of the viaduct, measured section by section at the workshops, amounted to 1.401.344 kilograms. The bridge was assembled on a large 95 meters long wood platform. Each stage of the launching of the bridge over its bases lasted about ten hours, being necessary to increase the number of workers up to a hundred as the work progressed. Once the bridge was laid out, temporary resting on hydraulic jacks placed on the piers and stirrups (abutments), the assembly of the first headset was finished, and the bridge was lowered to its definitive position by means of the jacks till it rested on the large cast iron supports. In February 1890, the sliding of the beam took place after a very complex operation.

Today, just as yesterday, the work impresses for its magnitude. Its length is of 347.5 meters, divided in five equal sections of 69.5 meters each. The bridge rests on its two end stirrups (abutments) and four intermediate piers, all of them made of steel. The first and fourth piers are 43.7 meters high, the second 67.7, and the third 75.7. The rails are at a height of 102 meters above the bottom of the gorge. Later on, diagonal reinforcements were inserted between the beam and the towers for the structure to bear the weight of more modern locomotives. The viaduct can be fully appreciated from the bridge for vehicles that was built parallel to it.



## San Pedro de Atacama

Long. 68°12' W ; Lat. 22°55' S

C (ii)(iii)(v)

The Atacama area has a desert-like climate, with big differences of temperature between day and night, and summer rains which do not surpass 100 millimeters per year. The main water sources are the San Pedro and Vilama rivers. The area's chief geographic element is the Solar de Atacama, occupying a surface 100 kilometers long by 80 km. wide. The salt mine is a result of the surfacing of underground waters saturated with mineral salts which, on evaporating, leave a crust rich in salts and minerals. The rivers, fed by the Andean snows, irrigate the area allowing the configuration of numerous oases. This is the scenario where the Atacama culture developed.

The first people to inhabit the Atacama area arrived at the place by the year 10,000 B.C., at a time when the area had large lakes and mighty rivers on account of the end of the glacial era. Evidences from the first archaic hunters in the region show that they hunted wild camelidae and rodents, that they used stone artifacts and lived a nomadic life in natural eaves and caves. Later on, high concentrations of wild camelidae and the exploitation of vegetable products made possible for these people the adoption of a semi-sedentary and migrating way of life. During autumn and winter, these groups collected the fruits of the alparrobas and chadares growing in the oasis, while in early summer, they climbed up to the high plateau for hunting camelidae and picking obsidian. Culture prospered during this stage: the first tombs found are circular cavities demarcated with stones which date back to 4,000 years BC; they contained bent bodies laying on their sides, sometimes accompanied with grinding mortars.

The Atacama people turned definitively sedentary during the second millennium BC, when they began growing food -particularly maize- and domesticating camelidae. The breeding of the llama was their main activity; this animal provided them with wool, meat and excrement for fuel and for fertilizing their fields. Textiles and ceramics appeared at this stage; the latter consist in cylindrical containers of red polished clay, decorated with anthropomorphic motifs. Later on, a new style of pottery resulted in a black ceramic engraved with geometrical motifs. Mining, particularly of copper, was important for providing a product of exchange with far-away regions.

During this stage, power was held by some prominent Atacama men who displayed their status by means of their axes, necklaces of semi-precious stones, hats with feathers, and fine textiles. Different landmarks of daily life, such as demises, crops, the arrival of llamas caravans, the mating of cattle, etc., gave occasion to festivities during which maize or carob liquor was drank and tobacco from the northeast of Argentina was smoked in pipes. Special importance within religious life -dominated by the figure of the chaman-, had the use of hallucinating drugs, for which several sorts of tablets and tubes, richly adorned, were used. The deceased were buried in funeral bales: the bodies were shrouded with their clothing, wrapped up like a parcel.

The first Atacama farmers built villages like that of Tulo. Located 10 kilometers to the southeast of San Pedro, it has circular adobe houses crowded together, with conical roofs supported by poles.

The Atacama culture, developing the aforementioned features, reaches its classical phase during the first seven centuries of the Christian era. Part of this phase developed under the influx of the Tiwanaku culture, influx that lasted between the years 400 to 1200 AD. This important ceremonial center, through the direct contact established by caravans transporting exchange products, strongly transmitted its conception of the world to the Atacama people, giving origin to changes in the most diverse spheres. The main symbolic figures of the Tiwanaku cult, the feline and the condor, appear on objects of social significance, as the many-colored tunics worn by prominent men, the ceremonial containers of llama bones, and the tablets for hallucinating drugs. The use of ceremonial vases and gold adornments is another symbol of status.

By the year 1450, the Atacama culture passed into the dominion of the Inca empire. Thus, the cult to the sun and the high summits is enforced upon the people of the area. Ceramics registers the new political reality, and expresses itself in the typical Inca aribalos. The Inca influx improved metallurgy among the Atacama people, and also architecture. From this epoch are defensive construction like the Pukara de Quito, and the village of Catarpe, administrative center built in stone and mud, from which the taxation on behalf of the empire was organized.

In 1540, the Atacama people make contact with the Spanish conquistadores who, after defeating them in the military order, settle in the area and establish Encomiendas de Indios (land and native inhabitants granted to a conquistador), parish and civil administration. The evangelization of the Atacama people succeeded in turning Christianity into a value of their own, thus giving rise to an Andean Catholicism lasting to the present day. The Hispanic urban pattern and architecture, combining the Spanish contribution and native techniques, have also survived.

The main landmark is the local church, built at the beginning of the XVIII century, after the destruction of the older one. Of a cross-like ground plan, its nave is 41 meters long by 7.50 wide. It is of stone and adobe. The roof framework is of local woods: chahar and alpanrobo, and the ceiling is made of small cactus boards, covered with mud and straw. The characteristic element of the indoors ornamentation is the reredos behind the high altar, of carved stone, displaying beautiful sacred images. The bell tower, of adobe, was recently rebuilt due to the destruction of the former ones. It is built on top of a stoutly volume attached to the building, and has an outdoors staircase.

Around the town of San Pedro, there are 12 ayllus, territorial, productive and social units, typical of the traditional organizing way of the Atacama people. On the whole, the town comprises approximately 1,700 hectares. Its inhabitants live on agriculture -alfalfa, maize and fruit trees- and on shepherding -camelidae, goats and sheep.

## Sewell Mining Camp

Long. 70°15' W ; Lat. 34°08' S

C (ii)(iii)(v)

Sewell's origins date back to 1904, when William Braden began setting it out after the creation of the Braden Copper Company with North American capitals. In 1905, the Chilean government granted official authorization to the Braden Cooper Co. to operate El Teniente copper deposit.

Until the middle of the following century, the established camp was small and had developed in a scattered manner, that is, lacking an ordering core. This first sector was called "Pueblo Hundido" (Sunken Town). Then, another arose known by the name "El Establecimiento" (The Establishment). The settlement had a concentrating plant, an hydroelectric plant, cableways for ore transportation, and a first foundry. By 1909, the first sulphuric acid factory was constructed. The majority of the workers lived in "colectivos" (collective houses) for single men, although there were some houses for married ones.



At the beginning of the copper exploitation, the ore was transported on low carts down to the town of Graneros, and from there by train as far as Valparaíso, where it was shipped to the international markets. The laying out of the railroad line between Sewell and Rancagua began in 1907, and it was operative in 1911.

The settlement took the name of "Sewell" in 1915, in recognition of the first president of the Braden Copper Co., Mr. Barton Sewell, who had died that year. The number of industrial installations increased -a new foundry, among others-, and the construction of the American sector on the northern slope of Cerro Negro began, for housing the North American technicians and their families. Service facilities were also built: a hospital -at the time, a model in its sort-, fire station, Social Center, etc.

In 1916, the Braden Copper Co. became a subsidiary of the Kennecott Corporation, after purchasing the latter 95% of its shares. The First World War determines an increase of the demand for copper and also an explosive growth of the Camp: by 1918, 14,000 people lived in it. There was a diversification of the type of houses and the service constructions step up. In 1921, the great new Caletones Foundry came into operation; ores were transported from the mine by means of a cableway 6 km. long. The settlement began to look like a real city as its installations became more complex and the socializing spaces for its inhabitants widened -dance academy, theater group, student music group, etc. On the other hand, the city starts to articulate itself around the Escalera Central (Central Stairway), taking the features which will characterized it in its maturity.

During the following decades, Sewell reached its maximum extension; in 1960, it had a population of 15,000. In 1967, the State bought 51% of the shares of the Braden Copper Co. From that year on, the so called "Operación Valle" (Operation Valley) took place, moving the people from Sewell, Colon and Caletones to live in Rancagua. Thus, the depopulation of Sewell Camp began. The Carretera del Cobre (Copper Highway) was built in 1969 in order to move workers from the city to their working places. The copper great mining industry was nationalized in 1971, and the Braden Copper Co. changed name to El Teniente. Nowadays, what is left of its installations houses the personnel working in the mine, but the place no longer has a city-like life.

In 1977, only 1,500 people were living in Sewell. Towards 1981, demolition works started, and the effects of abandonment began to be noticeable. That which survives today corresponds only to the camp's central core.

There are several types of constructions buildings of apartment-like units, larger services buildings, housing solutions for single workers called "camarotes" (cabins) -of which the "Sorensen type" buildings are a good example-, and family houses similar to those of the demolished American sector.

As a general rule, these constructions are made of native woods, applying the Balloon Frame system. This system provides the support for roofs of corrugated metal planks and ornamental stucco covers over wire mesh or metallic plank, placed directly over the structure. There are three and four storey buildings, all made of wood, which is something exceptional. Sewell's remaining installations show some problems of putrefaction, yet no structural risk. Worth mentioning as outstanding individual buildings are the old Hospital, the old Industrial School, the Social Club, the building Ner 152 -the only one built against the hill slope, of nine terraced plants-, the structure known as Punta de Rieles (Rail End), the Rebolledo bridge, amongst others.

The settlement's design is quite exceptional; the location of the buildings is conditioned by the site's topography; the inner transit ways are exclusively pedestrian, through paths and stairs. The group is organized around the Escalera Central, which is the main public space, starting from which different small squares intertwine, connected through secondary paths and stairs. No geometric principles rule the urban design, and there are no units following a block arrangement.

## Valparaíso

Long. 71°38' W ; Lat. 30°01' S

C (ii)(iii)(v)

The Valparaíso Bay was discovered and christened by the Spaniards in 1536. Years later, in 1542, Chile's conquistador, Pedro de Valdivia, chose it as the port for the recently founded city of Santiago. The place was to be peopled little by little.

The first chapel of the settlement was built in 1599, at the site now occupied by the Parent Church.

Valparaíso, as most ports of the Spanish America, was not officially founded and laid out, but it developed in a rather spontaneous manner. During the XVI and XVII centuries, the settlement was just a group of small houses arranged around the chapel. The port traffic was scarce: it only increased in summer, to languish again in winter. Little by little the chapel gave way to a church, houses turned more solid, and the port was provided with a fortification -the San José Castle- located on one of the surrounding hills.

The first decades of the XIX century marked the beginning of Valparaíso's period of prosperity. The independence of Latin America brought about the end of trade restrictions, and the port became a vital enclave within the routes communicating Europe with the American Pacific coast, through Cape Horns. The great port and commercial activity also stimulated an ever increasing financial activity.

Valparaíso took in a large number of immigrants, mainly English, Germans and French. Many of them amassed large fortunes which combined interests in commerce, finances and mining. This immigrant wave caused the city's growth with its peculiar characteristics. Once saturated the scarce flat ground next to the coast, the city grew towards the hills surrounding the bay. Buildings climbed up on them, giving rise to the typical morphology of the city.

The immigration of variegated origins and the intense port activity impressed a great cosmopolitanism on the city. The way of life and customs of its inhabitants were obviously different from those of the people of the rest of the country.

Moreover, Valparaíso was in the van of progress in different areas; not only in the economic one, but also in the political, intellectual and artistic areas. Valparaíso was a far-out city regarding urban improvements: streetcars, electric wiring, gas pipelines, etc. made their debut in this city, then spreading to the rest of the country.

Valparaíso's boom ended by the 1930s. The Panama Canal transformed the port from being the intermediate point of shipping routes into being their terminal point. Political changes and the new economic development strategies favored the capital city, Santiago, which grew at the expense of the displacement of cities such as Valparaíso, concentrating the political, economic and financial power.

As said before, Valparaíso developed at first at the narrow flat area laying between the coast and the hills, then occupying the latter. This generated a complicated traffic network; the main streets of the plane are longitudinally orientated and intersected by the streets climbing up the hills, thus creating a network of "knotty streets" articulated around squares.

This urban pattern makes necessary the most characteristic element of Valparaíso: its elevators. The ravines, cliffs and steep slopes of the terrain where the main part of the population lived, motivated the installation of these elements starting



in the latter part of the XIX century. The first elevator, at Cerro Concepcion, was opened in 1883; by 1930, the port city had 30 elevators. All, except one, are not properly elevators but funiculars. The only one which is really an elevator is that of the Polanco hill, the access to which is through a tunnel excavated in the hill, for then ascending it vertically.

The original core of the city lies in the plane. The fourth version of the historical Parent Church -built at the same spot where the chapel raised in 1559 stood-, is located there. Near the Church stands the old Custom House, built around mid XIX century. Facing the Prat Pier is the Sotomayor Square, where the Monument to the Heroes of Iquique's Naval Battle stands. In front of this monument is the old Mayoraity, historical building of great architectural value, built at the beginning of this century. Between the Sotomayor Square and the Anibal Pinto Square is located the city's financial quarter, with many noteworthy buildings, also from the beginnings of this century, such as the Stock Exchange, the former Bank of London, the Turri and the El Mercurio Newspaper buildings, etc.

The residential quarters are on the hills. Among the most characteristics of Valparaiso are those of the Cerro Alegre and of Cerro Concepcion, raised by Europeans during the second half of the XIX century. They have important traffic ways climbing the steep siopes (Montealegre and Templeman streets), and winding side streets where the architecture goes mounting uphill small volumes, bow-windows, projecting balconies, miradors, all standing amongst gardens and trees, in search of the sun and of views across to the sea. Many of these constructions are surprisingly well finished, with high quality materials, glass, iron and wood works delicately worked, bearing testimony of the city's former wealth. The sinuous sidewalks consist in terraced flights of steps, creating an extremely picturesque milieu of neighborhoods of intricate streets and large mansions evocative of bygone times, and also of alleyways of simple and colorful houses irradiating a warm atmosphere.

## Colombia

**Buritaca 200 - Ciudad Perdida -** Sierra nevada de Santa Marta, Dep. del Magdalena (ii)(iii) C (not specified)  
**Sierra Nevada de Santa Marta** Long. 77°50' West Lat. 11°07' North

Asentamiento indigena que cubre aproximadamente 14 hectareas sobre la cuchilla del cerro Corea hasta el Rio Buritaca en la Sierra Nevada de Santa Marta. Unico sitio de importancia reconocido como caracteristico de los asentamientos tayronas, cultura desaparecida con la conquista espanola. Buritaca 200 se desarrollo entre los siglos IX y XVI DC. Esta compuesto por un conjunto de terrazas para vivienda intercomunicadas por caminos de piedra que se desprenden transversalmente de una principal y que a su vez forma parte de un complejo sistema de comunicaciones con los poblados circundantes. Se trata de caminos de 4 o 5 metros de ancho, enlazados en piedra y con una escalinata central. Cada uno de ellos tiene incorporado un eficiente sistema de drenaje y proteccion. Ademas de los basamentos de las viviendas se conservan los de dos templos (cancurubas) y algunos ejemplares de petroglifos que aun no han podido ser interpretados. Es este un sitio arqueologico de gran valor testimonial que incluye por otra parte hallazgos ceramicos y de orfebreria.

### **Sistema Hidraulico Prehispanico del Rio San Jorge.**

Long. 74° -- 75°30' West (ii)(iii) C (not specified)  
 Lat. 8°10' -- 10° North

La region del bajo rio san Jorge esta cubierta por una intrincada y extensa red de canales artificiales que cubren una extension de 200000 hectareas, construida por un grupo etnico que habito la zona entre los siglos I y VII, segun los pocos datos existentes. La creacion de un sistema artificial de drenaje fue necesaria para el establecimiento permanente de la poblacion, pues se trata de un territorio que permanece inundado varios meses del ano, de tal forma que la actividad de sus moradores se ve sujeta a los ritmos de las crecientes y sequias. Los camellones han sido afectados por la accion continua de las aguas, tanto que en algunas regiones son dificiles de distinguir desde tierra. Existen sin embargo estructuras muy bien conservadas que pueden alcanzar hasta dos metros de altura. La vasta llanura inundada del bajo Magdalena es probablemente la reserva mas grande y mejor preservada de suelos agricolas del pais. Sin embargo, las inundaciones periodicas han limitado su uso a la ganaderia extancional y desde el siglo XVII la pesca en esta zona ha sido transhumante.

## Costa Rica

**San José-Limon Region** Long. 84°15' West (not specified)  
 Lat. 10°00' North

The area studied is constituted by a region of geographical variety, and consequently it is very rich in its culture and nature. It extends from the central intermountain valley (1176 meters over sea level) to the Caribbean coast. The region contains an important net of railways composed by tunnels and bridges of great historical transcendancy, constituting a valuable technological heritage and legacy of the 19th and 20th centuries. The beauty of the outseeings and environment of the railway region. San José-Limon, conforms a natural unit in which one can appreciate the richness in biodiversity of the tropical rain forests and rainy submountain forests Throughout this region there are urban and farming areas as well as towns that live from coffee, sugar, and banana plantations. And in the city of Limon, one can notice the influence of the british caribbean.



## Ecuador

### **Ciudad de Zaruma**

3°24' S, 79°39' W

C (iv)

In 1560, Spanish Captain Salvador Roman founded "San Antonio del Cerro Rico de ZARUMA" and on December 8 of 1595, King Philip II brought the city to the status of "Villa". Zaruma lays on one of the hills that form the slopes of the Western ridge of the Andes, in the southern Province of El Oro, at an altitude of 2.100 meters above sea level and therefore enjoying a very mild climate. The natural surroundings and the layout of the streets and buildings give to the city a beautiful and unique appearance. Zaruma has also been an important center for the mining industry since the time of its foundation. That explains the name "Cerro Rico" (rich hill).

## Mexico

### **Antique cité maya, Calakmul**

18°06'31" N ; 89°48'17" W  
Altitude 240 m.s.n.m.

C (ii)(iii)(iv)

La zone explorée et plus connue jusqu'à présent est composée par trois grands ensembles de construction. A l'ouest on trouve un vaste ensemble de structures formées par des cours et des plateformes avec des bâtiments, sur une surface rectangulaire de 450 par 350 metres environ. A l'est se situe un autre grand ensemble de caractéristiques semblables et avec une étendue un peu plus réduite que celle du secteur occidental. Entre ces deux ensembles s'établit la zone centrale du site, qui occupe une surface sensiblement carrée, avec 400 metres de côté et dans laquelle les vastes espaces ouverts et le grand volume de la structure II sont les éléments dominants.

Les édifices en maçonnerie et façades couvertes par des sculptures en stuc et reconnus comme plus anciens, étaient ceux de la fameuse pyramide E-VII-sub à Uuxactún et du bâtiment 34 au groupe du Tigre à El mirador, avant la récente découverte de cette structure II sub C à Calakmul. Maintenant, cette structure, reconnue comme la plus ancienne des terres basses centrales, conserve toutes ses caractéristiques formelles et constructives et montre aussi une iconographie complexe dans sa frise décorée par de grands masques modelés en stuc. Il s'agit de représentations d'images cosmiques qui reliaient les gouvernants avec le monde des dieux.

Comme dans d'autres sites maya, on trouve aussi à Calakmul un nombre important de tombes, cependant ce qui marque une différence importante, en plus de la riche céramique rituelle, abondante et variée, c'est le nombre de masques en jade, de grande valeur esthétique, trouvés jusqu'à présent. Avec ces neuf masques, c'est le site qui compte avec le plus grand nombre de masques de jade.

Calakmul est le seul site qui conserve une importante carrière, telle qu'elle était utilisée depuis l'époque préhispanique, sans avoir été modifiée plus tard, ce représente un très riche témoignage historique. D'autre part les fouilles permettent de connaître peu à peu, un très important et savant système de réservoirs et de conduction des eaux dans les différents secteurs de l'ensemble du site, utilisant aussi bien les aguadas, les chultunes (dépot en forme de bouteille) et les puits.

## Paraguay

### **Sistema Ferrocarril Pte. Carlos Antonio Lopez**

Region Oriental  
Departamentos: Central,  
Paraguari, Guaira, Caazapa e  
Ytapua

(not specified)

El sistema fue inaugurado en 1861 e incluye ademas del tendido de vias de esa epoca, los talleres, maquinarias y accesorios que son accionados por la figura matriz de una caldera, sistemas de agua corriente por gravedad, los sistemas de comunicacion del siglo pasado - telefono a magneto y telegrafo, las locomotoras a vapor y bienes muebles e inmuebles - estaciones y conjuntos arquitectonicos de algunos poblados ferroviarios - y su trayecto constituye un recorrido por zonas de gran valor paisajistico.



## 6.12. Latin America / Caribbean Tentative Industrial Heritage Classification



## Latin America /Caribbean Countries with Tentative Lists

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### Analysis of Industrial World Heritage Values

Country	Site name with stated Industrial WH	Description	Site name with Associate Industrial World Heritage	Description	Industrial Classification	
0. EXTRACTIVE INDUSTRIES						
Ecuador	Cuidad de Zaruma	Hispanic settlement, 2100m, important center for mining industry			1	
Chile			San Pedro de Atacama	Desert cultural town since 10000 B.C., tombs, relicts, town of San Pedro, Copper mine, salt mine	5.0	4.6
Chile	Sewell Mining Camp	1904, Copper mine, concentrating camp, hydroelectric plant, ore cableways, 1909 sulpheric acid factory, railroad line1911, settlement			5.0	87
1. BULK INDUSTRIES						
Chile	Humberstone and Santa Laura Nitrate Offices	1810, Sodium Nitrate Exploitation, grinding and crushing installations, nitrate railway network,			12.0	
5. TRANSPORTATION						
Chile	Locomotive depot of Temuco Railroad Station	1920, Locomotive depot, workshops, coal elevator			47	
Costa Rica	San José-Lomon Region	1176m culture natural beauty, important net of railways, tunnels, bridges, technological heritage 19 <sup>th</sup> and 20 <sup>th</sup> c.			47	
Paraguay	Sistema Ferrocarril Pte. Carlos Antonio Lopez	1861, Elevator system, steam locomotives			47	
Chile			Valparaiso	Spanish Settlement 1599, commercial port, boom 1930, complicated traffic network, elevators, funiculars	47.9	
7. BRIDGES, TRESTLES, AQUEDUCTS						
Chile	Malleco Viaduct	1890, highest railroad bridge, one of largest metal engin. works in Chile			63	



9. SPECIALIZED STRUCTURES AND OBJECTS					
<b>Colombia</b>			<b>Buritaca 200, Ciudad Perdida – Sierra Nevada de Santa Marta</b>	Historic settlements, 9 <sup>th</sup> c., <u>drainage systems</u>	81.3
<b>Colombia</b>	<b>Sistema Hidraulico Prehispanico del Rio San Jorge</b>	Prehispanic artificial chanel system 20000 ha, artificial drainage system			81.3
<b>Mexico</b>	0		<b>Antique cité maya, Calakmul</b>	3 Maya construction ensembles, <u>important system of reservoirs, irrigation system</u>	81.3



### 6.13. Global Tentative Industrial Heritage List Classification



## GLOBAL CLASSIFICATION LIST OF THE TENTATIVE LIST WITH INDUSTRIAL HERITAGE

COUNTRY	STATE PARTIES STATED INDUSTRIAL HERITAGE SITE	DESCRIPTION	STATES PARTIES STATED SITES WITH ASSOCIATED INDUSTRIAL VALUE	DESCRIPTION	<u>INDUSTRIAL CLASSIFICATION</u>
<b>0. EXTRACTIVE INDUSTRIES</b>					
<b>Burkina Faso</b>			<b>Les gravures rupestres de Pobe-Mengao</b>	Rock art drawings in <u>metallurgical iron extraction ruins with furnace ruins, necropolis</u>	1
<b>Burkina Faso</b>			<b>Les necropoles de Bourzanga</b>	2 different necropolis types, partly in <u>metallurgical ruin sites</u>	1
<b>Burkina Faso</b>	<b>Les sites d'extraction de fer Kindiba</b>	4 metallurgical sites with furnaces and mines of the Dogons and the Moagas			1
<b>Germany</b>	<b>Ore Mountains: mining and cultural landscape</b>	800 years ore mining			1
<b>Italy</b>			<b>Parco Archeologico Urbano e colline metallifere (Volterra)</b>	8 <sup>th</sup> c. BC city, cultivated landscape, Colline Metalifere metallurgical tradition, mining since Etruscan times	1
<b>Ecuador</b>	<b>Cuidad de Zaruma</b>	Hispanic settlement, 2100m, important center for mining industry	<b>0</b>		1
<b>Germany</b>	<b>The Cultural Industrial Landscape of the "Zollverein Mine"</b>	Biggest industrial conurbation for one century, mining industry, 1930 masterpiece of engineering and design, workshop hall, compressor halls, cooling towers, etc			2



<b>Dem. Rep. of Congo</b>			<b>Grottes de Matupi</b>	Ca. 40000 BC, <u>one of oldest stone industry sites</u>	4.0
<b>Romania</b>			<b>L'ensemble rupestre de Basarabi</b>	Monastic monuments in <u>ancient stone mine</u> , paintings	4.0
<b>Morocco</b>			<b>Ville de Lixus</b>	One of the first western mediterranean cities, 8 <sup>th</sup> BC – 6 <sup>th</sup> c., temples, pre- and roman settlement, <u>important salt producing industry</u>	4.6
<b>Niger</b>			<b>La route du Sel de l’Air au Kaouar</b>	Desert oasis since stone age with great beauty, stone inscriptions, <u>exploited salt beds</u>	4.6
<b>Uganda</b>	<b>Kibiro (Salt producing village)</b>	Unique example of industry for 900 years, salt producing process in pottery and later metallic vessels, archaeological and ethnographical value			4.6
<b>Austria</b>			<b>Old part of Hall in Tirol</b>	Salt historic town, historic buildings, <u>salt works</u>	4.6
<b>Italy</b>			<b>Fascia costiera da Castellammare del Golfo a Trapani, con Erice, Mozia e la Isole Egadi</b>	Costal Sicily landscape, <u>saline and its milled-system</u>	4.6
<b>Spain</b>			<b>La Ruta de la Sal (Canarias)</b>		4.6
<b>Poland</b>	<b>Krzemionki Opatowskie. Neolithic flint mine</b>	Archaeological reserve containing several thousand Neolithic mining units 4 <sup>th</sup> m. BC, different mining techniques			4.9
<b>China</b>	<b>Tonglushan Ancient Copper Mine Sites</b>	2 sq km, oldest and biggest ancient copper mine in China, drifts, smelting furnaces 8 <sup>th</sup> c			5.0
<b>Israel</b>	<b>Timna</b>	Ancient mineral mining and smelting, copper ore, mine working shafts and galleries, 11 mining camps late Bronze Iron Age to eraly Arab			5.0



<b>Sweden</b>	<b>Copper mine of Falun</b>	12 <sup>th</sup> century still running copper mine, most buildings 18 th c.			5.0	
<b>Chile</b>			<b>San Pedro de Atacama</b>	Desert cultural town since 10000 B.C., tombs, relicts, town of San Pedro, Copper mine, salt mine	5.0	4.6
<b>Chile</b>	<b>Sewell Mining Camp</b>	1904, Copper mine, concentrating camp, hydroelectric plant, ore cableways, 1909 sulphuric acid factory, railroad line 1911, settlement			5.0	87
<b>UK</b>	<b>Cornish Mining Industry</b>	Cluster of 7 areas representing metal mining for 4000 years, tin and copper largest producer in 1th to 19 th c., mining landscapes, buildings, mineral railway and mineral ports, tin and copper smelters, foundries, drill manufacturers, gunpowder, explosives, ropewalks, candle factories, brickworks			5.0	14
<b>South Africa</b>	<b>Pilgrim's Rest Historic Village</b>	Historic village, site of first major gold rush in South Africa, alluvial mining, gold field, 1881 first gold mining company			5.2	
<b>Slovenia</b>	<b>The Mining Town of Idrija</b>	500 years mercury mining, mining shaft system 700 km, well preserved installations			5.9	
<b>1. BULK PRODUCTS INDUSTRIES</b>						
<b>Hungary</b>	<b>State Stud-farm Estate in Mezöhegyes</b>	1784 center of horse-breeding and animal husbandry, large-scale farm, buildings			10	
<b>Rep. Korea</b>	<b>Kangjingu Kiln Sites</b>	918-1392 Koryo-period, earthenware and celadon kiln sites, 400 kilns discovered in this area			11.1	
<b>Chile</b>	<b>Humberstone and Santa Laura Nitrate Offices</b>	1810, Sodium Nitrate Exploitation, grinding and crushing installations, nitrate railway network,			12.0	
<b>Dem. Rep. of Congo</b>			<b>Grottes de Dimba et Ngovo</b>	Ca. 18000 BC, stone age grottoes with <u>archaeological finds of early food production</u>	13	
<b>Czech Republic</b>	<b>Fish pond Network in Trebon Basin</b>	1518, fishpond network, manmade water ditch, dams			13.0	81.3



<b>Republic</b>						
<b>Andorra</b>	<b>0</b>		<b>Eglises romanes d'Andorra</b>	Historic churches, villages, Graining mills with hydraulic energy, Water reservoir, canals	13.2	
<b>Hungary</b>			<b>Tokaji Wine Region Cultural landscape</b>	7248 km2, grape vine cultivation, settlements, vine houses and vaulted or carved cellars, multileveled, network	13.4	
<b>Netherlands</b>	<b>Van Nelle Fabriek (Van Nelle Factory)</b>	1925 factory for refining and packing of coffee, tea and tobacco			13.5	
<b>Nepal</b>			<b>Khokana, vernacular village and its mustard-oil seed industrial heritage</b>	Latitpur District, Bagmati Zone, unique village of medieval settlement pattern with system of drainage and chowks. Mustard-oil seed industry	13.9	81.3
<b>Zimbabwe</b>			<b>Ziwa National Monument</b>	Stone age to historical time archaeological finds. Stone age deposits, rock art sites, early farming settlements, field systems, hill forts, pit structures, iron smelting and forging furnace, house structures	14.0	
<b>Austria</b>	<b>Old part of Steyr including Wehrgrabenviertel</b>	Symbiosis of well-preserved medieval houses with adjacent industrial settlement, iron industry, hydraulic power reservoirs			14	87
<b>Austria</b>	<b>Styrian Erzberg and Eisenstrasse (Iron Road)</b>	Erzberg most prominent ore mining example of Central Europe, smelting industry, wheelworks once biggest charcoal furnace on the continent, Bronze Age copper extraction, standard-gauge cogwheel railway, historic villages			14	11.4
<b>Czech Republic</b>	<b>Industrial Complexes at Ostrava</b>	19 <sup>th</sup> c., Coal mines, coking plants, blast furnaces, complete concentrated technology of anthracite-based production of iron, coal mining, ironworks, railroad network, shaft 671m, electrification machines, blast furnace, settlement			14.2	2
<b>Mauritania</b>	<b>Site archéologique de Tegdaoust</b>	Commercial center for metalurgical industry of gold, iron and copper, 8-11 <sup>th</sup> c.			14.5	
<b>UK</b>	<b>Derwent Valley Mills</b>	Narrow, 24 km long stretch of Derwent Valley, textile mills 18 <sup>th</sup> and 19 <sup>th</sup> c., water power for cotton			15.0	



		spinning, watercourses network, North Midway Railway, aqueduct			
<b>UK</b>	<b>New Lanark</b>	Pioneering cotton-spinning village of late 18 <sup>th</sup> and 19 <sup>th</sup> c., most important woodland complex in Scotland, industrial settlement, Robert Owen social plannings, mill village			15.0 87
<b>UK</b>	<b>Saltaire</b>	1850, Saltaire preparatory process, textile mills and utopian mill settlement			15 87
<b>UK</b>	<b>Manchester and Salford (Ancoats, Castlefield and Worsley)</b>	Archetype of industrial revolution, Britain's first industrial true canal with aqueduct, first intr-city passenger railway and first industrial suburb on steam power, system of underground canals, individual cotton mills, skew-arched masonry railway bridge, oldest mainline station in the world			15.0 49, 47, 86.4
<b>Austria</b>			<b>Bregenzer Wald</b>	Farming landscape, farmstead villages, textile workshops	15.1
<b>Czech Republic</b>	<b>Paper Mill at Velké Losiny</b>	16 <sup>th</sup> c. handmade paper mill, paper work shops, Francis turbine, water wheel			16.4
<b>Poland</b>			<b>The valley of the Pradnik river in the Ojcowski National Park</b>	Cultural landscape, human settlements for 8000 years, castles, early gunpowder factory, mills, saw-mills, fulling mills, fauna	16.6 26
<b>2. MANUFACTURING INDUSTRIES</b>					
<b>Germany</b>	<b>Shoe last factory Carl Benscheidt, Fagus-Werk</b>	1914 Shoe last factory, sawmill, production machines			21
<b>USA</b>	<b>McCormick Farm and Workshop</b>	Virginia, 19 <sup>th</sup> c., mechanical reaper 1834, well preserved			21.2
<b>3. UTILITIES</b>					



<b>Netherlands</b>			<b>Noordoostpolder (North East Polder)</b>	Reclaimed farming zone, <u>1940 3 pumps stations</u>	31.3
<b>4. POWER SOURCES AND PRIME MOVERS</b>					
<b>Syria</b>	<b>Noréas de Hama</b>	226 km N of Damaskus, ruins of ancient lakes, reservoirs, aqueducts, bridges, irrigation systems, noreas are water lifting round installations			37 81.3
<b>5. TRANSPORTATION</b>					
<b>India</b>	<b>Victoria Terminus</b>	1888, Great Peninsula Railway, late Italian Medieval Gothic style, still in use, one of the finest station buildings in the world			47
<b>Slovakia</b>	<b>The Kysuce - Orava narrow-gauge railway</b>	1915, 110km, 218 m heights difference, narrow-gauge railway			47
<b>UK</b>	<b>The Great Western Railway: Paddington-Bristol (selected parts)</b>	1841, railway, tunnels, viaducts, bridges, station buildings			47
<b>Chile</b>	<b>Locomotive depot of Temuco Railroad Station</b>	1920, Locomotive depot, workshops, coal elevator			47
<b>Costa Rica</b>	<b>San José-Lomon Region</b>	1176m culture natural beauty, important net of railways, tunnels, bridges, technological heritage 19 <sup>th</sup> and 20 <sup>th</sup> c.	<b>0</b>		47
<b>Paraguay</b>	<b>Sistema Ferrocarril Pte. Carlos Antonio Lopez</b>	1861, Elevator system, steam locomotives	<b>0</b>		47
<b>Chile</b>			<b>Valparaiso</b>	Spanish Settlement 1599, commercial port, boom 1930,	47.9



				complicated traffic network, elevators, funiculars	
<b>Netherlands</b>			<b>Historic center of Amsterdam</b>	Middle Ages historic center, <u>17<sup>th</sup> c.</u> concentric, half-moon shaped ring of canals	49.0
<b>Spain</b>	<b>El Canal de Castilla, Castilla-León</b>				49.0
<b>Un. Rep. of Tanzania</b>			<b>Bagamoyo Stone Town and Kaole Ruins</b>	2 fishing villages, commercial port, slave market, <u>first harbor and first industrial establishment and capital of German East Africa</u>	50.0
<b>Italy</b>			<b>Porto di Roma</b>	Unique blend of historical late Roman and archaeological values, ruins of great harbour city, <u>two artificial docks</u>	50.0
<b>UK</b>	<b>Liverpool Commercial Centre and Waterfront</b>	from 1th c. to WW I, 1.4 ha commercial docks by 1715, hydraulic towers, pumphouses, warehouses			50.0
<b>Egypt</b>			<b>Dahab</b>	South Sinai, Great fort with byzantine foundations, rooms, storages, <u>lighthouse</u>	50.1
<b>7. BRIDGES, TRESTLES AND AQUEDUCTS</b>					
<b>China</b>	<b>Chengyang Yongji Bridge</b>	1912-1924, bridge piers in stone, body in timber, 78 m long, 20m high, with corridor with 5 pavillions with 19 rooms with central passage			58.0
<b>Jordan</b>			<b>Abila City (Modern Qweilbeh)</b>	Historic city, tombs, theatre, Roman bridge, <u>basilica etc.</u> , <u>2 aqueducts</u>	59.3 62
<b>China</b>	<b>Anji Bridge</b>	Zhao County, Hebei Prov., built ca.600 AD, giant open-body stone single-arched bridge, 64 m lenght, 9 m width			59.3
<b>China</b>	<b>Lugou Bridge</b>	1189, bridge, exquisite stone sculpurs, multiarched stone bridge, 266 m long, historical war monument			59.3



<b>Russian Federation</b>	<b>Railway Bridge Over Yenisey River</b>	Eastern Siberia, Siberian railroad, 1896 1 km long Railway bridge			60	
<b>UK</b>	<b>The Forth Rail Bridge</b>	1890, first major steel bridge in Europe			60.3	
<b>USA</b>	<b>Brooklyn Bridge</b>	New York City, One the world's first wire cable suspension bridges, main span 1595 feet			61	
<b>USA</b>	<b>Eads Bridge</b>	St.Louis, Illinois, first major bridge with steel employment			61	
<b>Lebanon</b>			<b>Valley of Nahr el Kelb</b>	Natural site, fauna, grottoes, churches, medieval <u>bridge</u> , church, <u>roman aqueduct</u>	62	59.3
<b>Lebanon</b>			<b>Valley of Nahr Ibrahim</b>	Natural site, fauna, grottoes, 2 storeys aqueduct	62	
<b>Lebanon</b>			<b>Valley of Oronte</b>	Natural site, fauna, monastery, <u>ruins of aqueduct</u> , church,	62	
<b>Mauritania</b>			<b>Paysage culturel d'Azougui</b>	Oasis, ruins, palm plantations, <u>traditional canalisation system</u>	62	
<b>Israel</b>			<b>Caesarea</b>	Mediterranean port city since hellenistic period, city buildings, <u>high-level aqueduct</u> ,	62	50
<b>UK</b>	<b>Pont-Cysyllte Aqueduct</b>	1800 cast iron, highest canal aqueduct, 313 m long			62	49.2
<b>Chile</b>	<b>Malleco Viaduct</b>	1890, highest railroad bridge, one of largest metal engin. works in Chile			63	
<b>9. SPECIALIZED STRUCTURES AND OBJECTS</b>						
<b>Jordan</b>			<b>Al Qastal (Settlement)</b>	Oldest and most complete Umayyad communities in Near East, palace, mosque, cemetery, etc, <u>substantial agricultural dam, reservoir, cistern, 400 m stone dam, quarry</u>	79	4.0
<b>Israel</b>			<b>Shivta</b>	Late Roman desert city, buildings, remains of canals, dams, <u>drainage system</u>	81	
<b>Netherlands</b>	<b>Nieuwe Hollandse Waterlinie (New Dutch Inundation Line)</b>	Building projects 19 <sup>th</sup> c., 3-5 km inundation zone, defence system with 6 basins regulated by dikes, culverts, canals, fan locks, dams, <u>shiplifts</u>			81.0	



		sluices			
<b>Oman</b>	<b>A Falaj System</b>	Network of canal, on the ground and subterranean, masterpiece of technical work			81.3
<b>Madagaskar</b>	<b>Paysage culturel rizicole et hydraulique de Betafo</b>	Rice growing village surroundings with complexe hydraulical net with canals			81.3
<b>Iran</b>	<b>Shushtar (Mian-Ab) hydraulic installations</b>	Shushtar ; Irrigation system for agricultural, urban and industrial purposes, dams, water distribution dikes, manually dug channels, water distribution tower, urban ventilation using gratuitous energy			81.3
<b>Spain</b>			<b>Marismas del Odiel</b>	Characteristic drainage system	81.3
<b>Turkey</b>			<b>Güllük Dagi-Termessos National Park</b>	Ancient city of Termassos, 1050 m high, building remains, <u>cisterns and drainage system</u>	81.3
<b>Colombia</b>			<b>Buritaca 200, Ciudad Perdida – Sierra Nevada de Santa Marta</b>	Historic settlements, 9 <sup>th</sup> c., <u>drainage systems</u>	81.3
<b>Colombia</b>	<b>Sistema Hidraulico Prehispanico del Rio San Jorge</b>	Prehispanic artificial chanel system 20000 ha, artificial drainage system			81.3
<b>Mexico</b>	0		<b>Antique cité maya, Calakmul</b>	3 Maya construction ensembles, <u>important system of reservoirs, irrigation system</u>	81.3
<b>USA</b>	<b>Goddard Rocket Launching Site</b>	Mass., 1926, launched the world's first liquid propellant rocket			82.1
<b>USA</b>	<b>Lowell Observatory</b>	Arizona, Astronomical Observatory, 1896 original			82.5



<b>Germany</b>	<b>Mine of Rammelsberg and historic town of Goslar - Extension by the "Oberharzer Wasser-wirtschaft", i.e. the "Upper Harz Water Management System"</b>	Medieval water management system, dam, drainage channel 1150, water ducts network, aqueduct 953m, historic mining landscape			81, 2
<b>Togo</b>	<b>Les Greniers des Grottes de Nok et de Mamproug</b>	Beautiful mountain area, autochtone populations refuges between 17 <sup>th</sup> and 19 <sup>th</sup> c., big caverns with cylindrical or semi-spheric storage volumes hewn in stone			85.9
<b>Spain</b>	<b>Colonias industriales de los ríos Cardener y Llobregat</b>				87
<b>USA</b>	<b>General Electric Research Laboratory</b>	Schenectady, New York, Laboratory, 3 building complex as first industrial research facility in USA, 1900			92
<b>USA</b>	<b>Original Bell Telephone Laboratories</b>	New York, 1898-1967, America's largest industrial research laboratory, pioneering telecom technology			92
<b>USA</b>	<b>Pupin Physics Laboratories</b>	Columbia University, New York, second Uranium atom split place 1939, intact and original			92
<b>USA</b>	<b>Trinity Site</b>	New Mexico, world's first nuclear device explosion, 1945			92



#### 6.14. Power Point Presentation



## **Global Strategy**

**...Pursue programmes of thematic studies and the classification of the themes into sub-themes, on the basis of the tentative list prepared by States Parties to harmonize the World Heritage List...**



# ICOMOS Analysis of the World Heritage List

## **Geographical imbalance**

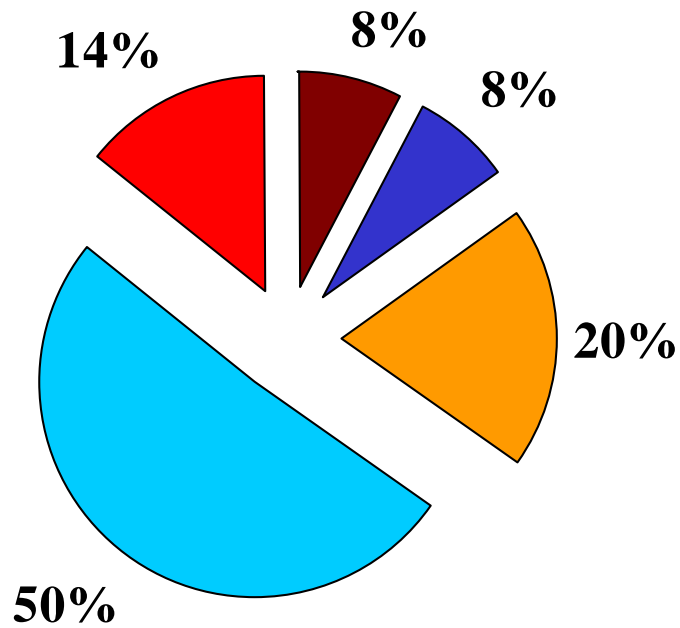
and

## **Thematic imbalance**

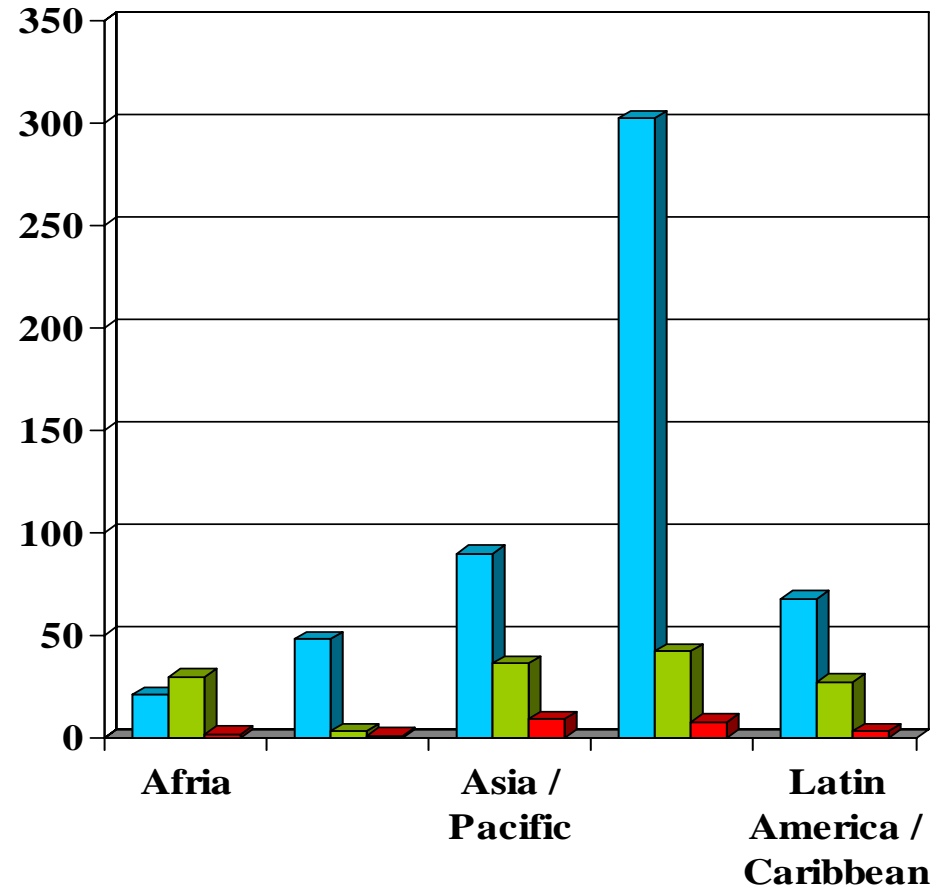
Historic towns and town centres are over-represented,  
**by contrast Industrial Heritage is poorly represented,**  
as well as the 20th century heritage.



# Global World Heritage List



■ Africa  
■ Arab States  
■ Asia / Pacific  
■ Europe / North America  
■ Latin America / Caribbean

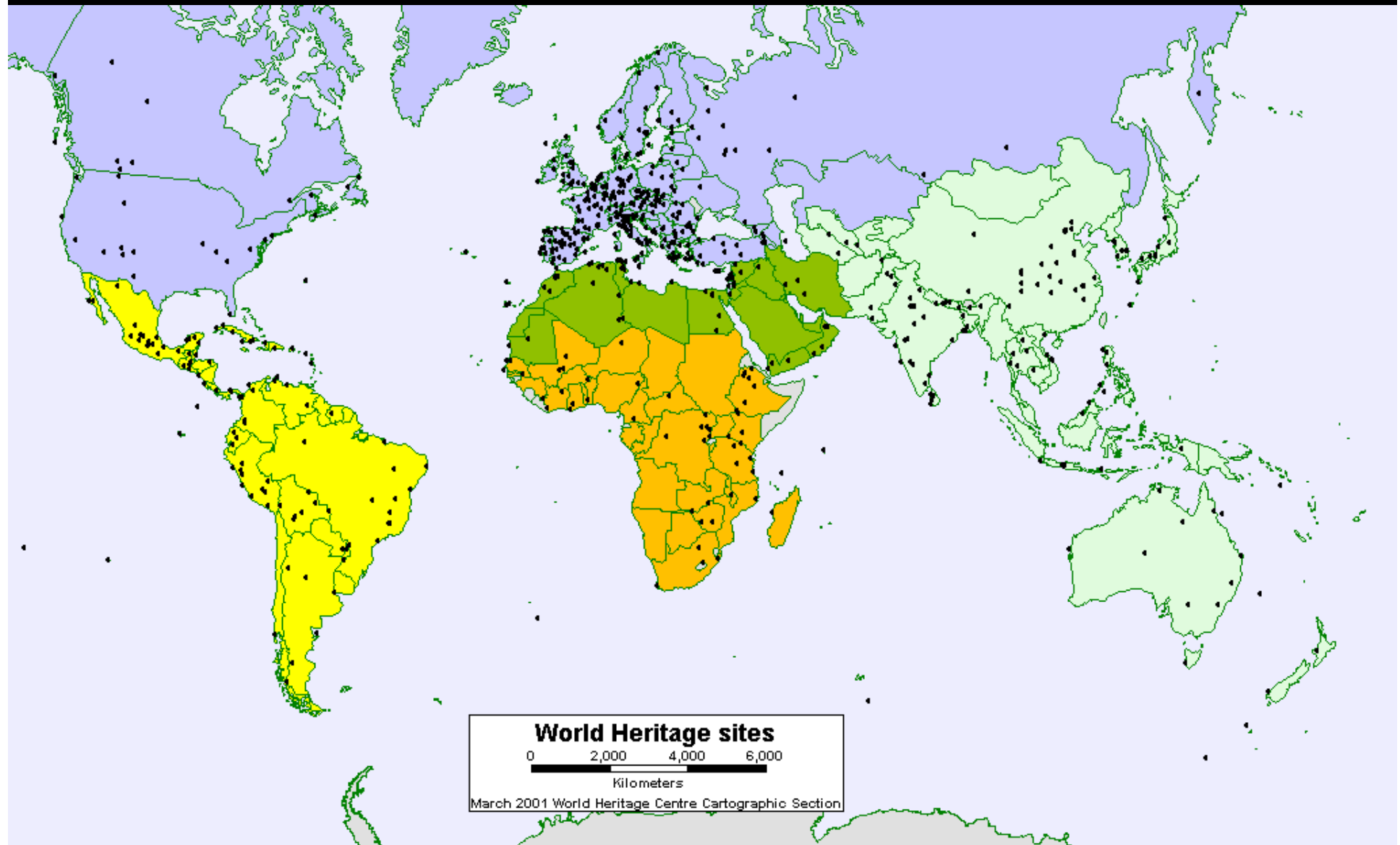


■ Cultural Sites  
■ Natural Sites  
■ Mixed Sites



# Industrial World Heritage Sites

## World Map



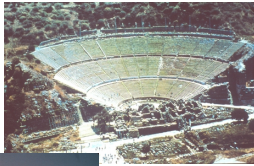


# 32 Cultural Properties being Reviewed

in 6 thematic categories

Already  
inscribed

Proposed  
for 2001



Archaeological properties

141

1



Historic town centres

181

11



Religious properties

120

4



Architectural monuments

41

2



**Technological ensembles**

**28**

**5**



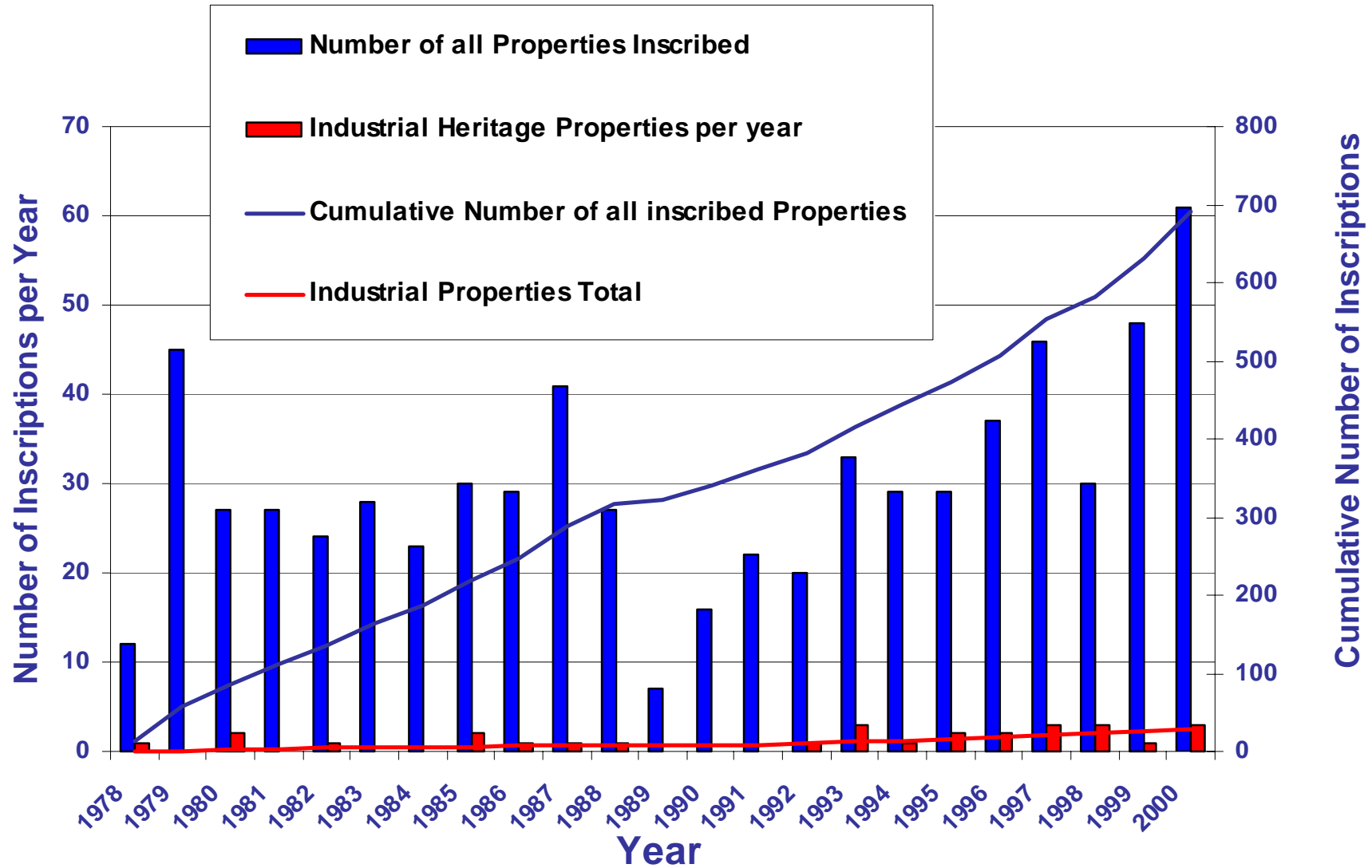
Cultural landscapes

23

9



# Industrial Heritage Properties on the World Heritage List





## **Industrial Heritage**

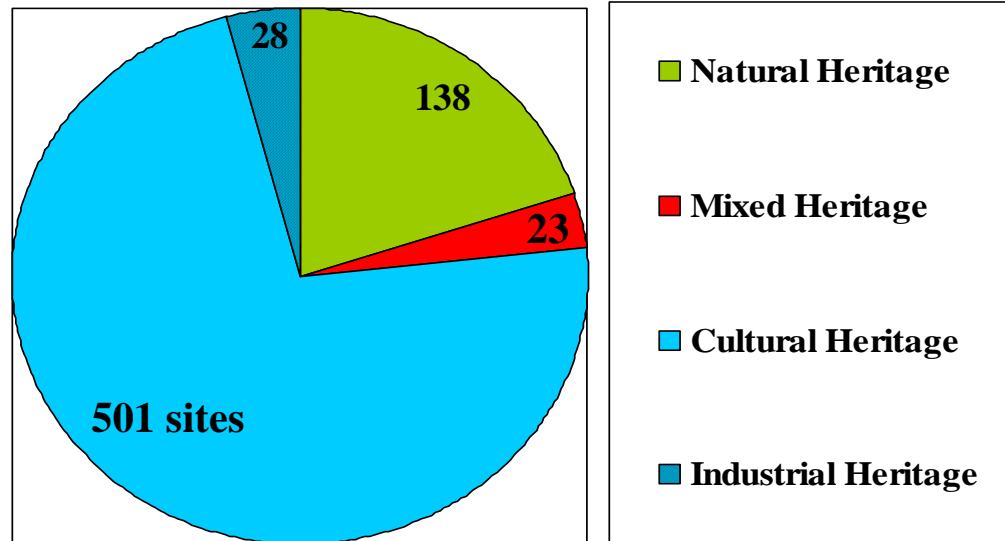
**“...Our industrial heritage includes not only the mill and factory, but the social and engineering triumphs spawned by new technologies: Neolithic flint mines, Roman aqueducts, company towns, canals, irrigation systems, railways, bridges and other forms of transportation and power engineering....,,**



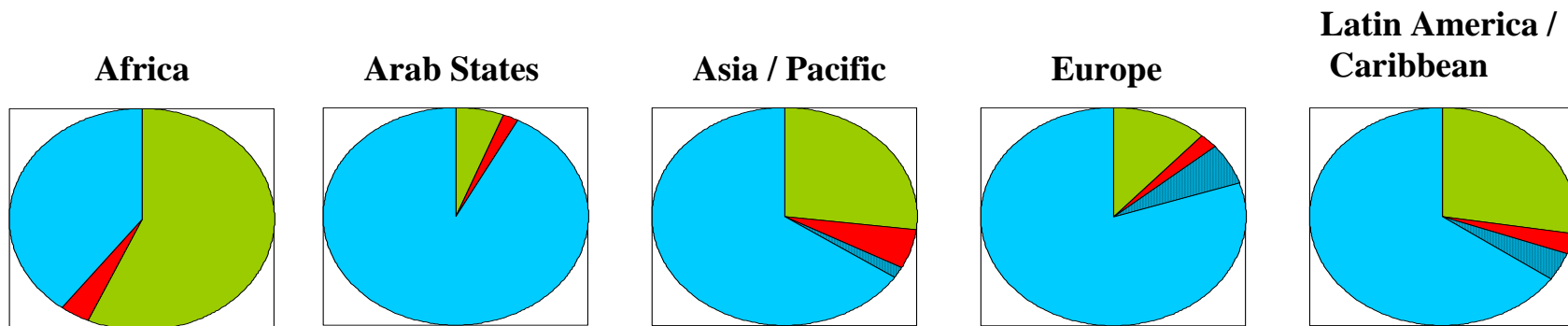
# **Analysis of Industrial World Heritage**



# Global World Heritage List



**Industrial Heritage  
embraces 5.3 % of all  
Cultural Sites and  
4 % of all World  
Heritage Sites.**



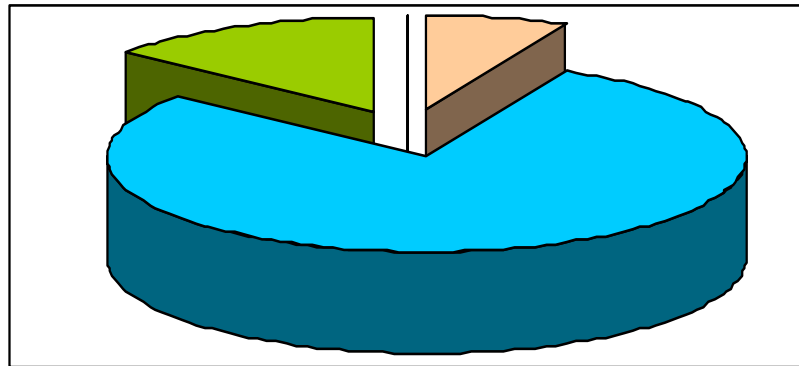


# Composition of the 28 Industrial World Heritage Sites

Africa and Arab States  
0 Industrial Heritage Sites !!!

Latin America / Caribbean  
4 Industrial Heritage Sites

Asia / Pacific  
2 Industrial Heritage Sites



Europe / North America  
22 Industrial Heritage Sites



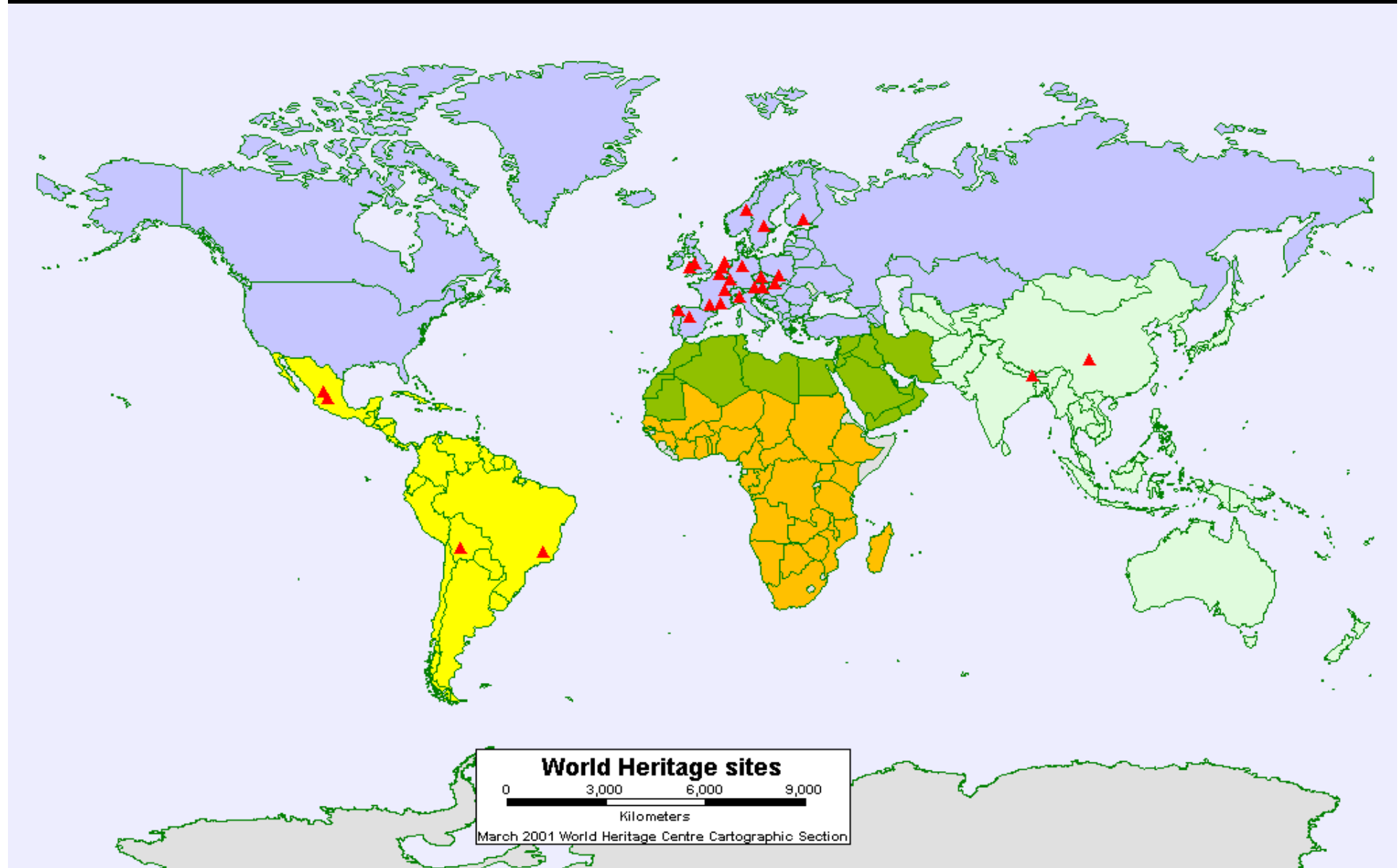
## Regional Composition of the World Heritage List

	Cultural Property	Natural Property	Mixed Property	(Industrial Heritage Site)	Total
<b>Africa</b>	21	30	2	0	53
<b>Arab States</b>	48	3	1	0	52
<b>Asia/Pacific</b>	90	36	9	(2)	135
<b>Europe / North America</b>	302	42	8	(22)	352
<b>Latin America / Caribbean</b>	68	27	3	(4)	98
<b>Total</b>	<b>529</b>	<b>138</b>	<b>23</b>	<b>(28)</b>	<b>690</b>



# Industrial World Heritage Sites

## World Map





# **Classification of Industrial World Heritage**



# Industrial Structures Classification System

## 0. Extractive Industries

e.g. Ore-Mining, Gold-Mining

## 1. Bulk Products Industries

e.g. Primary Metal Industries, Textiles

## 2. Manufacturing Industries

e.g. Machine Manufacture

## 3. Utilities

e.g. Water Supply, Electricity

## 4. Power Sources and Prime Movers

e.g. Water Wheels, Wind, Steam Turbine

## 5. Transportation

e.g. Railroads, Canals, Harbors

## 6. Communication

e.g. Radio, Telephone

## 7. Bridges, Trestles, Aqueducts

## 8. Building Technology

e.g. Roof Systems, Fenestration

## 9. Specialized Structures / Objects

e.g. Dams, Tunnels, Hydraulic Works



## Industrial Classification - Industrial World Heritage Sites

### 5. TRANSPORTATION

	Asia / Pacific	India	Darjeeling Himalayan Railway	Railway	47
	Europe / North America	Austria	Semmering Railway	Railway	47
	Europe / North America	France	Canal du Midi	Navigable waterways constructions	49.0
	Europe / North America	Belgium	The Four Lifts on the Canal du Centre and their Environs, La Louvière and Le Roeulx	Hydraulic Engineering works, boat-lifts	49.0

### 7. BRIDGES, TRESTLES AND AQUEDUCTS

	Europe / North America	France	Pont du Gard	Aqueduct	62.0
	Europe / North America	Spain	Old Town of Segovia and its Aqueduct	Aqueduct	62.0

### 9. SPECIALIZED STRUCTURES

	Europe / North America	Netherlands	D.F.Woudagemaal	Steam pump stations	81.0
	Europe / North America	Netherlands	Mill Network at Kinderdijk-Elshout	Hydraulic Works	81
	Asia / Pacific	China	Mount Quincheng and Duijiangwan Irrigation System	Irrigation system	81.3
	Europe / North America	France	Royal Saltworks of Arc-et-Senans	Ideal industrial architecture	87



# Industrial Classification - Industrial World Heritage Sites

## 0. Extractive Industries

- **Iron Mining**



- Germany: Rammelsberg-Mines
- Slovakia: Banska Stiavnica (right)
- UK: Blaenavon Industrial Landscape (left)





# Industrial Classification - Industrial World Heritage Sites

## 0. Extractive Industries

### 04. Non-Metallic Minerals

#### 04.6 Salt Mines

#### 04.9 Flint Mine

- Austria: Salzkammergut and Hallstatt
- Poland: Wieliczka Salt Mine (Photo)
- Belgium: Neolithic Flint Mine





# Industrial Classification - Industrial World Heritage Sites

## 0. Extractive Industries

### 5.0 Non-Ferrous Ores

### 5.2 Gold and Silver Mines

- Czech Republic: Kutna Hora (right)
- Norway: Roros Copper Mine
- Spain: Las Medulas Gold Mines (left)
- Bolivia: Potosi Silver Mine
- Brazil: Ouro Preto Gold Mine
- Mexico: Guanajuato Silver Mine  
Zacatecas Silver Mine





# Industrial Classification - Industrial World Heritage Sites

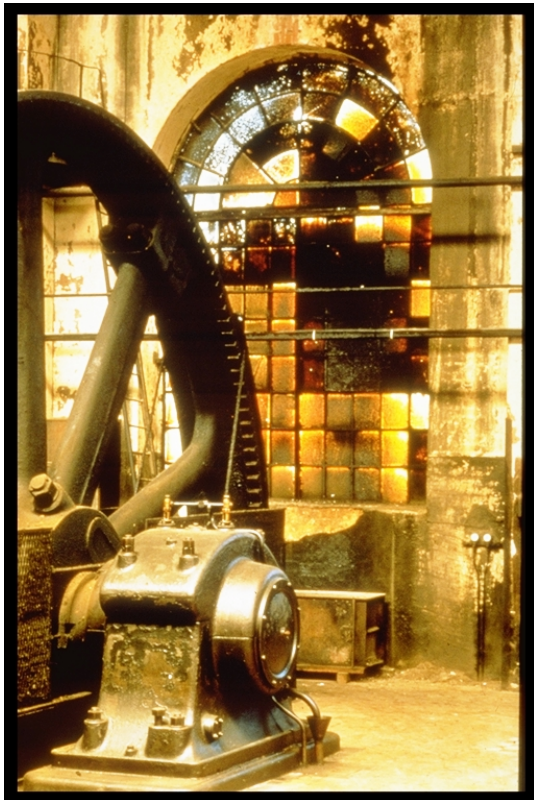
## 1. Bulk Products Industries

### 14. Primary Metal Industries

#### 14.0 Stone-based iron furnaces

#### 14.2 Steelworks

- UK: Ironbridge Gorge
- Sweden: Engelsberg Ironworks (right)
- Germany: Volklingen Ironworks (left)





# Industrial Classification - Industrial World Heritage Sites

## 1. Bulk Products Industries

**16. Lumber, Timber, Paper** •Finland: Verla Groundwood and Board Mill  
**16.4. Paper Making**





# Industrial Classification - Industrial World Heritage Sites

## 5. Transportation

### 47. Railroads

- Austria:Semmering Railway
- India: Darjeeling Himalayan Railway



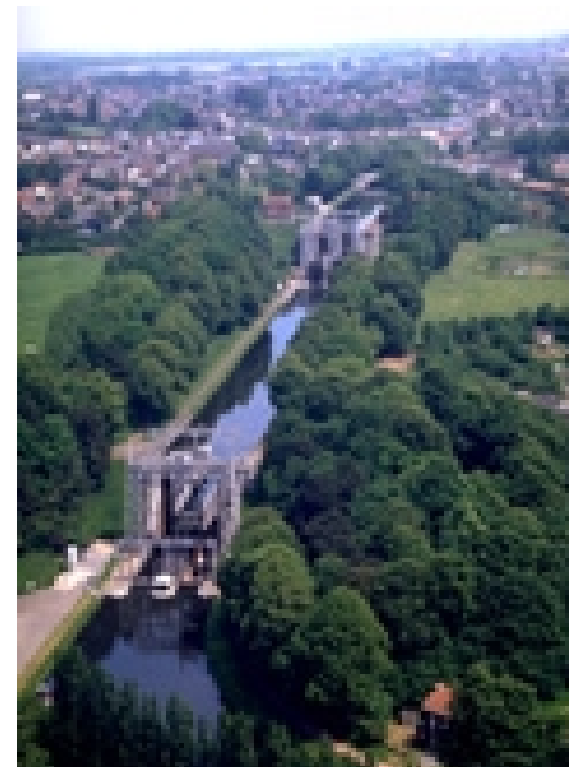


# Industrial Classification - Industrial World Heritage Sites

## 5. Transportation

### 49. Canals and Inland Navigation

- Belgium: The Four Lifts on the Canal du Centre
- France: Canal du Midi (left)





# Industrial Classification - Industrial World Heritage Sites

## 7. Bridges, Trestles, Aqueducts

### 62.0 Aqueducts

- France: Pont du Gard
- Spain: Old Town of Segovia and its Aqueduct (Photo)





## Industrial Classification - Industrial World Heritage Sites

### 9. Specialized Structures and Objects

#### 81. Hydraulic Works

- China: Dujiangyan Irrigation System
- Netherlands: Mill Network Kinderdijk (r)  
Woudagemaal Pump Station (l)





# Industrial Classification - Industrial World Heritage Sites

## 9. Specialized Structures and Objects

### 87. Working Houses, Communities, Industrial Settlements

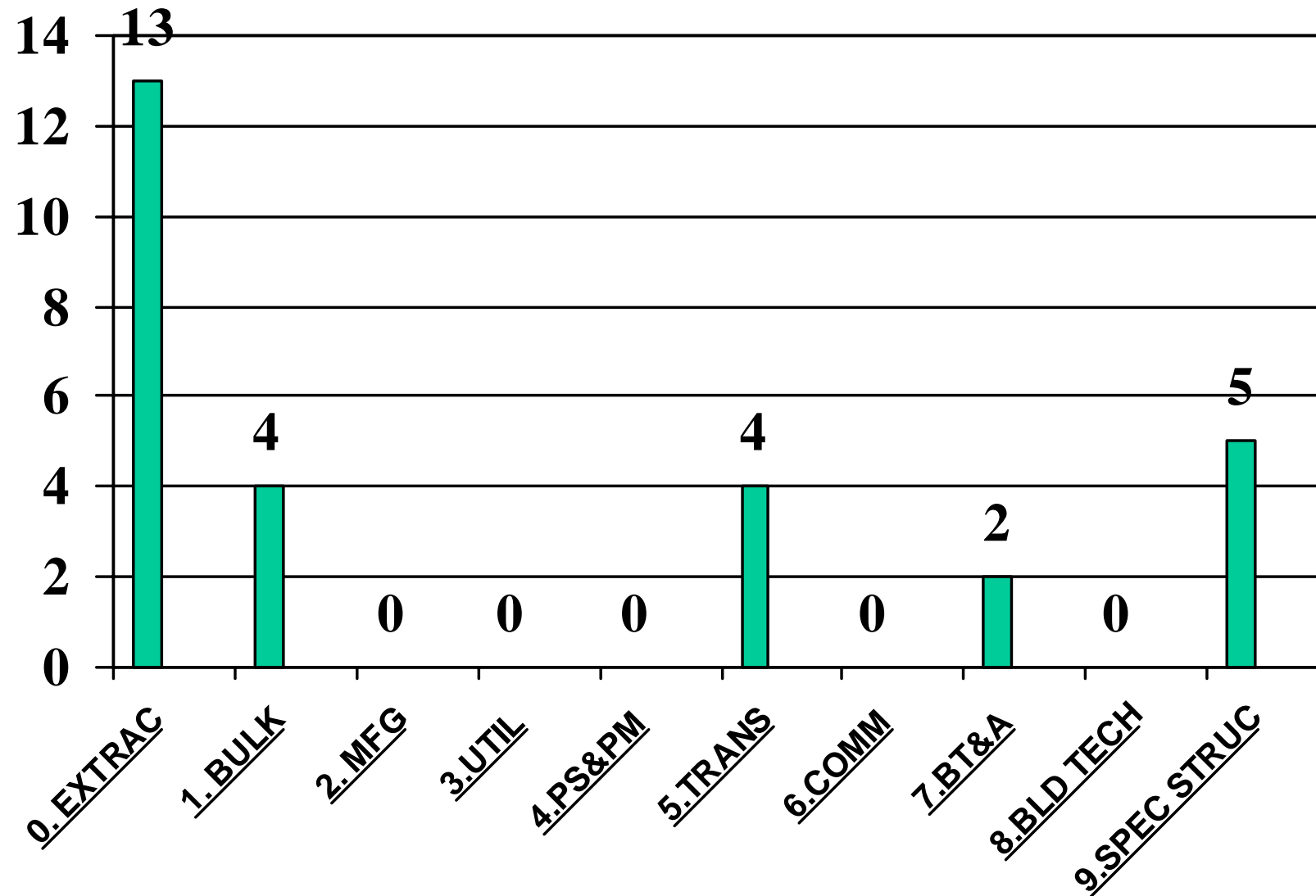


- France: Royal Saltworks of Arc-et-Senans
- Italy: Crespi d'Adda (left)





## Industrial Classification - Industrial World Heritage Sites





# **Classification of the Tentative List**



**Tentative Sites  
with stated Industrial World Heritage**



**Tentative Sites  
with Associated Industrial Value**



## Europe and North American Countries with Tentative Lists

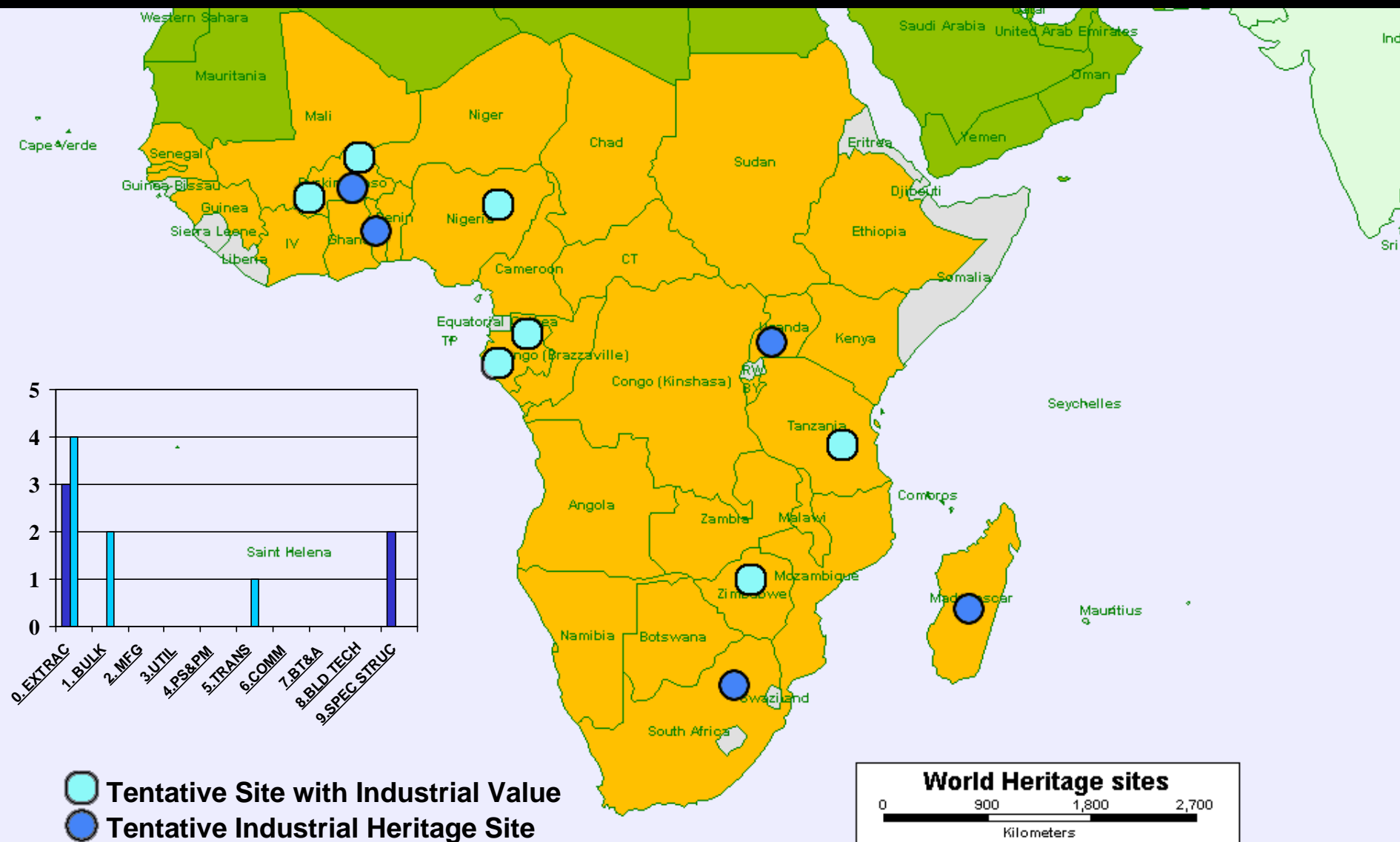
### Analysis of Industrial World Heritage Values

Country	Pot. Sites	C/N/M	Site name with stated Industrial WH	Description	Site name with Assoc. Ind. Value	Description	Industrial Classification
<u>Albania</u>	4	4/0/0	0		0		
<u>Andorra</u>	2	2/0/0	0		<u>Eglises romanes d'Andorra</u>	Historic churches, villages, <u>Grain</u> ing mills with hydraulic energy, Water reservoir, canals	13.2
<u>Armenia</u>	4	2/0/2	0		0		
<u>Austria</u>	12	12/0/0			<u>Bregenz</u> er Wald	Farming landscape, <u>farmstead</u> villages, textile workshops	15.1
					<u>Old part of Hall in Tirol</u>	Salt historic town, historic buildings, salt works	4.6
			<u>Old part of Steyr including Wehrgrabenviertel</u>	Symbiosis of well-preserved medieval houses with adjacent industrial settlement, iron industry, hydraulic power reservoirs			87, 14
			<u>Styrian Erberg and Eisenstrasse (Iron Road)</u>	<u>Erberg</u> most prominent ore mining example of Central Europe, smelting industry, wheelworks once biggest charcoal furnace on the continent, Bronze Age copper extraction, standard-gauge cogwheel railway, historic villages			14, 11.4
<u>Azerbaijan</u>	7	3/4/0	0		0		
<u>Belgium</u>	5	4/0/1	0		0		
<u>Bosnia/Herzegovina</u>	2	2/0/0	0		0		
<u>Bulgaria</u>	11	5/6/0			<u>Two neolithic dwellings with preserved interior</u>	6 <sup>th</sup> mill. B.C., preserved dwelling with furnishing and household, <u>furnaces</u> , hand-grinders	14.4
<u>Canada</u>	8	0/8/0	0		0		
<u>Croatia</u>	7	6/1/0	0		0		
<u>Cyprus</u>	2	2/0/0	0		0		
<u>Czech Republic</u>	13	12/1/0	<u>Fishpond Network in Třebon Basin</u>	1518, fishpond network, manmade water ditch, dams			13.0, 81.3



# Industrial Classification – Tentative Industrial World Heritage Sites

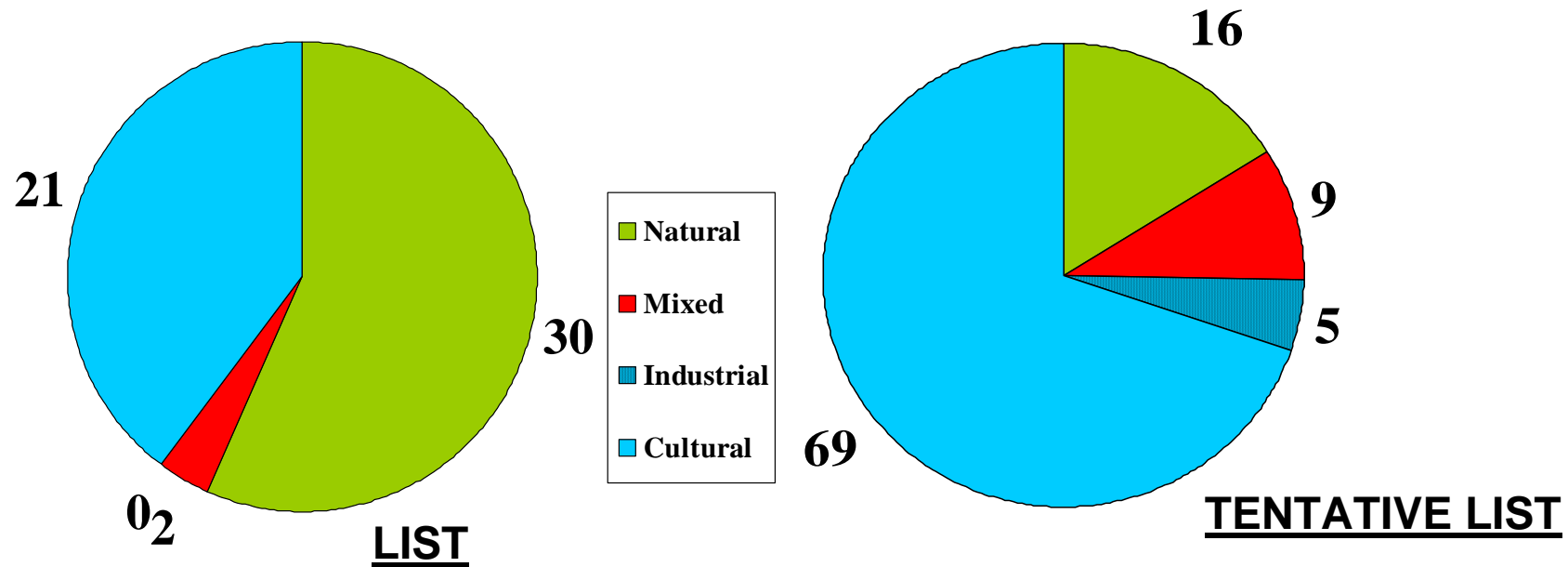
## Africa





## Tentative Industrial World Heritage Sites

**Africa**



## TREND

- Natural Sites down from 56% to 16%
- Cultural Sites up from 40% to 70 %
- No Industrial Heritage on the List
- 5 Tentative Industrial Heritage Sites with 4 Extractive Industries



## Tentative Industrial World Heritage Sites

## Africa

### Highlights

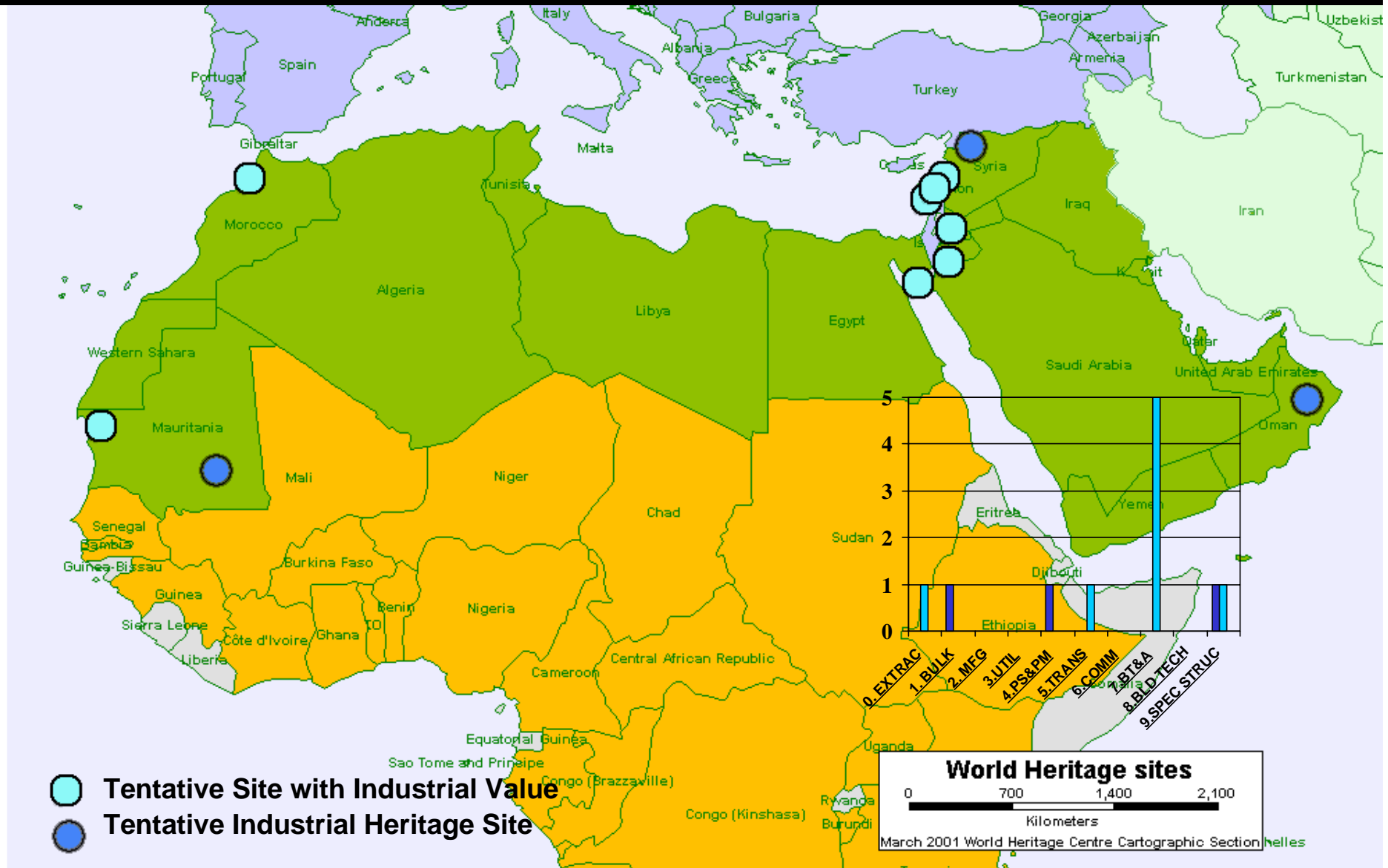


- Uganda: Kibiro Salt Producing Village (left)
- South Africa: Pilgrim's Rest Gold Mine (above)
- Togo: Les Greniers des Grottes N. et M.



# Industrial Classification – Tentative Industrial World Heritage Sites

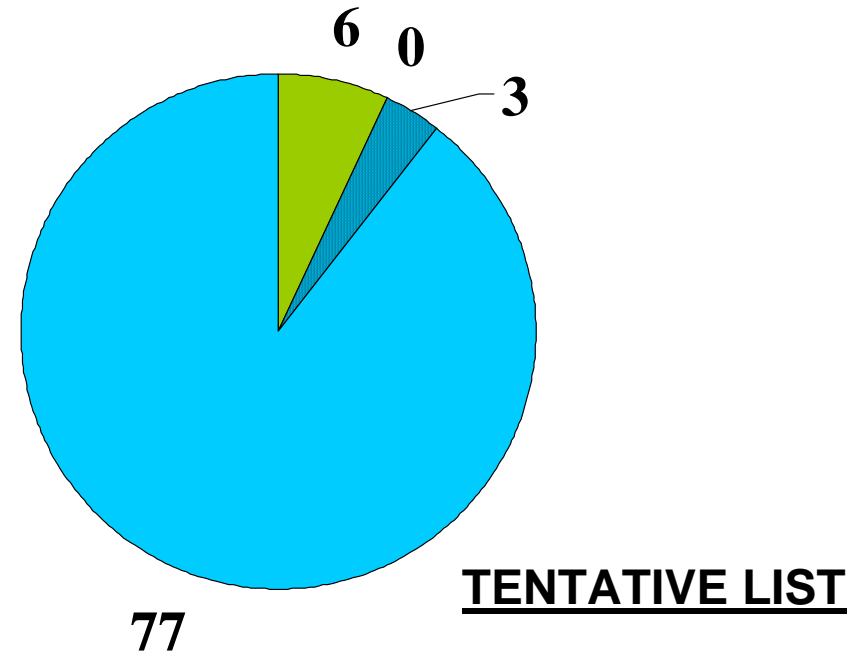
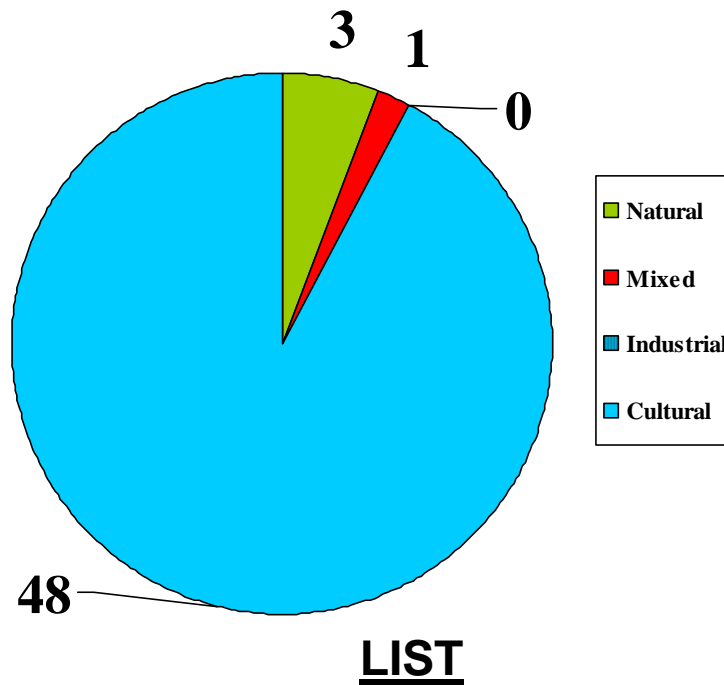
## Arab States





## Tentative Industrial World Heritage Sites

### Arab States



## TREND

- No more mixed Sites on the Tentative List
- No big Trend changes
- **No Industrial Heritage on the List**
- **3 Industrial Heritage Sites with very special Topics**



# Tentative Industrial World Heritage Sites

## Arab States

### Highlights



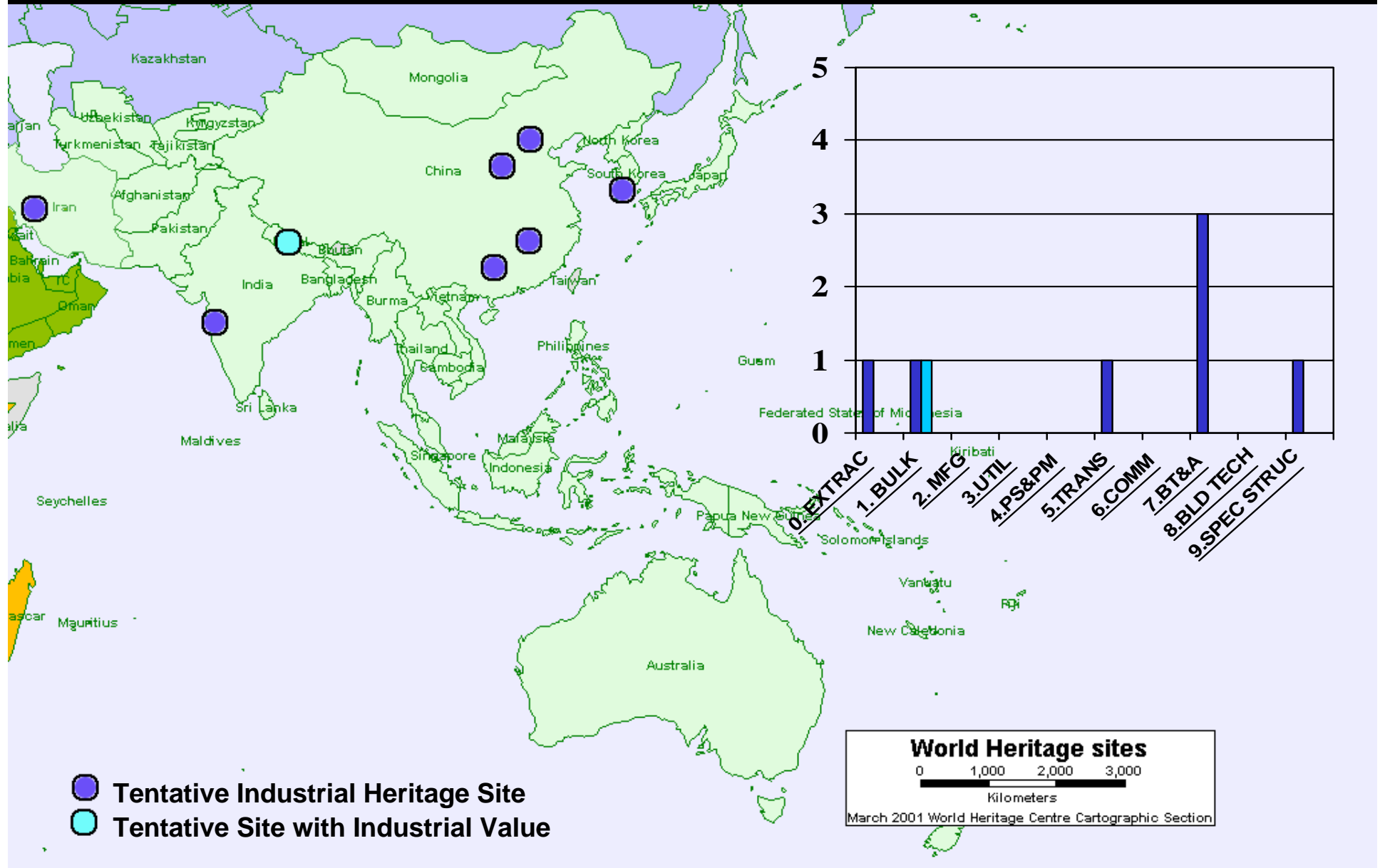
•Oman: A Fajal Canal Network System (above)

•Syria: The “Norea” Waterwheels of Hama (left)



# Industrial Classification – Tentative Industrial World Heritage Sites

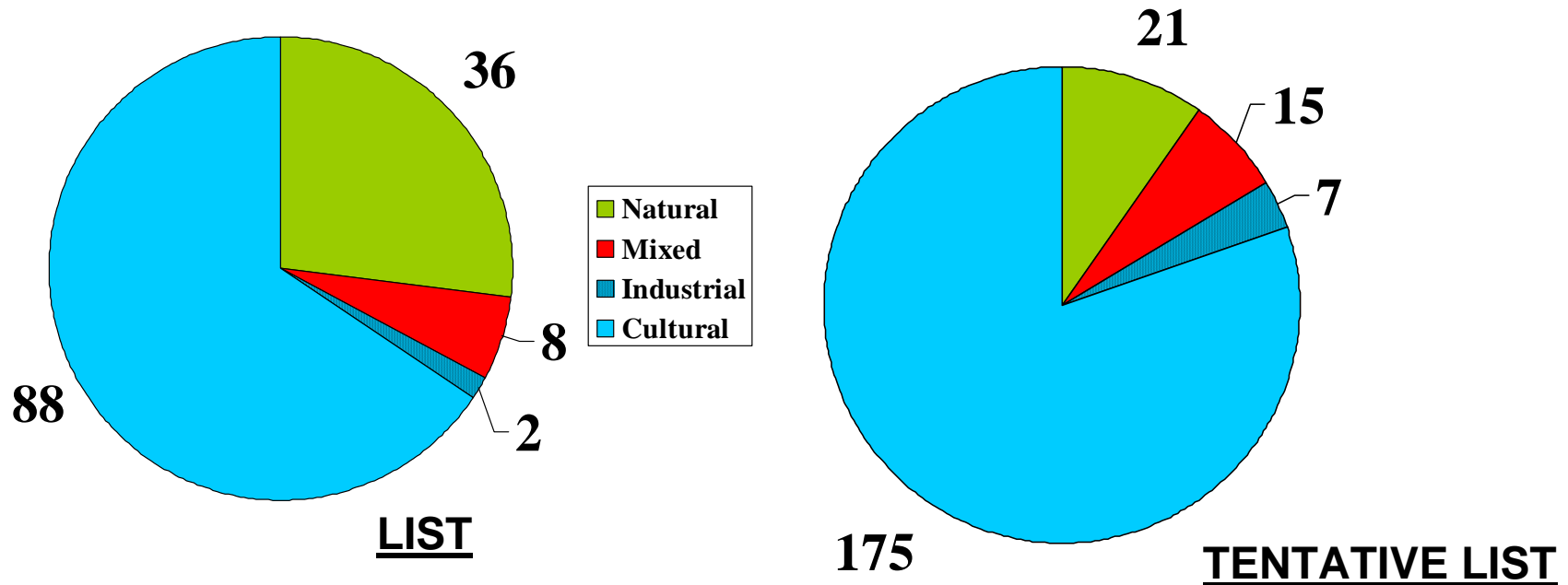
## Asia - Pacific





# Tentative Industrial World Heritage Sites

## Asia/Pacific



## TREND

- Natural Sites down from 27 % to 10 %
- Cultural Sites up from 66 % to 80 %
- **2 Industrial Heritage on the List**
- **7 Tentative Industrial Heritage Sites with 3 Chinese Bridges**



# Tentative Industrial World Heritage Sites

## Asia / Pacific

### Highlights

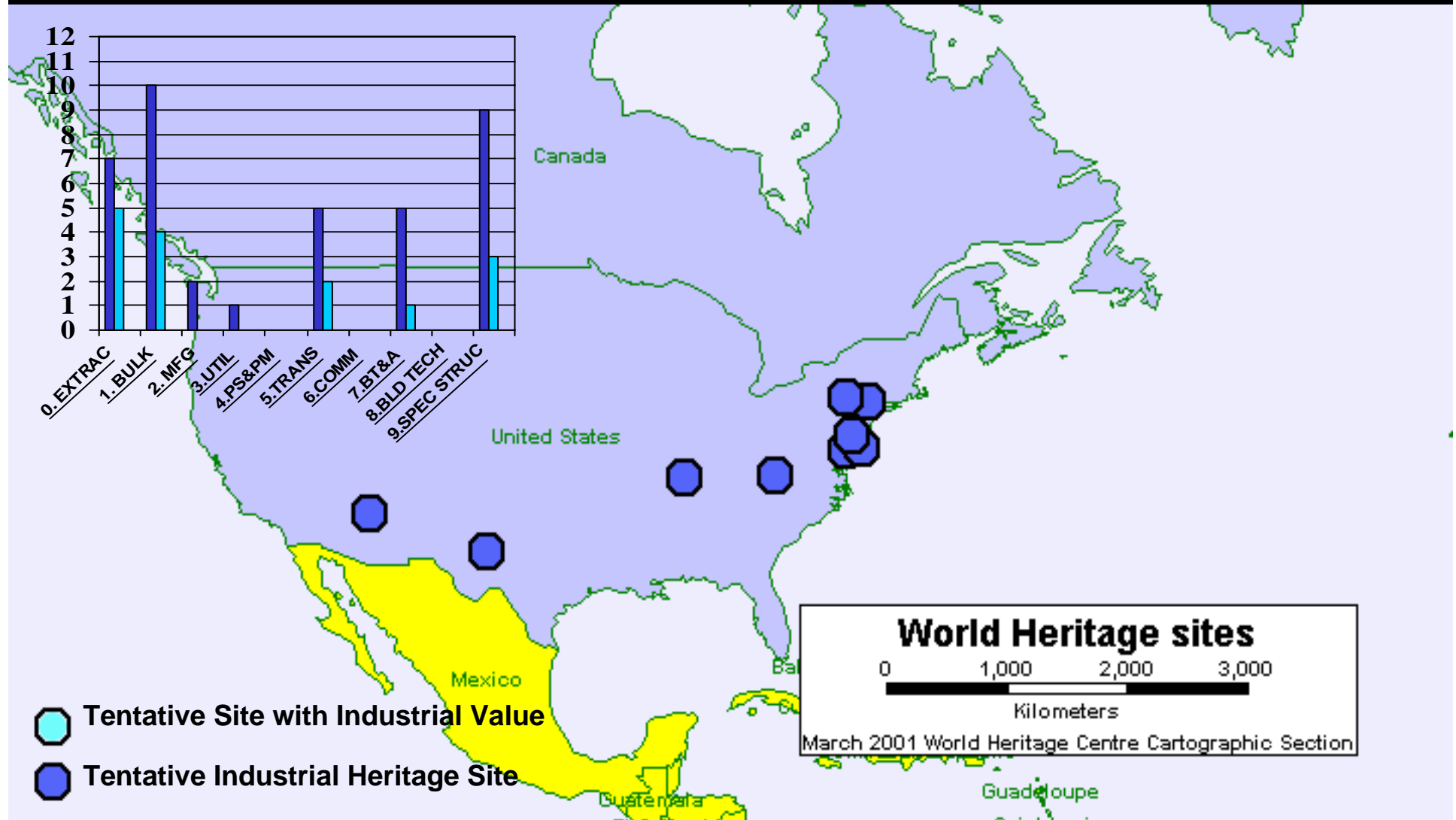


- **India: Victoria Terminal Trainstation** (left)
- **China: Lougou stone bridge** (above)
- **Rep. Korea: Kangjingun Kiln Sites**



# Industrial Classification – Tentative Industrial World Heritage Sites

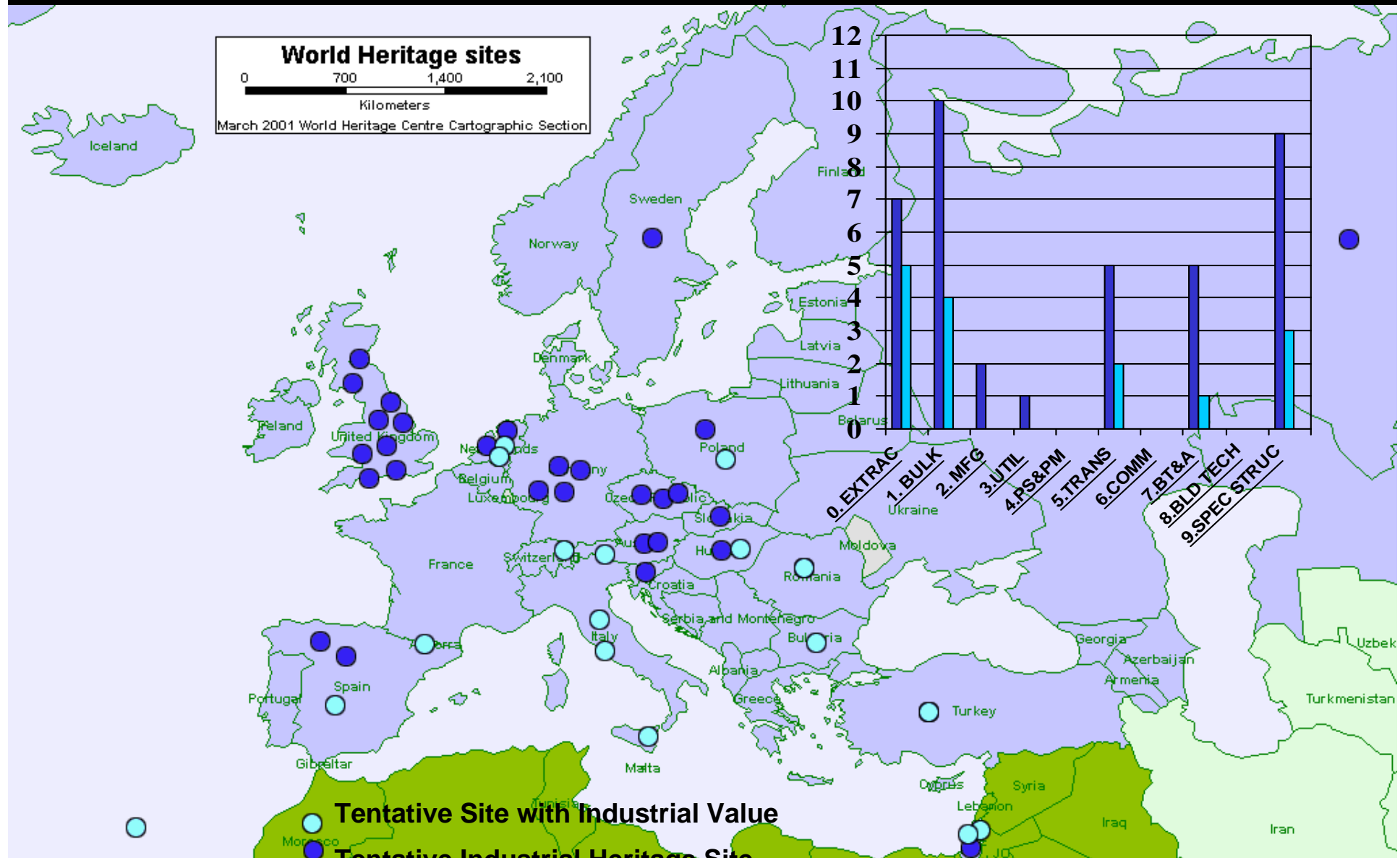
## Europe / North America





# Industrial Classification – Tentative Industrial World Heritage Sites

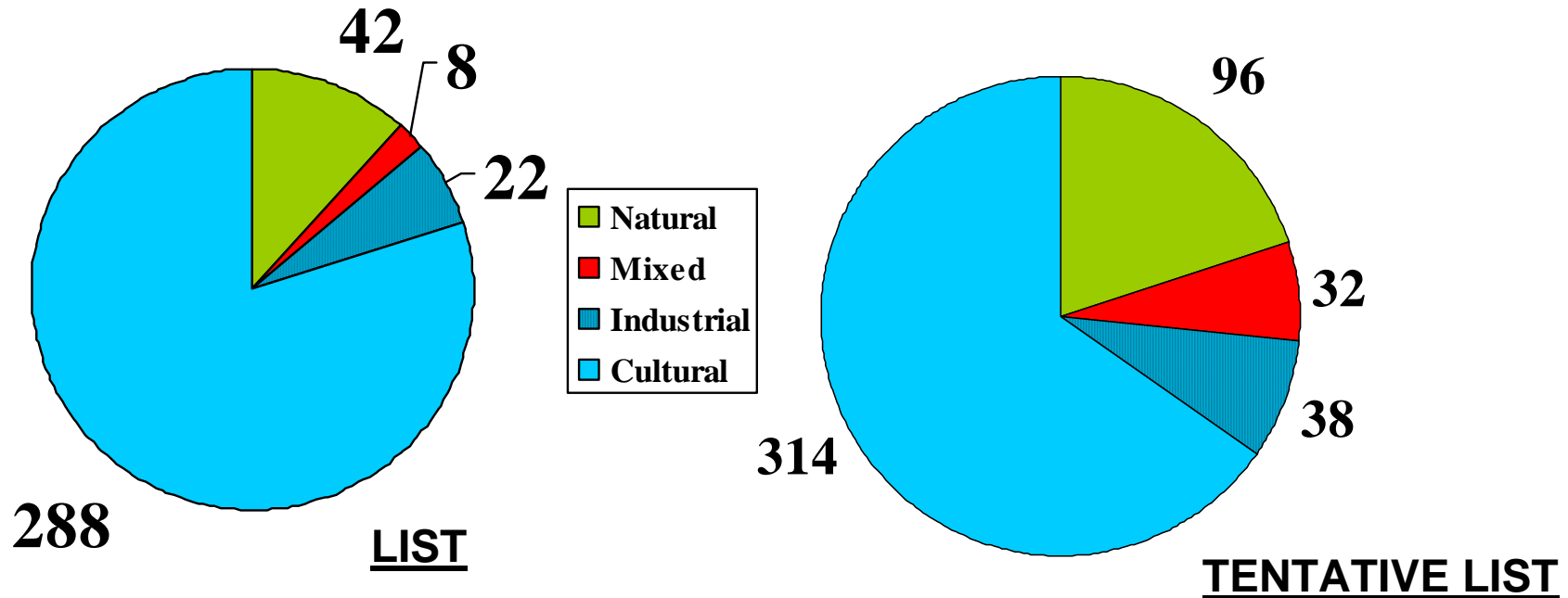
## Europe / North America





## Tentative Industrial World Heritage Sites

### Europe / North America



## TREND

- Natural Sites up from 12 % to 20 %
- Cultural Sites down from 80 % to 65 %
- **22 Industrial Heritage on the List**
- **38 Tentative Industrial Heritage Sites (up from 6% to 8%)**



## Tentative Industrial World Heritage Sites

# Europe / North America

## Highlights



- **Germany: Cultural Landscape “Zollverein”** (right)
- **Netherlands: Van Nelle Factory** (left)



## Tentative Industrial World Heritage Sites

# Europe / North America

## Highlights



- **Austria: Styrian Erzberg and Ironroad”** (above)
- **USA: Brooklyn Bridge** (left)



# Tentative Industrial World Heritage Sites

## Europe / North America

### Highlights

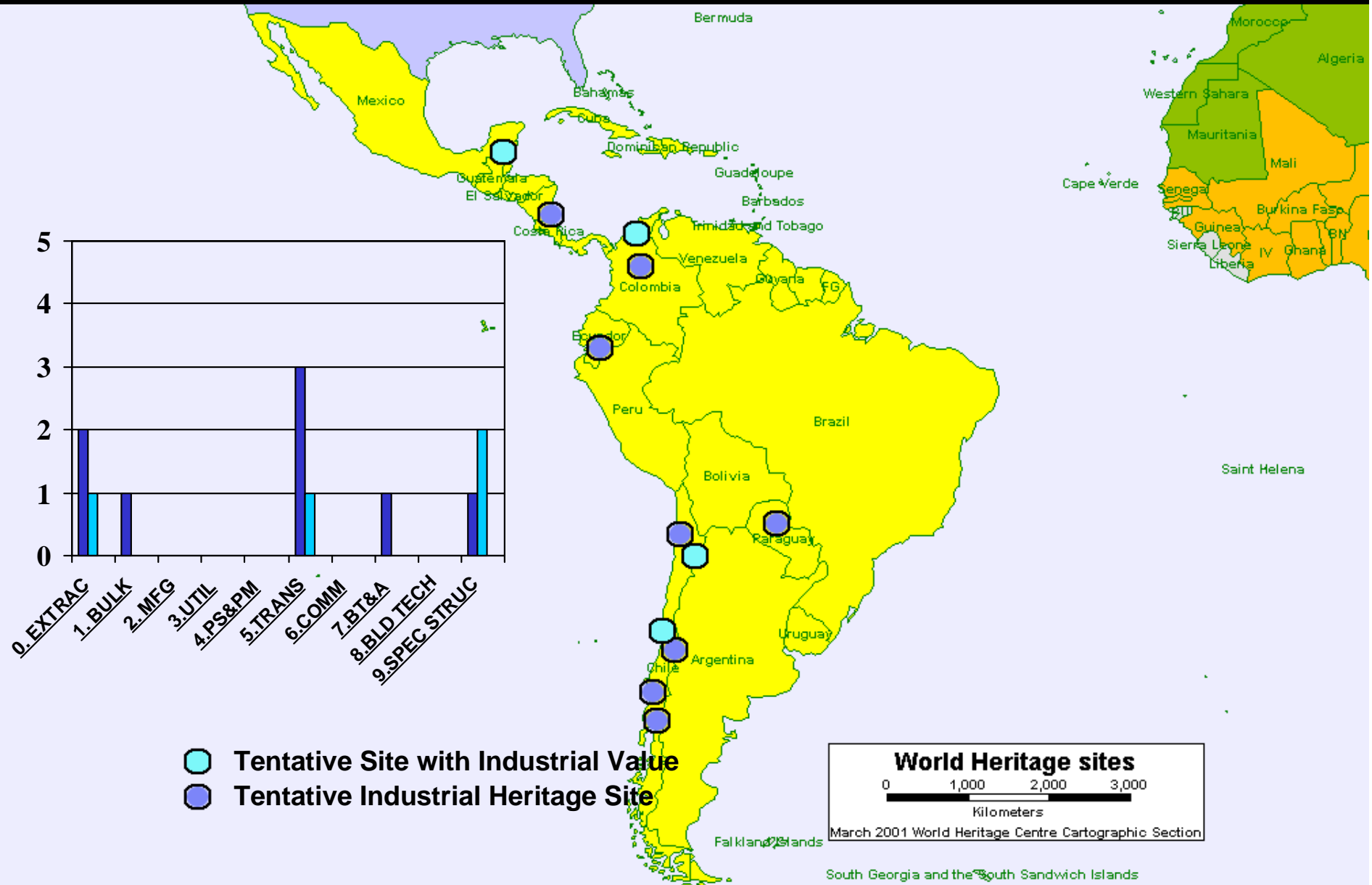
- Czech Republic: Fish pond Network in Trebon Bassin
- Czech Republic: Paper Mill at Velke Losony
- UK: Saltaire, Textile mills and utopian mill settlement  
(photo)
- UK: Pont-Cryslte Aqueduct
- USA: Goddard Rocket Launching Site
- USA: Lowell Observatory





# Industrial Classification – Tentative Industrial World Heritage Sites

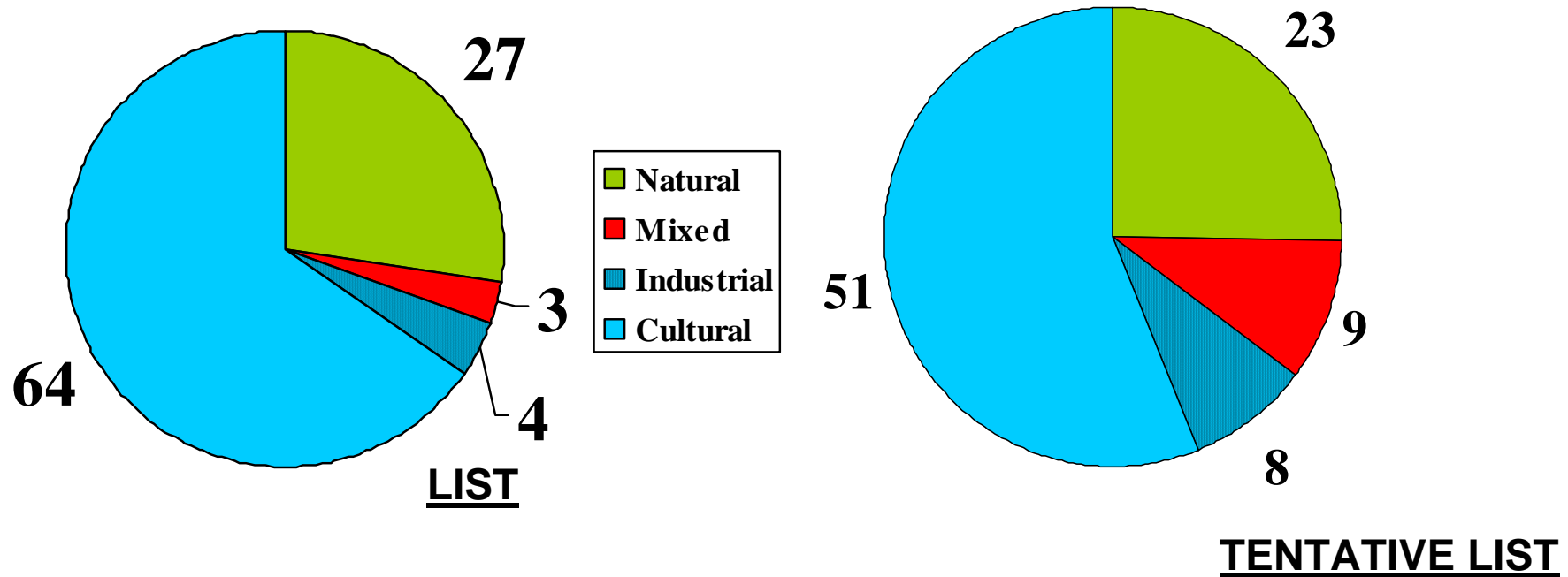
## Latin America and Caribbean





## Tentative Industrial World Heritage Sites

# Latin America / Caribbean



## TREND

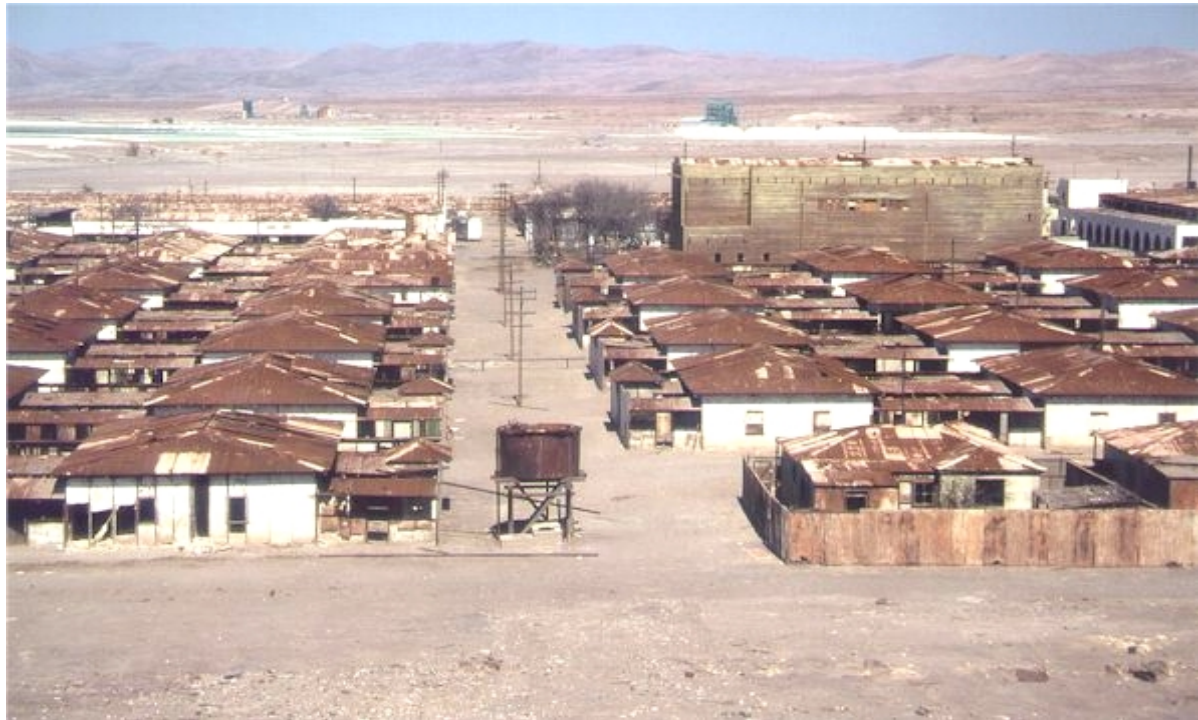
- Mixed Sites up from 3 % to 10 %
- Cultural Sites down from 65 % to 56 %
- 4 Industrial Heritage on the List
- 8 Tentative Industrial Heritage Sites (up from 4% to 9%)



# Tentative Industrial World Heritage Sites

## Latin America / Caribbean

### Highlights



- Chile: Humberstone and Santa Laura Nitrate Offices right)
- Chile: Valparaíso (Elevators – Associate Value ?)(left)



# **Classification of Industrial World Heritage**

## **Conclusion**



## Regional Composition of the World Heritage Tentative List

	<b>Cultural Property</b>	<b>Natural Property</b>	<b>Mixed Property</b>	<b>Tentative Industrial World Heritage Sites (TIWH)</b>	<b>Tentative Sites with Associated Industrial Value (TAIV)</b>	<b>Total</b>
<b>Africa (22)</b>	74	16	9	( 5 )	( 7 )	<b>99</b>
<b>Arab States (9)</b>	80	6	0	( 3 )	( 8 )	<b>86</b>
<b>Asia / Pacific (23)</b>	182	21	15	( 7 )	( 1 )	<b>218</b>
<b>Europe / North America (40)</b>	352	96	32	( 38 )	( 17 )	<b>480</b>
<b>Latin America Caribbean (18)</b>	59	23	9	( 8 )	( 4 )	<b>91</b>
<b>Total (112)</b>	<b>747</b>	<b>162</b>	<b>65</b>	<b>( 61 )</b>	<b>( 37 )</b>	<b>974</b>

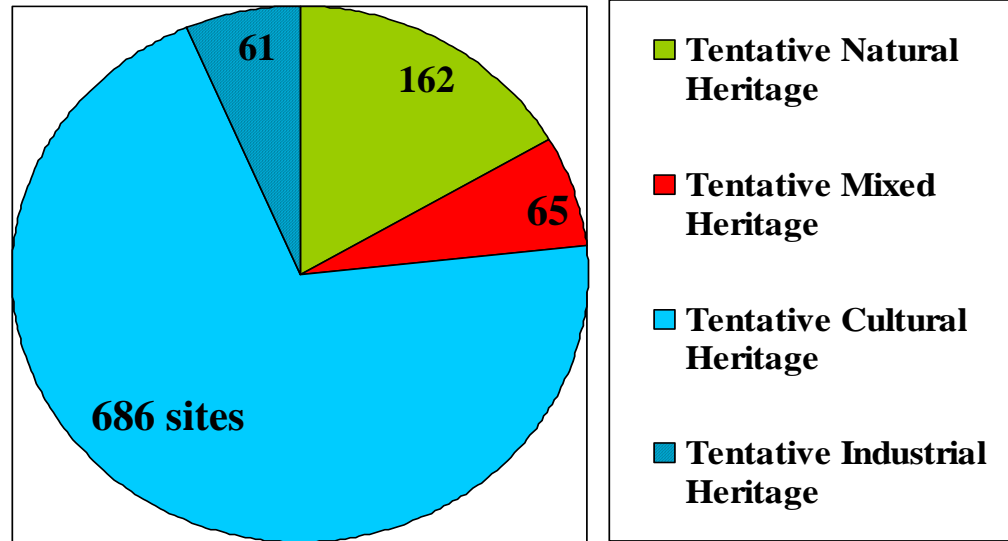


# Global Tentative List Classification

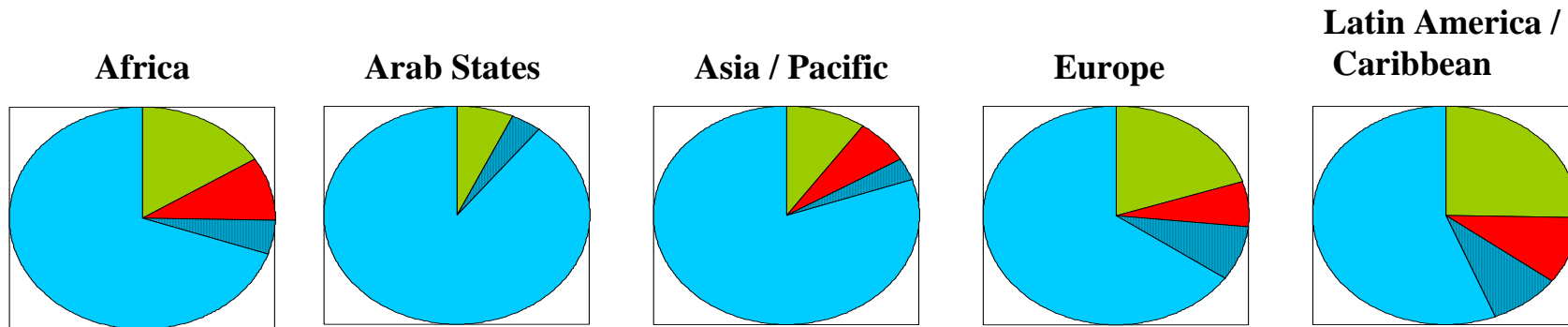
4. POWER SOURCES AND PRIME MOVERS						
Syria	Noréas de Hama	226 km N of Damascus, ruins of ancient lakes, reservoirs, aqueducts, bridges, irrigation systems, noréas are water lifting round installations			37	81.3
5. TRANSPORTATION						
India	Victoria Terminus	1888, Great Peninsula Railway, late Italian Medieval Gothic style, still in use, one of the finest station buildings in the world			47	
Slovakia	The Kysuce - Orava narrow-gauge railway	1915, 110km, 218 m heights difference, narrow-gauge railway			47	
UK	The Great Western Railway: Paddington-Bristol (selected parts)	1841, railway, tunnels, viaducts, bridges, station buildings			47	
Chile	Locomotive depot of Temuco Railroad Station	1920, Locomotive depot, workshops, coal elevator			47	
Costa Rica	San José-Lomon Region	1176m culture natural beauty, important net of railways, tunnels, bridges, technological heritage 19 <sup>th</sup> and 20 <sup>th</sup> c.	0		47	



# Global Tentative List



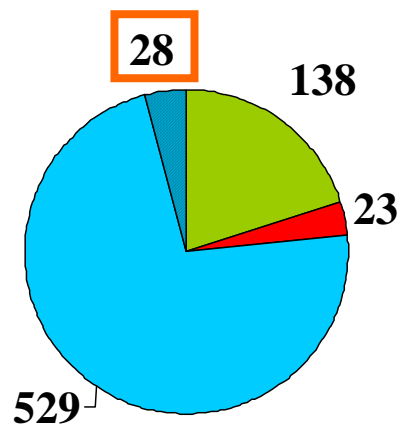
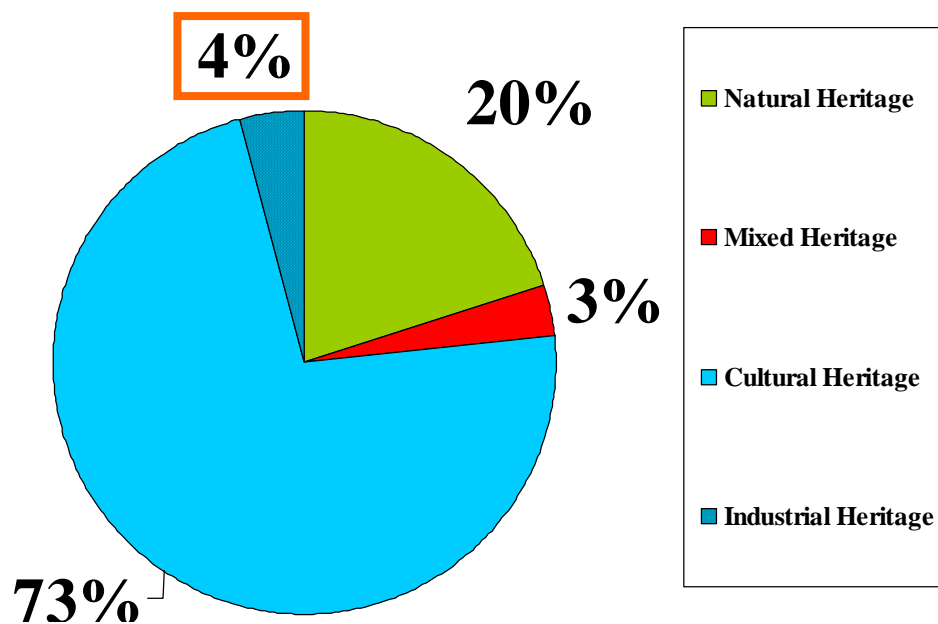
**Tentative Industrial Heritage embraces 8.2 % of all Tentative Cultural Sites and 6.2 % of all Tentative World Heritage Sites.**



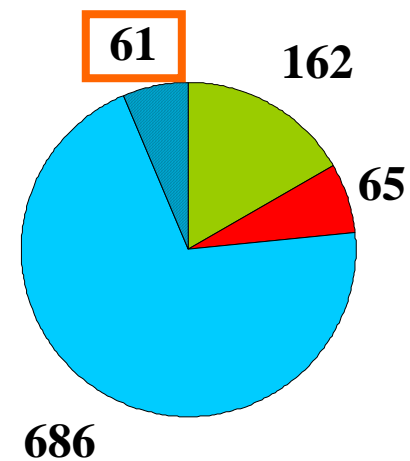
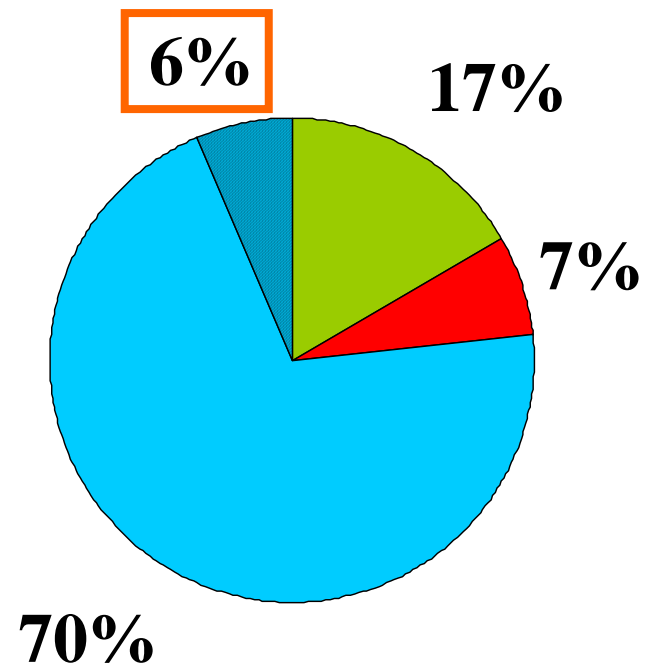


# World Heritage List and Tentative List - Trends

LIST

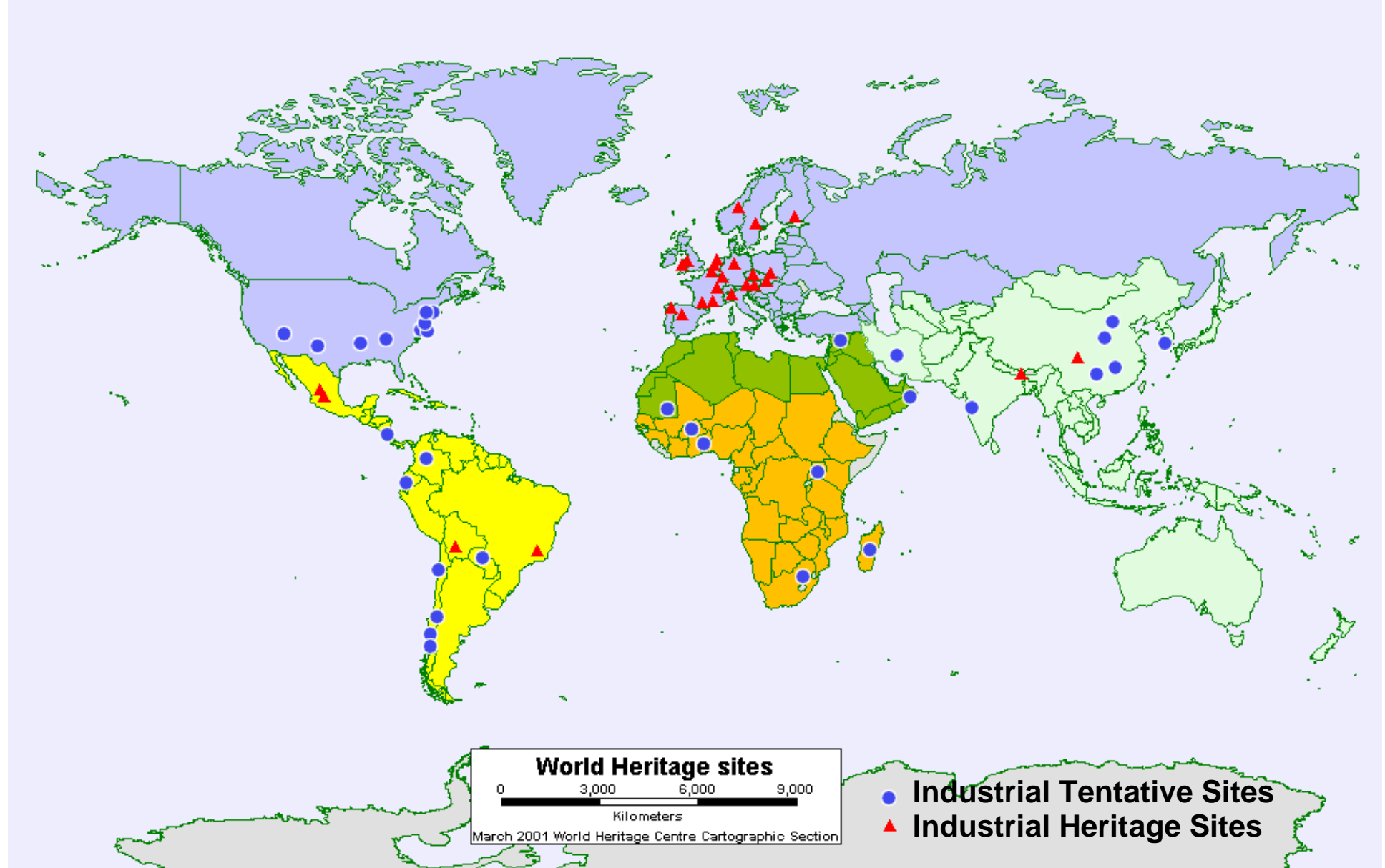


TENTATIVE LIST



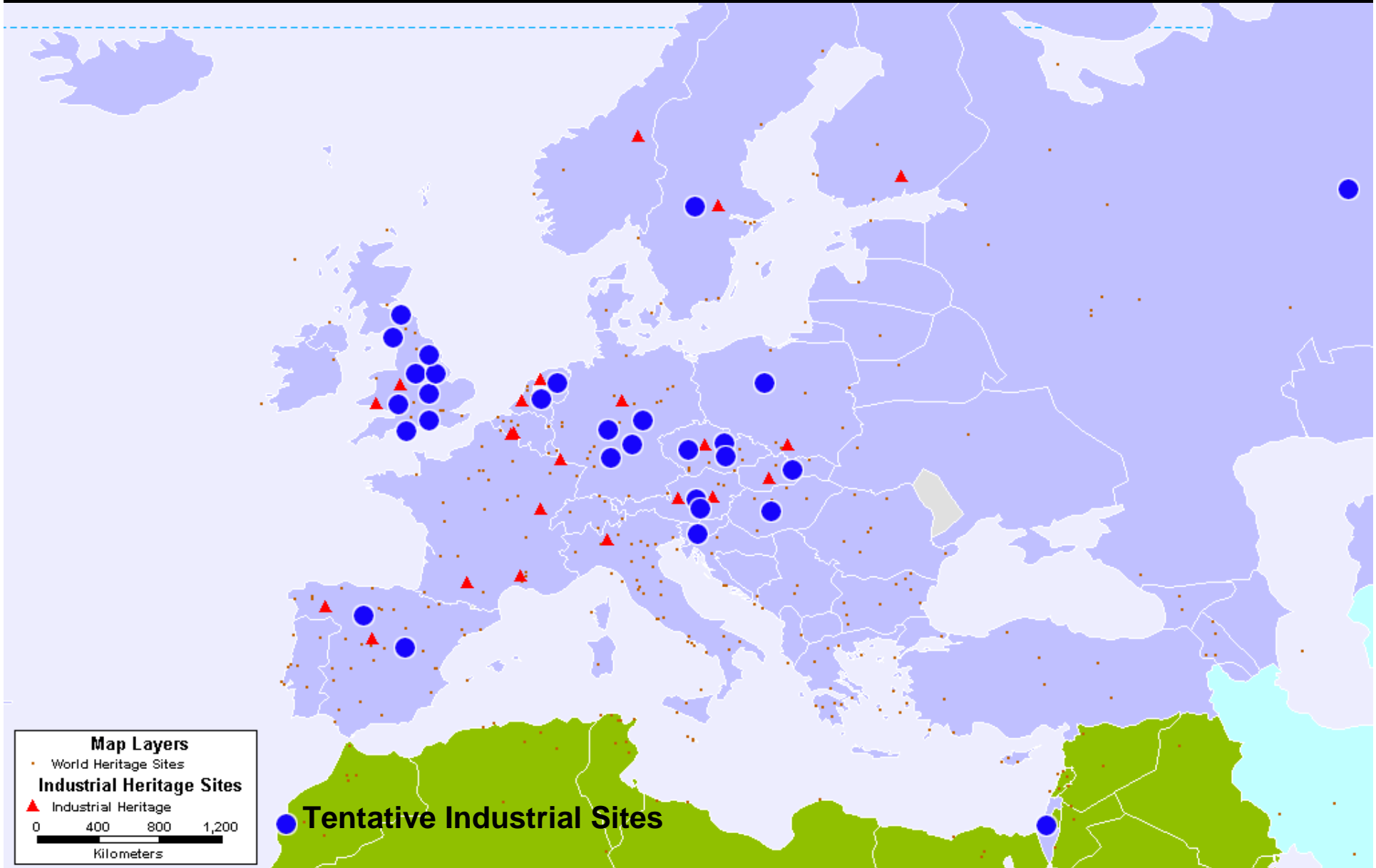


# Industrial World Heritage Sites and Tentative List Industrial Sites (without Europe)





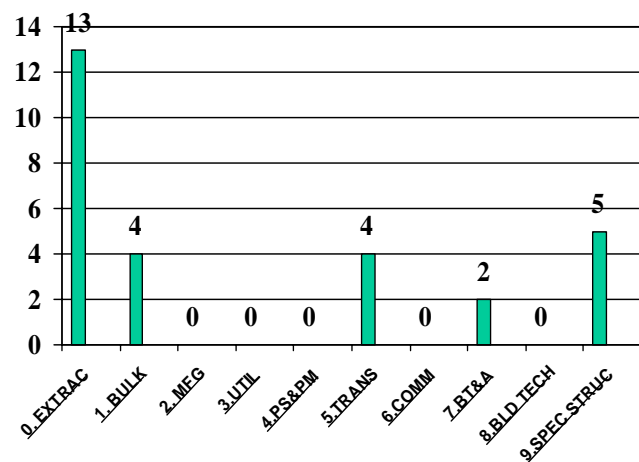
# Industrial World Heritage Sites and Tentative List Industrial Sites (only Europe)



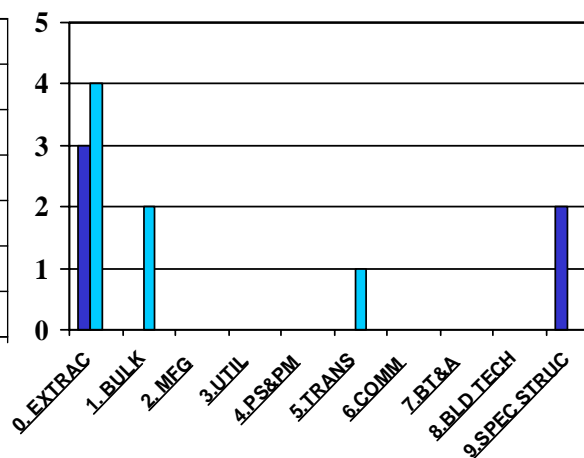


# World Industrial Heritage List and Industrial Tentative Lists

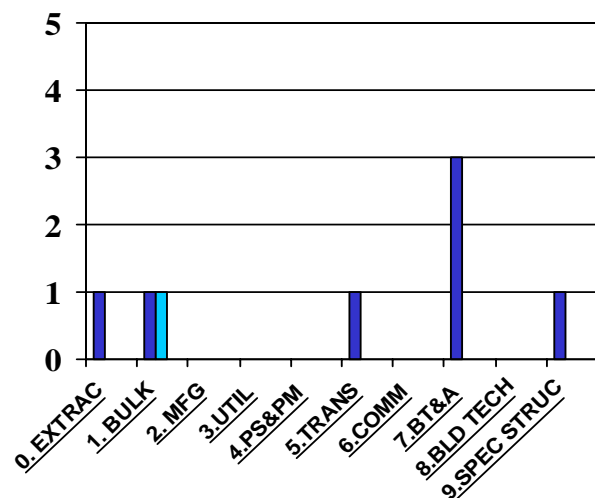
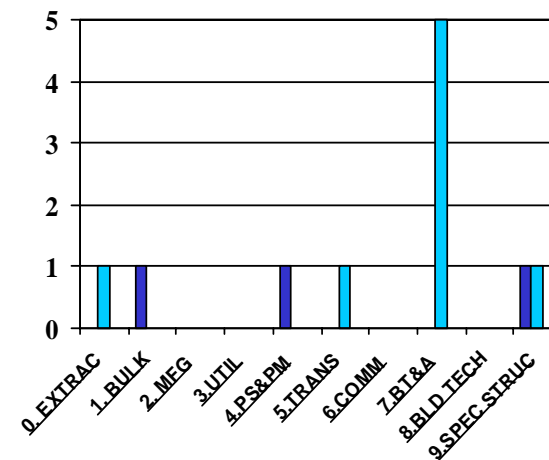
**World Industrial Heritage**



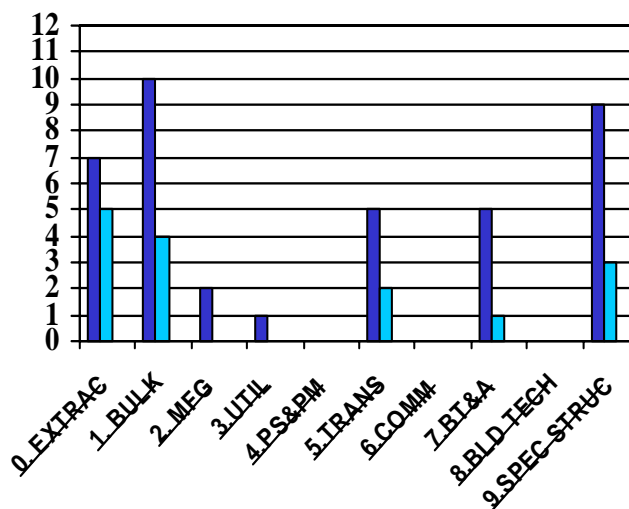
**Africa** (Tentative List)



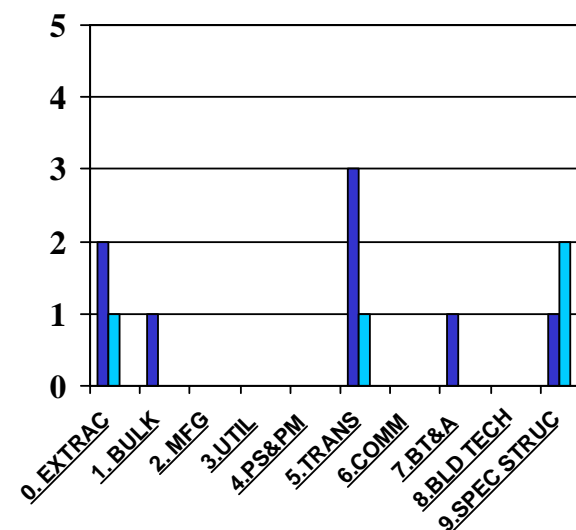
**Arab States** (Tentative List)



**Asia / Pacific**  
(Tentative List)



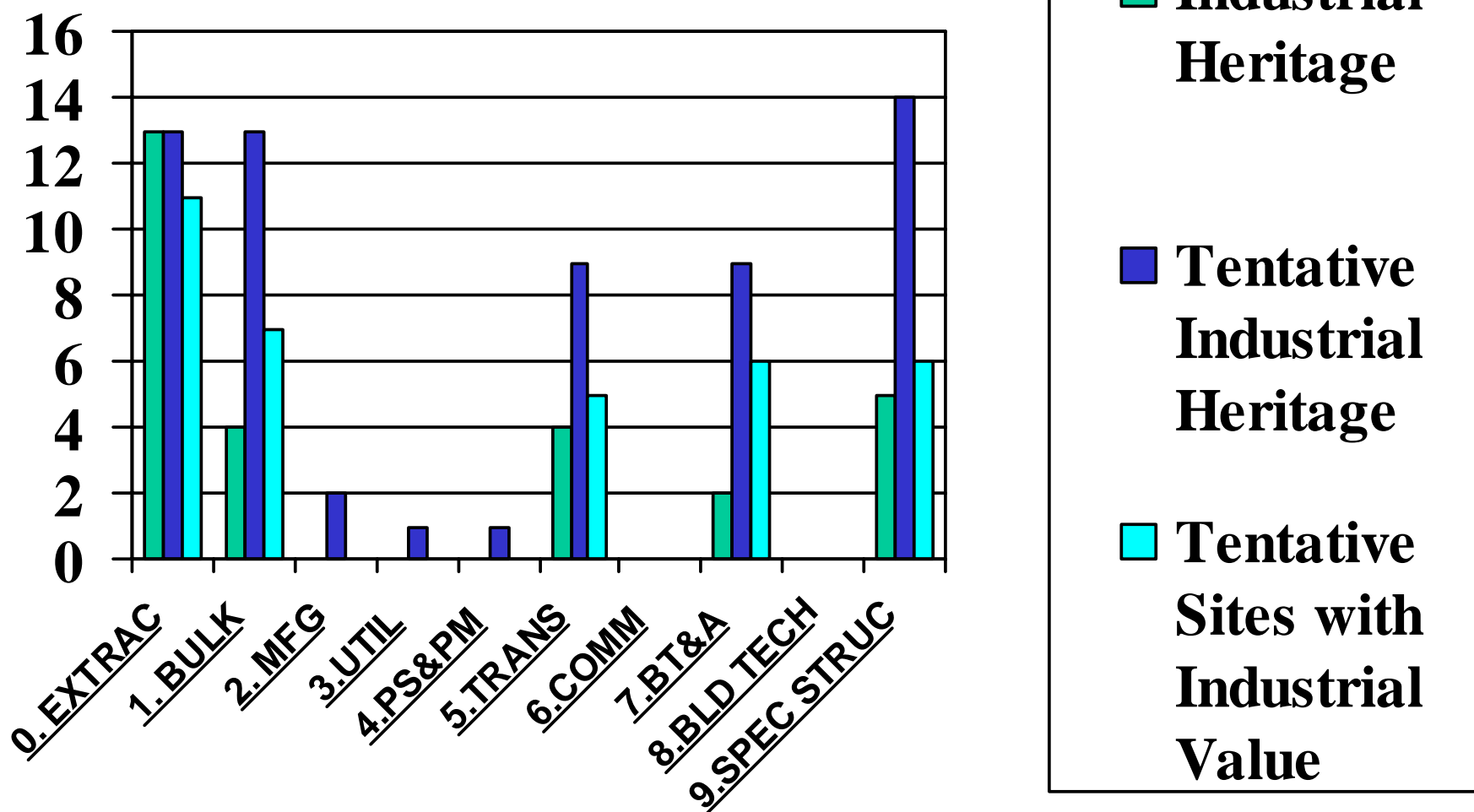
**Europe / North America**  
(Tentative List)



**Latin America / Caribbean**  
(Tentative List)

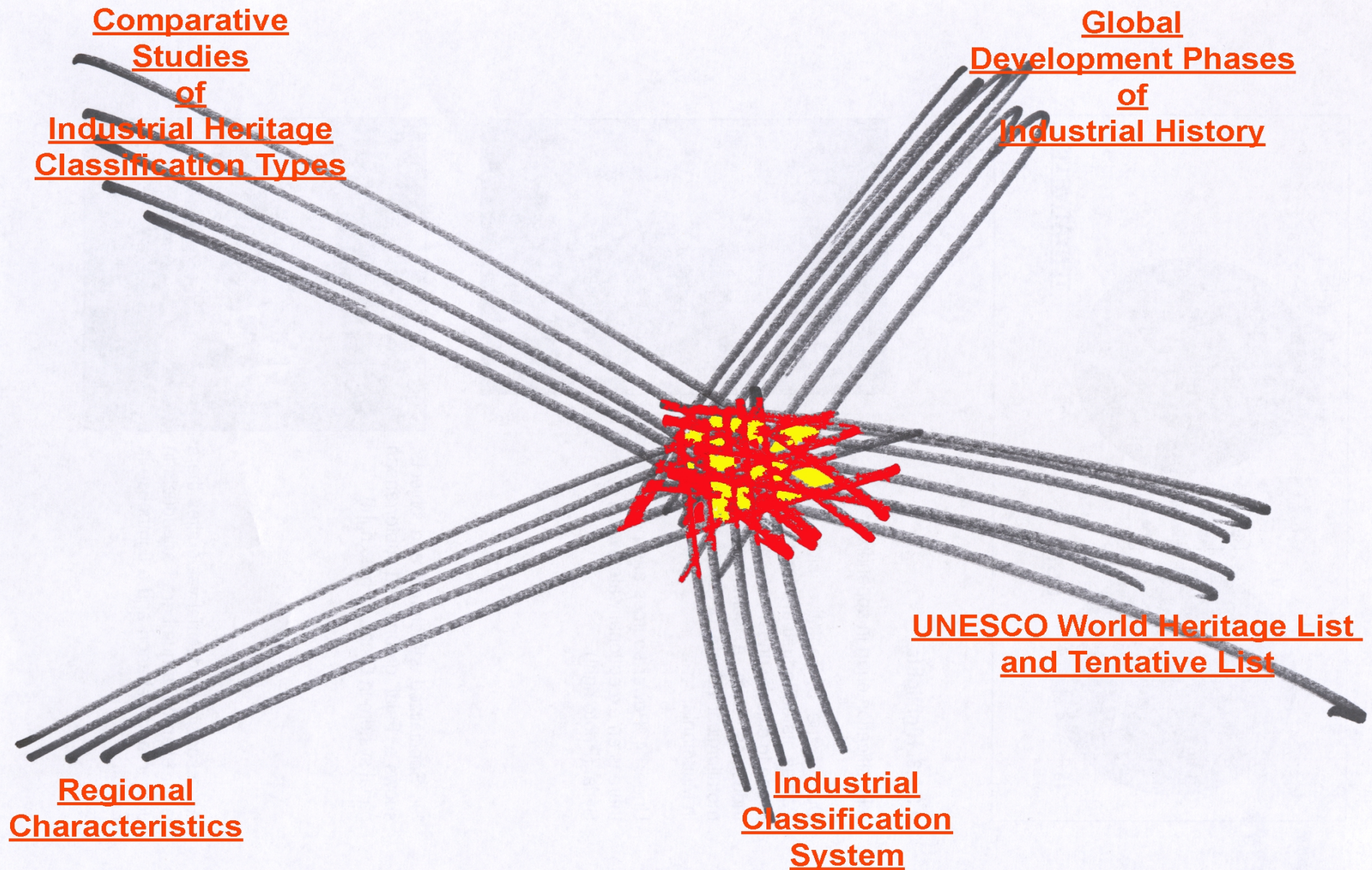


# World Industrial Heritage List and Industrial Tentative Lists





# Work for the future - A Matrix System







**Is Industrial Heritage  
under-represented on the World  
Heritage List ?**