A WONDERFUL TREASURE THAT IS VULNERABLE AND UNPROTECTED

MONT BLANC
Why Mont Blanc must and can become a UNESCO World Heritage Site?

The fact that the value of the site is extraordinary and symbolic is clear to everybody. Its unique qualities and position in the heart of Europe have made it famous throughout the world. But even with these advantages the Mont Blanc massif is the only great massif on the planet* that remains unprotected and unclassified.

The need to ensure protection is very clear. But why? For what reasons?

*The summits of the seven continents: Everest Himalaya/Asia, Aconcagua/South America, Mount Mc Kinley/North America, Kilimanjaro/Africa, Mount Vinson/Antarctic, Puntjak dijaja/Oceania and Mont Blanc/Europe?
MONT BLANC’S NATURAL UNIQUENESS

The fact that Mont Blanc deserves World Heritage status is clear. The natural environment has a multitude of diverse characteristics.

The massif rises distinctly above its surroundings. It is the highest point in the Alps, at the narrowest part of the mountain range. The other summits keep their distance as if in deference to its importance:

- The force deriving from the very centre of the earth, evident in the shape of the mountains (spires, razor sharp ridges, gendarmes, monoliths …)
- The quality of the rock, the fine grained crystal streaked granite (once known as protogine).
- The elegance of the pyramidal summit reveals the architecture of the massif. It is a unique sculpture with its distinctive ridges and rock faces.
- The glacial system representing all types of glaciers, from caps to glacial tongues flowing down towards the valley and to human settlements, leaving traces of passage on the mountains themselves.
- The particularities of the local climate as atmospheric currents converge high above all the other summits.
- The presence at all altitudes of life, flora and fauna from mild temperatures at 600 to 1000 metres to arctic conditions between 2500 and 4800 metres.

Even though Mont Blanc is not an exception in the Alps, representing just a small part, it is outstanding as it represents, enclosed within a defined perimeter, all the characteristics of high altitude mountains. This is the reason why Mont Blanc is viewed as a symbol and a place of great value....

Grandes Jorasses as seen from Lake Fenêtre in Switzerland.

Lake Chéserys 2210 m.
AN ALIVE AND EMBLEMATIC SUMMIT

The legendary height of Mont Blanc of 4807 metres has been constantly under observation since the beginning of the 1980s. New instruments, satellites and GPS judge the height as oscillating between 4807 and 4811 metres, depending on the year.

• 4808.40 m in 1986 two centuries after the first ascent,
• 4810.40 m in 2001,
• 4808 m in 2005.

These continual oscillations depend on the thickness of the snow on the rocky summit, judged to be 4780 metres. The official height of Mont Blanc, measured on the cap of snow and ice varies. This is not to the amount of snow and the low temperatures but more due to the direction and strength of the winds sculpting the summit itself.

It is claimed that increasing precipitations associated with global warming will add to Mont Blanc’s height.

It is also a mobile boundary with its summit rising between France and Italy. The two countries have been unable to come to an agreement over where the border lies. Usual practice says that the line should follow the natural watershed that runs along the summit but France claims that the line passes along the rocky ridge on Italian territory. The district of Saint-Gervais Les Bains, taking advantage of its small area bordering Italy, claims equal right to the summit with Chamonix….

The roof of Europe?
But which Europe?
Western, economical, political, geographical?

Mont Blanc is universal, the property of humanity. No other massif, however imposing, dominates such an important population.
**A REMARKABLE ACTIVE GEOLOGY**

Mont Blanc's geological evolution can be divided into three big phases.

**FIRST PHASE**
Between 500 and 250 million years ago, at the end of the Primary Age a crystal ridge, attached to the African continent, was formed. Following the carboniferous and permian periods, the second phase began, the Secondary Age.

1) Mid carboniferous - 325 m.yrs. 2) End carboniferous - 316 m.yrs.

**SECOND PHASE**
This is the age of the dinosaurs; their tracks were discovered at Emosson, now at 2500 metres. During the Secondary Age (between 250 and 60 million years ago), the continent, the “Pangea”, fractured. A huge sea, Tethys (about 800 kms wide), appeared where the Alps are now and marine sediments began to accumulate in its depths. It was a period, between the Jurassic and the Cretaceous, of a huge build-up of marine sediment. Mont Blanc lay buried beneath tens of thousands of metres below the sea level, as the sedimentary rocks were deposited that would one day form the calcareous pre-Alps.

110 million years ago, as the African and European plates moved closer together, an enclosed ocean was formed. The collision between the two plates began during the third phase of the history of the Alps. The Third age.

3) Permain - 260 m.yrs. 4) Jurassic inf. - 195 m.yrs. 5) Jurassic sup. - 135 m.yrs.

**THIRD PHASE**
The collision began 40 million years ago, creating the Alpine chain, 30 million years ago. This is the time (28 million years ago) when the Mont Blanc area emerged from the ocean. This evolution was accompanied by the appearance of an immense chain, similar to the Himalayas, connecting the Urals to the American chain. The Italian plate pushed northwards and corrugated the sedimentary rock creating a metamorphical elevation in the area of Mont Blanc. This elevation was higher than any other in the alpine range, reaching a height of 4000 metres. Twenty peaks over 4000 metres would be formed, incredible if compared to Aletsch that has nine. The consequences created particular rock formations and peaks. The rock structure and the tectonic fractures, together with freezing and thawing, account for the mountain’s fracturing into spires, gendarmes …

6) Miocene - 15 m.yrs 7) Pliocene inf. - 5 m.yrs. 8) Pleistocene from 2 m.yrs to present time.

The elevation of the massif is an on-going process though countered by erosion (about 1,5 mm a year).
Two granites are known in the Mont Blanc massif: Montenvers and Mont Blanc. The first is contained in a narrow band on a part of the western side of the mountain. The second forms the main body. Mont Blanc’s rocks tell the geological history previous to the creation of the Alps. This started at the beginning of the Primary Age, 500 million years ago, and the birth of the Alps, 240 million years ago, as the Mont Blanc massif was part of the foundations on which the raw material for the Alps, sediments, was deposited.

18 million years ago the elevation of Mont Blanc, buried below at least 15 kilometres of sedimentary rock, commenced. Thanks to its slow elevation and regular cooling, crystals were formed in cracks. These crystals came to the light following the processes of erosion and later elevations.

Fluorite and quartz on calcite, Pointe Kurz, Argentière, Mont Blanc massif. Photo: J-D. Bayle.
AT THE ORIGINS OF MODERN GEOLOGY
Mont Blanc has held people in thrall for centuries and has had a major role in the birth and evolution of geology. Literature, natural history and natural sciences all converge when studying the rock formations of the massif.

“Natural” sciences, based from their beginnings on the notion that nothing exists outside nature, have always been fascinated by Mont Blanc.

- Everything started with Horace Bénédict de Saussure (1740-1799), whose intense interest in Mont Blanc led him to claim that knowledge of the mountain was the key to understanding the structure and formation of the Alps and all mountain ranges.
- Goethe (1749-1797) wrote his diaries of his travels through the Alps during an epoch which saw the appearance of various schools of geological thought.
- The Neptunists, inspired by A.G. Werner (1749-1817), thought that all rocks were of marine origin.
- The Plutonists, inspired by J. Hutton (1726-1797), thought the appearance of volcanic rock followed the fusion of the earth’s crust.
- A new explanatory theory, as presented by Jurine (1806), saw the definition of the massif’s granite as “protogine”.
- The Plutonist, L. von Buch (1824), claimed that the elevation of the Alps, using the concentric structure as an example, was the result of magma reaching the earth’s surface. Mont Blanc was an example of this process.

The Mont Blanc massif, with its extraordinary scenery and alpine features, through centuries of scientific research, contributed to understanding the process of the genesis of the Alps. A heritage to be preserved for the future.
The Glacier Museum

Mont Blanc's glacial complex, covering 170 km², is characterised by a huge diversity of glacial structures, a variety of declivities and magnificent formations. There is an almost complete catalogue of glacial structures in the massif, whilst other areas have fewer examples that are often smaller and less visible. All the glaciers are extremely visible, easily reached and can be viewed by everybody.

Huge masses of ice descend from the points of accumulation in the high mountains, spreading out unevenly in all directions:

- The Mer de Glace, an example of a slowly moving glacier, has a 5 km section where the seracs descending from the summit create a unique formation of lighter and darker bands (50 pairs) known as the "Bandes de Forbes".

- Dynamic glaciers terminating in hanging glaciers, such as the Tour or lengthy falls of ice like the Bossons that run 3400 m vertically from the top of Mont Blanc all the way to the base of the valley.

Differences in position, exposure and erosion of the glaciers result in several tongues of white ice (Trient, Bossons, Tacconaz, ...) and a huge number of black glaciers, like the Brenva and Miage. These glaciers are often known as Himalayan or Andian.

The aesthetic beauty and educational qualities of this glacial heritage means that it must be preserved for humanity.
THE PERMAFROST

Ice is also found below ground in the Mont Blanc massif, in the rock faces and the detritical rock. The term permafrost is used for these permanently frozen terrains. Ice buried deep below the surface and in the cracks within the granite acts like cement, responsible for the stability of many of the structures. The slow degradation of the permafrost, caused by climate change, could increase the vulnerability of many of the steeper terrains, as seen in the recent collapse of the Drus (summers 2003 and 2005).

Permafrost is one of the surest indicators of global warming.
Mont Blanc is an example of 2 million years of glacial phenomenom that shaped Western Europe and human evolution.

During every glacial age of the Quaternary Period, the glaciers of Mont Blanc (Arve, Rhone and Dora Baltea) transported rock away from the centre of the massif. Tracks of their travels are found in the enormous moraines (Ivrea), and the blocks of granite known as “erratics” deposited in the Jura and as far away as Lyon (the Croix Rousse and Fourvière morenic hills). A perfect example is the Rancé stone” at Trévoux in the Dombes, 30 kms north east of Lyon.

So traces of Mont Blanc can be found hundreds of kilometres away from its origins, sometimes even as pavements in cities!

These monumental legacies are an important lesson illustrating natural climatic change, which can help us understand the present, often worrying, changes.
17000 hectares of ice are extremely important. As a reserve of both water and humidity the Mont Blanc massif is a weapon in the battle against global warming. Its deep and steeply sloping glaciers are resisting better than others. Delicate interactions between orientation, inclination, altitude, latitude, distribution of solar energy and precipitations create numerous micro-climates, differing from one valley to the next. Mont Blanc acts as a shield against atmospheric currents and generates precipitations and fierce winds. This territory is of unique value, an open air laboratory for research in climate change.

A further advantage is for tourism and the local economy: the summer season offers alpine scenery with spectacular waterfalls and roaring mountain torrents. Five million people come every year and the Mer de Glace is the most visited glacier in the world!

It is particularly important to realise that as these glaciers seem to be resisting climate change they could be the last great alpine glaciers, along with the flora and fauna, to survive.

**MONUMENT TO THE HISTORY OF EUROPE**

The Mer de Glace has been an object of research since 1598. Just like the Arctic and Antarctic ice caps, these high altitude sites contain a record of the history of our atmosphere. More than a century of information can be extracted by drilling into the depths (at -150 metres on the summit of the Dôme du Gouter, at the Col du Dôme). Along with Monte Rosa, Mont Blanc is the only European site where the ice has not melted and the layers are not mixed. These samples of ice and snow collected from the heart of Europe tell the story of the evolution of the natural and artificial composition of the atmosphere, over a period of a hundred years, during which industrial activity developed enormously.

*Mont Blanc contains the largest scientific data bank, a research resource now and in the future.*
The Mont Blanc massif is a geographically delimited habitat for flora and fauna as it is surrounded by deep valleys, difficult to cross. Altitudes vary enormously from 800 to 4800 metres and the numerous faces are fractured by valleys.

It is a bio-geographical crossroads where flora, fauna and habitats from the Western and Eastern Alps converge.

Being the highest massif in the Alps, Mont Blanc would be an invaluable point of observation and high altitude refuge if global warming proved to be catastrophic. Over the last 50 years, ecosystems have moved vertically by 300 metres.
THE FAUNA
Various animals are the symbols of the Alps, in particular birds of prey and ungulates (royal eagle, brown kite, ossifrage, mountain pheasant, mountain francolin, white alpine partridge, chamois, alpine ibex, alpine marmotte ...). All these animals have developed specific characteristics to survive alpine winters.

One of the Mont Blanc massif's unique characteristics is that, even though extreme, it is easily accessible (cable cars). This is what makes it so fascinating but at the same time it causes its vulnerability.

THE FLORA
Mont Blanc is a real life alpine botanical garden sheltering species of various origins, typical of many different environments. Even though the massif has no endemic species, it is home to numerous rare and protected plants in various different habitats that represent the four vegetation zones (mountain – sub alpine – alpine – niveal). This rich variety is also due to the Massif’s different faces, the chemical composition of the rock, above all granite and acidic but also calcareous, and also to the historical presence of man who transformed the lower and medium regions, creating open grassland. Some of the habitats - conifer forests (above all red pine, stone pine, larch, pine), moors, rocky areas, moraines are integral to the survival of numerous species. No less than a thousand species of plants have been catalogued in the Massif in the area ranging from 500 metres to 3800 m., where the Alpine Chrysanthemum (Haute-Savoie) grows breaking all altitude records.
CONCLUSION

In the very heart of an overpopulated Europe, thanks to its accessibility, Mont Blanc is a perfect laboratory for teaching about:

- the presence of all the vertical zones of natural habitats,
- observation of how life adapts according to altitude, orientation, seasons and microclimates,
- the development of the Alps,
- the Earth’s history.

A total of 730 sites, of which 144 are natural and 23 natural/cultural, distributed over 125 countries, had been granted the status by the end of 2003. 57 of these sites are mountains but Mont Blanc is not yet among them. As the authors of the Convention concurred, nature and culture are complementary to each other. Cultural identity is entwined with the natural environment in which it has developed. The Convention gives substance to the principle of collective responsibility in the protection of humanity’s heritage. Requests for nomination must come from the state in which the site is located and must involve a plan illustrating the management and protection that will be enforced. Alpine countries have been invited to present joint candidatures for transboundary sites.

THE NATURAL SITES CANDIDATE FOR UNESCO’S WORLD HERITAGE STATUS MUST RESPOND TO AT LEAST ONE OF THE FOLLOWING CRITERIA:

| **To be a perfect illustration of one of the great stages in the history of the Earth.** | A site that represents the history of the Alps and their present day situation. It is a site of great symbolic worth where every success or failure in its management can have a multiple effect on other mountain regions, in the press and in the general public. |
| **To be a perfect illustration of ecological or biological processes in evolution and the development of ecosystems.** | As an observatory of interactions between the natural environment and humans. This site could be vitally important in verifying hypotheses on global warming, evaluating the impact of winter tourism on alpine and niveal areas, monitoring environmental changes through the local population and operators. |
| **Illustrate natural phenomenon or constitute areas of natural beauty and exceptional aesthetic importance.** | Its unsurpassed natural beauty has been the subject for thousands of artists and viewed by millions of people. |
| **To include the most representative and important natural habitats for the preservation on the site of biological diversity.** | The altitude and isolated areas of the massif make it a perfect refuge for natural and fragile habitats. |

CONCLUSION

Mont Blanc has a place in UNESCO’s World Heritage list

The World Heritage Convention of UNESCO (the UN Organisation for Education, Science and Culture) was adopted in 1972. It provides for choosing sites that are of “exceptional universal value”, like Egypt’s pyramids, the Galapagos Islands and Kilimanjaro, in an attempt to stimulate international cooperation in protecting them.

The territory surrounding Mont Blanc contains all the main features found in the World mountains. This confers it an extraordinary value.
PROTECTION FOR MONT BLANC AND ITS PEAKS WILL INCREASE AWARENESS IN THE VALLEYS

This inscription will only be worthwhile if it includes protection of the areas surrounding the massif as well. This area, corresponding to all or a part of Espace Mont-Blanc must be the object of a management plan that takes into consideration the local population, and creates a real spirit of willingness to work together between the various social groups in Italy, Switzerland and France. The transborder action must be an example and the Sustainable Development Plan, devised by the three countries, must be an efficient instrument to create, a biosphere reserve, for example.

So, it is a question that involves all of us, our daily behaviour, what we do and the choices we make. It would be a wasted opportunity if we applied this project just to the natural environment, the flora and fauna….. All of us must make it our own at home as well.

PROPOSAL FOR THE PERIMETER BY PRO MONT-BLANC

The first perimeter with a central nucleus, or ecological perimeter. This comes under UNESCO’s World Heritage criteria for an ecological zone.

A second perimeter circling the 15 districts with an ambitious sustainable development plan, corresponding to the areas of human activity nearest the central nucleus (biosphere reserve).

A third, wider, perimeter illustrating Espace Mont Blanc, that partially responds to the criteria for the biosphere reserve.

“Do we really need to save this type of condor? Not really …. Apart from the fact that by saving the condor we will be able to save ourselves.” Conway MacMillan

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Thanks for their contribution to:
CREATED IN 1991 pro MONT-BLANC WAS THE FIRST INTERNATIONAL GROUP OF ASSOCIATIONS DEMANDING PROTECTION FOR THE MASSIF. MEMBERS INCLUDE:

- Alp Action, Italia Nostra (Rome)
- CAA (Club Arc Alpin)
- CAAI (Italian Academic Alpine Club)
- CAF (Federation of French Alpine Clubs)
- CAI (Italian Alpine Club)
- CAS (Swiss Alpine Club)
- CIPRA-Switzerland
- FFME (French Federation of Mountains and Climbing)
- FFRP (French Federation of Trekking)
- Legambiente (Italy)
- LS-FP (Swiss Foundation for Environmental Protection)
- Mountain Wilderness-France/Italy/Switzerland
- PRO NATURA-Switzerland
- UIAA (International Union of Alpine Associations)
- WWF-Switzerland/France/Italy
- ADMB (Association for the Defense of Mont Blanc)
- ARSMB (Association for Protection of Mont Blanc)
- Committee for the Protection of Mont Blanc
- FRAPNA Haute-Savoie (Rhône-Alpes Federation for the Protection of Nature)
- Verdi Alternativi of the Aosta Valley
- Vivre en Tarentaise (FRAPNA Savoie)

**pro MONT-BLANC**

- Mediates the communication between actors at various levels, international, regional and local population,
- Communicates scientific research and its findings to the wider public,
- Circulates information on the levels of protection of the Mont Blanc massif,
- Stimulates specific actions,
- Is an official observer of Espace Mont Blanc.

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- Patagonia dedicates 1% of its sales to environmental protection.
- The Best Western hotels in Chamonix are currently implementing an action policy to reduce the environmental impact of their activities on the Mont Blanc massif. Taking into consideration the ecological, economical and social aspects, this policy aims at conciliating development with environmental respect in the valley of Chamonix and for its inhabitants.
- The oldest ice axes and crampons factory in the world.
- IGN is a public body responsible for producing, sustaining and distributing geographical information in France.