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Geotourism

The geological attractions of Italy for tourists

Translated from the Italian 3rd edition
Contains more than 80 geotouristic locations in Italy

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PART 1

Geotourism introduction

In every place there are wonderful forms of landscape and amazing phenomena. Geotourism means travelling to discover the most beautiful scenery of our planet.

Erosion on layered rocks, Morocco

Waterfalls, deserts, volcanoes, caves are more than only fascinating, they have a story to tell: the history of the Earth.

The explanation of how the earth is made up comes to us from the geology. This science is known for the role it plays in the field of civil engineering, in practical terms in all those activities for which you need to know the underground: digging of tunnels, exploitation of mineral resources, construction of buildings.

In fact, one of the main purposes of geology is to reconstruct the events that have occurred to our planet since it was formed.

Understanding how beautiful landscapes originated could become a subject of interest even for those not active in research as "the understanding of the

Ophiolitics landscapes and the ocean floor

Even without reaching the depths of the abyss, you can see how a ocean bottom is formed because in some areas the outcropping rocks that originally formed the sea bottom are present. If you go to these places you can "see the bottom of an ancient ocean."

The formation process of the ocean depths is explained by the tectonic plate theory, two plates diverging, that move away from one another, are separated by an ocean ridge. The ocean ridges are long "cracks" that can cross an entire ocean and the magmas that comes out from it solidify, creating new oceanic crust.

The sequence of rocks formed by the oceanic ridges is similar in all oceans and can be sketched as follows. The substrate of the sequence is made-up by serpentine (so called for its bright green and black colour), a rocks derived from great depths of our planet, from the mantle.

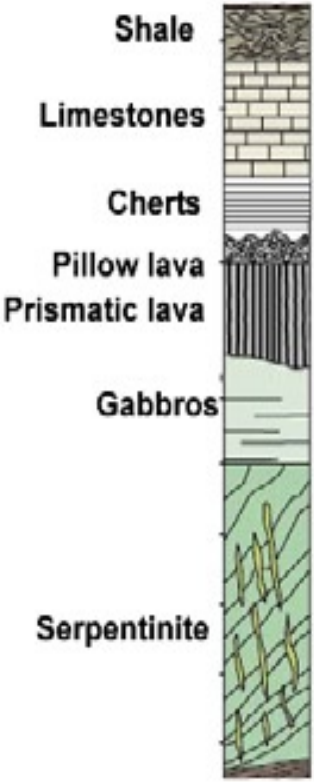
The magmas from the mantle, solidified within the serpentine, form large intrusive magmatic rocks bodies: the gabbros. The magmas that is solidified on top of the serpentine form thick layers of columnar basalt, so called because, when observed on the surface, they are divided into very regular prismatic columns.

There are famous examples of columnar basalt along the Irish coast in a place called the Giant's Causeway, in Iceland, in the Nikko National Park in Japan, in Hoggar Algeria, in Canary Islands, n the United States of America is also

Erosion over granite rock

famous the Devil's Tower, in the French Massif Central at the Regional Park of Auvergne. In Italy some cases can be seen in Sardinia within the Iglesiente area, in Sicily in the Alcantara gorges and in Acitrezza and Acicastello.
The same magmas, when it comes in contact with water, solidified very quickly producing pillow lava basalt.
Above the pillow lava basalts often are placed sediments typical of oceanic areas: cherts (chemical and biological deposits of quartz), limestone (mainly produced by chemical deposition), mudstone (sedimentary deposits of clay).
The association of the rocks described above is called ophiolites (from the greek Ophis: snake, and lithos: stone).

What to see in ophiolitics landscapes
The Serpentines and gabbos rocks, columnar basalt, pillow lava basalts, cherts, limestone, mudstone.



Sketch of the ocean floor


Prismatic columnar basalts

Routes

After having "studied" the geology, it is now time to understand how to organize a geotouristic trip.

If some aspects of a geotouristic trip correspond to the one of the traditional tourism, in other areas it differs, both during the preparation prior to departure and during the trip itself.

During the organization of the route it is better to remember that, although the rocks are very common, there are some places where they are suitable in order to understand the geology with ease.

In a good geotouristic route is foundamental to select some "key locations". In many cases the distance between these locations will require the help of an appropriate means of transport to move from one location the other. Outlining the routes is better, depending on the time available, not to take into account many different geological issues, otherwise there is the risk of confusion between places and "objects". Many rocks are similar but each one has its own history.

Geological information

How to gather the informations needed to prepare a geotouristic trip.

Road maps and travel guides are well known in traditional tourism, less known is that there exist geological maps and geological guides. Geological maps are produced by the geological survey officies of many countries for the purposes of planning, for the knowledge of the geological resources and for scientific purposes, although they can also be used as a useful aid in the planning of a journey. Ggeological maps are very rich in information showing the topography by means of the contour lines i.e. lines on a map that joins points of equal elevation, they defines the shapes of the land that represent.

In addition to isoipse, geographical common features are shown as roads, houses, rivers, lakes, boundaries and more. Do not forget to take into account the scale adopted by the map: it gives the correlation between real objects size and the shown actual size on the map (example: scale 1:100.000 means that one centimeter represented on the map is equals to 100.000 centimeters the real object, or also 1000 meters). The Italian official geological maps use a 1:100.000 scale; in the future will be available maps

with 1:50.000 scale, there are also more detailed maps (scale 1:25.000, 1:10.000 scale) for some regions. The peculiarity of these maps is that the existing geological formations are represented in different colours. The colours represents the rocks found below the surface even if they are not directly observable, this information are deduced from the interpretation of geological data collected in the area. In one side of the map is also present the legend that allows to understand what kind of rock symbolize each colour, which features presents, what age, which fossils and minerals contains and much more. The geological maps also show, as symbols, information about the structures of rocks and their arrangement in space. For example, a place with layered rock on the map will be described with a symbol that indicates the presence of stratification and its orientation and inclination.

Geological cross sections, usually present on these maps, are a sketch of what could be ideally seen cutting the Earth's surface along a vertical line. Looking at a geological section, we can imagine the arrangement of the rocks underneath.

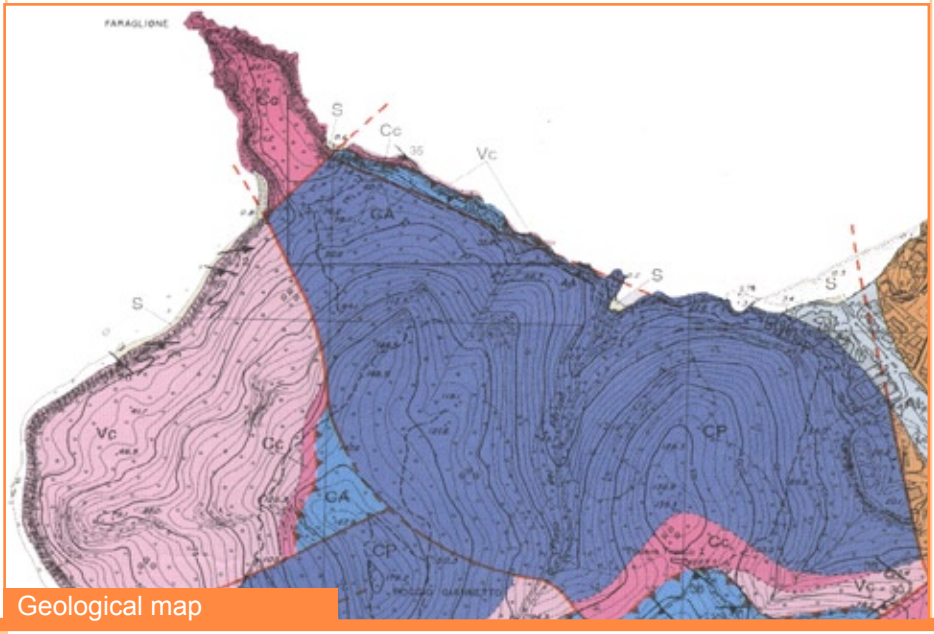
Geological maps are a valuable tool to understand where certain types of rock are placed. These maps, however, does not indicate where the rocks are actually visible on the surface neither indicate the sites of major scientific and educational interest and where to find them. For those reasons, the geological maps should be used together with other documentation. It should be noted that it is not easy to find this kind of maps, indeed geological maps can be found on sale in specialized libraries, in consultation in university departments and cultural centers. It is useful to know that while in Italy and in some other countries there is good geological cartography continuously updated, in other countries this thematic cartography may not exist.

Other valuable sources of information to organize a geotouristic trip are geological guidebooks. These books can be found in specialized libraries.

Usually they have a comprehensive introduction about the concerned area, where it is described the reconstruction of geological events that led to the current situation according to the most accredited theories. Then some routes or places of geological interest are presented, with a road map showing the routes that drive to the places to be visited (also called "stop" or geosites). The stops most of the time are selected for their high scientific value and are described and represented with diagrams and drawings.

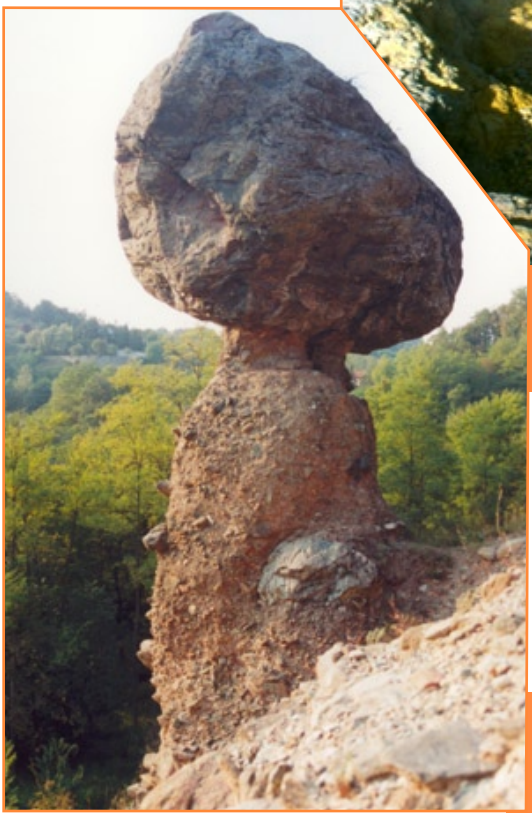
Typically, a route can be completed in one day but nothing prevents you from taking the information from different itineraries and to assemble new interesting itineraries.
If there is a need for more in-depth information, you can find a huge number of scientific publications on journals issued for geologists. These can be found in consultation in the universities or in libraries.
For those who wish to have the support of an expert for their trip or excursion, there are in each region entitled naturalistic guides. They are often graduates in science and may organize a trip for the tourists who wish to visit areas of natural interest.

In order to contact a geological guide may be helpful to ask information to the local tourism agencies or park working on the promotion of the place you want to visit.
It is also a good idea to ask wheather there are of museums, near the area you wish to visit, especially asking about the presence of a section about the local geology. There are often valuable minerals and fossils collections, although most of the time modest in terms of number of samples.



Geological map

Volcanic emissions, mount Vulcano, Sicilia, Italy



Mushroom-like shape, Piana Crixia, Liguria, Italy

PART 2

Italian geoturistic locations

The areas of geotouristic interest in Italy are uncountable. It would be impossible to list them all.
In this chapter will be described some geoturistic places that can be helpful for those who wish to approach this exciting sort of natural tourism, it also serve as a basis for developing new and personal itineraries. All the places listed are suitable for easy excursions and are suitable for people with only a minimum of geological knowledge.

LEGEND OF THE SIMBOLS


MUSEUM & EXPOSITIONS


MINERALS & ROCKS


FOSSILS


LANDFORMS


VOLCANOES


CAVES & MINES

Lombardia

8. Val Malenco Geological Park

Getting there	Region: Lombardia
From Sondrio follow the Valmalenco road for about 15 km to the Chiesa di Valmalenco village, from there, towards Chiareggio, then you arrive after about 12 Km.	
 	

The Valmalenco Geological Park is located in Chiareggio, the area is of great interest in relation to the diverse geological topics about the Alps extending from petrology to structural geology and from mineralogy to glaciology.
Besides the park, the valley offers many suggestions of geological, natural and historical interest.
Val Malenco is one of the mineralogical most important areas of the Alps and destination for over a century of collectors looking for items on Mount Motta, on Crestun, in the crystals cave or in old mines. The great diversity of mineralogical species present in the area (almost 300 different) is mainly due to geological complexity. vesuvianite, titanite, diopside are just some of the minerals that can be found.
The ethnographic historical museum nature of Chiesa holds the mineral collection of Pietro Sigismund, a true pioneer in this field, in the collection can be found fine quartz and garnet crystals.
In the valley for a long time has been extracted "soapstone" or steatite, a rock that has a color between gray and green, is composed in equal proportions of magnesite and talc with about a 5% chlorite, and itself is easily modeled. Thanks to its high qualities of thermal conduction, is particularly suitable for the construction of stoves and also of the "lavecc" the traditional pots circled with bands of copper.
To the soapstone are related to some of the traditional jobs of the valley now almost disappeared and their names for example gthe giuelé h, was one who extracted and crafted flat blocks from quarries, sometimes even becoming gteciàt h, using precise techniques, often secret, to cover the roofs, the "lavegiat" was the craftsman who worked the soapstone with a lathe to obtain items such as dishes, vases, also called "pignatte" or

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