



PETROLOGY [the study of rocks]

GRANITE

Granite is classified according to the QAPF diagram for coarse grained plutonic rocks (granitoids) and is named according to the percentage of quartz, alkali feldspar (orthoclase, sanidine, or microcline) and plagioclase feldspar on the A-Q-P half of the diagram. Granite-like rocks which are silica-undersaturated may have a feldspathoid such as nepheline, and are classified on the A-F-P half of the diagram.

True granite according to modern petrologic convention contains both plagioclase and alkali feldspars. When a granitoid is devoid or nearly devoid of plagioclase the rock is referred to as alkali granite. When a granitoid contains <10% orthoclase it is called tonalite; pyroxene and amphibole are common in tonalite. A granite containing both muscovite and biotite micas is called a binary or two-mica granite. Two-mica granites are typically high in potassium and low in plagioclase, and are usually S-type granites or A-type granites. The volcanic equivalent of plutonic granite is rhyolite.

Granite is currently known only on Earth where it forms a major part of continental crust. Granite often occurs as relatively small, less than 100 km² stock masses (stocks) and in batholiths that are often associated with orogenic mountain ranges. Small dikes of granitic composition called aplites are often associated with the margins of granitic intrusions. In some locations very coarse-grained pegmatite masses occur with granite. Granite has been intruded into the crust of the Earth during all geologic periods, although much of it is of Precambrian age. Granitic rock is widely distributed throughout the continental crust of the Earth and is the most abundant basement rock that underlies the relatively thin sedimentary veneer of the continents.

Despite being fairly common throughout the world, the areas with the most commercial granite quarries are located in Finland, Norway and Sweden (Bohuslän), northern Portugal in Chaves and Vila Pouca de Aguiar, Spain (mostly Galicia and Extremadura), Brazil, India and several countries in southern Africa, namely Angola, Namibia, Zimbabwe and South Africa.

Granite is an igneous rock and is formed from magma. Granitic magma has many potential origins but it must intrude other rocks. Most granite intrusions are emplaced at depth within the crust, usually greater than 1.5 kilometres and up to 50 km depth within thick continental crust. The origin of granite is contentious and has led to varied schemes of classification. Classification schemes are regional; there is a French scheme, a British scheme and an American scheme. This confusion arises because the classification schemes define granite by different means. Generally the 'alphabet-soup' classification is used because it classifies based on genesis or origin of the magma.

Geochemical origins:

Granitoids are a ubiquitous component of the crust. They have crystallized from magmas that have compositions at or near a eutectic point (or a temperature minimum on a cotectic curve). Magmas will evolve to the eutectic because of igneous differentiation, or because they represent low degrees of partial melting. Fractional crystallisation serves to reduce a melt in iron, magnesium, titanium, calcium and sodium, and enrich the melt in potassium and silicon - alkali feldspar (rich in potassium) and quartz (SiO₂), are two of the defining constituents of granite.

This process operates regardless of the origin of the parental magma to the granite, and regardless of its chemistry. However, the composition and origin of the magma which differentiates into granite, leaves certain geochemical and mineralogical evidence as to what the granite's parental rock was. The final mineralogy, texture and chemical composition of a granite is often distinctive as to its origin. For instance, a granite which is formed from melted sediments may have more alkali feldspar, whereas a granite derived from melted basalt may be richer in plagioclase feldspar. It is on this basis that the modern "alphabet" classification schemes are based.

Uses:

Antiquity

The Red Pyramid of Egypt (c.26th century BC), named for the light crimson hue of its exposed granite surfaces, is the third largest of Egyptian pyramids. Menkaure's Pyramid, likely dating to the same era, was constructed of limestone and granite blocks. The Great Pyramid of Giza (c.2580 BC) contains a huge granite sarcophagus fashioned of "Red Aswan Granite." The mostly ruined Black Pyramid dating from the reign of Amenemhat III once had a polished granite pyramidion or capstone, now on display in the main hall of the Egyptian Museum in Cairo (see Dahshur). Other uses in Ancient Egypt,[7] include columns, door lintels, sills, jambs, and wall and floor veneer. How the Egyptians worked the solid granite is still a matter of debate. Dr. Patrick Hunt[8] has postulated that the Egyptians used emery shown to have higher hardness on the Mohs scale.

Many large Hindu temples in southern India, particularly those built by the 11th century king Rajaraja Chola I, were made of granite. There is a large amount of granite in these structures. They are comparable to the Great Pyramid of Giza.[9]

Modern

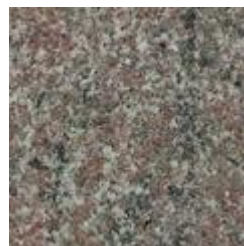
Granite has been extensively used as a dimension stone and as flooring tiles in public and commercial buildings and monuments. Because of its abundance granite was commonly used as to build foundations for homes in New England. The Granite Railway, America's first railroad, was built to haul granite from the quarries in Quincy, Massachusetts, to the Neponset River for transport. With increasing amounts of acid rain in parts of the world, granite has begun to supplant marble as a monument material, since it is much more durable. Polished granite is also a popular choice for kitchen countertops due to its high durability and aesthetic qualities.



Azul Noche (Spain)



Santa Cecelia (Brazil)



Gran Violet (Brazil)



Lavender Blue (Brazil)

Engineers have traditionally used polished granite surfaces to establish a plane of reference, since they are relatively impervious and inflexible. Sandblasted concrete with a heavy aggregate content has an appearance similar to rough granite, and is often used as a substitute when use of real granite is impractical. A most unusual use of granite was in the construction of the rails for the Haytor Granite Tramway, Devon, England, in 1820. Curling stones are traditionally fashioned of Ailsa Craig granite. The first stones were made in the 1750s, the original source being Ailsa Craig in Scotland. Because of the particular rarity of the granite, the best stones can cost as much as US\$1,500. Between 60–70 percent of the stones used today are made from Ailsa Craig granite, although the island is now a wildlife reserve and is no longer used for quarrying.[10]

Marble is a metamorphic rock resulting from regional or rarely contact metamorphism of sedimentary carbonate rocks, either limestone or dolostone, or metamorphism of older marble. This metamorphic process causes a complete recrystallization of the original rock into an interlocking mosaic of calcite, aragonite and/or dolomite crystals. The temperatures and pressures necessary to form marble usually destroy any fossils and sedimentary textures present in the original rock.

MARBLE

Pure white marble is the result of metamorphism of very pure limestones. The characteristic swirls and veins of many colored marble varieties are usually due to various mineral impurities such as clay, silt, sand, iron oxides, or chert which were originally present as grains or layers in the limestone. Green coloration is often due to serpentine resulting from originally high magnesium limestone or dolostone with silica impurities. These various impurities have been mobilized and recrystallized by the intense pressure and heat of the metamorphism.

Types of marble



Natural patterns on the polished surface of "landscape marble" can resemble a city skyline or even trees (see photo).



Blocks of cut marble at the historic mill in Marble, Colorado



Black Dębnik marble portal (17th century) of St. Wojciech's Church in Kraków



Marble from Italy

Some historically important kinds of marble, named after the locations of their quarries, include:

<u>Marble</u>	<u>Color</u>	<u>Location</u>	<u>Country/Region</u>
Beijing White	White		China
Black Marble		Dębnik	Poland
Black Marble		Kilkenny	Ireland
Boticena and Onyx(Green)			Pakistan
Brač		Island of Brač	Croatia
Brown marble		Chęciny	Poland
Carrara marble	white or blue-gray	Carrara	Italy
Connemara marble	Green	Connemara	Ireland
Danby marble		Danby	Vermont
Durango Marble		Coyote Quarry	Mexico
Fauske			Norway
Llano Pink			Central Texas
Luni marble		Luni	Italy
Macael			Spain
Makrana	Grayish white		India
Nabresina		Trieste	Italy
Parian marble	Fine-grained semitranslucent pure-white	Island of Paros	Greece
Penteli Marble	Flawless white with a uniform, faint yellow tint	Penteli	Greece
Proconnesus Marble		Island of Marmara	Turkey
Red Marble		Rușița	Romania
Rouge de Rance	Red	Rance	Belgium
Royal White	White		China
Thassos	Snow white, White, Grayish white, White with pink veining	Island of Thassos	Greece
Vietnam White	Grayish White		Vietnam
Yule	Uniform pure white	Marble, Colorado	Colorado

White marbles, like Carrara in Italy, Royal White and Beijing White in China, have been prized for sculpture since classical times. This preference has to do with the softness and relative isotropy and homogeneity, and a relative resistance to shattering. Also, the low index of refraction of calcite allows light to penetrate several millimeters into the stone before being scattered out, resulting in the characteristic "waxy" look which gives "life" to marble sculptures of the human body.

Industrial use of marble:

Colorless or light-colored marbles are a very pure source of calcium carbonate, which is used in a wide variety of industries. Finely ground marble or calcium carbonate powder is a component in paper, and in consumer products such as toothpaste, plastics, and paints. Ground calcium carbonate can be made from limestone, chalk, and marble; about three-quarters of the ground calcium carbonate worldwide is made from marble. Ground calcium carbonate is used as a coating pigment for paper because of its high brightness and as a paper filler because it strengthens the sheet and imparts high brightness. Ground calcium carbonate is used in consumer products such as a food additive, in toothpaste, and as an inert filler in pills. It is used in plastics because it imparts stiffness, impact strength, dimensional stability, and thermal conductivity. It is used in paints because it is a good filler and extender, has high brightness, and is weather resistant. However, the growth in demand for ground calcium carbonate in the last decade has mostly been for a coating pigment in paper.

Calcium carbonate can also be reduced under high heat to calcium oxide (also known as "lime"), which has many applications including being a primary component of many forms of cement.

Production:

According to the United States Geological Survey, U.S. dimension marble production in 2006 was 46,400 tons valued at \$18.1 million, compared to 72,300 tons valued at \$18.9 million in 2005. Crushed marble production (for aggregate and industrial uses) in 2006 was 11.8 million tons valued at \$116 million, of which 6.5 million tons was finely ground calcium carbonate and the rest was construction aggregate. For comparison, 2005 crushed marble production was 7.76 million tons valued at \$58.7 million, of which 4.8 million tons was finely ground calcium carbonate and the rest was construction aggregate. U.S. dimension marble demand is about 1.3 million tons. The DSA World Demand for (finished) Marble Index has shown a growth of 12% annually for the 2000-2006 period, compared to 10.5% annually for the 2000-2005 period. The largest dimension marble application is tile.

Cultural associations:

As the favorite medium for Greek and Roman sculptors and architects (see classical sculpture), marble has become a cultural symbol of tradition and refined taste. Its extremely varied and colorful patterns make it a favorite decorative material, and it is often imitated in background patterns for computer displays, etc.

In folklore, marble is associated with the astrological sign of Gemini. Pure white marble is an emblem of purity. It is also an emblem of immortality, and an insurer of success in education.

Pietre Dure



Pope Clement VIII in pietre dure designed by Jacopo Ligozzi, executed by Romolo di Francesco Ferrucci del Tadda

Pietre dure (or Parchin kari, in south Asia) is an art-historical term for the technique of using small, exquisitely cut and fitted, highly-polished colored stones to create what amounts to a painting in stone. It is considered a decorative art. The stonework, after the work is assembled loosely, is glued stone-by-stone to a substrate after having previously been "sliced and cut in different shape sections; and then assembled together so precisely that the contact between each section was practically invisible". Stability was achieved by grooving the undersides of the stones so that they interlocked, rather much like a jigsaw puzzle, with everything held tautly in place by an encircling 'frame'. Many different colored stones, particularly marbles, were used, along with semiprecious, and even precious stones. It first appears in Rome in the 1500s but reaches its full maturity in Florence.

Pietre dure is an Italian plural meaning hard rocks, or perhaps better durable stone and this is the preferred term; the singular pietre dura is also encountered. The English term "Florentine mosaic" is sometimes also encountered, as is "micromosaic", but these are disparaged, often as terms developed by the tourist industry.

As an artistic medium, it descends from Byzantine mosaics, especially their predilection for incorporating semiprecious and precious stones into the work. It is distinct from mosaic, however, in that first, the stones are not cemented together with grout, and second, for the fact that the works in pietre dure are generally portable.

For fixed inlay work on walls, ceilings and pavements that do not meet the definition for mosaic, the terms intarsia or cosmati/cosmatesque are better used. Similarly, for works that use larger pieces of stone (or tile), opus sectile may be used. Pietre dure is essentially stone marquetry. As a high expression of lapidary art, it is closely related to the jewelers art. It can also be seen as a branch of sculpture as three-dimensionality can be achieved, as with a bas relief. The Florentines, who most fully developed the form, however, regarded it as 'painting in stone'. It is stated that Domenico Ghirlandaio "dubbed the medium 'Pittura per l'eternità' -- that is, painting for eternity".



Floral 'Parchin kari' work in the Taj Mahal, incorporating precious and semi-precious stones

As it developed in Florence, the technique was initially called opere di commessi (approximately, "Works of the commissariat"). Medici Grand Duke Ferdinando I of Tuscany founded the Galleria di'Lavori in 1588, now the Opificio delle pietre dure, for the purpose of developing this and other decorative forms. By the early part of the 1600s, smaller objects were widely diffused through Europe, and even in the East to the court of the Mughals in India, where the form was imitated and reinterpreted in a native style; its most sumptuous expression is found in the Taj Mahal.



Altar frontal of Italian opera di commessi, (Cathedral, Dubrovnik)

A multitude of varied objects were created. Table tops were particularly prized, and these tend to be the largest specimens. Smaller items in the form of medallions, cameos, wall plaques, panels inserted into doors or onto cabinets, bowls, jardinières, garden ornaments, fountains, benches, etc. are all found. A popular form was to copy an existing

painting, often of a human figure, as illustrated by the image of Pope Clement VIII, above. Examples are found in many museums. The medium was transported to other European centers of court art and remained popular into the 19th century. In particular, Naples became a noted center of the craft. By the 20th century, the medium was in decline, in part by the assault of modernism, and the craft had been reduced to mainly restoration work. In recent decades, however, the form has been revived, and receives state-funded sponsorship. Modern examples range from tourist-oriented kitsch including syrupy reproductions of 19th century style religious subjects (especially in Florence and Naples), to works copying or based on older designs used for luxurious decorative contexts, to works in a genuinely contemporary artistic idiom.

LIMESTONE

Limestone is very common in architecture, especially in North America and Europe. Many landmarks across the world, including the pyramids in Egypt, are made of limestone. So many buildings in Kingston, Ontario, Canada were constructed from it that it is nicknamed the 'Limestone City'. [7] On the island of Malta, a variety of limestone called Globigerina limestone was for a long time the only building material available, and is still very frequently used on all types of buildings and sculptures. Limestone is readily available and relatively easy to cut into blocks or more elaborate carving. It is also long-lasting and stands up well to exposure. However, it is a very heavy material, making it impractical for tall buildings, and relatively expensive as a building material.



Courthouse built of limestone in Manhattan, Kansas



A limestone plate with a negative map of Moosburg in Bavaria is prepared for a lithography print. **Limestone was most popular in the early 20th and late 19th centuries. Train stations, banks and other structures from that era are normally made of limestone. Limestone is used as a**

facade on some skyscrapers, but only in thin plates for covering rather than solid blocks. In the United States, Indiana, most notably the Bloomington area, has long been a source of high quality quarried limestone, called Indiana limestone. Many famous buildings in London are built from Portland limestone.

Limestone was also a very popular building block in the Middle Ages in the areas where it occurred since it is hard, durable, and commonly occurs in easily accessible surface exposures. Many medieval churches and castles in Europe are made of limestone. Beer stone was a popular kind of limestone for medieval buildings in southern England.

Limestone and marble are very reactive to acid solutions, making acid rain a significant problem. Many limestone statues and building surfaces have suffered severe damage due to acid rain. Acid-based cleaning chemicals can also etch limestone, which should only be cleaned with a neutral or mild alkaline-based cleaner.

Other uses include:

The manufacture of quicklime (calcium oxide) and slaked lime (calcium hydroxide);

Cement and mortar;

Pulverized limestone is used as a soil conditioner to neutralize acidic soil conditions;

Crushed for use as aggregate—the solid base for many roads;

Geological formations of limestone are among the best petroleum reservoirs;

As a reagent in desulfurizations;

Glass making, in some circumstances;

Toothpaste;

Suppression of methane explosions in underground coal mines

Added to bread as a source of calcium

Limestone is a sedimentary rock composed largely of the mineral calcite (calcium carbonate: CaCO_3).

SERPENTIN

Overview:

"Their color and mottled scaly appearance is the basis of the name from the Latin *serpentinus*, meaning serpent rock," according to Best (2003). They have their origins in metamorphic alterations of peridotite and pyroxene. Serpentine may also pseudomorphously replace other magnesium silicates. Alterations may be incomplete, causing physical properties of serpentine to vary widely. Where they form a significant part of the land surface, the soil is unusually high in clay.

Antigorite is the polymorph of serpentine that most commonly forms during metamorphism of wet ultramafic rocks and is stable at the highest temperatures -- to over 600°C at depths of 60 km or so. In contrast, lizardite and chrysotile typically form near the Earth's surface and break down at relatively low temperatures, probably well below 400°C. It has been suggested that chrysotile is never stable relative to either of the other two serpentine polymorphs.

Samples of the oceanic crust and uppermost mantle from ocean basins document that ultramafic rocks there commonly contain abundant serpentine. Antigorite contains water in its structure, about 13 percent by weight. Hence, antigorite may play an important role in the transport of water into the earth in subduction zones and in the subsequent release of water to create magmas in island arcs, and some of the water may be carried to yet greater depths.

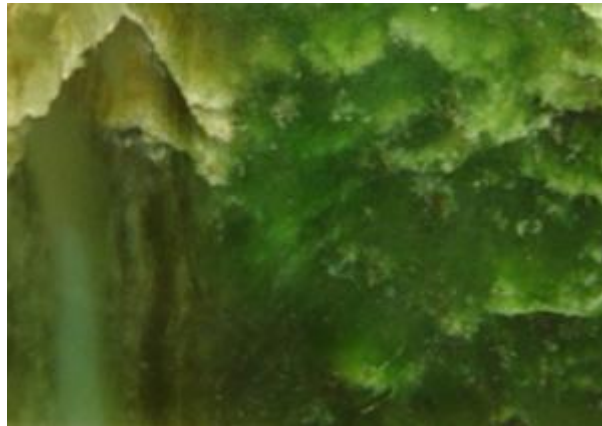
Soils derived from serpentine are toxic to many plants, because of high levels of nickel, chromium, and cobalt; growth of many plants is also inhibited by low levels of potassium

and phosphorus and low calcium/magnesium. The flora is generally very distinctive, with specialised, slow-growing species. Areas of serpentine-derived soil will show as strips of shrubland and open, scattered small trees (often conifers) within otherwise forested areas; these areas have been called "serpentine barrens".

Most serpentines are opaque to translucent, light (specific gravity between 2.2–2.9), soft (hardness 2.5–4), infusible and susceptible to acids. All are microcrystalline and massive in habit, never being found as single crystals. Luster may be vitreous, greasy or silky. Colours range from white to grey, yellow to green, and brown to black, and are often splotchy or veined. Many are intergrown with other minerals, such as calcite and dolomite. Occurrence is worldwide; New Caledonia, Canada (Quebec), USA (northern California), Afghanistan, Cornwall, China, Asia, France, Norway and Italy are notable localities.

Rock composed primarily of these minerals is called serpentinite. Serpentines find use in industry for a number of purposes, such as railway ballasts, building materials, and the asbestiform types find use as thermal and electrical insulation (chrysotile asbestos). The asbestos content can be released to the air when serpentine is excavated and if it is used as a road surface, forming a long term health hazard by breathing. Asbestos from serpentine can also appear at low levels in water supplies through normal weathering processes, but there is as yet no identified health hazard associated with use or ingestion. In its natural state, some forms of serpentine react with carbon dioxide and re-release oxygen into the atmosphere.

The more attractive and durable varieties (all of antigorite) are termed "noble" or "precious" serpentine and are used extensively as gems and in ornamental carvings. Often dyed, they may imitate jade. Misleading synonyms for this material include "Korean jade", "Suzhou jade", "Styrian jade", and "New jade". New Caledonian serpentine is particularly rich in nickel, and is the source of most of the world's nickel ore.



Polished slab of bowenite serpentine, a variety of antigorite. Typical cloudy patches and veining are apparent.

The Māori of New Zealand once carved beautiful objects from local serpentine, which they called tangiwai, meaning "tears". Material quarried in Afghanistan, known as sang-i-yashm, has been used for generations. It is easily carved, taking a good polish, and is said to have a pleasingly greasy feel.

The lapis atracius of the Romans, now known as verde antique or verde antico, is a serpentinite breccia popular as a decorative facing stone. In classical times it was mined at Casambala, Thessaly, Greece. Serpentinite marbles are also widely used: Green Connemara marble (or Irish green marble) from Connemara, Ireland (and many other sources), and red Rosso di Levanto marble from Italy. Use is limited to indoor settings as serpentinites do not weather well.

SOAPSTONE

Soapstone (also known as steatite or soaprock) is a metamorphic rock, a talc-schist. It is largely composed of the mineral talc and is rich in magnesium. It is produced by dynamothermal metamorphism and metasomatism, which occurs at the areas where tectonic plates are subducted, changing rocks by heat and pressure, with influx of fluids, but without melting. It has been a medium for carving for thousands of years.

Physical characteristics and uses:

Steatite is relatively soft (because of the high talc content, talc being one on Mohs hardness scale), and may feel soapy when touched, hence the name. Soapstone is used for inlaid designs, sculpture, coasters, and kitchen countertops and sinks. Traditional Inuit carvings often use soapstone, and some Native American groups made bowls, cooking slabs, and other objects from soapstone, particularly during the Late Archaic archaeological period. Soapstone is sometimes used for fireplace surrounds and woodstoves because it can absorb and evenly distribute heat while being easy to manufacture. This is found in many upscale Alaskan homes. It is also used for griddles and other cookware.

Tepe Yahya, an ancient trading city in southeastern Iran, was a centre for the production and distribution of soapstone in the 5th–3rd millennia BC. Another instance of use in the ancient world is found in Minoan Crete at the Palace of Knossos, where archaeological recovery has included a magnificent libation table made of steatite.

Soapstone has been used in India for centuries as a soft medium for carving, but unfortunately the world wide demand for soapstone is threatening the habitat of India's tigers. The Hoysala Empire temples were made from soapstone.

Soapstone is used by welders and fabricators as a marker because, due to its resistance to heat, it remains visible when heat is applied.[citation needed] Soapstone is used to create molds for the casting of pewter objects.

Soapstone smoking pipes are found, for example, among Native American Indian artifacts.

Locally quarried soapstone was used for gravemarkers in 19th century northeast Georgia around Dahlonega and Cleveland, as simple field stone and "slot and tab" tombs.



An Egyptian carved and glazed steatite scarab amulet.

The term steatite is sometimes used for soapstone. It may also denote also a type of ceramic material made from soapstone with minor additives and heated to vitrify (to change or make into glass or a glassy substance, especially through heat fusion).[citation needed] It is often used as an insulator or housing for electrical components, due to its durability and electrical characteristics and because it can be pressed into complex shapes before firing. It was used for beads and seals in ancient civilizations. Steatite undergoes transformations when heated to temperatures of 1000-1200 °C into enstatite and cristobalite; in the Mohs scale, this corresponds to an increase in hardness from 1 to 5.5-6.5.

TRAVERTINE

Travertine is a sedimentary rock. It is a natural chemical precipitate of carbonate minerals; typically Aragonite, but often recrystallized to or primarily Calcite. Basically calcium carbonate is deposited from the water of mineral springs or rivulets saturated with calcium bicarbonate. The spring water can either be hot, warm or cold. The amount of deposits may increase with the waters temperature or when biotic material accelerates the precipitation.

Formation:

When carbon dioxide-rich water percolates through rocks in limestone areas, the water dissolves the limestone (typical karst process) and becomes saturated with it. When the environment the water runs through, changes significantly (ex. drop in pressure and/or change in temperature) this causes the water to release the carbon dioxide as gas, much like fizzy drinks. The calcium carbonate then recrystallizes; small debris, scrub and living biotic material like (moss, algae, Cyanobacteria) are encrusted. The biotic material may survive and continue growing on top. Rich deposits of aged, dried and hardened travertine have already been mined by the Romans. The rock typically remains quite porous with numerous cavities. When exceptionally porous it is known as "Calcareous Tuff" (German: Kalktuff). When pure and fine, travertine is white, but often is brown to yellow due to impurities (other than carbonate minerals).

Occurrence:

Extensive deposits exist at Tivoli, Italy, near Rome. In fact, travertine derives its name from this town. Tivoli was known as Tibur in ancient Roman times. The ancient name for the stone was lapis tiburtinus meaning tibur stone, which has been corrupted to travertine. Detailed studies of the Tivoli travertine deposits revealed diurnal and annual rhythmic banding and laminae which have potential use in geochronology.

In Central Europe's last postglacial palaeoclimatic optimum (Atlantic Period, 8000-5000 B.C.) huge "Calcareous Tuff" of karst spring deposits formed. Important geotopes are found at the Swabian Alb, mainly in valleys at the foremost northwest ridge of the cuesta, in many valleys of the eroded periphery of the karstic Franconian Jura, at the northern Alpine foothills and the northern Karst Alps. On a smaller scale these karst processes are still working. Travertine was a very important building material for housing and representative buildings since the Middle Ages.

Travertine has formed 16 huge, natural dams in a valley in Croatia known as Plitvice Lakes National Park. The travertine clings to moss and rocks in the water, and has built up over several millennia to form waterfalls up to 70 m in height.

Other beautiful cascades of natural lakes formed behind travertine dams can be seen in Band-i-Amir (Afghanistan), HuangLong Valley (Sichuan, China), Semuc Champey (Guatemala), and Pamukkale (Turkey). Many geyser fields also have colorful travertine deposits.

Use as a building material:

The largest building in the world constructed largely of travertine is the Colosseum in Rome. Other notable buildings using travertine extensively include the Sacré-Cœur Basilica in Paris and the Getty Center in Los Angeles, California. The travertine used in the construction was imported from Tivoli. The website of the Getty Center contains more information about the use of travertine in its construction, including some videos of travertine being quarried and cut for use. The stone is most widely used in Italy, Greece and Turkey.

Travertine is one of several natural stones that are used for paving patios and garden paths. It is sometimes known as travertine limestone, sometimes as travertine marble; these are the same stone, even though it is neither limestone nor marble. The stone is characterised by pitted holes and troughs in its surface. Although these troughs occur naturally, they suggest to some eyes that considerable wear and tear has occurred over many years. Some installers use a grout to fill these holes, whereas others leave them open — travertine can even be purchased "filled" or "unfilled." It can be effectively polished to a smooth, shiny finish and comes in a variety of colors from grey to coral-red. Travertine is most commonly available in tile sizes for floor installations.

Travertine is one of the most frequently used stones in modern architecture, and is commonly seen as façade material, wall cladding, and flooring. Architect Welton Becket was one of the most frequent users of travertine, incorporating it extensively into many if not most of his projects. The entire first floor of the Becket-designed UCLA Medical Center has thick travertine walls.

There are two or three small travertine producers in the western United States. U.S. demand for travertine is about 0.85 million tonnes, almost all of it imported.