Sorrento Peninsula and Amalfi Coast: The Long-Term History of an Enchanting Promontory

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Abstract

The mountain ridge forming the Sorrento Peninsula and the Amalfi Coast is of great physical beauty and plenty of tourist attractions. Moreover, it has an interesting geomorphological history that this chapter illustrates in the form of a 7-stops visit tour. The local landscape was influenced by extensional tectonics that divided the western coastal belt of southern Italy in horsts and grabens. While creating impressive fault scarps with truncated landscapes suspended above them, tectonics promoted, among others, cutting of steep canyons and opening up of ancient karstic conduits. Around the end of Middle Pleistocene the area attained tectonic stability and the following climatic and eustatic changes are geomorphologically recorded at stream mouths and in some coastal caves.

Keywords

Limestone geomorphology • Morphotectonics • Eustasy • Ignimbrite terrace • Sorrento Peninsula • Amalfi Coast

34.1 Introduction

The area presented in this chapter is a famous tourist destination since the eighteenth century. Sorrento and Amalfi were major stops along the *Grand Tour* that brought to Italy visitors from the European elites who wanted to be immersed in Classical culture. The beauty of the natural landscape and the rich artistic and historical heritage contribute to the longstanding appeal of the Amalfi coast. UNESCO has included the Amalfi Coast among its World Heritage Sites because of its “great physical beauty and natural diversity… (and of) towns such as Amalfi and Ravello with architectural and artistic works of great significance”. However, while a number of existing guidebooks provide information on the towns and the historical monuments, no source focuses on the surrounding natural context; the goal of the present chapter is to fill this gap and to offer explanations on the origin and evolution of landforms to those who are interested in going beyond the aesthetic appreciation of landscape.

34.2 Geographical and Geological Setting

The area, lying along the west coast of southern Italy, is a well-defined physiographic unit consisting of a WNW trending calcareous ridge (Lattari Mts.) abruptly rising between two large gulfs and coastal plains (Fig. 34.1). The Amalfi Coast is the south flank of the eastern part of the ridge, whose peaks are 900 to over 1400 m high. The Sorrento Peninsula is the western part of the same ridge, whose elevation rarely exceeds 500 m a.s.l.

The area has a climate of the Mediterranean type (mesothermal with summer drought) with average annual temperatures of 21–28 °C at the sea level and 12–14 °C at the highest peaks. Correspondingly, the annual rainfall varies from 850 to 1800 mm. Differently from other calcareous massifs of the Mediterranean zone, the Lattari Mts. are very

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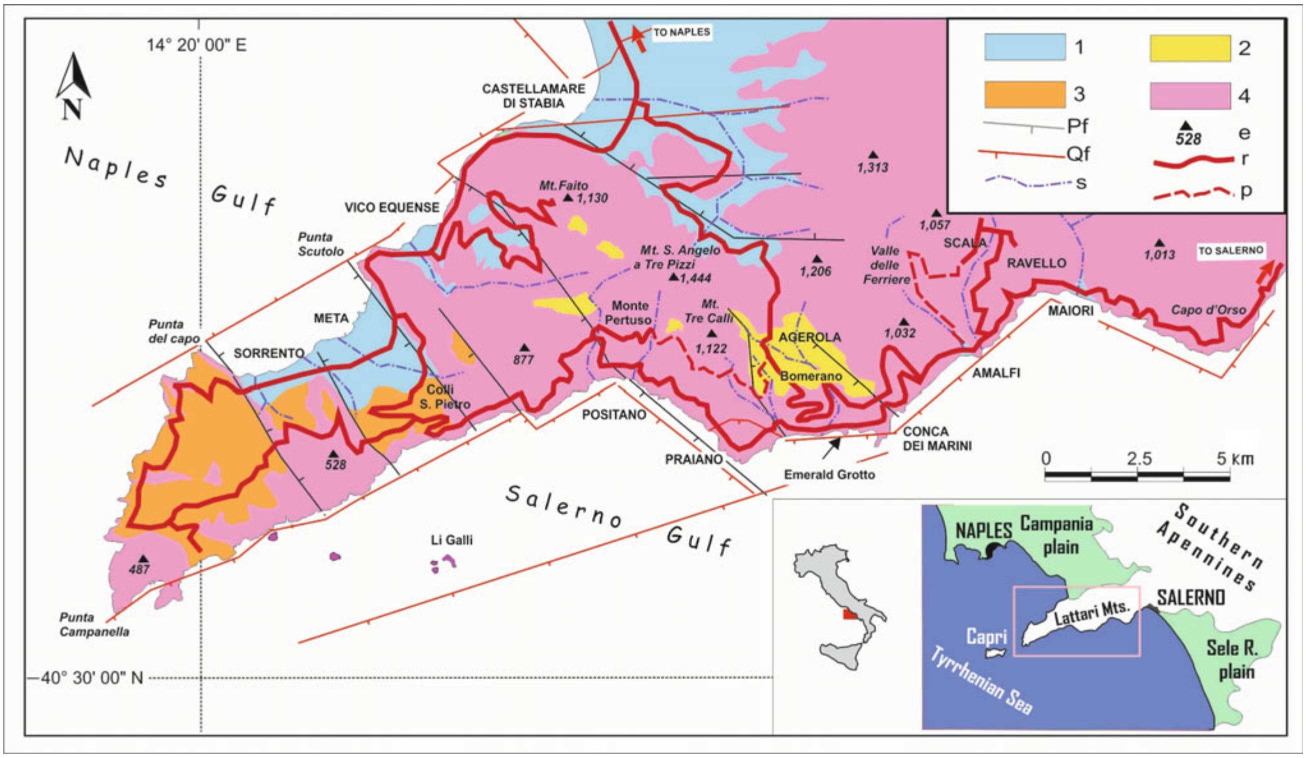

Fig. 34.1 Simplified geological map of the Sorrento Peninsula. *Legend 1* Quaternary deposits (mostly continental sediments and volcanics); *2* Pliocene continental deposits; *3* Miocene marine sediments (mostly sandstones and shales); *4* Cretaceous to Triassic marine carbonate rocks (limestones and dolostones); *Pf* main faults of Pliocene age; *Qf* main faults of Quaternary age; *s* main water courses; *e* main summits and their elevation in m a.s.l.; *r* main roads; *p* pathways mentioned in the text (Bomerano—Positano and Scala—Valle delle Ferriere—Amalfi)

green because they are mantled by pyroclastic material coming from Mt. Vesuvius and other Neapolitan volcanoes. The natural vegetation cover (often replaced by cultivations of lemons, grapes, olives and chestnuts) includes *maquis* up to 300–500 m a.s.l. and mixed deciduous forests as well as birch dominated woodlands above 800–1000 m.

Geologically speaking, the Lattari Mts. belong to the Southern Apennines; a chain segment that formed in Late Tertiary—Early Pleistocene times on a SW-dipping subduction zone. As the subducting slab was also subject to roll back, the chain migrated progressively to the NE while incorporating new and new thrust sheets at its front. Simultaneously, the Tyrrhenian Sea basin was forming and progressively enlarging towards E and SE due to extensional tectonics, at the rear of the chain. The enlargement of the back-arc basin was accomplished by tectonically drowning new and new slices of the chain in the Tyrrhenian Sea. The last episode of this kind occurred in the Early Pleistocene. In the Campania Region two wide coastal grabens were created at that time: the one hosting the Naples Gulf and the Campania Plain and the one hosting the Salerno Gulf and the Sele River Plain (Fig. 34.1). The Lattari Mts. ridge is the horst separating those two grabens; a narrow strip of the Apennines that escaped the collapse and underwent additional uplift (200–350 m) during Lower and Middle Pleistocene (Caiazzo et al. 2006).

In terms of bedrock lithology, the ridge is made of shallow marine dolostones and limestones of Late Triassic to Late Cretaceous age (totalling a thickness of about 4500 m) followed by transgressive synorogenic sandstones and shales of Mid-Late Miocene age (preserved only on the Sorrento Peninsula and up to 500 m thick). Moreover, unconformably on the bedrock there are Pliocene and Quaternary formations (Fig. 34.1) most of which are continental and clastic (talus debris and alluvial fan deposits), but locally of littoral origin and their present elevations indicate the amount of uplift which occurred during the Early and Middle Pleistocene. Finally, there are the pyroclastic materials deriving from ancient explosive eruptions of Mt. Vesuvius and Campi Flegrei; they occur both as matrix of the Late Quaternary clastic formations and as purely volcanic cover on the hill slopes and terraces (ISPRA 2013).

34.3 Landforms and Landscapes

This section describes some representative landscapes and landforms of the area ordered as in an ideal 7-stops visit tour. It departs from Castellammare di Stabia, crosses counter-clockwise the area and reaches finally Salerno.

34.3.1 The Sorrento Terrace

The northern coast of the Sorrento Peninsula—well observable from the Castellammare-Sorrento road—shows an alternation of rocky promontories and bays. This depends largely on the presence of NW trending faults creating an alternation of structural highs and lows (Fig. 34.1). On the landward side of the embayments Late Quaternary depositional terraces made of alluvial conglomerates and pyroclastic materials occur. On a couple of such terraces (80–100 m a.s.l.) rests—for example—the town of Vico Equense.

Further ahead, where the road turns around the Punta Scutolo promontory, one comes in sight of the much wider Sorrento terrace (Fig. 34.2). It consists of an even top surface, inclined to the NW by a few degrees, and a bounding sea cliff 40–55 m high. The latter exposes perfectly the deposit that created the former: a tens of metres thick bank of greyish welded tuff belonging to the formation named the Campanian Ignimbrite. Its emplacement occurred around 40,000 years ago upon huge fissural eruptions—emitting about 300 km^3 of materials—from various faults of the Campania Plain graben (Bellucci et al. 2006).

As to the origins of the cliff below the terrace, we have to consider that the Gulf of Naples suffered tens of metres of sudden subsidence soon after the eruption of the Campanian Ignimbrite, while the Sorrento Peninsula remained stable. Consequently, a NE trending fault scarp appeared about 1 km north of Sorrento (Cinque et al. 1997; Fig. 34.1). This straight tectonic scarp may be regarded as the ancestor of the present coastal cliff, whose curved plan shape and more retreated position are due to what happened during the Post-glacial sea-level rise (18,000–6000 years ago) and the following Holocene High Stand. In fact, the reaches where the fault scarp exposed the hard Cretaceous limestones (i.e. off Punta del Capo and Punta Scutolo capes) suffered little erosional retreat while being submerged. On the contrary, 1–1.5 km of retreat occurred in the reach between Sorrento and Meta, where the scarp was made of the ignimbritic tuff and also the underlying, loose continental sediments were easy to

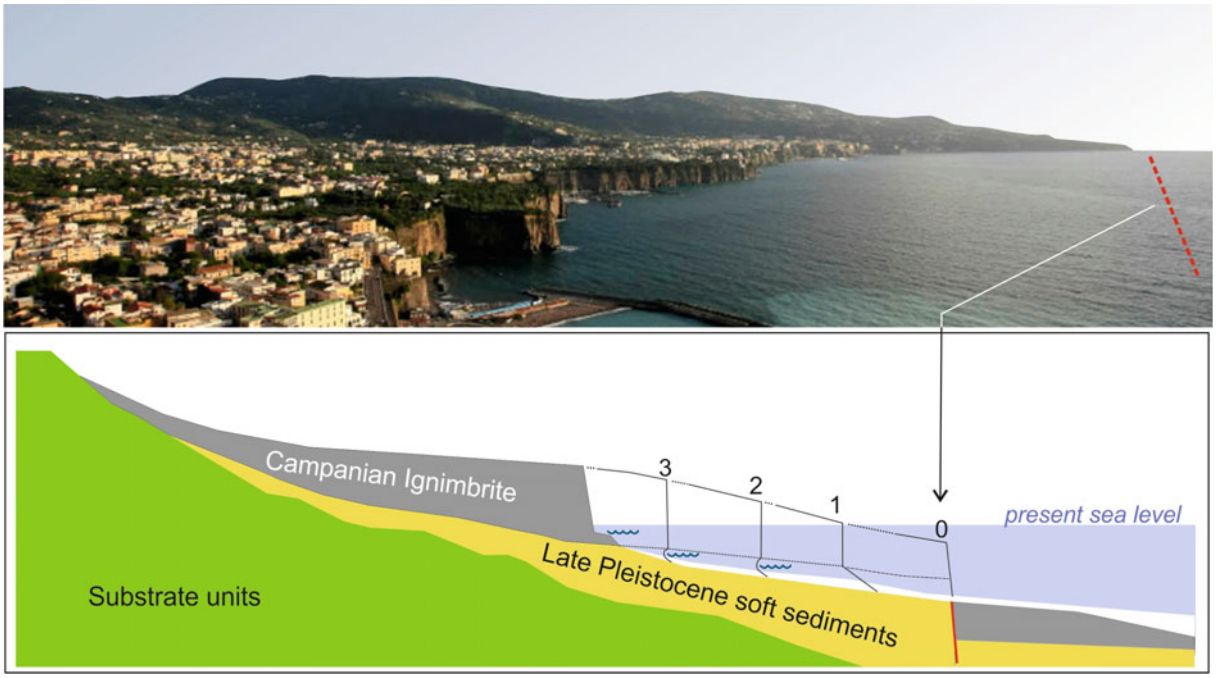

Fig. 34.2 The ignimbritic terrace of Sorrento. The photo is a view from Punta Scutolo (*red line* position of the fault reactivated after the eruption of the Campanian Ignimbrite). The drawing is a SW–NE geological section (not in scale) describing also the post-fault retreat (*0*, *1*, *2*, *3*) of the terrace margin

be eroded by sea waves. The rate of cliff retreat (initially close to 10 cm/year) decreased dramatically when the rising sea level came above the base of the ignimbritic plate (−5 to −20 m) with the consequence that waves started attacking directly the tuff—which is resistant enough—instead of dismantling it (as they were doing before) by removing the underlying soft sediments and provoking falls of tuff slabs.

While visiting the beautiful Sorrento and other towns resting on the same terrace, attention should be also devoted to the gorges that dissect the local tuff.

34.3.2 Views from Colli San Pietro Pass

The Meta-Positano road crosses the Sorrento Peninsula main divide at Colli San Pietro (317 m a.s.l.) and offers views revealing the strong asymmetry of the Peninsula itself, whose southern slope appears much steeper and shorter than the northern one. This is partly due to the NNW dip of the bedrock strata, but what matters even more is the difference in age of the two flanks. In fact, to the north there is a polycyclic morphology that started evolving in Pliocene times, when the area had not been yet reduced to a narrow peninsula; i.e. when the two grabens hosting the gulfs of Naples and Salerno did not exist yet. During the Pliocene the landscape was broken by NW trending faults (Fig. 34.1), but this was followed by a phase of erosion long enough to sensibly smooth the previous fault scarps. When a new tectonic phase reduced the area to a narrow and steep flanked peninsula (Early Pleistocene; Caiazzo et al. 2006), there was a renewal of both fluvial dissection and landslide activity. These erosion phenomena reduced the previous, mature landscape to some isolated remnants on the summits. In the meantime—at lower elevations—the NW trending faults opposing hard Cretaceous limestone to soft Miocene shale had parts of their planes exhumed by differential erosion, adding steep fault-line scarps to the landscape (e.g. the ones flanking the Meta-Sorrento depression).

More simple and short is the history of the southern slope of the Sorrento Peninsula, which is a fault scarp created anew during the Early Pleistocene. It belongs to the long and zigzagging fault-zone that borders the Salerno graben to the north (Fig. 34.1) and shapes the fundamental geometry of the spectacular Amalfi Coast.

Looking south from Colli San Pietro (or other places along the road to Positano) one can see a group of three small islands at about 4 km from the coast (Fig. 34.3). They are now known as Li Galli, while in Hellenistic and Roman times they were called *Seirenoussai* (meaning "Islands of the Mermaids") because this was supposed to be the place where Odisseus met the mythical mermaids. Geologically speaking, Li Galli and other small islands further west are summits of a limestone block (originally standing hundreds of metres above the sea level) that subsided when the Salerno graben formed.

On the road to Positano one can also note how the coastal fault scarp (originally planar and sub-vertical) has been reshaped by both linear and areal processes of erosion. As normal on limestone hill slopes, the cutting of gullies and ravines was not only mechanical, but also chemical, creating diffuse karstic furrows, notches and other microforms. In the interfluvial sectors of the escarpment the typical cross profile includes (a) an active sea cliff at the base, followed upwards by (b) a segment about 35° inclined. Where the scarp is not higher than about 500 m, "b" reaches up to the top, while scarp sections exceeding that limit, disclose above "b" a third element, that is (c) a residual cliff (still to be consumed), sometimes made more complex (stepped) due to alternations of more and less resistant strata. The "b-c" couple is typical of scarps evolved by "slope replacement". It implies that the initial cliff (the fault plane in our case) migrates gradually backwards and upslope due to repeated rock falls, leaving below it a gentler element (the "replacing slope") having just the inclination required to permit the downwasting of the falling coarse debris. The above noted difference between lower and higher reaches of the escarpment at issue tells us that the time elapsed since faulting was insufficient for the complete slope replacement of cliffs higher than about 500 m.

Under the present mild climate, the cliffs produce very little debris and slow karstic degradation prevails on the whole slope. Instead, most of cliff recession occurred during the cold periods of Pleistocene when physical rock weathering was stronger. Consequently, thick screes of debris formed at the base of the scarp, but they are rarely visible today because they are submerged and eroded by the following sea-level rises (interglacial and post-glacial ones).

34.3.3 The Montepertuso Rock Arch and the Surrounding Landscape

As the Lattari Mts. ridge is made mostly of carbonate rocks, its landscape includes also karstic forms. In terms of epikarst, the most diffuse and pronounced forms are solution trenches, furrows and pits occurring where the rock has maintained for long a cover of pyroclastic material speeding up the dissolution process because of its acidic pH and its high water-retaining capacity. In terms of hypokarst, the tens of caverns and galleries so far discovered in the area (Del Vecchio and Fiore 2005) are relatively short, the longest one being the Cave of Scala, a gallery of 280 m. The existence of other hypogean cavities is locally revealed by large collapse dolines like the one hosting the Cemetery of Vico Equense and others nearby. Most of the explored caves were accessed through openings created by either Quaternary faults or canyons

Fig. 34.3 The steep Quaternary fault scarp forming the southern slope of the Sorrento Peninsula. A portion of the much gentler northern slope appears in the *right upper corner*. To the *extreme left* are the Li Galli islets

incised in response to the same Quaternary tectonics. This created also some rock arches, such as the one called *Finestra* (west periphery of Amalfi) and the one below Furore's cemetery, both of them visible from the Amalfi-Agerola road.

The most famous arch in the area (a real landmark) is the one called Montepertuso ("pierced mountain"), giving name also to the nearby hilly hamlet. It is visible from the road connecting Positano to Montepertuso (Fig. 34.4a) and from inside the hamlet. Visitors willing a closer glance may ascend through an ancient stairway of 450 steps (Via Campola) that ends up inside the arch (Fig. 34.4b).

The narrow and cliffed rocky spur that carries the Montepertuso arch belongs to the SW flank of Mt. S. Angelo a Tre Pizzi; a NW trending fault scarp that goes from Positano to Praiano and whose vertical throw (1.5 km) was generated half in the Middle-Late Pliocene and half during the Early Pleistocene (Amato and Robustelli 2002). The second movement, which belongs to the opening of the Salerno Gulf, by adding a very steep basal portion to the scarp, caused the beginning of a still ongoing phase of fluvial dissection of the scarp itself. Among the resulting incisions the longest and deepest one is the wonderful Vallone Porto, admirable from bridges along both the Positano-Praiano and the Montepertuso-Nocelle roads.

The shaping of the Montepertuso spur as a cliffed crest separating two adjacent valley heads can be related to the above mentioned phase of fluvial dissection and to combined processes of cliff retreat. During such events, an ancient karstic system (probably made of galleries and caverns) was unroofed and a small remnant of it became the present Montepertuso rock arch.

34.3.4 The Emerald Grotto

After phases of uplift in the Late Tertiary and in the Early and Middle Pleistocene, the Lattari Mts. attained a final stability. Consequently, relative sea-level change stopped being controlled mainly by movements of the landmass and started being determined only by eustasy (i.e. absolute and global changes of water level in the oceans due mostly to cyclic expansions and contractions of glaciers).

The local record of such Late Quaternary eustatic palaeo-sea levels spans from −120 to +8 m; respectively corresponding to the coolest moment of the Last Glacial (about 18,000 years ago) and to the warmest period of the Last Interglacial (about 130,000 years ago; Riccio et al. 2001).

Eustasy influenced also the evolution of some karstic caves, as it can be seen, for example, in the beautiful Emerald Grotto (Grotta dello Smeraldo) near Conca dei Marini (Fig. 34.5). One can access it either by the special lift located alongside the coastal road or by a boat service departing from the Amalfi port.

The Emerald Grotto is a cavern having a trilobite plan of about 35 by 35 m. Its vaulted roof reaches almost 20 m a.s.l., while its floor reaches 11 m below sea level. Four narrow galleries (two emerged and two submerged) open into the cavern from the mountain interior (NW). To the south, another gallery about ten metres long departs from the cavern and reaches into the plunging sea cliff outside. Its roof is at −7 m and its section (about 6 m wide and 4 m high) reveals signs of an enlargement due to ancient wave erosion. The sunlight penetrating through this submerged

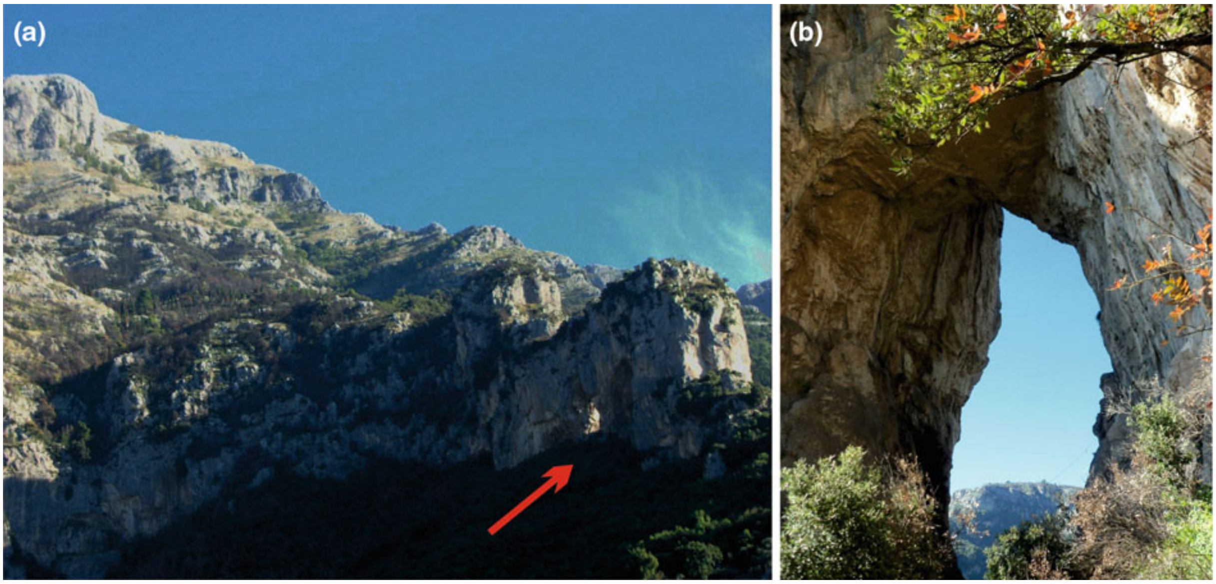

Fig. 34.4 The southwestern flank of Mt. S. Angelo a Tre Pizzi and the perforated rock spur of Montepertuso (*arrow* on photo **a**). Image **b** offers a close view of the arch from the SE

Fig. 34.5 The Emerald Grotto near Conca dei Marini. Note the half-submerged stalagmitic column to the *right* and the bluish light arriving through the submarine entrance tunnel

passage imparts a distinctive emerald colour to both the water and the cave walls.

The first speleogenetic stages of the Emerald Grotto are poorly known. Probably the cavern formed during the Middle Pleistocene upon the enlargement of originally pressurized karstic galleries. At the beginning of the Last Interglacial (about 130,000 years ago), when a strong global warming occurred, the sea level rose enough to reach the cavern and to flood it up to about 8 m above the present sea level. The most striking evidence of such marine transgression can be found on the cavern walls which appear perforated up to the height of 8 m by marine molluscs *Lithodomus lithofagus*. The holes are particularly evident in the western part of the cave, were they occur both on the substrate rock and on the calcite concretions that predate the marine transgression (Colantoni 1970).

Aside from minor sea level fluctuations that occurred during the Last Interglacial, the other major change that affected the cave is the long period of very low sea level characterizing the last glacial period (about 70–15 ka ago). All over that period the Emerald Grotto remained out of sea water and a second generation of calcite concretions formed on its roof, walls and pavement. On the cavern walls these younger calcitic formations can be distinguished from the older one because they show no *Lithodomus* perforations above the present sea level. Two solid and tall stalagmitic columns reaching well below the present sea level can be ascribed to the same younger generation of calcitic formations. As we all know, such columns grow upwards from the floor and cannot form inside a flooded cavern; their present condition shows the sea-level changes that affected the Emerald Grotto in the recent geological past. The cave was partially submerged after the end of the last glaciation and the onset of the current warm period (Post-glacial) due to a rise in sea level of about 120 m induced by melting of ice sheets. The last 10 m of sea-level change, which occurred in the past 7000 years, are well recorded in the Emerald Grotto.

34.3.5 The Suspended Agerola Basin

Overtaking the last curve of the road from Amalfi to Agerola is like making a jump in the geological past. In fact, at that point, one suddenly loses the sight of the steep coastal escarpment (shaped by Quaternary tectonics and erosion) and gains the view of the much gentler landscape characterizing the highest part of the Lattari Mts., which dates back to the Pliocene.

Agerola is composed of four villages resting on terraces between 600 and 675 m a.s.l. These terraces testify to a stage of landscape evolution when the Agerola basin had its floor flattened by alluvial fan deposits discharged by creeks dissecting the flanks (Pliocene fault scarps) of the surrounding mountains. These fault scarps differ from the younger ones of the coastal zone by having unbroken, slightly convex-concave cross-profiles that rarely exceed 30° of inclination; proving that there was enough time not only to complete slope replacement, but also to allow some slope decline after that.

As regards the long-term morphostructural evolution of the Agerola basin, good evidence is found in the area of *Grotta Biscotto* cave, which is along a mule-track called *Sentiero degli Dei* (i.e. Gods path). This pathway, renovated in part during recent times, was created in the early Middle Ages to connect Agerola with Montepertuso and Positano. Nowadays it is a great tourist attraction, as it cuts along the cliffs offering amazing views to the visitors.

The path departs from the main square of Bomerano (one of the villages forming Agerola), passes through a tributary incision of the Praia Valley and—after 600 m—reaches a cliffed rocky spur at the base of Mt. Tre Calli where the Grotta Biscotto cave is located. Here, over a substratum made of extremely fractured Mesozoic strata, there are thick continental conglomerates of the Mid-Late Pliocene. They include two different facies: (a) matrix rich detrital beds dipping 10–15° to NE and (b) beds of angular debris, generally matrix poor, dipping 30–35° to E. The latter represents the rock debris that slid and rolled down from Mt. Tre Calli block soon after its upfaulting with respect to Agerola's one. On the other hand, the sub-coeval facies "a" witnesses an ancient alluvial fan that was fed by a mountain catchment existing SW of the spot. But in that direction there is now a descending topography, not a rising one! (Fig. 34.6). This change of landscape is due to the Early Pleistocene phase of extensional tectonics, which created and progressively enlarged the Salerno Gulf graben by throwing down blocks of the previous relief (Caiazzo et al. 2006).

Of course, the newborn Early Pleistocene fault scarp soon started being dissected by running water and two of the resulting ravines (developing on more fractured rocks) retreated enough to capture the Agerola basin: the Praia and the Penise valleys (Fig. 34.6).

Grotta Biscotto area offers also a good example of rock dwelling (houses built in small caves centuries ago) around which are ancient stairs of artificial terraces that permitted agriculture on slopes as steep as 100%. In many cases, the ground contained in the terraces (weathered pyroclastic material) was not found on the spot, but it had to be collected around and patiently carried there ladle by ladle. The retaining walls (locally called *macerine*) are made of limestone slabs without mortar, so as to ensure a good internal drainage and minimize the soil pressure against the wall itself. Of course, because of the lack of mortar, great attention was paid to proper fitting of the stones and to the maintenance of the walls.

34.3.6 The Canneto River Canyon (Valle delle Ferriere)

Being formed of pervious carbonate rocks, the Lattari Mts. have few perennial streams. One of them is the Canneto River, which debouches on the Amalfi beach (Fig. 34.7). Its valley is named Valle delle Ferriere after the iron mills that have been operating there between the fourteenth and the eighteenth century. However, since the early Middle Ages the same water course has been used to power also grain mills, paper mills and factories of other kinds. The ruins of such early industrial buildings are well worth visiting, also

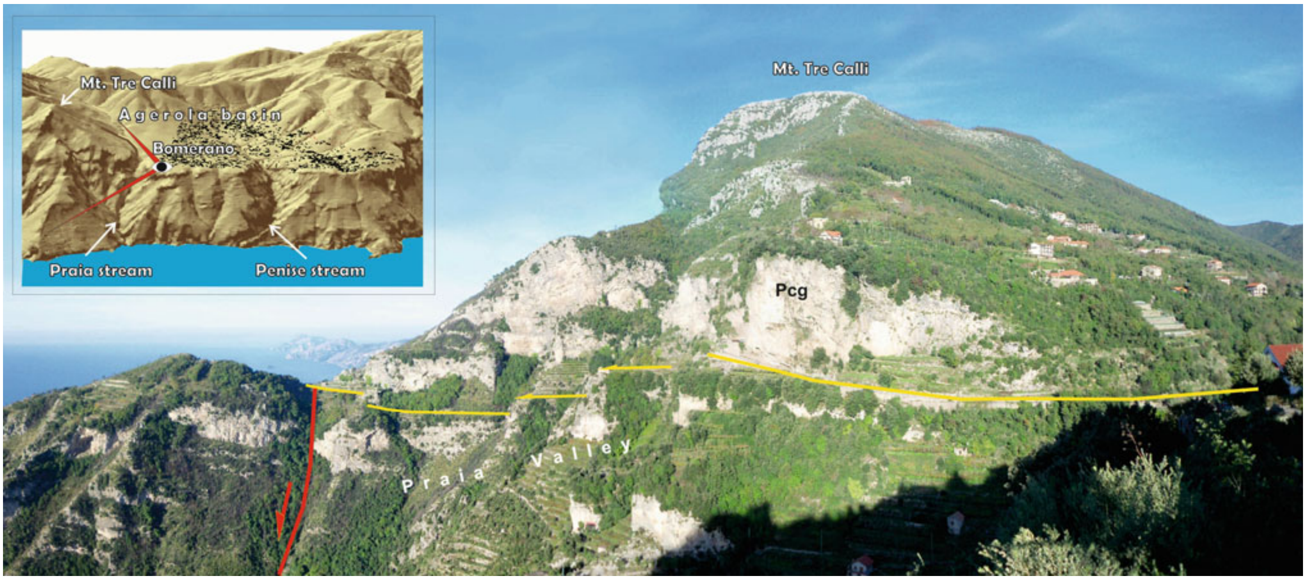

Fig. 34.6 View of Mt. Tre Calli from the southern edge of Bomerano terrace. *Pcg* outcrop of Pliocene conglomerates near Grotta Biscotto; *Yellow line* Sentiero degli Dei pathway; *red line with arrow* one of the faults that truncate the Pliocene landscape. *On the left*, a DEM-derived perspective from the south showing the whole Agerola basin and the coastal fault scarp below it (*eye with rays* location of the photographic shot)

Fig. 34.7 View of the Canneto River canyon from Amalfi

because they are immersed in a landscape of remarkable beauty and great biodiversity. This is especially true for the upper part of the basin, where a governmental protected area was created in 1972.

The Canneto canyon is approximately 5.5 km long, 1–1.5 km wide and up to 800 m deep. It is the greatest fluvial dissection of the whole Amalfi Coast, being surpassed only by some basins originating from tectonic depressions (e.g. Agerola basin). The mentioned primacy depends largely on the fact that here fluvial dissection started both earlier and from higher elevation than elsewhere in the Lattari Mts.

In fact, the mountains through which the Ferriere canyon is cut carries remnants of an Early Pliocene erosional landscape (Caiazzo et al. 2000) in the summit position (1000–

1200 m a.s.l.). This area started being dissected by an ancestor of the Canneto River in Mid-Pliocene times, when the area turned into an uplifted block with respect to the surroundings (e.g. Agerola basin and Scala-Ravello area). Then—in the Early Pleistocene—the formation of the Salerno Gulf graben caused a dramatic truncation of the palaeo-Canneto valley. With this event, the valley portion that remained suspended above the newborn coastal escarpment—suffering also additional uplift—entered the still ongoing period of regressive erosion that has turned it in a deep canyon.

The easiest way to visit the canyon is to follow the path in the valley floor that departs from inside Amalfi. However, for a better view we recommend descending into the canyon from Scala (about 400 m a.s.l.) and then walking along the valley floor path to reach Amalfi. In any case, a place to not miss is Acqualta, a section of the valley floor with beautiful waterfalls, some of which generated by karstic springs in the cliffed sides of the canyon. This place is located at 320 m a.s.l. beyond the gate leading to the protected area. Here the spray released by the falling water creates a condition of abundant and constant moisture that allows the presence of a luxuriant vegetation, including rare plants such as the giant subtropical fern *Woodwardia radicans,* two species of *Pteris* and several others.

Downslope of some springs, the wet slope is densely vegetated by moss and herbs. As they subtract CO_2 to the spring water passing on them, the dissolved calcium bicarbonate precipitates as calcite, so encrusting the vegetation carpet and forming lobes of calcareous tufa.

Where lying on steep slopes—or against cliffs—those lobes disclose an internal structure that includes curtain-like and stalactite-like pendants of encrusted vegetation.

Fluvial deposits are rare in the upper-middle reach of the valley, consisting of few patches of gravels accumulated upstream of obstacles given by blocky rock fall deposits. On the contrary, valley floor aggradation is widespread in the lowermost reach of the canyon, and a recent drilling near the river mouth has proved that bedrock rests at least 40 m below the present sea level. This datum combines well with the submerged mouths of the Praia and Penise valleys, narrating the downcutting occurred upon the marine regression of the last glacial periods of the Pleistocene.

34.3.7 The Capo d'Orso Promontory

The portion of Lattari Mts. located east of Maiori exposes the lower part of the Mesozoic sequence (Triassic strata). During diagenesis, this part had the calcium ions partly replaced by magnesium, so that dolomite ($CaMgCO_3$) instead of the original calcite ($CaCO_3$) became the dominant mineral and—therefore—the rock type changed from limestone to dolostone.

In general, dolostones are a little less pervious, less soluble and more erodible than limestones, and confirmation of this can be found by comparing landforms of the mountains east of Maiori with the ones observable on the limestones dominating the area around Positano and Agerola.

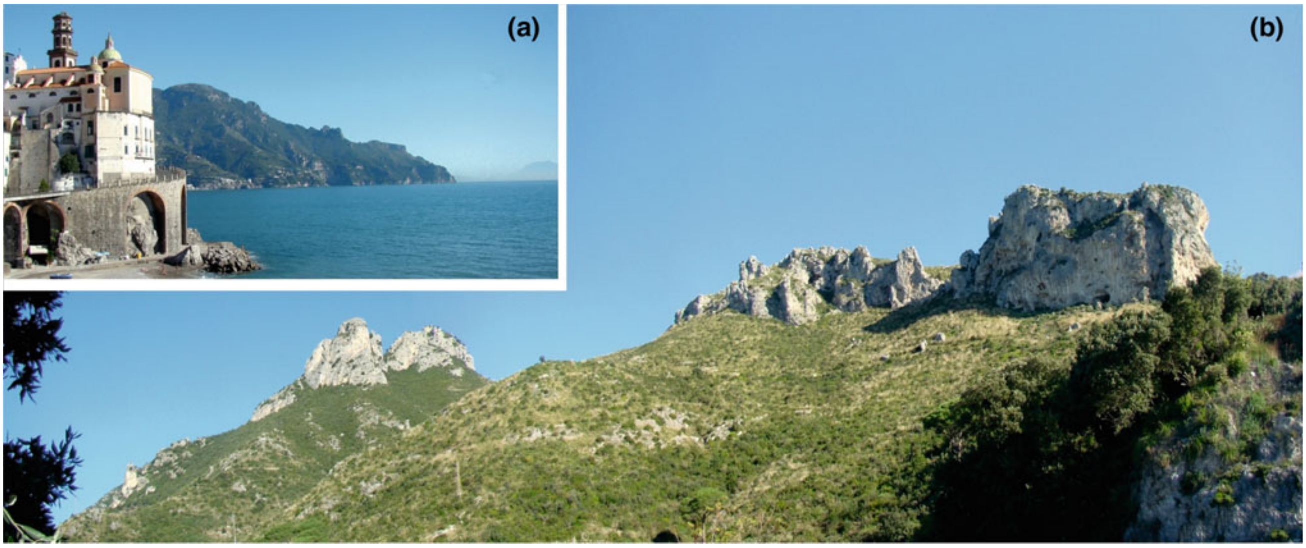

Fig. 34.8 Capo d'Orso promontory. General view from Amalfi (**a**) and the group of pinnacles visible from the coastal road while turning around the promontory end (**b**)

Following the road going from Maiori to Salerno, we go across the dolomitic Capo d'Orso promontory (Fig. 34.8) and observe that here the frequency of erosional valleys and ravines is clearly higher than in the western part of the Lattari Mts., because runoff is higher on dolostones and because this rock type—when exposed to weathering—disintegrates in fine particles easier to be washed away.

Other points of difference are that here—on the dolomitic part of the ridge—karstic landforms are more rare, sea cliffs are less precipitous and, finally, fault scarps—being more dissected by streams—have their original planarity less preserved than fault scarps in the calcareous part of the ridge.

Peculiar of Capo d'Orso are also landforms due to "selective erosion". They are due to the circumstance that the degree of dolomitization varies from place to place within the rock mass, so as to make variable the rock resistance to erosion. Consequently, processes such as backwearing of slopes and downwearing of crests did not proceed uniformly, resulting in the formation of spurs alternating with hollows, or pinnacles and towers alternating with saddles, where fully and poorly dolomitized rocks occur side by side.

Some of these features can be seen even from a distance in the outline of Capo d'Orso (Fig. 34.8), while a closer look at an interesting group of pinnacles of different shape and degree of evolution is possible from the point where the coastal road turns around the cape (Fig. 34.8).

Another recommended stop along the coastal road (km 39) is the small monastery of Santa Maria de Olearia, built in a cavern and displaying interesting features of Byzantine architecture along with frescos dating to the tenth century. The cavern opens in a coarse-grained conglomerate belonging to an uplifted and much dissected alluvial fan of Middle Pleistocene age.

34.4 Conclusion

The suggested visit tour across the Sorrento Peninsula and the Amalfi Coast permits to appreciate how much the present landscape of Southern Apennines is influenced—especially to the SW—by events of extensional block faulting occurred in Quaternary times, when the Tyrrhenian Sea basin had its last pulse of enlargment.

By creating high fault scarps, truncating pre-existing mature landforms and also triggering deep fluvial dissection, said tectonic events laid the foundations of the great physical beauty of the area.

Especially along the Amalfi Coast, this beauty couples with terrain roughness so often to determine remarkable settlement limitations. But the latter were brilliantly surmounted during Early Middle Ages, as the occurrence of widespread terracing works, ruins of factories and sparse towns rich of monuments demonstrate.

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