

Obsidian and the Aeolian Islands

Cavalier Madeleine

Museo Eoliano 98050, Lipari (Messina), Italy

The geological history of Lipari

Lipari, with an area of about 37.6 Km², is the largest of the Aeolian Islands. It reaches an elevation of 602 m at Mt. Chirico and 594 m at Mt. Sant'Angelo, which represents the summit of a volcanic complex emerging from the sea bottom, over 1000 m deep. This complex extends northward to the island of Salina and southward to that of Vulcano, along a great tectonic fault that cuts up the Aeolian island arc.

The geological and volcanological history of the emerged part of the island starts with the emplacement of a series of lava domes, aligned in a North - South direction along the present western coast of the island. They are latitic-andesitic in composition, often intensely red - blackish in color. A similar couple of domes, farther to the East, is similar in composition; the domes were isolated at the time of their formation, and presently constitute the Mt. Rosa Promontory. Some minor lava domes may have been in an intermediate emerged position between the above formations. These rocks were dated at 100,000 y ago.

After a long rest, volcanic activity restarted (probably between 70,000 and 40,000 y ago) giving birth to the formations of the second period of the geological - volcanological history of the island. These are characterized by an increasing concentration in silica. At this stage the volcanic complexes of Mt. Chirico - Costa

d'Agosto and Mt. Sant'Angelo were emplaced. These are the most massive formations of the island, and gave to Lipari its present form. The Mt. Sant'Angelo lavas, flowing to the East, surrounded the two Mt. Rosa domes, previously an island, and transformed them into a peninsula. Huge emissions of pyroclastic material are alternated to lavas in the formations of this period.

In the very steep western coast, where the front of the pyroclastic deposits outcrops in the Bagno Secco area, thin fossiliferous layers contain remains of the ancient flora, and intercalated flint layers where exploited in neolithic age. The rhyodacitic lavas emitted from Mt. Sant'Angelo to the East (Pietra nera di Serra) and, more extensively, to the South-West (Fuardo and Pulera flows), furnished the best building stone from classical times to the present.

The western coast of Lipari, formed by lavas of the first period is very steep and 15 - 30 m high; it is topped by fossil beach deposits, that on the North shore of the Mt. Rosa promontory are only 2 m high. This proves tilting of the island.

At the end of the second period the South end of the island underwent a volcano tectonic collapse, that produced a large caldera, from which the formations of the third period were emitted. These form the southern extremity of the island, south of Vallone Ponte and Valle Muria, that correspond roughly to the southern

border of the island during the second period.

The new activity, younger than 45,000 y b.P., is characterized by rhyolitic lavas much richer in silica than the preceding ones, and consequently much more viscous. Different phases have been identified. Also in this case a huge mass of pyroclastics was emitted first. These covered a large part of the island and overlaid the older formations. A first effusive phase followed, that gave birth to largely submarine domes at the base of the western side of the promontory. A second effusive phase generated the lava domes of Cappero, Falcone and Capistello crater, and, more to the North, on the East coast, those of Rione Sopra la Terra and Castello. The formation the domes of Mt. Giardina, Mt. della Guardia and Fossa di Lazzaro is still later. These form the backbone of the newly formed promontory.

A fourth period of volcanic activity was confined to the North - East tip of the island. It originated Mt. Pelato, and was characterized by extremely silicic lavas (alkaline rhyolites) that mark the extreme of the Aeolian lithologies. These are the bright white pumices, that today are commercially exploited, and the obsidians, largely amorphous or with twisted laminar structures, but also partly vitreous. Exploitation and exportation of the latter were the great resource of Lipari in neolithic age.

The same sequence of events took place twice, with identical characters, in the formation of Mt. Pelato. The opening of a crater took place first, with the emission of a great mass of pumices that formed a volcanic cone, and were spread largely around. In a later phase a lava flow was emitted, that broke the crater wall and made its way to the sea. The first of these sequences (probably between 11,000 and 8,000 y ago) formed the flow of Lami-Pomiciazzo, whose vitreous obsidians were exploited in neolithic times. The second one, after a rest of several millennia, which lasted during protohistoric-classical times, took place in

medieval times between the end of the seventh and the eighth century a.C. It gave birth to the Rocche Rosse lava flow, that reached the sea at Punta della Castagna. Attrition of airborne pumices produced the very fine, bright white dust that covered the entire island, and partly the nearby Vulcano island, under a layer 20 cm thick. The last episode of medieval activity was the opening of the Forgia Vecchia crater, near Pirrara, on the East flank of the ancient Mt. Sant'Angelo volcano. It originated the lava flow that nearly reached the sea and stopped over the village of Canneto.

All in all the Lipari volcanic complex must be considered still active, and may produce volcanic activity crises, maybe in some millennia.

Obsidian

Among the economic resources that the volcanic nature of the Aeolian Islands, and Lipari in particular, offered to ancient man, the most important is obsidian, the black volcanic glass emitted 7,000 y ago by the Mt. Pelato volcano at the North-East tip of Lipari island. Obsidian was the sharpest material available to man during prehistory, before the technology of metals took over. It was by far sharper than flint, then the widely prevalent raw material used for production of weapons and ordinary tools; but it was much more fragile than flint. Obsidian could not substitute flint, but it was more apt for specialized tasks that did not require strength. It is common saying that the difference between a blade made out of flint and one made out of obsidian is the same that we have today between a knife and a razor. In fact, obsidian cannot stand a strong pressure because it crumbles into small pieces. The very reason that motivated the early settlements in the Aeolian Islands, in Lipari in particular, was the presence of the obsidian flows of Mt. Pelato. These obsidian flows,

however, may have been exploited for many centuries before any settlement by inhabitants of the nearby coasts of Sicily and Calabria, who may have crossed the sea to collect the raw material that they would later work in their home places. This is suggested by remains of obsidian manufactures on the calabrian coast, especially at Curinga. Such manufactures are hardly datable, because pottery remains are absent; but obsidian blades or tools are also present in some cultural levels of prehistoric Sicilian sites that could be older than the earliest settlements in the Aeolian Islands. One of these is Sperlinga di San Basilio, near Novara Sicilia.

Perhaps the problem of water was an obstacle to a stable settlement in the Aeolian Islands, given the nearly complete absence of springs. In fact the earliest villages identified in Lipari and Salina are not older than middle neolithic, maybe the fifth millennium b.C. These are those of Castellaro Vecchio on the Lipari highlands, about 400 m over s.l., excavated in 1955 and 1957, with other minor traces in the same area or at Zinzulo, a few hundred meters West of the present village of Varisana di Sotto. These minor settlements have not been studied systematically yet, because they underlie rich vineyards. In fact it was the excavations made to plant the grapes that brought to the surface collectable remains. These show that the earliest settlements were not developed on the coast, but on fertile highlands favorable to agriculture, while nearby areas could be favorable to stock-breeding. One may wonder if the choice of these sites was influenced by the small spring of Madoro, one of the very few in the islands. Today it is just a little more than dripping, but it may have been more abundant in the past, because the mountains may have not been barren as they are today. Choosing the highlands, however, may have also been determined by the need of defense against the danger of raids from the sea. On the highlands, the inhabited area could be well hidden to any view from the sea, and it had to be reached with

a strenuous walk longer than an hour, which would rule out any chance of surprise.

In the Castellaro excavations no trace of huts was identified. Actually the soil was largely upset by the implantation of the vineyard, and little of the original deposit was left in just a few places. A thin blackish layer underlies the surface humus and overlies untouched volcanics, and it was rich in pottery fragments and innumerable waste chips of obsidian industry. Twentysix obsidian nuclei were found in the same place, perhaps ready for export, collected and left on the ground for some accident unknown to us. The upper part of the obsidian flow, and the ancient crater itself (not existing anymore, but whose position can be easily inferred by the present morphology) could be easily reached from the Castellaro settlement. In fact, they were about at the same elevation, only about 3 km away; and perhaps it was even more easily reached than today, since the medieval eruption of Mt. Pelato accumulated huge masses of pumices (Fiume Bianco, Costa dei Funghi etc.) in the way between Castellaro and the obsidian flow.

A hut was recently discovered in Salina, miraculously nearly intact on the Rinicedda plain, about 40 m over s.l., over the present village of Rinella. Perhaps it is a survivor of a scattered inhabited area, as suggested by coeval pottery remains at the border of the plain, some 100 m away. It was an oval hut, about 3.5 x 2.5 m large, excavated in a compact tuff layer, almost one m deep. Different soil layers were identified in the hut. Stones were accumulated around its border, and these were certainly connected to a wall of wood or canes. Innumerable obsidian chips and nuclei around the hut (and few within it) testify the very prevalent activity of its inhabitants: obsidian workmanship and export. The obsidian flow of Mt. Pelato is just in front of the Rinella beach, only about 15 km away. It was easily reachable by boat, and transport of the raw material by boat

was even easier than at Castellaro Vecchio, where it had to be carried on shoulders. The typology of the hut is known in Southern Italy, but it was previously unknown in the Aeolian Islands or in Sicily.

The materials collected in these settlements in Lipari and Salina are very heterogeneous, probably in connection with the very wide exportation of obsidian to different shores. The prevailing pottery is of the impasto type, with simple printed or incised decorations, largely widespread all over the Mediterranean, but it also exhibits frequently much richer, more varied and complex decorations, corresponding to the "Sentinella style", known at least from the beginning of the Neolithic all over Sicily and southern Calabria. This demonstrates a Sicilian origin of the early inhabitants of the Aeolian Islands. But a study of the impasto, recently made by John Williams and Sarah T. Levi, showed strong differences between individual pieces, suggesting that at least large part of the ceramics may have reached Lipari or Salina from different places of Sicily or Calabria as an exchange for obsidian. All the ceramics made in purified clay, painted with red flames or bands over a cream color, and with rare black margins, were imported from southern Italy. Relatively few fragments of these were found in Sicily (Stentinello, Megara Hyblaea etc.), but they are very abundant in the Aeolian settlements. Lithic materials give a similar impression.

Flint is relatively scarce in comparison with the huge amounts of obsidian. It was mainly imported from Sicily or from the Italian peninsula, and corresponds to the quality and typologies known there. At Castellaro Vecchio half a dozen of whitish wide blades were found, similar to those well known in villages from the Siracusa area. They are made in silicic limestone, rather than real flint, coming from layers in the Iblei Mts., Modica and Ragusa areas, like those of Mt. Tabuto or Mt. Sallia near Comiso. At Castellaro some blades were also

found, made in a local flint found in Lipari as thin layers intercalated in the very thick pyroclastics erupted by the Mt. Sant'Angelo volcano, just a few hundred meters from the Castellaro inhabited area.

The first human settlement on the Lipari Castle belongs to a later phase of the Middle Neolithic. The Lipari Castle is an isolated rhyolitic dome and has nearly vertical, almost inaccessible walls, that form a natural fortress by the wide bay that forms the best landing place of the island. There must have been a very populous colony, since the corresponding layer extends to the whole surface of the rock. It is over one meter thick and is very rich in archaeological material. It is characterized by painted purified ceramics, always in three colors (red belts or flames with black borders). John Williams showed that they were produced locally (with clay imported from northern Sicily) because local sand grains got stuck to the bottom of the vases before baking. They have simple forms. Brown impasto ceramics from the same layer bear no resemblance to the Stentinello tradition. Thus they do not appear to be derived from these, but rather they seem to be new types that remind other types from southern Italy, from the Adriatic coast and especially from the eastern Adriatic shores of Dalmatia and Albania. These, in particular, are referred to by techniques and motives of the decoration: ochre and cinnabar or white ornaments on the dark impasto background, thin engravings and intaglios that show probably the oldest known in Italy meander and spiral motives; these cover the whole surface of the vase like a carpet. Fragments of strange portable lamps with four feet and animal legs, with a wide lateral opening and an arched handle are known with the inaccurate name of "D...nilo's Rhyta". They closely resemble some prototypes from the south-eastern Adriatic coast, but similar fragments were also found in northern Greece and Corinthos. The latter, in particular, have

hollow legs, while those from Dalmatia have massive legs. Therefore no correlation is apparent with the Castellaro facies described earlier. Everything would suggest a settlement of people from overseas, from the other side of the Adriatic sea, who became masters of the island to dominate the trade of obsidian. The provenance of the obsidian found in Dalmatia and Albania is unknown, but the one found around Trieste is from Lipari. The very strong position of this settlement is a clear proof of a period of sharp contrasts. Very few fragments of ceramics in three collars were found in the plain (urban area and Contrada Diana) that surrounds the Castle.

At the Lipari Castle the layer characterized by ceramics in three colors is overlain by a different one, characterized by very sophisticated painted ceramics, with thin walls and refined shapes, with painted decorations very often miniaturized, based on complex interlocking or meandering patterns. They have very particular handles that look like complicatedly twisted clay ribbons. This ceramics is widespread all over the Italian peninsula up to southern Tuscany, and is present also in Sicily, where it goes under the name of "Serra d'Alto style", from the settlement near Matera where it was first defined. Clearly, this style is based on new contributions from the Balkan peninsula, belonging to a late Dimini deeply modified in the Italian peninsula. The simplest impasto ceramics and the lithics are virtually unchanged with respect to the older phase. Obsidian export continues to base of the economy in the island, and commercial relationships with far away shores are testified by a square-mouthed vase, by small ladles with hollow handles (Pipe vases) and by "pintaderas" that remind the Neolithic of the Ligurian coasts (Arene Candide) and northern Italy. Probably at the end of this period the inhabited area began to move from the Castle to the surrounding plain (contrada Diana), where remains of this style were found, and the first agricultural settlements

were established (contrada Mulino a Vento). A fragment of the Serra d'Alto style was found in Panarea island. It seems that at this stage defense was not a concern anymore.

In the following phase, upper Neolithic, the inhabited area developed entirely in the plains. It is characterized by the disappearance of painted ceramics and by the diffusion of coral red monochrome ceramics, with shapes that, at least initially, are similar to those of the Serra d'Alto ceramics because of the high stiff brinks. The brinks, however, disappeared soon, and the profiles of the vases became stiffer and sometimes with a sort of keel. This is the "Diana style" ceramics, which shows a slow evolution through the centuries. The handles too became simpler, similar to tubes, rather saddle or reel like, or became thinner almost like pins, with only thicker extremities; they lost any functions and became pure ornaments. It can be said that they are the only ornament of this ceramics. The Diana style ceramics was found also in Sicily and in the Italian peninsula up to Cesena, in Romagna, with identical shaped and motives. Thus Lipari is part (as in the preceding Serra d'Alto period) of a very wide cultural complex, almost uniform, or at least with few local variations.

In the upper Neolithic the inhabited area became very wide. It extended progressively, perhaps southwards, all over the plain, that is over the area of the modern town and over contrada Diana, between the two torrents that border the plain to the North and to the South. But it even crossed the torrent Ponte to the South, since traces of it were found also in contrada Sant'Anna. Therefore it more than doubled the modern Lipari of the 1970ties, before its last urban expansion. It must have been one of the largest and most populous locations of the entire central-western Mediterranean. Many small agricultural settlements developed on the highlands in connection to this very wide inhabited area.

They may have lasted only a short time, because the fertility of the land may have exhausted soon, since rational rotation of the crops was unknown. It is the differences between these settlements that permit to reconstruct the evolution of this culture even better than stratigraphy. Settlements were also set in the other islands, that from this age on were all inhabited. This great demographic development must have taken place in connection to the great development in the trade of obsidian, that reached its climax in this period. Waste chips of obsidian manufactured can be collected by the tons at Contrada Diana.

The cultural facies of upper Neolithic, characterized by ceramics in a stiffened and decayed Diana style, delays in the Aeolian Islands up to the first centuries of the third millennium b.C., when, by this time, in Sicily a new cultural world calling attention for itself, enriched by oriental contributions and characterized by ceramics in the San Cono - Piano Notaro - Conca d'Oro I style. Well identifiable elements of the new style were implanted in the old local tradition. More changes took place. The inhabited area abandoned the plain, and again set itself on the Castle, a clear demonstration that the long pacific period, lasted for several centuries, had ended, and new dangers were in the view. In the layers of this age on the Castle, however, copper melting scoriae were found, which demonstrate a local metal technology. A long progressive demographic recession began, increasingly serious during the third millennium. Such a recession does not seem to be confined only to the Aeolian Islands, but is recognizable all over the Italian peninsula. Thus it would not seem to be connected only to the diminished demand of obsidian that took place in this period.

Obsidian is very rare in the early bronze age settlements (Capo Graziano cultural facies: end of the third, first half of the second millennium b.C.). It seems to have been used just locally, because of its abundance, and not traded any more. It can be considered absent from the middle bronze age layers (Milazzo cultural facies, end of the XV - beginning of the XIII century b.C.) except for the accidental presence of chips in the ground, due to its manufacture in earlier millennia, which can still be found.

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