

SICILY – 1999

9th International Symposium on Vulcanospeleology

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ABSTRACT

A report on the IUS Commission on Vulcanospeleology's 9th International Symposium held at Catania, Sicily, September 1999, and field trips to Grotta Tre Livelli, Grotta Micio Conti, Grotta Immacolatella I, Grotta de Petralia (archaeological site), Grotta Serracozzo, Grotta dei Ladri and the most impressive, Grotta Cutrona. Two excursions were made to Mt Etna to observe volcanic landforms and active lava flows. The Aeolian Islands of Lipari, Vulcano and Stromboli were visited; the impressive, regular eruptions of Stromboli were observed at night.

The ninth international meeting of lava cave devotees, "Inside Volcanoes", was held at Catania, on the Italian island of Sicily, in the shadow of Mount Etna (Fig. 1). It was hosted by the Centro Speleologico Etneo (CSE) on the occasion of its 15th anniversary, and was co-sponsored by Ente Parco dell'Etna, Istituto Internazionale di Vulcanologia del CNR, Area della Ricerca di Catania del CNR, Soprintendenza ai BB.CC.AA di Catania – Sezione Archeologica, Assessorato all'Ambiente della Provincia Regionale di Catania, Assessorato all'Ambiente del Comune di Catania, Istituto di Scienza della Terra dell'Università di Catania, with the support of Società Speleologica Italiana and Federazione Speleologica Regionale Siciliana for the International Union of Speleology's Commission on Volcanic Caves. But the real work seems to have been done by Giuseppe Licitra and members of the local caving group.

THE SYMPOSIUM

The formal presentation of papers (13-14 Sep.), and an excellent photographic and information display on Etna's lava caves, were held in a refurbished industrial site known as «Le Ciminiere» because of the large number of chimneys still dotting the site. Pre- and post-symposium field trips were run to a number of lava caves on the slopes of Mt Etna, to the mountain itself and to offshore volcanic islands. Associated with the symposium was the launch of *Le Grotte dell'Etna*, a comprehensive and well illustrated multi-authored volume bringing together all current knowledge on the lava caves of Etna. (Unfortunately it is completely in Italian and not available for sale.)

Papers presented ranged widely over the field of vulcanospeleology: a number concerned studies of the caves of Mount Etna and wider afield to Sardinia, the Carpathian mountains, Surtsey and elsewhere in Iceland, the Canary Islands, Kenya, Grande Comore, Mauritius, Japan, Australia (Undara) and Hawaii. In one of his papers Bill Halliday identified more than 100 volcanic show caves world wide. The simultaneous translation (Italian↔English) was excellent. A round table discussion on *Speleology and Environmental Conservation in Volcanic Parks* was interesting but appeared to reveal wide differences of opinion between local park administrators and local cavers; international contributors urged cooperation. The proceedings will be published in due course.

The Symposium was truly international with representatives from: Australia – 2 (Jon Stephenson from Townsville and the author), Austria – 1 (Hubert Trimmel), Canary Is. – 1, Germany – 3, Iceland – 1, Italy – 27, Japan – 3, Netherlands – 4 (incl. Jan Paul Van Der Pas), Slovakia – 1, Switzerland – 4 (incl. Roberto Buzzini), United Kingdom – 3 (incl. Chris Wood), USA – 1 (Bill Halliday).

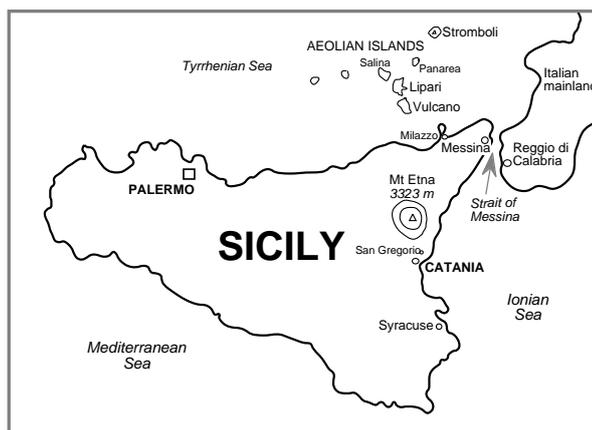


Fig. 1. Sicily and the Aeolian Islands

COMMISSION MEETING

The IUS Commission on Volcanic Caves met in general assembly on 16 Sep., chaired by Jan Paul Van Der Pas. The most appropriate home for a library was discussed at length, with nominations for Arizona State University, NSS, Hawaii, Catania (CSE) and IUS in Switzerland. There were two proposals for the next Symposium on Vulcano-

speleology: Azores Islands (Portugal) in 2001 and Iceland (combined with glaciospeleology). 2001 was ruled out as the Brazil IUS Congress will be held in that year. [Later 2002 was advised as a likely date for the Iceland meeting.] I raised the matter of the need for a guideline document on conservation of volcanic landscapes, to parallel IUCN's *Guidelines for Cave & Karst Protection* (1997). Chris Wood of School of Conservation Sciences, Bournemouth University, UK, undertook to coordinate preparation of such a guideline.

Motions put forward by Bill Halliday on

- (1) cessation of disposal of sewage and toxic and hazardous waste in Hawaiian lava tube caves;
- (2) creation of a protected area around the Padierna lava tube system in the Predro los Encinos, Mexico; and
- (3) reopening of Mowich Cave, Oregon, USA, to geoscientists and planning to protect the geological and biological values of this exceptional cave;

were unanimously adopted, as was one by the author, seeking action by the Government of Mauritius to protect lava caves on that island.

FIELD TRIPS

Grotta Tre Livelli

The first field trip (11 Sep.) was planned to the Grotta Cutrona, a cave in the Valle del Bove on the SE slopes of Etna. We drove as far as possible, up to a gate at about 1850 m elevation (the summit is 3330 m) and proceeded to walk for about an hour, steadily upward to a viewpoint at 2000 m overlooking the Valle. Although it had been sunny and warm, at this point a heavy mist rolled up the valley and the locals decided it looked like rain. Apparently at times of heavy rain water flows into the cave entrance, dislodging rocks and causing a hazard for anyone climbing out. Grotta Cutrona is not entered if it is raining or looks like rain. We walked back to the cars.

The alternative was a visit to the nearby and more easily accessible Grotta Tre Livelli. In fact, as we learnt, there could hardly be a more accessible cave (Fig. 2). The entrance currently used, «Ingresso Basso», is not the original way into the cave; it was crossed by roadworks only a few years ago. Realising they were dealing with a major lava cave, the road builders proceeded to bridge across the entrance with concrete, leaving the passage open below. Now one climbs over a piece of protective railing, down into the cave and through the concrete-roofed passage into the upper level of this three-level cave. In fact, there are at least five



Fig. 2. *Grotta Tre Livelli* has become easily accessible since a road was built over its entrance.

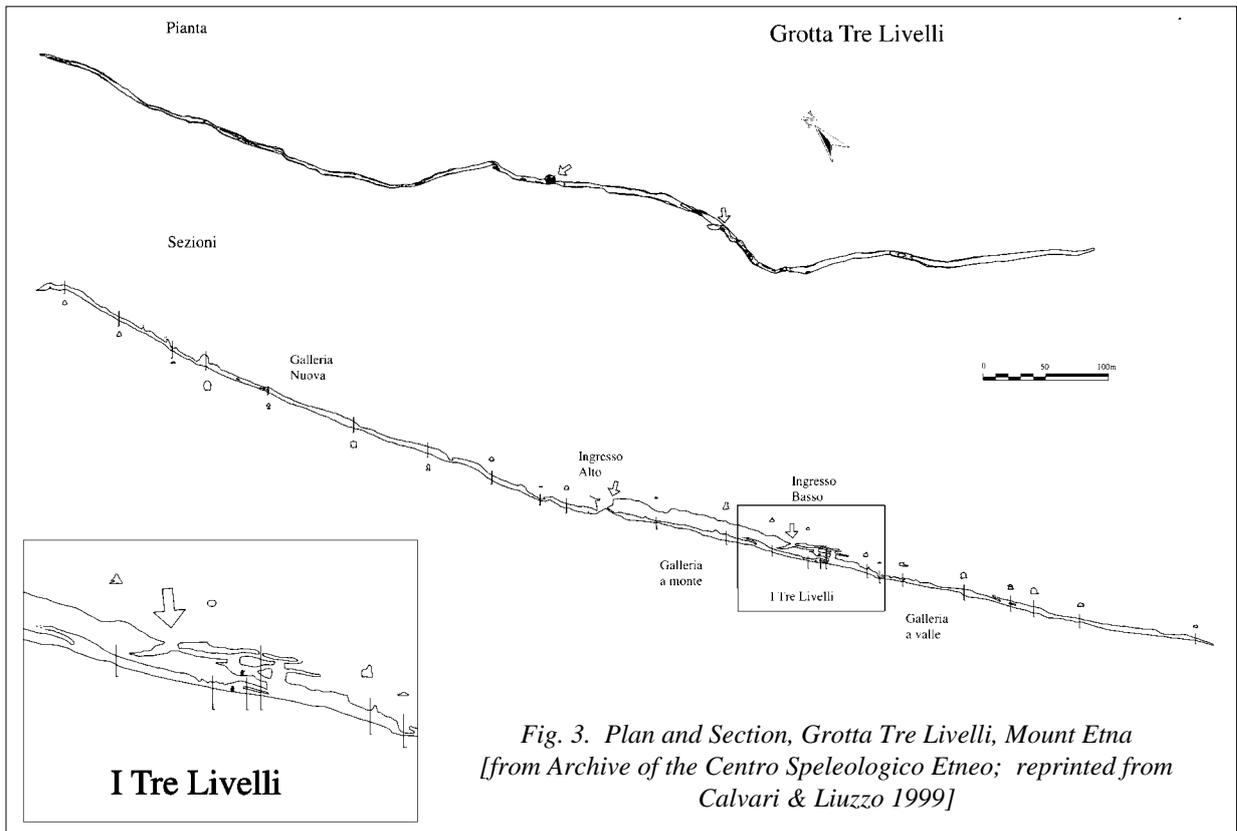
levels, if one counts all the stacked tubes at this point (insert, Fig. 3). From here one descends about 6 m (by ladder) and then a further 2 m to the main level, the «Galleria a valle» which runs downslope/downflow (*makai* as the Hawaiians would have it) quite steeply, eventually pinching out. One can also proceed upslope (or *mauka* as they say in Hawaii) from below the entrance, through the «Galleria a monte». After about 150 m you reach the original or upper entrance, «Ingresso Alto». From here the «Galleria Nuova» runs *mauka* for about 450 m at a slope of up to 40°. Ascending this passage becomes progressively more difficult, especially as the floor consists of loose *aa* clinker, but this is the most interesting part of the cave. The highest part of the cave is, in fact, the original eruptive fissure, indicated by the fact that the walls become more vertical, the roof higher and in places one can see the nearly horizontal sequence of lava flows through which the fissure opened. We emerged after about 4 hours underground to quite heavy rain.

The total length of the cave is 1150 m; its highest point is 304 m above the lowest. The cave is developed in a lava flow dating from 1792-93.

Caves of San Gregorio Area

A much larger group of cavers descended on the San Gregorio area, immediately north-east of Catania on Sunday, 12 Sep. This was split into two groups, one visiting the Micio Conti Cave and the other, the Immacolatella I Cave, swapping over after lunch.

The Grotta Micio Conti lies in prehistoric undated lava. Its upper section, running northwestward, features collapsed sections, columns and a sandy floor over ropy lava. Archaeological material from the Bronze Age were found here. To the southeast, through a tight, dusty crawl, lies the lower section. The floor is again alluvium which, at the time of our visit, was quite damp. There are wide chambers, but generally only 1.5 m high. The



cave has a total length of 350 m.

On our way to the other cave we were overtaken by the local mayor and his entourage, bearing sausages, olives, cheese and red wine in a huge bottle. While the barbecue took a while to get going, the wine and olives went down very well.

Grotta Immacolatella I, in much more recent lava than Micio Conti, has spacious rooms with many roof collapses, a large colony of bats, a few roots hanging from the roof and some good examples of collapsed wall linings (Fig. 4).



Fig. 4. Jon Stephenson examines an accumulation of linings peeled from the wall of Grotta Immacolatella I.

Excursion to Mount Etna I

The official excursion to the Mountain took place on 15 Sep. First stop was the town of Linguaglossa, NE of the mountain, where we were given a civic reception, followed by a taste of local wine and

sweet cakes. We then ascended the northern slopes to a refuge and park station at Caserma Piraio (?) where we were plied with a lot more local wine with bread, cheese, chick pea and mushroom soup, sausages, sweet almond wine, biscuits and grapes. About 4 pm we tore ourselves away from this repast to ascend to Piano (plain) Provenzana (at 1800 m) where we changed to 4WD unimogs for the drive up to an observatory at about 2800 m and on to the mountain guides' hut at the foot of the Central Crater – around 3000 m – which is as high

as anyone is supposed to go. Here we went for a short walk and saw some fine – and recent – volcanic bombs (Fig. 5) and the pock-marked landscape they create. We could see steam venting higher up the slope but there is no active lava flow in this vicinity.



Fig. 5. Dr Stephan Kempe with a recent volcanic bomb on the upper slopes of Etna.

Grotta de Petralia

On 16 Sep. a special excursion was arranged, for those interested, to

a lava cave of particular archaeological importance beneath a suburb of Catania. Roxanne, an American resident in Italy who helped with the organisation, translation, etc., explained that the name translates as ‘Rock Lily Cave’. The entrance is conveniently located in the back yard of a house and it was used as an air raid shelter in WWII. Since then excavations have revealed human bones and very large quantities of pottery – perhaps the cave also provided shelter in ancient times. We were shown where a skeleton had been removed from under stones – presumably an ancient burial site. The cave is quite extensive but in few places does the roof reach 1.8 m. We returned to town in time to clean up for the official closing dinner which was an alfresco affair with large quantities of local cuisine.

Serracozzo Cave

We drove up the eastern side of the mountain to Rifugio Citelli (1700 m) and walked from there, by a very ill-defined trail, for about an hour to the 1971 flow containing this cave. The cave is entered at the original eruptive fissure and a high passage with skylights (in Hawaiian: *puka*) provides a spectacular introduction (Fig. 6). The «Galleria Principale» is a large tube running gently

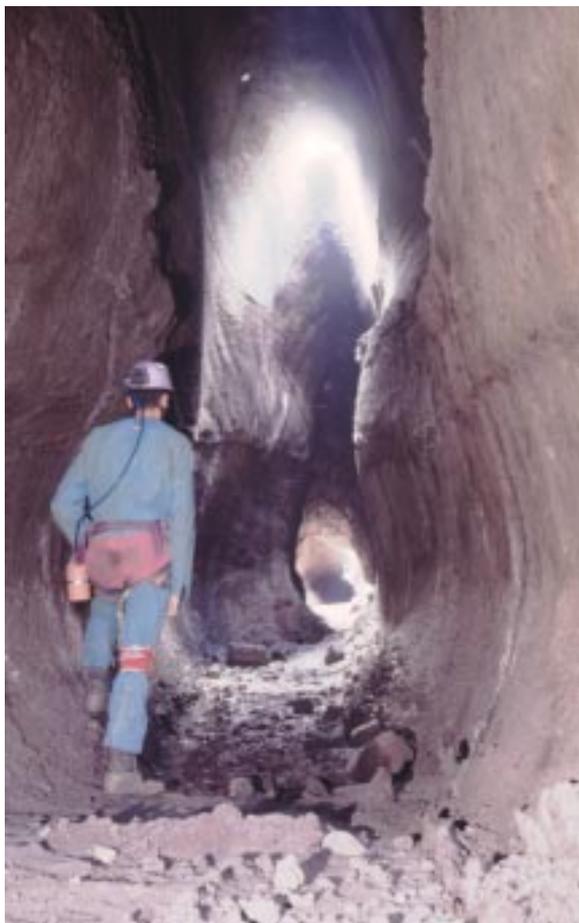


Fig. 6. The high passage with pukas admitting daylight, Grotta Serracozzo. Taken with the assistance of Jo De Waele (left).

makai for about 300 metres (see Fig. 7). There are a few piles of roof collapse but generally the tube is two to three metres high and provides many opportunities for multi-flash photography (Fig. 8).



Fig. 8. The long, gently curving main passage of Serracozzo Cave provides great opportunities for multi-flash photography.

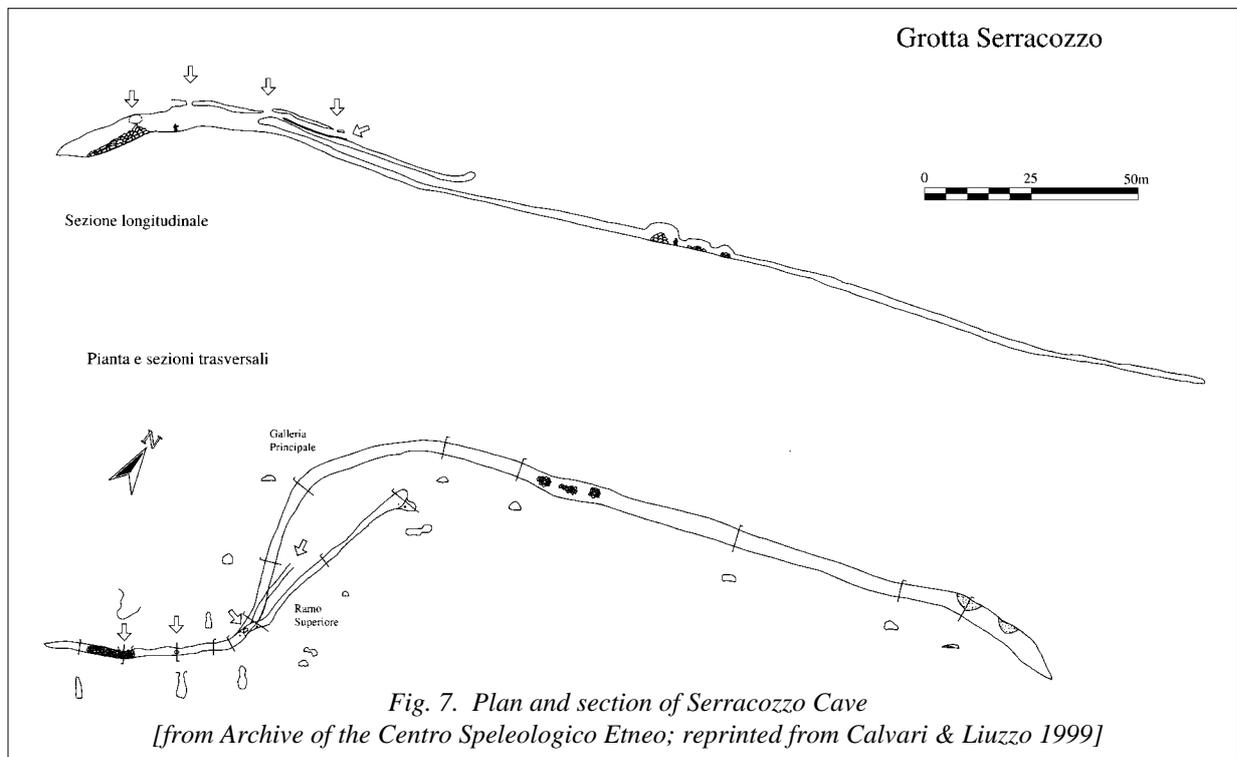
Above this is the much shorter, and below 1 metre high, «Ramo Superiore» (Fig. 9) which ends after about 50 m in coarse sand which has been excavated for a few metres. Back on the surface we had lunch and looked at a few other volcanic features in the vicinity before walking back to the Refugio, where we enjoyed a few beers or wine – very civilised.



Fig. 9. In the somewhat cramped «Ramo Superiore» of Serracozzo Cave.

Grotta dei Ladri

On our way back down the mountain we paused to look at the Grotta Dei Ladri, a small cave quite close to the road. It is signposted and simple railings protect visitors from falling in the holes. The interest in this cave is that it was used in earlier times for the ‘making’ and storage of ice. For this purpose two holes each about a metre in diameter have been excavated from the surface, about 6 to 8 metres down to the lava tube. During winter, snow would be shovelled down these to accumulate below and form ice. In the following summer this could be cut out as required. The cave was also used by thieves as a storage place for their booty.



At the foot of the mountain we diverted to the town of Milo where we were accorded a civic reception by the Mayor and invited to sample the local wines, cheese, bread and olives – a great way to round off a day’s caving!

Grotta Cutrona

Our second attempt to reach Cutrona took place on Saturday 18 September. It was a much more foggy day than on our first attempt but rain was thought to be unlikely. Slithering and sliding our way down the scoria scree slope nearly 300 m into the heavy mist in the Valle del Bove was great fun. Eventually, at the bottom, we encountered the 1991-93 lava flow, with a surface like a frozen wild sea: slabs of rock at every angle, crests and hollows, smooth surfaces, ropy surfaces, small crevasses and wide trenches. And in the midst of it all, the puka which gives entry to Grotta Cutrona down a 5 m ladder climb. Because of fears about the thin edges around the hole breaking, the ladder is rigged from three suspension points so that it hangs centrally into the hole, not against any edge (Fig. 10). This makes it slightly difficult to actually get on the ladder, but once on, the free climb is very easy.

As the guidebook explains: “The cave is formed by two sub-parallel branches of about 400 m length each, oriented E-W and joined at the western end,

for a total development of 870 m.” (Calvari and Liuzzo 1999)(Fig. 11). The cave was first entered and surveyed within a year of its formation and at that time contained a wealth of speleothems comprised of secondary mineralisation. Sadly these were highly soluble in seepage waters and today little remains except for patches of white crystalline snow-like material on the floor (Fig. 12). There are examples of all the usual lava cave features such as roof collapses, lava stalactites, benches, ropy surfaces, *aa* surfaces, large passages and occasional larger rooms. The most impressive rooms are the «Sala del Bivio» at the only junction in the cave (Fig. 13) and the «Bocca del Forno» at the eastern end of the «Ramo Nord» (Fig. 14).

With the help of Jo De Waele, a Dutch caver resident in Sardinia who operated my flash, and a

tripod, I obtained in this cave some of the best lava cave photos I have taken anywhere (Fig. 15). Despite the usual darkness of the walls, this cave does not seem to absorb light quite as much as most lava caves do. The three hours we spent in this cave was the caving highlight of the trip. Clambering back up out of the Valle de Bove was not nearly as difficult as I had expected as a fairly stable route occurs on the vegetated side of the scree slope.



*Fig. 10. Descending entry pitch,
Grotta Cutrona*

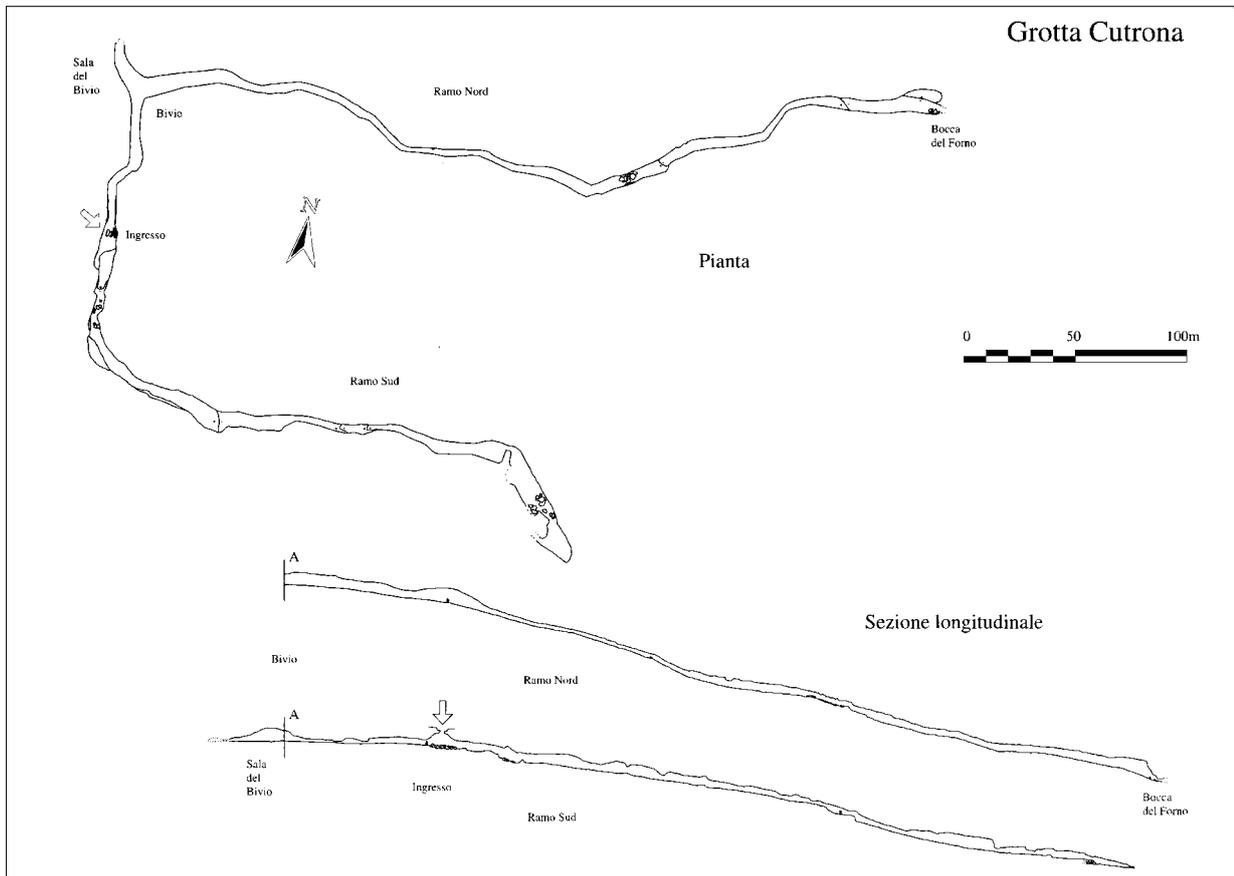


Fig. 11. Plan and section, Grotta Cutrona [from Archive of the Centro Speleologico Etneo; reprinted from Calvari & Liuzzo 1999]



Fig. 12. Remnants of white mineral formations which decorated Grotta Cutrona in 1994.



Fig. 13. Junction of large and smaller passages at Sala de Bivio.



Fig. 14. Large chamber at end of «Ramo Nord», the «Bocca del Forno».

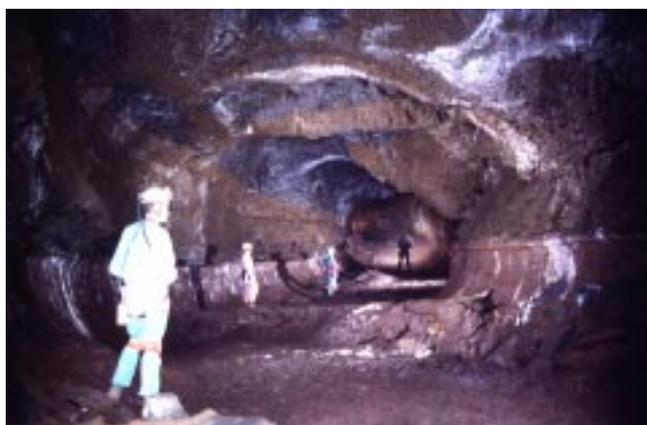


Fig. 15. Grotta Cutrona contains some quite spectacular sections of large tunnel.

Excursion to Mount Etna II

Our second ascent of the Mountain was a somewhat less formal affair than the official Symposium Excursion. It was organised by Marco Bani and Angela Privitera for a couple of us who had not either left or gone on the excursion to Lipari, and who were keen to see the current active lava flow. We caught the chairlift (18,000 lira, about A\$16.50) up about 600 m to the «Piccolo Rifugio» at la Montagnola. Although you can catch four-wheel drive busses from there up to the «Rifugio Alpino» at 2920 m, we elected to walk, mainly off the beaten track, enabling us to observe many undisturbed volcanic landforms and the spectacular view over the Valle de Bove from Cisternazza, nearly a thousand metres above the entrance to Grotta Cutrona. From there we ascended the Piano del Lago on 1989 flow surfaces, meeting up with the tourist throngs again near the «Rifugio Alpino». From there a short and well-worn trail leads north and east to the site of the currently-active eruptive fissure. As we approached the place where the lava was oozing out of the ground (Fig. 16) I wondered if sulphur or other fumes would cause discomfort. In fact, the smell of sulphur was overcome near the vent by the stink of rubber melting on the soles of tourists' shoes!



Fig. 16. Approaching the site of a currently active lava vent on the slopes of Mt. Etna.

The red-hot lava flowed in a stream about 1.5 m wide out of an elevated vent down a gentle slope (Fig. 17). It was not easy to see where it went; it just seemed to spill out over the ground surface. As



Fig. 17. Lava flowing from a vent at about 2950 m on the south-eastern slopes of Mt Etna.

it moved it crackled and occasionally hissed as it pushed against and over material in its path. It was awe-inspiring to watch, and hear, new rock coming into being. Naturally it was very hot in the immediate vicinity and this had a self-regulating effect on how close visitors could get. Nevertheless it was possible to approach within a couple of metres and stay there for a few minutes without undue discomfort. A group of enterprising guys had figured out a way to exploit this free resource: with a long pole they were scooping up the molten lava and pouring it into moulds with the word "Etna" in the bottom to make ashtrays from the virgin rock. In a way maybe it was appropriate but I felt it was a sacrilege to use this pristine material for so base a purpose. I didn't buy a souvenir.

Marco knew of another active vent out of sight of that at the end of the tourist trail. Avoiding the alpine guides who attempt to keep visitors under control, we went around the back of the first vent, to another a little lower down. This one, in fact, had two separate lava 'streams' running from a single elevated vent (Fig. 18). We stood watching this fascinating sight for quite a while, and took many photos.



Fig. 18. Red hot lava flowing in two separate streams from a second vent on Mount Etna.

Eventually we tore ourselves away, rejoined the tourists and returned to the «Rifugio Alpino» in the vicinity of which we had our picnic lunch. We then walked / ran / slithered / slipped our way back down to the cable car station at «Piccolo Rifugio». It was only then, with my aching leg muscles making me look forward to the ride back down, that it was pointed out to me that we had only bought one-way tickets! There was nothing else for it but to continue slipping and sliding our way down the scree slopes to the car park at the foot of the cable car where somebody's friends produced very welcome cold beer and hot coffee from a campervan. Thus the Sicilian part of the trip finished on a great high.

AEOLIAN ISLANDS (Isole Eolie)

Next day I took a train to Messina and another to Milazzo, followed by a bus to the port in order to catch a hydrofoil ferry to Lipari, largest of the wholly-volcanic Aeolian (or 'windy') Islands (see Fig. 1). On 21 September I took a ferry from Lipari to Vulcano, the island with the 'type-specimen' volcano. Though not a spectacular landform, this is a classic volcano, now dormant for 400 years but retaining a few hissing vents which are surrounded by beautiful bright yellow sulphur crystals. An amusing, yet serious, sign on the approach to the mountain says, in four languages: "Dangerous gasses; do not sit down; do not lie down". Near the shore there is a large hot mud pool which some people were swimming in; the sulphurous stench was, however, decidedly unpleasant. I had heard that Paolo Forti and others had documented a cave on this island, known as Alum Cave. Unfortunately it is in a weakly consolidated material (a tuff?) rather than lava and the elements have not dealt kindly with it over the years. It is now regarded as very dangerous and is fenced against visitors. I had to be content with viewing its quite impressive arched entrances from the outside (Fig. 19).

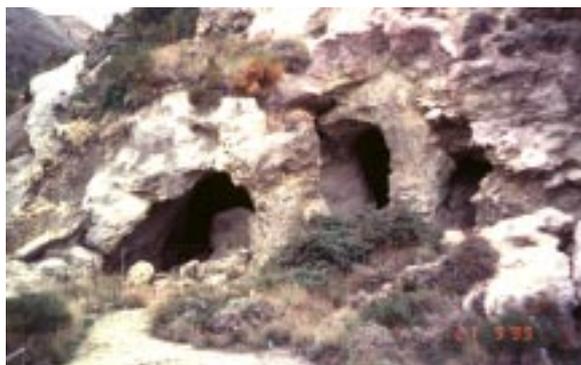


Fig. 19. Entrances to the collapsing Alum Cave, Vulcano Island.

On 22nd I left Lipari for the main object of my visit to these islands, Stromboli. In fact, the reason I had not joined the official Aeolian excursion was that it omitted this most active and impressive volcano of the archipelago. As I disembarked from the ferry, who did I spot on the wharf but a German vulcanologist who had been at the Symposium, Ulrich Kueppers. It transpired that he had visited Stromboli on many occasions and so enjoyed the volcano that he had not passed up this opportunity to return. I was concerned at suggestions that it was forbidden to visit the volcano, especially at night as I wanted to do, without a guide. I could see no reason to pay a guide to take me up a mountain where the path was perfectly obvious and it was only 924 m high. Ulrich said not to worry, he was going up the mountain that evening and he would

be my guide! I checked into a hotel and lazed around the swimming pool, resting up for the night's exertions.

At about 4:30 pm we set out from a bar up behind the village of Piscita with a great view up to the mountain and down to the sea. The path climbs gradually at first and is cobbled. This, my 'guide' told me, was a result of a 1930s order of Il Duce to provide employment during the Depression. Too soon, however, it becomes more steep and more eroded – sometimes it is cut down over 1.5 m – but it is at least easy to follow. Here Ulrich's colleague, Robert, caught up with us and we continued on up to a spot which Ulrich assured me was the best place to view the display. Already we had seen and heard a few eruptions – Stromboli apparently erupts in a fairly controlled way about every 20 to 30 minutes – but they were not particularly spectacular. As the sun set the eruptions became more impressive until, when it became truly dark you could see why people made the trek to be here at night. The fiery display against a black sky was truly an awesome sight (Fig. 20). We, and hundreds of others, sat in the darkness for over six hours to witness the volcano's fury for perhaps a minute about every 30 minutes, and no one would have descended the mountain afterwards disappointed. Reluctantly we dragged ourselves away about midnight. Ulrich knew the track back down so well that he didn't use a torch once during the descent.



Fig. 20. Mt Stromboli in typical eruption, at night - a sight truly worth the effort to get there.

We parted back at the village and next day I caught the ferry for Naples – but that is another story.

REFERENCE

CALVARI, Sonia and LIUZZO, Marco 1999. *Inside Volcanoes : IXth International Symposium on Vulcanospeleology Excursion Guide*. Centro Speleologico Etneo: Catania 46 pp + 10 maps.