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Cambridge University caving club expedition to the Pindus Mountains, Greece, 1962

This article is based very largely on Dave Mercer's paper in the Cave Research Group Newsletter No. 87 March 1963 and we acknowledge with thanks the Group's permission to republish this work.

The summer of 1962 saw a party of Cambridge cavers in the Pindus Mountains of north-west Greece. The group was first attracted to the area by the lurid accounts of limestone massifs and gorges given by a recent botanical expedition to the region.

There were nine people on the expedition. Dave Heap, Dave Mercer and Jan Branson from Cambridge and Tom Holden from Manchester arrived first, travelling via Jugoslavia. The other five, Trevor Faulkner, Barry Barnes, Peter Goford, and Trefor Woodford from Cambridge and Graham Stvens from Oxford eventually arrived in a clapped-out ex-grocery van leaving chaos behind through Switzerland and Italy. We chose the town of Ioannina as the centre for our investigations. This town, the economic and administrative hub of Epirus, is notable for its picturesque Turkish influence and for its spectacular setting on the shores of a lake beneath the foothills of the Pindus Mountains. The lake, which is about 1600 feet above sea-level, lies in a long tectonic trough of limestone which has subsequently been modified by solution, and it is drained by "katavothrai", or subsurface outlets. This trench, or polje, forms a convenient boundary between the predominantly impermeable rocks of the coastal range, and the Pindus Mountains, formed of a succession of Cretaceous and Jurassic limestones, to the north and east. The Pindus form the main watershed between the rivers flowing to the Adriatic and those flowing to the Aegean. They are highly dissected on the western edge and they have been subjected to considerable faulting. Rising to an average height of 6000 ft, but occasionally exceeding 8000, they are barren and have maquis as the dominant vegetal covering. The mountains support a sparse population, consisting mainly of Vlachs - nomadic peoples similar to the Lapps who live off herds of goats and sheep. In addition villages are scattered over the region. Many of these have old religious institutions as a basis, but past glories are largely forgotten in the face of the difficult environment and the toll exacted by emigration. Roads in the area are generally bad and the mule and donkey are the main transport media. The motorbus is however bringing some measure of unity to what was originally an area as dissected socially as it is physically.

To the north-west of the Ioannina lake, and in the centre of the polje is a small hump or isolated erosional remnant, and in this hillock is the Perama show cave. The hill is covered with weathered limestone scree and the entrance to the cave was not discovered until 1940. The cavern is a very ancient landscape feature - there is no stream in it, and its main interest lies in the magnificent limestone formations which are gradually filling it up. The route taken through the cave is a purely arbitrary one, weaving in and out of the stalactite formations which are on every side. I feel sure that the cave could be extended, but this would involve breaking down formations, and is unlikely to yield more than extra shapes with which the guides could play their word-games.

A similar hillock exists today as a small island in the middle of a lake. On investigation, this was found to be pitted with small collapsed sink-holes and a resurgence cave with a small stream was discovered down near the lake. This was
explored upstream for about 300 feet. The passage rose very steeply and the end,
which was blocked with boulders, was close to the surface. The cave was a veritable
haven for bats, which provided quite a new hazard to any we had encountered in
British caving. Also interesting to the biologist were the fine cavernicolous
Orthoptera. The cliffs around the island were interesting, since they were covered
with an impressive array of calcite curtains and stalactites, some of them quite large.

To the north-east of the Ioannina trough rises the Mitsikeli Range. This is the foothill
range of the Pindus, and it is a limestone area consisting of an irregular succession of
variously-sized solutional depressions and rounded hills. The range represents a
maturely dissected landform assemblage par excellence, and as such it is totally
lacking in accessible caves and potholes. The whole range is thickly mantled in scree
- the hills have a rounded form and all cave entrances are masked. The transportation
of sediment towards the lake (presumably in a former wetter phase) has resulted in the
formation of large alluvial fans - the main village and cultivation sites in the area. The
cone-shaped hill is one of the characteristic features of limestone scenery in the
tropics today, notably in Cuba and Malaya. Deposits suggestive of laterites were
noted, and deep rock-rotting, sometimes to a depth of 10 or 12 feet could frequently
be seen in road-cuttings. Clints on the higher parts of the foothills have been
weathered to such an extent that they were leaning crazily against one another and
could be moved around with the foot. Obviously without much more investigation the
hypothesis of tropical weathering is no more than tentative, but writers from other
parts of the Greek mainland and from Yugoslavia have also seen suggestions of it,
and it bears thinking about.

Moraines in the Pindus Mountains lead inevitably to considerations of periglaciation,
the effects of which are found all over the region. For the time being it is best to think
of the deep rock-rotting and scree formation as being due to a much higher rainfall
and more intense frost action under periglacial conditions rather than to tropical
climate weathering. Similarly, the vegetation cover was much thicker in historical
times and would have provided the necessary mechanism for the greater acidulation
of the precipitation and the speeding up of all solutional processes. The main result of
these processes is that a thick layer of scree mantles the hills and blocks many of the
joints, thus precluding cave development.

Having seen the set up in the Mitsikeli Range - a complete lack of drainage and a
mature landscape rotted to a considerable depth, we decided to investigate the country
northward, towards Konitsa and the Albanian border. At first the road runs along the
Ioannina trench and then strikes off into the hills and poljes of the Pindus foothills. At
the summit of this range it descends in a series of Z-bends to the course of the Vikos
river, where it debouches from a gorge on to a wide flood-plain. This is now a
military zone, and passes have to be Obtained from the army authorities in Ioannina -
these are however easy to come by. Our first camp was at the end of the gorge, by the
side of a dam which has been built to provide irrigation facilities for the region. The
gorge itself is very spectacular - the walls are of massive limestone and are some 8 or
900 feet high in this part. Higher up, they attain heights of anything up to 2000 feet.

A preliminary investigation of the gorge seemed quite promising. The limestone was
solid to the touch and obvious-looking cave entrances could be seen in the sides.
When we came to study these entrances more closely however, we found they never
went in more than about ten feet. They are scour hollows formed as the river cut down
through successive stages. They are found at widely differing heights, both near the
top of the gorge and down at river-level, where they may be seen in the process of
formation today. Caves such as are found in the Tarn Gorge do not exist - the water
merely percolates down through the fissures in the limestone and appears in the form of tiny springs at river level. It is probable that the down-cutting of the main river has been so rapid that the water in the interstices of the limestone is having continually to adapt itself to a changing base-level. This precludes all possibility of great solutional enlargement of the joints. The plateau surface above the gorge scarcely warrants such a name since it is a mass of dissected pinnacles and spreads of felsenmeer. There is no indication of water-courses, and no possibility of water collecting in to one central funnel, as there is for instance, on the Causses. The great gullies near the cliff-tops do however give the impression of swallow-holes sawn in half and viewed in section. At some time in the past it appears that streams have collected, and disappeared down deep shafts, only to be abandoned by the lowering of the base-level, and then almost completely weathered away. Here, as in other parts of the Greek mainland, ancient karst forms are close to immature forms.

A short investigation north of Konitsa showed that the rock here was of flysch rather than limestone, so we left this area and went further up the Vikos Gorge, to the village of Papingon. This village is situated on a small plateau above the gorge, and behind it the limestone massif of Astraka rises to a height of nearly 8000 feet. It was on the summit plateau-surface of this impressive mountain that we found Provatina. An English-speaking Greek in the village told us about the hole, which he had seen whilst hunting wild goats, and so, on the following day we set off to find it. The gradient on the lower slopes of the mountain is not steep, and here again, scree is widespread. Once above the tree-line one soon reaches the base of the cliffs, and the only way to get to the summit is to climb one of the gullies which score the mountain's north face. At the top of one of the gullies and after about an hour's climb, the hole was seen on a grassy plateau to the left of the dried-up valley. It lay at the base of a small cliff and had no water-course leading into it. In surface dimensions it was similar to Alum Pot, but the depth is far greater - we reckoned the total depth of the first pitch to be of the order of 800 feet. A 250 foot rope lowered with a rock on the end failed to touch a ledge of any sort, and a stone thrown down could be heard rattling for thirty seconds - there being a second pitch as deep as the first one. Stones fell for about 5 secs - one stone fell free for 8. Allowing for air resistance and the time taken for sound to travel up the shaft the depth of Provatine is at least 800 ft. The vertical sides of the hole were well fluted, though it is difficult to say whether water action has been a modifying or a formative agent in this case. A thin capping of flysch does exist on the top of Astraka, and this may indeed have provided the necessary conditions for vertical development, as on Ingleborough. However, against this must be set the fact that Provatina is the only deep hole in the area, and it would seem more likely that faulting is the formative mechanism, such as is the case with the Yorkshire pot-holes of Long Kin West or Rift Pot. Other pots do exist on Astraka, but these are generally of the order of 100 feet deep and are choked with rubble or snow at the bottom. The possibility of extending these does not seem to be very great. Provatina thus seems to be something of an anachronism. Certainly its position away from the present valley, and the fact that it has no water course leading in to it are rather unpromising features, making it appear that faulting is the main mode of formation. If this is the case it is unlikely that the hole can be extended deeper than its estimated depth of about 1200 feet. On the other hand, the hole may be a very ancient feature, the old valley leading into it having been eroded away. Such a hypothesis does not fit in with the poor development of other karstic landforms in the area.

Several smaller caves in the sides of valleys tributary to the Vikos were investigated. These were in a band of Reef limestone. They had no streams in, but were liberally decorated with formations. The passages were of the rift type and closely controlled
by the jointing. Development was almost certainly in accord with the changes in base-level. As this dropped the small cave passages were left dry in the valley sides.

From Papingon our final expedition was further still up the Vikos River to the village of Monodendri some 20 miles north of Ioannina. Again this village was perched high above the gorge and received its water supply from perched water tables on flysch or flint within the limestone. The geological succession in the region consisted mainly of a great thickness of very thinly bedded limestones. These have been eroded into fantastic shapes where they stand out above the surrounding doline-country. The finest succession of dolines we encountered was in the Monodendri region where they varied from a few yards to half a mile in width. Many of the depressions had pot-holes associated with them. These are frequently at the lowest point of the doline, and drainage must have gone down them in the past. The anomalous position of some holes in the district leads again to the probability of faulting as the dominant mechanism. All the pots are now dry and all are choked at the bottom with scree. The village president, an old white haired man with a working knowledge of English, told us there were caves and holes in the district, but they were, he said, so deep that he felt sure there was no air at the bottom. He told us a story about a cow that had fallen down the deepest of the holes - cows eye pot. Some time later, it was claimed, the eyes of this same cow were found at the bottom of the Vikos Gorge, about 1000 ft below.

We were given permission to camp at an old, recently deserted tannery built on the edge of the Vikos gorge, and a smaller gorge leading into it. The dried up river bed lay about 1000 ft below, whilst above us rose another 300 ft of sheer cliff face. A camp was established in a courtyard in the Nunnery, near the wellhouse. Sleeping accommodation was provided in a minute room jutting out over the gorge - on a balcony in the gatehouse - on a terrace under ripening grapes, and out in the courtyard, until it was found that the scorpions found it first.

Our interpreter provided us with a guide and the services of a really tough mule which carried about 6 cwt of equipment. We descended every hole the guide showed us. The deepest - cows eye pot - had two entrances, though at first it was not apparent that both belonged to the same system. The rift leading to an easy 70 ft pitch looked a much easier proposition than the vast adjacent hole, about 50 ft across, which, according to local opinion, was 300 metres deep. The first entrance, however, led to another pitch which was very difficult to belay because of loose material at the sides. Instead we descended the main shaft which was very difficult to belay and was found to be 320 ft in one big pitch. 100 ft down the hole narrows to a steep gulley for some 70 ft, then goes out in a vast cylindrical chamber in which the ladder hangs free for over 100 ft. One down-to-earth Northern member was even heard to remark that this was a really aesthetic ladder climb. The bottom was most unexciting. It is simply choked up with scree and is now completely dry.

The height of the pot-holes in this area is about the same as the summit surface of Astraka, and the general accordance of the highest plateaux in the Pindus of this area suggests a high-level erosion surface with rather better karstic development than we encountered at lower levels near Konitsa.

In conclusion then, apart from the finding of Provatina, which we could not attempt with the tackle we had at our disposal, our expedition was rather disappointing. We had expected a similar set up to that in Yugoslavia, but this is not so. Surface drainage of any type is almost lacking in the Pindus and a thick layer of scree seals off all joints in the limestone and prevents any concentrated percolation. Such rock accumulations
are probably the result of very intense frost action in periglacial times, on the edge of small local ice caps. Although overworked, the term Maturely Dissected ideally describes the rounded hills and ancient landform assemblages to be found in the Pindus. It was only on the highest erosion surfaces that we found any significant vertical development and I would advise any future expedition to the area to concentrate on the summit plateaux at about 7000 feet.

D.C.Mercer, with minor alterations by T.Woodford

Refs:

- Cambridge Expedition to the Pindus Mountains, Greece, By D.C.Mercer
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- CUCC Expedition to the Pindus Mountains, Northern Greece, 1962
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- Potholing: Beneath the Northern Pennines, by David Heap 1964

I should like to thank Dave Mercer for providing the geographical details and for permission to use his material. I should also like to take this opportunity to congratulate Dave on his recent marriage to Jan Branson - who also features elsewhere in this journal. Ed.