

Caves and Karst of the Argolic Peninsula Greece

By Gerald Glenn Forney

The Argolic Peninsula is in the eastern part of the Peloponessus about 60 km southwest of Athens. Its important towns include Kranidi, Ermione and Methana. The northern part of the peninsula has rugged mountains with heights up to 1100 m that are composed of Mesozoic limestone and flysch with occasional serpentinite intrusions. The area south of Kranidi and near Porto Cheli is composed of Quaternary conglomerate with an area of serpentinite to the east. The geology of the peninsula has been summarised by Bannert and Bender (1968). Susskoch (1967) described the geology of the central part of the Adheres Mountains in more detail.

The University of Pennsylvania has been excavating the late classical town of Halieis near Porto Cheli since 1962. Indiana University joined the project in 1966 and excavations began at the Franchthi Cave near Koilada in 1967. During the summer of 1970, the excavation party included Dr. Robert Giegengack as geologist and I was his assistant. We did reconnaissance geology in much of the Argolic Peninsula, but we were especially concerned with the area near Porto Cheli and Kranidi. Therefore, we did not have an opportunity to examine all of the karst features that we knew about.

There has been some previous study of the karst features of the region. Riccardi (1962) described four sinkholes and a small cave north of the town of Didyma. Jacobsen (1969a, 1969b) reported on the excavation of Palaeolithic, Mesolithic and Neolithic material from the Franchthi Cave.

Mme. Anna Petrochilou gave us details on six locations for caves and sinkholes from the files of the Societe Speleologique de Grèce. The karst features include the cave at Franchthi or Fragthi (no. 253) and the area of Didyma or Didimion (no. 859). The files also mention nine sea caves (no. 254) that are northeast of the town of Astrous and must be approached by boat. This town is on the west coast of the peninsula near Nauplion, but we did not visit the area during our fieldwork. The files also mention a cave at Poros (no. 862), but no details were given. We were told of a cave discovered during the construction of a road from the town Poros to the monastery nearby. The cave was said to contain many formations, but it was closed to prevent vandalism until an appraisal of its touristic potential could take place. Across the strait and east of Poros

at Artimo and Lemonadasos (no. 863) are a series of limestone springs and a sea cave. The files also refer to a cave at Katafigiou (no. 1406) which is northwest of Ermione. Although we did not visit that area, Dr. Thomas Jacobsen told us that the area only contained a group of rock shelters.

During June and July of 1970, we examined the cave at Franchthi and the karst near Didyma that was described by earlier workers. We also found previously undescribed caves at Mouzaki near Ermione, at Khnoia near Koilada and at Km 54 near Ano Fanari. On the peninsula of Methana near Kaimeni Chora we explored a cave in lava. We also inspected karst features on Nisos Korakias and at the eastern end of the Franchthi Mountain. We briefly examined the limestone and travertine springs on the north slope of the Adheres Mountains at Troizen and Lemonadasos.

Franchthi

Franchthi Cave is located 4 km northwest of Kranidi on the western end of the Franchthi Mountain. The entrance is directly across Ormos Kranidhiou from the town of Koilada. Although the entrance to the cave cannot be seen from the town, a skylight in the middle of the cave is quite prominent. The cave is accessible by boat from Koilada or by walking along the south slope of Franchthi from the quarry at the eastern end.

The entrance to the cave is about 30 m wide and the cave trends in a southeasterly direction for about 150 m. The cave has two skylights, one near the middle of the cave and a second near the end. The skylights provide so much light that no artificial lights are necessary to explore the cave.

The floor of the cave is completely covered with breakdown except near the entrance. The mouth of the cave is at an elevation of 12.5 m and the breakdown floor slopes up to a point 30.4 m above sealevel. Beyond the skylight the floor slopes downward to a pool of water near the back of the cave that is 4 m wide and 15 m long and is about a meter above sealevel. The water in the pool is brackish, but it seems to be frequently used by local animals. We spotted a fox near the skylight outside the cave and also found many animal skats at the edge of the pool. Offshore of the mouth of the cave there are several freshwater springs that emerge from the limestone underwater. They are easily detected while swimming because they are a great deal colder than the surrounding water. In Pleistocene times sealevel was probably as much as 100 m lower because of

the water stored in polar ice caps. Therefore, if there were springs at the cave, they were probably freshwater.

The cave was excavated in 1967, 1968 and 1969 and the reports of findings are in Jacobsen (1969a, 1969b). Much Neolithic and Mesolithic material was found which indicates that the occupancy of the cave may date from as much as 10,000 years ago. The area between the entrance to the cave and the ocean was once part of the cave, but has been unroofed by erosion. The cave is known to local residents as the «Cave of the Cyclops» according to Jacobsen and it has been used during the winter as a shelter for sheep and goats. Sheep dung from the cave brings as much as 50 drachmas (Sr. 66) for two large burlap bags on the local market (Jacobsen, 1969b, p. 367) and dung collectors have seriously disturbed the surface soil.

The limestone at Franchthi is described on the map in Susskoch (1967) as «Cenoman Massenkalk» of Cretaceous age. At the cave the limestone strikes to the east and dips very steeply to the south. The cave seems to be on a fold since at the entrance the strike of the limestone seems to change from a northeast to a more easterly direction. Most of the blocks of breakdown show bedding plane control. Near the back of the cave the blocks are tilted on their sides because of the steep dip and they resemble a shelf of leaning books.

Dr. Giegengack and I examined the cave on June 18 and 28 and I returned on July 11.

To the east of Franchthi Cave there is a quarry on the opposite end of the mountain. During the summer of 1968, quarrying operations intersected a large dome-pit that is partially water-filled. Dr. Giegengack and I examined it on July 18 and we were told by one of the employees of the quarry that German hydrologists had measured the depth of the pit to water as 18 m and the depth of the water as 108 m. The water seems to be slightly above sealevel and is said to be rather brackish. This is not surprising since the northeastern corner of the Ormos Kranidhiou is only about 200 m from the quarry. The dome-pit is about 8 m long in an east-west direction and about 4 m wide. The long axis of dome-pit parallels the long axis of the cave which is about 1 km west.

Khonia

Khonia is an area about a kilometer west of the town of Koilada and just east of Akra Kokkino (Red Point). On June 23, Dr. Giegengack and I found a cave near the cove just below the point. The entrance is 20 m east of the shore of the cove and on the north side of a dry stream bed.

The cave is in what is probably Mesozoic limestone even though it looks very different from the Cretaceous limestone across the water at Frantithi and Nisos Koronis.

The cave is apparently used by goatherds during the winter months and it has been modified somewhat. It consists of one room 4 m long and 2 m high with a passage near the back that is too small to enter. Along the hillside to the east there are other solution pockets, but none of them can be entered.

According to Dr. Thomas Jacobsen there is also a large sinkhole on Nisos Koronis, but we did not get an opportunity to examine it. The sink is 75 m long and 15 m wide.

Nisos Korakias

Nisos Korakias is a small island about 100 m from the mainland and about seven kilometers southwest of Kranidi. The island and a portion of the shore facing it are a small outcrop of Mesozoic limestone whose existence was previously unsuspected.

Dr. and Mrs. Giegengack and I visited the island on July 2 in a small caique that we rented in Koilada. The island is about 200 m in diameter and the only trees growing on it are scrub. Near the northeastern end of the island there is a water-filled sinkhole about 10 m in diameter. The edge of the sinkhole is at an elevation of about 6 m while the water inside is at about sealevel. I made a collection of potsherds from near the edge of the sinkhole and they were identified by Mr. Merle Langdon as Roman sherds of the most ordinary sort. The water in the sinkhole is very murky and no attempts were made to plumb its depth.

Mouzaki

Mouzaki is a prominent headland of Cretaceous limestone about two kilometers south of the town of Ermione. Although it is only a kilometer in diameter, it rises abruptly to a height of 200 m. It is bounded on the west by low-lying hills of serpentinite and flysch and on the other three sides by water. The bay to the north of Mouzaki is called Ormos Kouverta and the entrance to the cave is along the south shore of the bay about a kilometer from the nearest beach. The entrance to the cave is at sealevel and is visible from the Sanctuary of Poseidon at Ermione. Although the cave is accessible from both land and sea, the best route is to go by small boat since the terrain is very rugged.

Several years ago, a possible Neolithic sherd was found during a trip to the cave, so we were very interested in examining the cave in

search of Neolithic material. Dr. and Mrs. Ciegengack, Mr. Ralph Silverman and I visited the cave on June 30. A shepherd encamped nearby was kind enough to lend us his small rowboat to make the trip in.

The main passage of the cave slopes up and to the south and east for 25 meters until it reaches a skylight in the ceiling. At that point a side passage goes off to the south for about 10 m. The side passage is in total darkness and since we brought no lights, we explored it with matches. The passage had several small flowstone formations in it and also untold thousands of gnats. The passage seemed to be floored with bedrock and flowstone in contrast with the main part of the cave which had a predominantly breakdown floor.

We made a collection of potsherds for archaeological examination, but there was very little material. It consisted of Roman and modern sherds and some roof tiles, but there was no definite Neolithic material. Although Franchthi is an exception, Neolithic man seemed to prefer caves with a southern exposure for increased sunlight and with a gentle sloping path to the entrance. Mouzaki has a northern exposure and in neolithic times when the sea was much lower, it was probably on a cliff. The bottom of the ocean falls off very rapidly in front of the entrance and reaches a depth of 30 m of the mouth of the cave.

The cave has a few formations including one piece of flowstone that is a «bacon rind» about two meters tall. It has only been slightly vandalised.

Didyma

The town of Didyma is in a large closed basin or polje about 10 km north of Kranidi. The alluvial floor of the valley is very flat and measures about 4 km north and south and 3 km wide. The drainage pattern is radial so that all the rainfall drains into the center of the valley and is absorbed by the alluvium or evaporated. Since the area is very dry none of the streams is perennial or even well-developed.

Bannert and Bender (1968, p. 159) describe the local rock as «Kreidekalk», a limestone of Triassic age. Riccardi (1962) has described four large sinkholes and a small cave in the area north and west of the village. Dr. and Mrs. Ciegengack, Mr. Ralph Silverman and I examined the sinkholes on June 10 and 11, but we did not relocate the cave. The cave was inaccessible because construction made the road to the top of Mt. Didym impassable.

The valley sinkhole is located about half a kilometer west of the town of Didyma. It is nearly circular with a diameter of about 150 m and a depth of about 35 m. The walls are entirely in alluvium and the bottom

would be difficult of access except that a man-made tunnel facilitates entry. There are two small churches named Metamorphoseos and Ayiou Georgiou built into the sinkhole walls. Apparently the collapse that produced this sinkhole was in limestone at some depth below.

The upper sinkhole is in the valley wall and is obvious from most parts of the Didyma valley. It is smaller than the sinkhole in the valley and has a greatest width of about 30 m. The sinkhole is close to the edge of the valley and the contact between the alluvium and the limestone. The uphill wall of the sinkhole has a height of 30 m while the valley side is only 10 m tall. There are corrals in the bottom of the sink where goats winter. A short cave passage goes off from the west side of the sink for about 6 m and then it ends. Dr. Thomas Jacobsen found a number of pieces of worked and unworked flint and obsidian in the sinkhole. These artifacts indicate definite prehistoric activity, but there were no clear-cut ceramic remains.

A road leads north out of the town of Didyma climbing steeply until it comes to a pass between Mt. Didyma (1103 m) and Mt. Avgos (710 m). The northern two sinkholes are located just north of the crest of Mt. Avgos at an elevation of about 508 m. They are rather difficult of access and are best reached by parking in the pass and walking along the crest of the mountain.

The easternmost of the two sinkholes shows signs of an intermittent lake that probably forms during the winter months. The sinkhole is nearly circular with a radius of about 200 m, but it is very shallow and nowhere are the walls much more than 15 m high. There are several small caves in the sinkhole but they are hardly worthy of the name. The western sinkhole is very deep and has the possible remains of a large cave passage on its south side. The two sinkholes are only about 150 m apart but terrain is rather rough.

Riccardi (1962, p. 353) described a small cave six km northeast of the town of Didyma at an elevation of 800 m. The entrance is a small pit 5 m in diameter. There is one major passage a meter wide and about a meter and a half high and ten meters long. At that point the passage subdivides into smaller crawlways that pinch out. There are a few formations but most of them have been vandalised. During the Civil War in the 1950's a number of local people supposedly used the cave as a hiding place.

Kilometer 54

A cave entrance is visible to the east and upslope from the Naup-

lion to Poros road between km 54 and km 55 near Ano Fanari. The entrance to the cave is about 6 m high and 4 m wide, but unfortunately the cave is only 5 m deep. The cave seems to be formed along a bedding plane with a strike of N 60 E and a dip of 70 N. Bannert and Bender (1968, p. 159) indicate that the limestone at that point is «Mitteltrias - Lias, Pantokrator - und Hornsteinplattenkalk» of Middle Triassic to Lower Jurassic age. The cave was visited on June 11 by Dr. Giegengack, Mr. Ralph Silverman and myself.

Kaimeni Chora

Kaimeni Chora, the «Burnt Village,» is a town on the northwestern tip of the peninsula of Methana. The village is built at the foot of a large volcano that probably erupted within the last 15,000 years judging from the condition of the lava. We were told of a cave in the volcano by Mr. Costas Zagouroglou, the geologist at the Ermione mines. Actually there is a cave produced by rock slippage in the crater of the volcano and several smaller caves that breathe cool air. Mr. David Harper and I visited the cave on June 6 and Mr. and Mrs. Steven Diamond, Dr. Robert Giegengack, Dr. Thomas Jacobsen and I visited the cave on June 14.

The road from the town of Methana along the west coast of the peninsula ends at Kaimeni Chora, but a trail continues. About 100 m beyond the town the main trail forks and the left-hand branch goes towards the volcano. Then 200 m further along a less obvious trail leans up the side of the volcano. The trail is well-built and it continues up and it continues up and across the crater and apparently ends at the cave.

The cave is 20 m long and 5 m deep. It is 3 m wide at the entrance and narrows to a point. The inside of the cave is shaped like a wedge with the widest point at the floor and its height is about 10 m. The cave is not a true lava tube, but was formed when two slightly molten blocks drifted apart while cooling. We found a scorpion in the rocks of the cave but no artifacts of any sort.

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Π Ε Ρ Ι Λ Η Ψ Ι Σ

Υπό τόν τίτλον «Σπήλαια καί Κάρστ τῆς Ἀργολικῆς Χερσονήσου ἐν Ἑλλάδι,» ὁ Γεωλόγος Gerald Glenn Forney ἀπό τὸ Wilmington, De. Ἦνωμ. Πολιτειῶν Ἀμερικῆς, δίδει ἐνδιαφέρουσαν περιγραφὴν διαφόρων σπηλαίων τῆς ἄνω περιοχῆς. Ἀναφέρει ἐπίσης καὶ τὰς πηγὰς ἄλλων ἐργασιῶν σχετικῶν, καὶ παραθέτει καὶ δύο σχεδιαγράμματα, τὸ μὲν ἐν τοῦ σπηλαίου Φράχτη, Β.Α. τοῦ χωρίου Κοιλάδα (περιοχὴ Κρανιδίου), ὑπὸ κλίμακα περίπου 1 ἐκ. = 14 μέτρα, τὸ δὲ ἄλλο τῆς δλης Ἀργολικῆς Χερσονήσου, μὲ σήμανσιν τῶν διαφόρων θέσεων, ὑπὸ κλίμακα περίπου 1 ἐκ. = 3,2 χμ.

Τὰ ἀναφερόμενα σπήλαια εἶναι τὰ ἀκόλουθα :

Σπήλαιον Φράχτη, ΑΣΜ. 253 4 χμ. ΒΔ τοῦ Κρανιδίου, εἰς τὸ δυτικὸν ἄκρον τοῦ ὄρους Φράχτη. Δίδονται πλεῖσται πληροφορίες, τόσον γεωλογικαί, ὅσον καὶ περὶ τῶν εὐρημάτων, μαρτυρούντων ἀνθρωπίνην ἐκεῖ διαβίωσιν ἴσως καὶ πρὸ 10 000 ἐτῶν.

Σπήλαιον Χώνια. Α.Σ.Μ. 4211 εἰς τὴν περιοχὴν ἐν χ.μ. δυτικῆς τῆς πολίχνης Κοιλάδα.

Σπήλαιον. εἰς τὴν μικρὰν νησίδα Κορακιά Α.Σ.Μ. 4194 εἰς ἀπόστασιν 7 χμ. ΝΔ τοῦ Κρανιδίου.

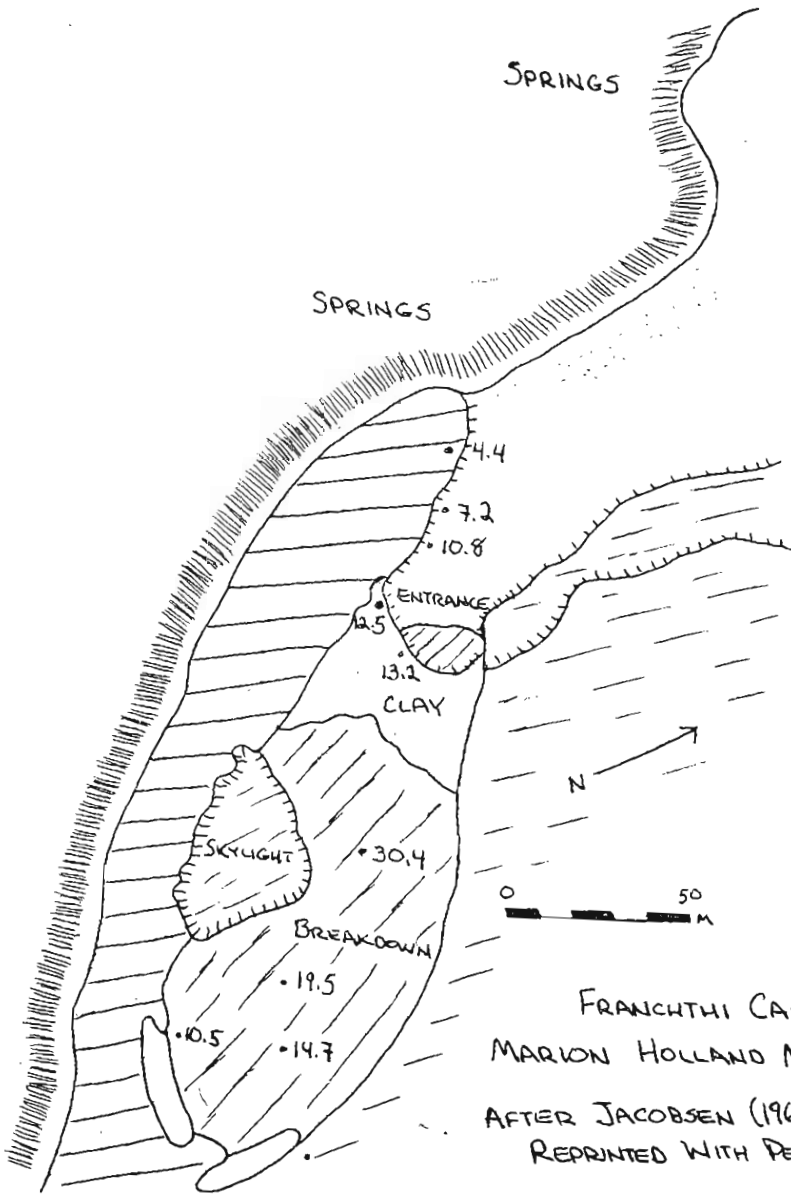
Σπήλαιον Μουζάκι. Α.Σ.Μ. 4193 περίπου 2 χμ. νοτίως τῆς πόλεως Ἐπιδαύρου.

Περιοχὴ Πολίχνης Δίδυμα Α.Σ.Μ. 859 καὶ 860. Περιγραφὴ διαφόρων Sinkholes.

Σπήλαιον. Εἰς χμ. 54 τῆς ὁδοῦ Δίδυμα - Ἄνω Φανάρι (πρὸς Μέθανα). Α.Σ.Μ. 3969.

Σπήλαιον Καϋυένη Χώρα. Α.Σ.Μ. 4162 εἰς τὴν Β.Δ. γωνίαν τῆς Χερσονήσου τῶν Μεθάνων.

Ἡ ἄνω ἐργασία, ἐκ 12 δακτυλογραφημένων σελίδων, ἔχει γραφῆ εἰς τὴν Ἀγγλικὴν γλῶσσαν.



FRANCHTHI CAVE ΑΣΜ. 253
 MARION HOLLAND McALLISTER
 AFTER JACOBSEN (1969b, p.345, fig 2)
 REPRINTED WITH PERMISSION.