

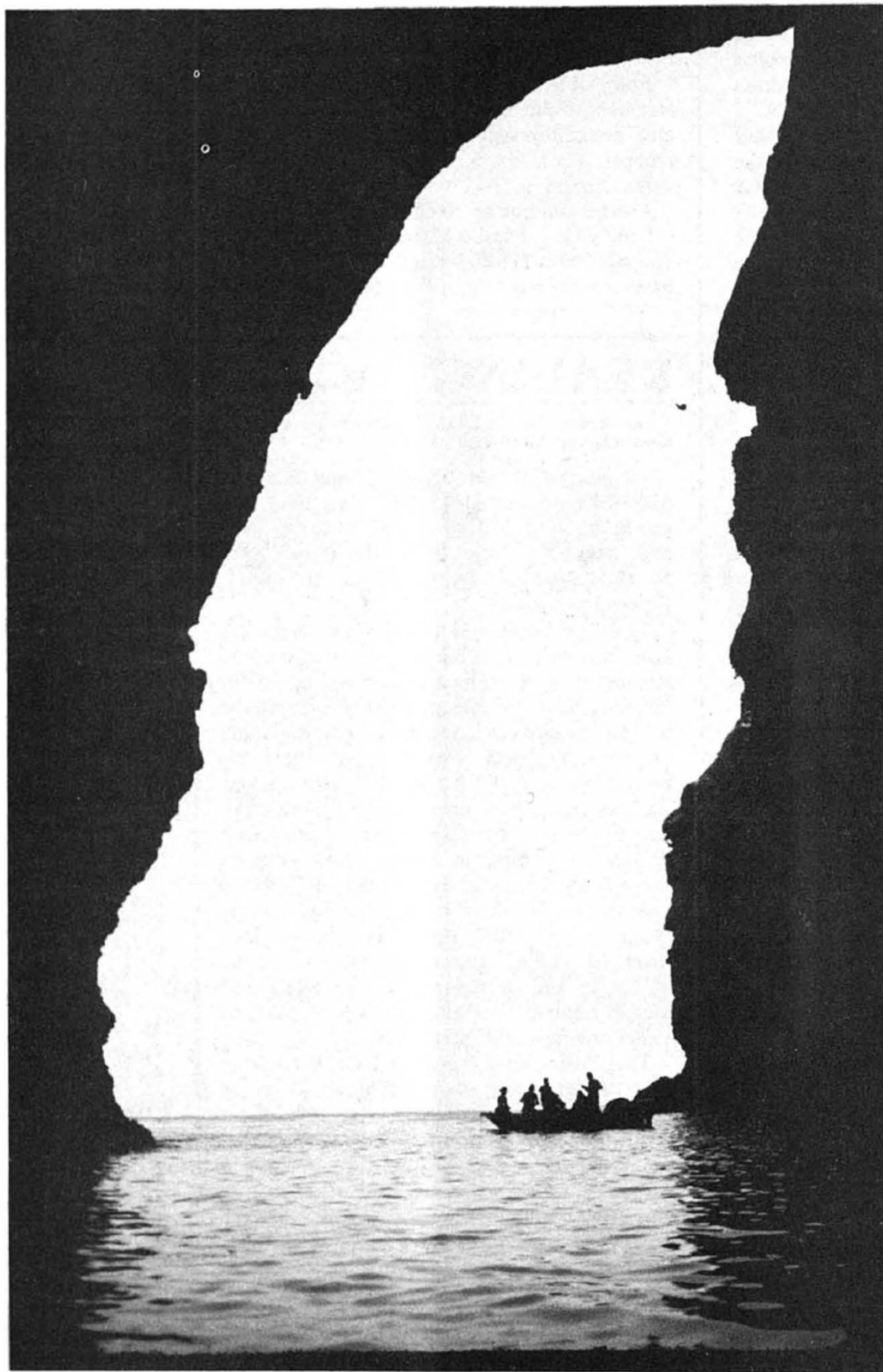
The Amazing Caves of Santa Cruz Island

By Dave Bunnell, NSS 14760, and Carol Vesely, NSS 18730

Along California's rugged coastline are hundreds of caves that have been carved out by the pounding sea along zones of weakness in the cliffs. The variety and size of these caves is surprising, ranging from small fissures to large chambers. Equally diverse is the tidepool life, with each coastal region having its own unique marine flora and fauna. While many of these caves are well known and are mentioned in Halliday's *Caves of California*, no systematic survey had been undertaken. Thus it was that Dave Bunnell and Carol Vesely, two displaced easterners looking for a good caving project, initiated the Southern California Sea Cave Survey, an informal group of Southern California Grotto members interested in mapping and charting sea caves from San Francisco to San Diego.

The largest of California's sea caves are located on Santa Cruz Island, largest of the nine Channel Islands (see map on page 89). Viewed from the beach at Santa Barbara, the islands appear as rugged, towering mountains rising more than 2,000 feet above the sea. Due to their unique ecologies and beauty, four of the islands have been declared part of the recently designated Channel Islands National Park. Santa Cruz Island is now privately owned, and a permit is required to land there; agreements with the present owners will split control of the island in the future between the National Park Service and the Nature Conservancy.

Located 25 miles off the coast of Santa Barbara, Santa Cruz is 25 miles long and six miles wide at its widest point. Geologists say the island is a seaward extension of the Santa Monica Mountains on the mainland, with a prehistoric connection suspected. Supporting the theory of a land bridge between the islands and the mainland are fossil records of a "pygmy" mammoth and other large animals found on the islands. However, recent studies indicate that even during the ice age when sea level was lower there was still at least four miles of ocean separating these land masses. At that time the four islands known today as Santa Cruz, Santa Rosa, San Miguel and Anacapa were joined as one large island. The islands' species of animals, such as the island foxes, large blue jays and field mice, may have



Southern California Sea Cave Survey members, aboard their 17-foot Boston whaler, release a helium-filled balloon (small speck 2/3 way to the top) to measure the 130-foot-high entrance to Painted Cave, Santa Cruz Island. (Dave Bunnell)

been transported across the ocean by logs or, later, in Indian canoes and then evolved further into the subspecies found on the islands today. And the pygmy mammoth? Well, elephants supposedly are proficient swimmers.

Santa Cruz Island is composed of basalt overlain by andesite from more recent volcanic eruptions. Much of the island's west end has sheer basaltic cliffs as much as 300 feet high that plunge directly into the sea. At various points the cliffs are broken by coves, forming natural anchorages with sandy beaches. In other areas faults have created zones of weakness, exposing cliffs to differential erosion by the sea. The result: sea caves.

The island and its caves were well known by the Chumash Indians who inhabited the islands for centuries before the arrival of Cabrillo and other Spanish explorers in the late 16th century. The Chumash, or island-people, led a prosperous existence, trading food and commodities by traveling from island to island and to the mainland in their canoe-like craft, the *tomol*. The natural resources of the island and sea supported a population of 1,500 to 2,000 Indians (Hudson, 1980) who lived in dome-shaped structures made of whale bone covered with grasses. Today, a small shelter cave contains the only known Indian pictographs found on the island. The colonization of coastal California by the Spanish resulted in the spread of decimating new diseases among the Chumash. Their culture was destroyed further by missionaries who

resettled the island inhabitants on the mainland in an effort to convert them to Christianity. Exploitation of the area by Europeans continued in the form of intense hunting of sea otters and other marine species, which nearly led to their extinction. Today the island and surrounding waters are a marine sanctuary, but a threat to this unique environment still exists from offshore oil drilling.

In May 1982 the SCSCS made its first journey to Santa Cruz Island. Our major objective was to map the island's longest and most famous cave, Painted Cave. The location of this cave (along with Cueva Valdez) is marked on the USGS topographic map of the area and is a favorite excursion

destination for those with the means to visit the islands. The cave was reported to be more than a quarter-mile long, with a large inner chamber in total darkness (Heald, 1956). However, the only formal exploration of the sea caves on the island prior to our trip had been an "expedition" led by Orr in 1951. Orr's party had observed more than 100 cave entrances but had entered few. High seas had prevented his group from entering Painted Cave, so reports of its size had not been verified.

Thus it was that early on a Saturday morning, Bob Richards, Ernie Garza, Alan Heller, Carol Vesely and Dave Bunnell set out from Prisoner's Harbor on the north side of Santa Cruz in a 17-foot Boston whaler. We were the guests of the marine science institute at the University of California, Santa Barbara. The institute maintains a permanent field station on the island. We were fortunate to have calm seas, for we knew that heavy swells could frustrate our attempts to enter the cave. Accompanying us on our excursion was Dr. Lyndal Laughrin, supervisor of the research station, who joined us partly out of curiosity and partly over concern for his boat. On our 10-mile trip along the coast of the island we noted dozens of large cave entrances along the way. These, too, would require exploration, but our thoughts were on Painted Cave.

About an hour later we rounded Diablo Point, and the gaping, cathedral-like opening of Painted Cave lay before us. A prominent fault was visible along the cave's roof, and a V-shaped notch had been formed at the dripline from a surface stream that followed the fault. We cut our engine in the blue-green water just inside and took in the scene.

We could see what turned out to be a good 600 feet back to where the ceiling lowered to within 12 feet of the water. Splashes of color — purple, pink, green and orange — adorned the walls and ceiling. (Early explorers had attributed these colorations to the Chumash, hence the cave's name. In reality, the color comes from slime molds and algal growths.)

The entrance chamber proved to be 130 feet high at the entrance and 50-75 feet wide for much of its length. Our ceiling heights were not mere estimates, for Ernie had managed to bring along two helium-filled "Snoopy superballoons," complete with Snoopy emblem. By tying the balloons on a long string and releasing them upwards, we were able to ascertain the ceiling height. Despite bothersome winds near the cave's entrance, we obtained fairly accurate readings, at least to within a couple of feet.

That piece of surveying accomplished, the boat began to rock precariously as five cavers donned wetsuits for the foray into the cave. Originally, we had planned to take the 17-foot boat into Painted Cave's inner chamber, but a few large swells near the constriction suggested a preliminary investigation in rafts. Oh, yes, rafts. "Did you bring your raft, Alan?" At that point we learned that Alan's alleged raft, our planned second "mobile" survey station for this deep water sea cave, was a mere air mattress. Carol and Dave had purchased a brand new FedMart special, which they inflated with lung power. We took a few photos and then formed a survey crew: Carol and Dave in their raft, Bob towed along behind in a lifevest.

Approaching the constriction we became more aware of the roaring of the sea lions beyond. Since these are large animals that probably would be frightened by our lights (not to mention the M3Bs Dave had brought along to illuminate the interior), it was with some trepidation that we approached the constriction. We caught a small swell that carried us around a corner and into total darkness.

We found ourselves in a large chamber, the boundaries of which were not yet distinct. Waves crashed loudly in hidden corners of the room. Glowing pairs of red eyes were visible on rock ledges some six feet above the water. As our eyes adjusted we could see dozens of sea lions, now loudly protesting our invasion of their privacy. Hesitant to approach them, we found a large ledge on the left side of the room free of sea lions. We beached the raft and discussed our plan of attack. Surveying here was not going to be easy, we thought, with only one raft; additionally, the barking of the sea lions and the noise of crashing surf — magnified to thunderous proportions in the echoing confines of the chamber — made communication quite difficult.

We decided to find the end of the cave and work out from there, hopefully being able to start on dry land. As we shoved off we noted that the ceiling above our ledge was covered with white flowstone deposits.

We headed for one of two "leads" we had noticed on the way in, the first of which lay between two ledges full of sea lions. At our approach the noisy animals began a mass exodus, barking furiously and splashing into the water around our raft. We tried not to think about what it would be like to have one of those 500-1,000 pound creatures hop into our raft as we passed by!

We soon landed on a nice gravelly beach that was part of a little room perhaps 75 feet long. We saw some red flowstone and a number of bones, most likely sea lions. Surveying this dry area proved simple enough, but then it was time to go out into the crashing surf and set a station. Dave paddled out with the tape tied to the raft and located a potential station, holding the raft in close so he could maintain a somewhat stable position. This proved somewhat difficult as the "station" rose and fell with the passing swells

about five feet every minute or so. And then, psssss...tt!! A sudden hissing told him that one of the sharp barnacles that covered the cave's walls had sliced a gash in our quality FedMart raft. This did not bode well for the survey, as it would be difficult to produce a quality sketch while swimming, so the three of us decided to swim back to the boat to rethink our plan of attack.

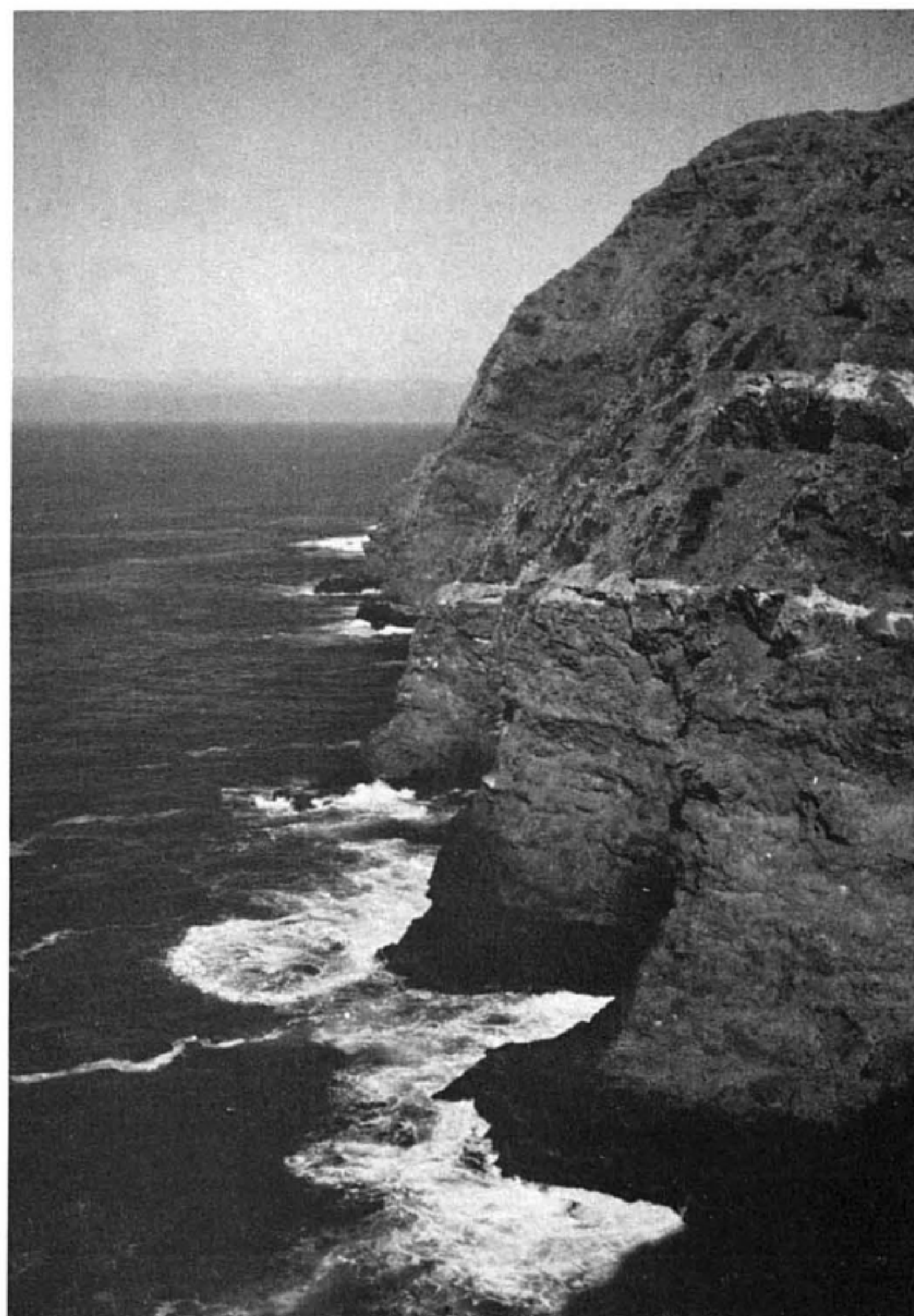
Back at the boat we explained our plight to Lyndal, who volunteered to take the boat back into the inner chamber. This proved quite simple with the help of some oars to avoid the walls. With the boat in the room, Carol had a dry perch from which to sketch as Bob and Dave swam about in lifevests and wetsuits taking tape and compass readings. Ernie obtained another balloon reading there in the dark chamber where the roof was barely visible.

As the accompanying map shows, the total surveyed length of the cave was 1,215 feet, making it the largest known sea cave in California (and possibly in the world!). The cave's geology has been studied in detail by Dr. K.O. Emery, who reported that the cave was formed as a result of "differential erosion of volcanic agglomerate deposits within the basaltic cliffs" (Moore, 1954). This process was facilitated by the presence of two major faults, shown on the map.

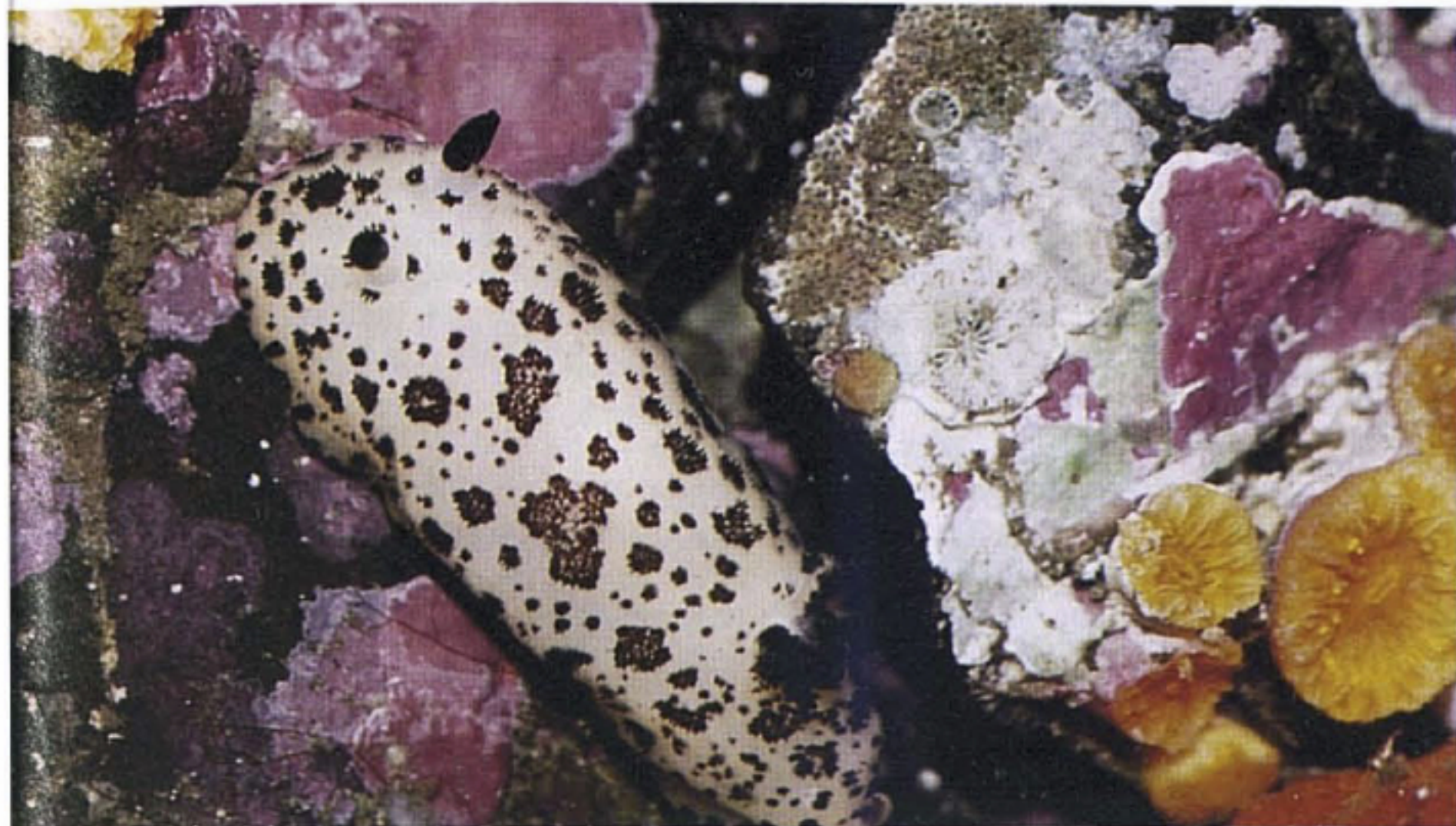
Calcite deposits are found along the length of the fault. The cross-fault found in the inner chamber accounts for the room's unusually large size, but other processes have contributed to its enlargement. As the map shows, the ceiling lowers considerably at the entrance to this chamber, while the ceiling in the room itself is much higher. The restricted entrance to the chamber leads to high internal humidity, increasing the rate of weathering of the walls and ceiling. Coupled with the fault, this has resulted in a large, high-ceilinged room. Another example of differential erosion in the inner chamber are the two shelves at the west end, about five feet above the water. These shelves are formed of a slow-cooling volcanic rock more resistant than the agglomerate that was deposited later (Emery, 1982). The tops of these shelves have been worn smooth by generations of sea lions.

It is very likely that Painted Cave connects underwater with another large sea cave located 500 feet to the east. Evidence of such a connection came from a report of what was perhaps the first and only sea lion "dye" trace, as

continued on p. 91

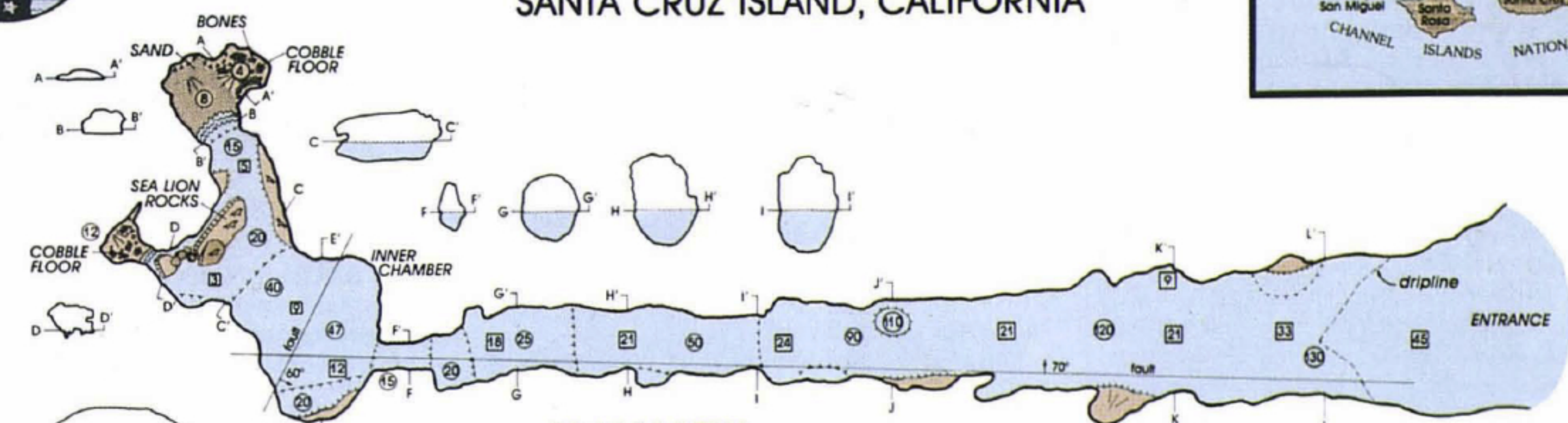


Rugged basalt cliffs on west end of Santa Cruz Island. (Dave Bunnell)



PAINTED CAVE

CHANNEL ISLANDS NATIONAL PARK SANTA CRUZ ISLAND, CALIFORNIA

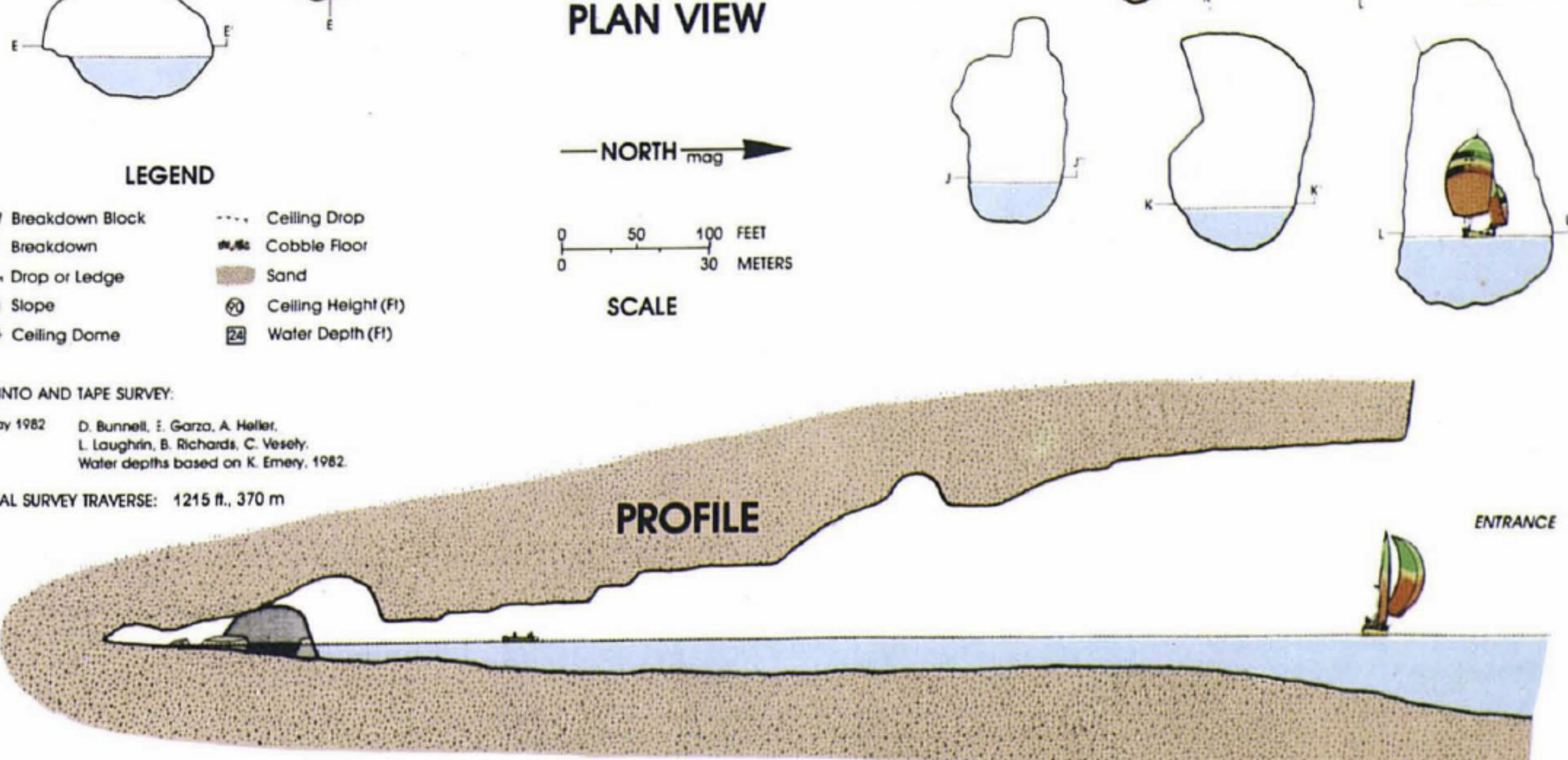


LEGEND

- Breakdown Block
- Breakdown
- Drop or Ledge
- Slope
- Ceiling Dome
- Ceiling Drop
- Cobble Floor
- Sand
- Ceiling Height (Ft)
- Water Depth (Ft)

SUUNTO AND TAPE SURVEY:
 1 May 1982 D. Bunnell, E. Garza, A. Heller,
 L. Laughlin, B. Richards, C. Vesely.
 Water depths based on K. Emery, 1982.

TOTAL SURVEY TRAVERSE: 1215 ft., 370 m



recounted in Margaret Eaton's *Diary of a Sea Captain's Wife*:

"On October 17, 1905, Ira got an order for seals from Captain McGuire, so early in the morning he started for the Islands . . . On the fifth day he was back in town with the seals . . . [and] he reported that he and the boys had discovered another entrance to the Painted Cave . . . Ira and the boys drove all the seals out of the Painted Cave and set out the seal net across the opening so none could get back in. A few hundred feet up the coast they found another cave and another bunch of seals; one of these had unusual markings which would be easily recognized. These seals were chased into the second cave, and another seal net stretched across the opening. At low tide, the men rowed into this cave as far back as possible and could hear the sound of rushing water, but no seals came out. Then they rowed back to Painted Cave and there they found the same big bull seal with the funny markings — he had traveled through the underground watercourse and come out in Painted Cave. Ira thought the inner ends of the two caves were about three hundred yards apart."

More recently, divers have reported that there indeed are lengthy underwater passages extending from these caves, but to our knowledge no human connection has been made.

As we headed back towards Prisoner's Harbor, after completing the Painted Cave survey, we stopped off at Cueva Valdez, which is an anchorage as well as one of Santa Cruz Island's nicest and more friendly caves. Unlike Painted Cave, this one is mostly dry, even at higher tides. It has three large entrances (hence its other name, Tres Bocas), one facing the ocean, one opening onto a dry beach, the other facing the sea obliquely. We made a smooth landing by bringing the whaler right up into the cave and hopping off into knee-deep water. The drier conditions made for easy surveying here and we soon mapped the 400-foot cave, basically one large chamber up to 60

feet high.

There are many more caves to explore on the island, each with its own special beauty. Two of these are Lady's Harbor, one of the island's nicest anchorages. These caves were described, and one, Sponge Cave, was the only cave on the island mapped by Orr in 1951.

The entrance chamber is divided by a large pillar. Just inside the entrance, the ceiling rises to 30-40 feet and the passage widens to 20-50 feet. Most of the cave is in total darkness. According to Orr's map, the cave ends at 350 feet in a sandy beach, which we found to be fairly accurate. The cave is named for the plentiful red and white sponges found on the floors and walls. We observed only a single sea lion on our visit.

We are always reluctant to leave the rugged and unique beauty of Santa Cruz Island. The variety of the littoral caves there and the challenge of getting to and exploring them offers a new dimension in the caving experience. With more than 100 sea caves left to explore, chart and survey, we surely shall return to this island paradise.

References

- 1.) Eaton, M.H. *Diary of a Sea Captain's Wife*. Santa Barbara: McNally Loftin, 1980.
- 2.) Emery, K.O. Chapter on Painted Cave in W. Berssen (Ed.) *Pacific Boating Almanac for Southern California, Arizona, and Baja*. Western Marine Enterprises, 1982, pp. 288-290.
- 3.) Halliday, W. *Caves of California*, 1962.
- 4.) Heald, W.F. Cave of the Sea Lions. *Nature Magazine*, December 1956, p. 517ff.
- 5.) Howorth, P.C. *Channel Islands: the Story Behind the Scenery*. Las Vegas: KC Publications, 1982.
- 6.) Hudson, J. The Splendor of Santa Cruz Island. *University of California, Santa Barbara Alumnus*, 11:3 pp. 8-14, 1980.
- 7.) Moore, D.G. Origin and Development of Sea Caves. *NSS Bulletin*, 16:71-76, 1954.
- 8.) Orr, P.C. The Orca Goes Underground. *Museum Talk*, 26:2, 1951. Published by the Santa Barbara Museum of Natural History.