

## SOME PACIFIC CAVES.

BY C. F. HOLDER.

The Pacific coast lacks the grandeur which the plutonic rocks of the New England shores give to the Atlantic, yet there are many picturesque sections where the waves have cut the rocks into strange and picturesque shapes. At Santa Monica there is a fine natural bridge, which, if better known, would attract wide attention. It is a lofty arch, forming part of an adjacent mountain, and at low tide can be entered, constituting the shore passage at this point of the coast.

The islands off the coast of Los Angeles and Santa Barbara Counties, Southern California, abound in some remarkable caves. An interesting one is situated on the island of Santa Catalina, which is a trip of about three hours and a half from Los Angeles. The cave lies on the eastern side near what is known as the isthmus, and from the sea presents the appearance of a large, shallow room, the entrance being, at low tide, thirty or forty feet in height. The writer's attention was attracted to it by the strange play of light on the front walls and roof, giving the impression that it was covered with the webs of spiders, moving in a tremulous manner. At the entrance the water is so deep that the largest ship could thrust the tip of her bowsprit into the cavern, and of a rich blue, telling of great depth. This blue tint directly in the entrance of the cave has given the name Blue Cavern to the great opening in the rock.

Pushing a boat in, one is surprised to find a small tunnel branching off to the right—the real cave. The writer entered this in a small boat one day when the tide and sea were low, and penetrated it without difficulty. The water was about six feet deep, over a perfectly level floor covered with pebbles and seaweeds, while here and there could be seen the sparkle of the pearl of the abalone. The sides were too narrow to use oars, and the wall so low that every wave that came rolling in through the tunnel lifted the boat unpleasantly near the roof, showing that at very high tide, when the wind was fresh, the attempt to enter the Blue Cavern might be accompanied with some danger. By standing up and pushing the boat by hand, using the sides and roof, the passage was easily made for about one hundred and fifty feet, the boat suddenly coming out around a point some distance from the main entrance. For unknown centuries the waves have been working at this cave, gradually eating it out, with the result given. At night, when the waves roll in, the spectacle here is a grand one. The seas passing through the long tunnel burst into the larger cave, sweeping up against the sides and bathing them in a rich phosphorescent light that falls in gleaming rivulets down the black walls, producing a weird and spectral effect. Not far from here are several smaller caves below the water, which emit strange noises as the waves are forced in, while one sends out, apparently from the very rock itself, a mass of spray, appearing like a geyser.

The most imposing cave of all in this region is found upon the island of Santa Cruz, off Santa Barbara, about twenty-five miles from the shore. The entrance of the cave is about forty or fifty feet at an estimate, no measurement having been made, and from it one can look directly into a series of chambers for an estimated depth of an eighth of a mile, nearly all of which can be traversed in a small boat.

The first chamber excites the wonder of the visitor as to how it could have been formed, the roof being far above the reach of waves, except in the fiercest storms. It has been suggested that originally the cave was at a lower level or partly submerged; that it was worn away beneath the water, and that the island has since risen, thus elevating the roof high above the sea. Be this as it may, the vast cave stands one of the wonders of the Pacific coast. It is to be regretted that it is so isolated and beyond the reach of the traveling public, no regular passenger boat running to the island, as in the case of Santa Catalina.

In entering the great cave of Santa Cruz the splash of the oars reverberates from wall to wall, and one realizes what was meant by the line

"Dark unfathomed caves."

The water is as clear as crystal and of a delicate green. In the opinion of many, the effect of coloring is more beautiful than at Capri. One feels that he is entering

a vast temple dedicated, perhaps, to Neptune. The first hall or chamber rises at the entrance perhaps fifty feet, but as the boat passes slowly on, the second hall and coming wonder is seen to be of loftier dimensions, and carrying out the idea of some old cathedral.

Owing to the large entrance, and that the cave opens in a straight line for some distance through a series of arches, it is well lighted, which brings out one of the remarkable features of the rooms. They might have been ornamented by design, so beautiful is the coloring and soft blending of green, red, yellow and brown, all the rich possibilities which come with the presence in rock of sulphur and copper. The walls are strangely infolded, as though the cave had been an enormous blow hole for a volcano. The splendors of this wall decoration appear to be imparted to the submerged floor, which is covered with delicate seaweed that seems to flash with iridescent tints.

As the boat enters the third and fourth chambers the reverberations increase, and the breaking of the waves on a little beach far in the interior is heard; then suddenly comes a terrific barking that, thrown back from wall to wall, has been sufficient in times gone by to

which can be entered, and scores of smaller ones which are being slowly enlarged by the sea.

## Telegraphy Without Wires.

An invention which promises to be of the greatest practical value in the world of telegraphy has received its first public announcement at the hands of Mr. W. H. Preece, the telegraphic expert of the London post office. During the course of a lecture on "Telegraphy Without Wires," recently delivered in London, Mr. Preece introduced to the audience a young Italian, a Mr. Marconi, who, he said, had recently come to him with a system of telegraphy without wires "which depended, not on electro-magnetic, but on electro-static effects, that is to say, on electric waves of a much higher rate of vibration, not less than 250,000,000 a second; that is, Hertzian waves." These vibrations were projected through space in straight lines and, like light, were capable of reflection and refraction, and, indeed, they exhibited all the phenomena which characterized light.

Telegraphing without wires was, of course, no new idea. Mr. Preece stated that in 1884 operators in the telephone exchange, London, were able from sounds heard to read messages that were in transit from London to Bradford by the telegraph wires. The post office wires were underground and the telephone wires above ground, and careful experiment showed that this fact accounted for the telegraphic messages to Bradford being read by the telephone company. In 1893 telegrams were transmitted a distance of three miles across the Bristol Channel by induction, and during a break in the cable connecting the island of Mull with the mainland communication was established by means of parallel wires as follows: On the mainland an insulated wire was laid along the ground, earthed in a running stream at one end, the other end being in the sea. Skirting the coast of the island was an overhead wire suited to the purpose. In the course of four days one hundred and fifty-six messages were dispatched.

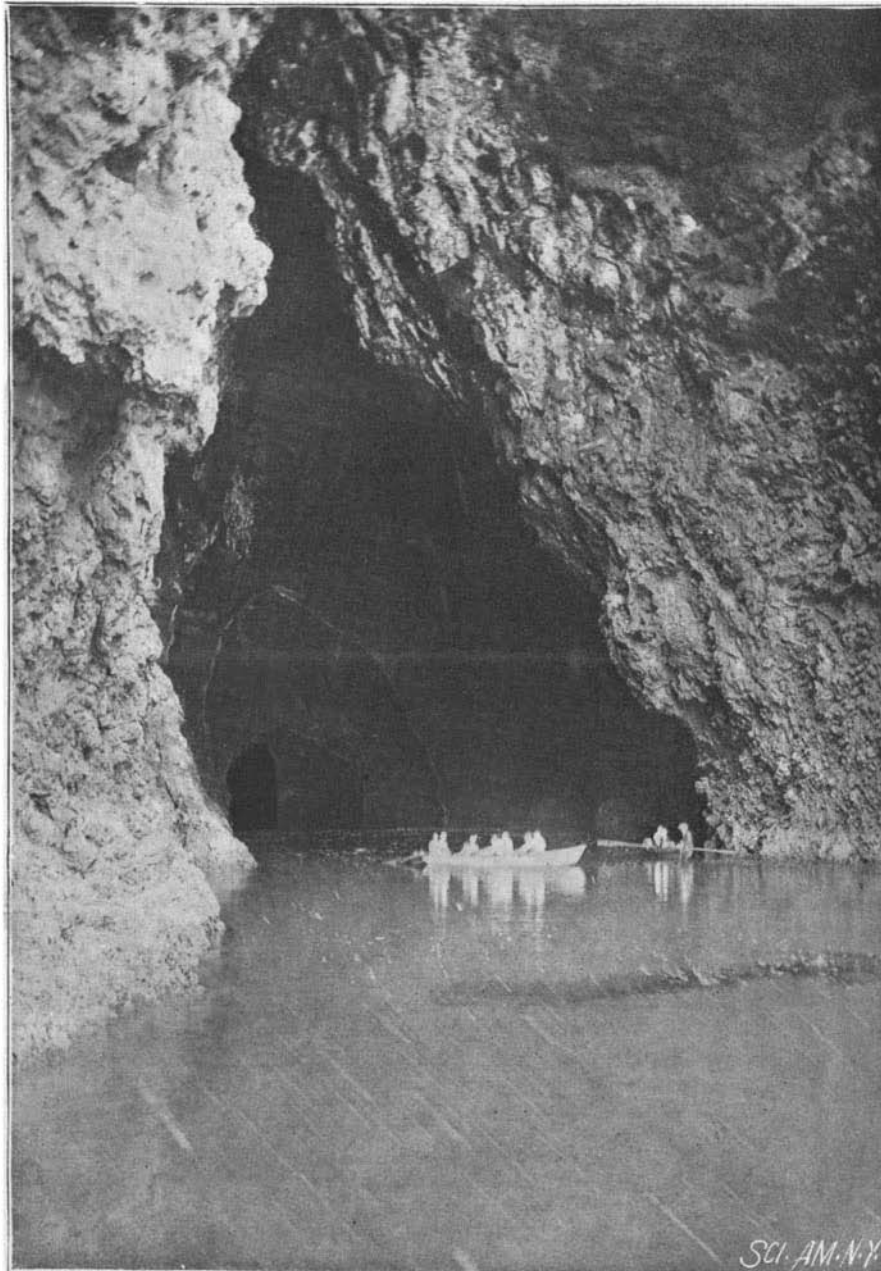
The invention of young Marconi solved the problem on entirely different principles. The post office officials had used it successfully on the roof of the general post office, and then made a successful test on Salisbury Plain at a distance of three-quarters of a mile. The great difference between the Marconi and the inductive methods of wireless telegraphy was that the former did away entirely with the wires at each end. Vibrations were set up by one apparatus and received by the other.

The apparatus shown at the lecture consisted of two plain boxes which were placed at opposite ends of the hall. The current was set in motion in one box, and immediately a bell was rung in the other. Mr. Preece said that the British post office authorities had decided to spare no expense in experimenting with the apparatus and one of the first trials would be from Penarth to an island in the English Channel.

If the experiments were successful, it would be of inestimable value to shipping, for it would provide another easy way of communicating with light-

ships and lighthouses. To take an instance: Since last year they had had a cable with the Fastnet Light (the first light seen by Atlantic voyagers), but in the early part of this year it broke down, and they had never been able yet to land on the rock in order to repair it. But there was a possibility beyond this of enabling ships as they came near dangerous rocks and shallows to receive an intimation of the fact by means of these electric waves. Neither day nor night made any difference, fog or rain or snow would not interfere with them, and if the invention was what he believed it to be, our mariners would have been given a new sense and a new friend which would make navigation infinitely easier and safer than it now was.

THE brigand Tiburzi's brain was given after his death to Professor Lombroso for examination. The professor is obliged to admit that it is perfectly normal, as are all the criminal's other organs, but he saves his theory by calling him a criminaloid. By that he means a man whose natural qualities are not bad, but who becomes an outlaw only technically. Under more favoring circumstances, he thinks, Tiburzi might have become a leader of mercenaries like Sforza, or a founder of a state. He dodges the point that the man was a murderer and a thief.



CAVE OFF SANTA BARBARA SANTA CRUZ ISLAND, CAL.

appal the stranger. But the Californian recognizes in the rumble and roar the voice of the sea lion that has pre-empted some of the rocks in the inner cave and resents the intrusion.

The full length of this cave has never been reached, and careful investigation would probably show that this remarkable cavern pierces the bluff of the island to a much greater depth than is generally supposed.

Twelve miles north of San Diego, at La Jolla, the coast is cut and worn into numerous caves, many of which are of remarkable size, ranging from fifty to two hundred feet in height, some being four hundred feet in width and extending from four to six hundred feet into the cliffs, which present a singularly picturesque appearance. The stratification is plainly outlined, and at various points has been broken; in this way affording an opening wedge to the water, which has gradually worn the sandstone rock away.

This is especially noticeable in the western cave, about whose entrance are strange, fantastic shapes of rock, worn by the sea. This cave is a miniature cathedral done, its walls ornamented in a marvelous manner. The sea breaking into this vast chamber reverberates like the booming of cannon, and finally makes its way out through another passage.

There are eight or ten large caves in the high cliff,