



FIRST HISTORICAL VOLCANO—Smoke billows from the volcano on San Benedicto Island in the Pacific. The photograph shows one of the 20-minute-apart explosions at its maximum.

VOLCANOLOGY

Pacific Volcano Explodes

Credited with "scientific importance out of all proportion to its size," the San Benedicto volcano has erupted, covering the island with yellow ash and changing its shape.

By PEGGY McCABE

Science Service Correspondent at San Diego

See Front Cover

➤ AN EXPLODING volcano on San Benedicto Island, 780 miles south of San Diego, may be the by-product of a huge undersea upheaval reaching from the volcanic Hawaiian Islands to the offshore islands of Mexico, in the opinion of Dr. Robert Dietz, oceanographer with the Naval Electronics Laboratory on Point Loma, Calif.

He flew around the belching saffron-colored cone on the island of San Benedicto Sept. 12. The 1,050 foot crater is now spewing yellow volcanic ash in 20-minute-apart explosions. The flight, in a U. S. Air Force B-29 weather reconnaissance plane, was first in a series sponsored by the Scripps Institution of Oceanography, La Jolla, Calif.

Results are now under study by Dr. Dietz and Dr. H. W. Menard, members of a six-man team of oceanographers assigned by the Navy to study the Pacific sea floor. They are also on the Scripps Institution's staff.

The San Benedicto eruption was credited by the oceanographers with "scientific importance out of all proportion to its scale."

According to a theory advanced by Dr. Menard, the volcano may represent a link in a "fundamental rift zone" on the earth's crust.

Two deep trenches, lying 500 miles apart between Hawaii and Mexico, and pointing directly toward the site of the new volcano were discovered by a Scripps Institution expedition in 1950.

The island of San Benedicto is one of the Revillagigedo group, four lonely barren islands, lying about 225 miles south-southwest of the tip of Lower California.

A California scientist, G. Dallas Hanna, in 1925 studied the islands, and described them in the *Proceedings of the California Academy of Science* (Vol. 15, No. 1, 1926) as volcanic, rising from the deep sea floor, 12,000 feet down.

The observations of the recent airborne expedition, indicating the volcanic activity began in the west and proceeded eastward, check with the 1925 findings.

Clarion, the farthest west, is deeply eroded and obviously the oldest in the group. Roca Partida follows. Socorro, 4,500 feet high, has been active recently, according to Dr. Dietz.

"We were impressed by the recent look of many of the flows there," he said. "They resemble the Hawaiian flows. One of the eruptions looked no more than a few hundred years old. Judging from San Benedicto's present eruption, such outbreaks might go completely unnoticed."

San Benedicto is the easternmost of the islands. The next land to the east is the Mexican mainland, 400 miles away.

In the Hawaiian Islands, the pattern of volcanic activity followed a similar trend, progressing from the oldest islands in the northwest toward the still active volcanoes on Hawaii in the southeast of the group.

Fundamental Rift Zone

"It is likely that the Revillagigedo Islands have formed by eruptions from a single large fundamental rift zone in the earth's crust," Dr. Dietz said.

Enlarging on this, he explained the earth's crust is solid only to a depth of 30 miles. Below this, it is hot and plastic. Large amounts of heat, released by radioactive decay within the earth, cause "convection cells," something like bubbles, to form between the hard crust and the iron-nickel core 2,000 miles deep within the sphere.

When two of these "cells" lie close together, the earth's crust between their tops is agitated, and may be thrown upward in a long, swelling welt across the ocean floor. Finally, the tension along this wrinkle causes fissures, and pressure from below sends lava upward.

The Hawaiian Island Navy sound station at Kaneohe, Oahu, has been picking up an unusually large number of unidentified noises since the end of July. Many of these could come from distant volcanic rumblings.

The ocean is an excellent transmitter of sound, because of its sound channel effect. The Hawaii station has recorded underwater explosions as small as a two-pound charge of TNT detonated off the coast of California.

Many Go Undetected

It is probable that many lava flows take place off the deep Pacific floor, and go completely undetected. However, if the Navy's sound apparatus is able to distinguish between the noises from undersea volcanic rumblings and other distant noises, it may be possible in the future to keep track of such unseen activity. This would be a tremendous step forward in the study of the changing form of the earth's crust.

The new volcano, a beautiful fluted cone, as can be seen from the picture on the cover of this week's SCIENCE NEWS LETTER, has completely changed the shape of the 3-mile-long island. Circling within 200 feet of its summit, through dingy, yellowish clouds with the rotten-egg smell of hydrogen sulfide, the scientists observed that the circular

cone practically fills the gap between the two old peaks on the island. Its growth from a probable level of 200 to 1,050 feet has happened in about six weeks. The crater is 500 feet deep.

Yellowish ash mantles the entire island and each explosion flings huge quantities into the muddied sea water.

"We saw man-o'-war birds and red-tailed tropic birds circling the island, more than somewhat disturbed," said Dr. Dietz. The eruption with its sulfuric ash has evidently destroyed an important nesting place for thousands of these birds.

No Lava Evidence

There was no evidence of lava flows, present or past, the scientists said, and no large rocks seem to have been thrown up lately, though they may have been during the early, earth-breaking stages of the eruption.

Dr. Ruy Finch, volcanologist of Watsonville, Calif., also on the exploring flight, said this volcano is an exception to the general rule of the Pacific. The Hawaiian volcanoes, for example, send forth great quantities of molten lava. They are "well behaved" and quiet. San Benedicto's new crater is of the explosive type. The explosions are occurring regularly every 20 minutes, after which smoke pours out in diminishing quantities.

The presence of hydrogen sulfide "suggests that the eruption may have reached its maximum and be about ready to quiet down," said Dr. Finch, who formerly served the Geological Survey at its Kilauea, Hawaii, laboratory.

Large rafts of pumice were floating near the erupting island. This spongy light-colored material, which can only be formed under water, is exploded lava. It looks like foam rubber. (See p. 199.)

Science News Letter, September 27, 1952

MEDICINE

Diagnose Cancer Cells

➤ **CANCER CELLS** have about twice the amount by volume of nucleic acid in their nuclei as normal cells, scientists at Memorial Center for Cancer, Sloan-Kettering Institute and Cornell University Medical College have discovered.

Better diagnosis of cancer, especially early cancer and pre-cancer, and more knowledge of basic changes from normal to cancer in the cell nucleus are expected as a result of this finding.

The discovery was made by Drs. Robert C. Mellors, George N. Papanicolaou and John F. Keane, Jr.

Measurement of the amount of light that goes through an object, called absorption spectroscopy, is the method that led to the discovery and that will be used on a microscopic level for the expected new cancer detection test.

The new test may prove more accurate than the famous smear test developed by

ELECTRONICS

Foresee Automatic Factory

➤ A COMPLETELY automatic factory run by giant "brains" assisted by smaller ones was foreseen during the Centennial of Engineering in Chicago.

Such machines could work out the design of a machine part, punch out this information on a paper tape, then feed the tape to a production machine that would accurately cut the part to the correct shape.

Dr. J. W. McRae, vice-president of Bell Telephone Laboratories, told a symposium on communications and the future that there is today "a real basis" for predicting such machines. They open up the "prospect of relief from human mental drudgery just as the application of power in the industrial revolution gave relief from physical drudgery."

Further, he said, jobs that we cannot now imagine could be done by such machines. There is no need to worry, however, about the possibility that they will take over to rule mankind or that the human mental process will become less efficient.

"None of these electronic brains is a true brain in the sense that none of them can ever have creative thought. They can only," he stated, "do what man has designed them to do and what he has instructed them to do in detail. Man can remain in full control, and he can benefit from a general increase in the intellectual content of his work."

Of great promise in the development of electronic computers are transistors, pea-sized, rugged devices that do many of the jobs of the vacuum tubes more efficiently and on considerably less power. In one test made, Dr. McRae reported, a 10-to-one re-

duction in power consumption and in volume of equipment was possible using transistors instead of vacuum tubes.

Such electronic brains will not come into being overnight, he warned, because so much scientific and engineering work will be needed to develop and construct them.

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Mushrooms are one of the most difficult foods to produce profitably.

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In the light of their findings on the differences in nucleic acid content of cancer and non-cancer cells, the scientists state in their report in the journal *Science* (Sept. 12), that, "it is intriguing to think that the nucleic acids themselves may perpetuate these alterations in the cell."

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