

Volcanoes Said to Put Salt in Ocean

Volcanology

The 485 known volcanoes of the world, discharging every year more than a hundred million tons of hydrochloric acid, supply the chlorine that keeps the ocean salty. This is the opinion of Dr. Thomas A. Jaggar, director of the Hawaiian Volcano Observatory at Honolulu. Even though the amount of hydrochloric acid gas in steam from volcanoes is almost negligible, the ceaseless emission of this steam puts the gas into the air, and thence into the rain. With the average rainfall of about 40 inches a year the world over, rain water would only need to contain about one part of chlorine in five million to supply the ocean's needs. This chlorine unites with the sodium brought into the sea by the rivers and forms sodium chloride, or common salt.

The volcanoes of the Katmai area in Alaska alone supply about one per cent. of the hundred million tons of hydrochloric acid gas needed. Even the great Hawaiian volcano Kilauea, the steam of which contains only a trace of the gas, contributed something like thirty thousand tons a year, Dr. Jaggar said. And in addition there are many unknown submarine volcanoes, each of which is doing its bit.

Dr. Jaggar also explained the presence of calcium carbonate, which is the same as marble, in sea water.

"This is secreted from the water in the body of globigerina, a tiny organism ceaselessly dying and depositing billions of skeletons that make chalk on the ocean bottom. Locally the ocean floor is built up a foot per annum. Ten thousand years would

shoal the ocean, but there have been millions of years, and the ocean is still deep.

"But though globigerina is everywhere in the upper waters, two-thirds of the seabottom has no chalk. What could account for chalk banks being absent? The chalky bottoms are where the ocean is not so deep. It was found by Dr. J. Stanley Gardiner, professor of Zoology at Cambridge University, that where the ocean is more than two and a half miles deep, where the pressure approaches three tons per square inch, sea water can readily dissolve the chalk skeletons. And so, with the circulation of the oceans the lime salts are brought back and secreted over again by the live organisms."

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Ultra-Violet Rays Show Age of Statues

Physics

The uncanny skill with which X-rays have sorted out paintings of old masters from upstart modern copies may now be duplicated by ultra-violet rays working in the field of sculpture. In a series of tests made by the Metropolitan Museum of Art, pieces of old Carrara marble were compared with freshly cut Carrara under the ultra-violet light. A decided difference in color was noted.

Pieces of marble statues, some antique, some known to be modern or fraudulent, were then put to the ultra-violet test, and in every case the rays gave the same verdict that experts had reached by careful observation. One Roman portrait head of a young girl was immediately condemned by the lights. On checking the record of this statue it was found to be a modern work by Dossena, whose success in imitating antique sculpture has caused much excitement

in art circles. The surface of the head had been altered by baking the marble and then pitting it with a ragged stone, but the powerful light could not be fooled by recently cut marble. Further, the test showed that the three portions of the broken statue are all of the same age, which settles the argument that part of the figure might have been old and the rest supplied by a modern workman.

When the rays were turned on some fifteenth-century marbles they detected breaks in the stone that had been long ago patched and painted so skilfully that experts had never noted the repairs.

Great usefulness for the ultra-violet light in this new field is predicted, but the museum experts warn that there will still be need for careful judgment and experience in interpreting the facts that the light may reveal.

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The Electric Ship

Electrical Engineering

"Marine electrical engineering" is the new branch of engineering science required by the advent of electric propulsion for ships. Our cover shows the control room of the electric ship "Virginia," in service between the Pacific and Atlantic coasts, via the Panama Canal.

This ship and the "California", sister ship, is owned by the Panama Pacific Line of the International Mercantile Marine Company. Both

are electrically propelled and otherwise electrified throughout, and are the largest American-built steamships in the world. They are also the world's largest electrically-driven commercial vessels.

They have power plants consisting of two 6,750-horsepower turbines, each driving an electric generator, and the propulsion motors are each rated 6,750 shaft horsepower.

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New Fossil Elephant

Paleontology

Fossil remains of a pre-historic animal resembling a mastodon, yet somewhat like a modern elephant, are now being obtained near Arkansas City, Kan., by H. T. Martin, curator of paleontology, at the University of Kansas. The specimen is to be mounted and added to the University's museum of fossils.

The specimen is declared to be of especial scientific interest by L. B. Roberts of Kansas City, who accompanied the Roy Chapman Andrews expedition to the Gobi desert, and who has examined the first bones recovered of the Arkansas City find. He is of the opinion that it may prove to be the long-sought "missing link" between the mastodon and the elephant. Whether or not it is a unique specimen, it is declared to be in an unusual state of preservation.

The skeleton was discovered by a telephone lineman, who was excavating for a pole. When he found he had penetrated the skull of an animal, he notified authorities at the University, and Mr. Martin, who was in the western part of the state on his annual summer fossil search, went at once to Arkansas City, and transferred activities there.

The palate of the skull is almost perfect, and two teeth remain—a rather unusual condition. The tusks measure eight feet in length.

Several weeks will be required to excavate the fossil, and the better part of a year will be needed to complete the mounting at the university.

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