OCEANOGRAPHY

Oceans Half Billion Years Old, Their Salt Tells Scientists

Finding That Clay Acts to Remove Salt Content Of Water Leads To Revision of Antiquity Estimates

THE EARTH'S salty oceans are some 500,000,000 to 700,000,000 years old, almost double the accepted previous estimates, Drs. A. C. Spencer and K. J. Murata, of the U. S. Geological Survey, have concluded after an intensive study of oceanic chemistry.

Before the turn of the century, geologists determined the age of the oceans by dividing the amount of salt in them by the amount added each year. This was based on the idea that all the salt brought to the oceans by rivers stayed there. Such an early determination of age, after hundreds of surveys and analyses, was about 100,000,000 years. Later research brought the age to 350,000,000 years. But such figures were found to be too small. Dinosaurs are now known to have existed about 100,000,000 years ago and oceans obviously existed long before that.

Studying the action of clay on salt water, Drs. Spencer and Murata in the recent work have found that some of the salt carried to the oceans is removed by clays, and deposited on the sea floors as a compound that does not easily dissolve. Correcting the old figures for this salt removal give them the new age figure of 500,000,000 to 700,000,000 years.

The geologists who measure the earth's age by the products of the decay of radioactive elements are expected to say the new ocean age estimates are too small. They pronounce the earth at least 2,000,000,000 (two billion) years old. While the earth in its earlier stages may have been oceanless, there is in the radioactive age figures plenty of room for even more ancient oceans.

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CHEMISTRY

Synthesizing Carbohydrates Will Not Cause Revolution

REVOLUTION in agriculture will not come immediately as a result of the artificial preparation of carbohydrates by Prof. E. C. C. Baly of Liverpool University. Such seems to be the consensus of opinion among U. S. Department of Agriculture scientists interviewed by Science Service.

The nub of the matter is the very great expenditure of light-energy necessary, when water and carbon dioxide are brought together in the presence of the nickel oxide catalyst used by Prof. Baly. Plants are admittedly inefficient in their energy use, but in its present stage of development the artificial synthesis of food out of its raw materials is even less efficient when carried out in glass flasks.

It is more or less like the atomic energy situation. Fabulous sums of energy are locked up in atoms, and assertions are freely made that if this could be liberated one could run all the machinery in the world on a few quarts of water a day. The only trouble is that in practical experiments it takes more energy to break the atoms apart than they yield by their decomposition.

So we probably won't be able to put out our nickel-oxide-lined dish full of soda-water in the morning and let the sun make our porridge for us. There will still be a market for oats raised in the old-fashioned way.

The real value in Prof. Baly's work, and what he was aiming at in the first place, is a better understanding of how plants themselves carry on photosynthesis. It has long been a disputed point, for example, whether they first made sugar and then turn it into starch, or whether starch comes first and is broken down into sugar. In the results presented at Calcutta there is a hint that the progress is from the more complex starch to the less complex sugar.

Nevertheless, it would be rash to deny the possibility of eventual practical application. When Benjamin Franklin performed his classic kite experiment, he was interested only in finding out, as "pure" science, what lightning was made of. It was not until a hundred years or more later that even the crudest beginnings of the Age of Electricity could be recognized. Perhaps there will be sunshine-and-sodawater porridge in 2038.

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GEOGRAPHY

Northwest Coast Once Worried Map-Makers

SCHOOL children today scarcely realize what a past the American map has had. Maps of America are invariably the same shape—two triangles linked by the same thin isthmus, and with the same bays, lakes, cities, in the same expected places.

It was very different in earlier days. A young scholar in Colonial New England might be taught that California was an island by one teacher, and later might encounter another teacher who put faith in a different map, equally insistent that California was not an island. The entire northwest coast was one big uncertainty, with map-makers violently disagreeing over its shape and features.

Tracing the evolution of that part of the North American map is no easy task. Henry R. Wagner, who has studied the history and cartography of the northwest coast almost 15 years, has finally put the results into two volumes, each the size of a geography schoolbook. (THE CARTOGRAPHY OF THE NORTHWEST COAST OF AMERICA TO THE YEAR 1800—Henry R. Wagner—*Univ. of California Press,* II Vols., 543 p., illus., $20.)

Our northwest coast was for a long time, he explains, the most remote part of the inhabited world that a European could think of. True, a few colonists lived there in rude plenty. But in general, "no one wanted to go there and no one did."

The world was gold mad, and there was no gold near the sea. The coast had to wait for civilization to develop its riches.

Mr. Wagner describes nearly a thousand maps, atlases, and globes that confidently set forth the features of that distant region, up to 1800.

"Not only," he says, "did it form