

MARINE BIOLOGY

"Red Tide" Destroys Fish

This phenomenon, described in the Bible, is caused by sudden increase in the number of red one-celled organisms that poison fish.

► "RED TIDES" like the present one that has been killing myriads of fish off the Gulf coast of Florida are far from being a new thing under the sun. Thomas F. Austin, of the U. S. Navy's Hydrographic Office, has been searching all records for mentions of such outbreaks, and finds first mention in the Book of Exodus, chapter 7, verses 20-21: ". . . and all the waters that were in the river were turned to blood. And the fish that was in the river died; and the river stank, and the Egyptians could not drink of the water of the river; and there was blood throughout all the land of Egypt."

"Red tides" are caused by sudden increases in number of red-colored one-celled organisms that are near the borderline between plants and animals, down near the bottom of the evolutionary scale. They have big names because only biologists pay any attention to them as a rule; two quite common genera are known as *Gonyaulax* and *Peridinium*, belonging to the order *Dinoflagellates*.

They are normally present at all times but in small numbers. When something happens that offers them highly favorable conditions for growth, like an upwelling of bottom water bringing up more food materials, they multiply at a terrific rate, until they color the water red, as swarms of corpuscles make the blood red.

They appear to produce an active poison, which has not yet been identified. Fish placed in water containing them die quickly, presumably absorbing the poison through their gills. They are also held responsible for the occasional outbreaks of mussel poisoning on the California coast. Rock mussels, a favorite shell-fish, suck them in as food—and anyone eating mussels at times of "red water" takes chances with his life.

Tales of the "red tides" and the windrows of dead fish being caused by dumping of war gases into the Gulf are absurd on their face. The government did dump huge quantities of lewisite and other gases after World War 1, but it took them far out in the open Atlantic and sent them to the bottom in sealed

containers. When corrosion finally released the deadly stuff it was so diluted in the ocean's vast bulk of water that it was never noticed, even by the fish.

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PALEONTOLOGY

Corals Built Skyscrapers Of Lime Many Years Ago

► Modern architects may not be so modern after all. Today's skyscraper apartment houses look very much like an apartment house built about 400,000,000 years ago in the Silurian sea by a colony of tiny corals called Favosites.

The Favosites had an answer to the housing problem; their building was a by-product of their favorite pastime, eating. The animals deposited lime as a product of digestion and respiration. This deposit made a protective coating for their soft bodies.

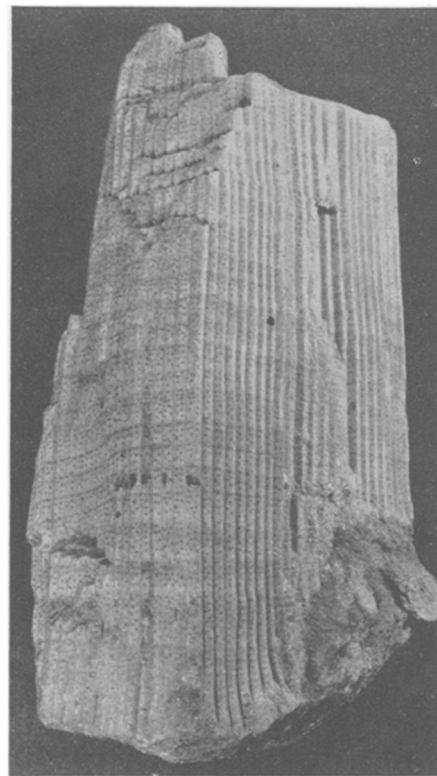
Being so tiny, it was to their advantage to live in colonies, so each coral's lime nook touched its neighbor's. As the animal ate and breathed, the lime coating grew. In time, the coating would become too great for it to reach around to grab food, so the Favosite would pull itself to the top of its tube and build itself a floor to stand on to catch its microscopic wild game.

This repeated moving to the top caused the one-tenth inch long animals to finally reach the top of a structure that might be several feet high.

The dots that look like windows on the structure are holes the corals left for buds to grow out of. A bud is a young coral that grows out from the side of the parent. Some of these buds were crowded out by next-door neighbors. The regularity of the "windows" indicates that the whole colony got the impulse to sprout buds at the same time.

The abandoned lower apartments filled with crystalline calcite, even during the lifetime of the animals themselves. This gave these tiny marine architects a firm foundation to build on.

Scientists can look at the houses of these animals and determine what the



"SKYSCRAPER"—Ages ago, corals built residences that resemble today's modern apartment houses.

dwellers must have looked like, reports Eugene S. Richardson Jr., curator of invertebrate fossils at the Chicago Natural History Museum.

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MATHEMATICS

Weird Models Represent Mathematical Equations

See Front Cover

► NOT MODERNISTIC dancers, or weird animals from the moon, the models on the cover of this SCIENCE NEWS LETTER represent mathematical equations. Instead of being described by a single equation, however, they are formed by the operation of certain combinations of equations under specific mathematical controls. Rutherford Boyd posed these mathematical models at Columbia University. They are shown here by courtesy of the journal *Scripta Mathematica*.

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Ten years ago China supplied the United States with about 99% of its imports of dried eggs, frozen eggs and tung oil, and about 70% of the imports of shelled walnuts and sesame seed.