BIOLOGY

Marine Life Food Source

How the tiny marine creatures, zooplankton, obtain their food, a problem that has puzzled scientists for centuries, has now been solved—By Barbara Tufty

➤ TINY BITS of brown, shapeless matter, created on air bubbles in the sea, have been found to be a vast supply of food for marine life.

For centuries scientists have puzzled about what tiny marine creatures eat. Now biologists have discovered that molecules of dissolved substances, too small for sea animals to eat as such, are brought together into larger edible substances by adherence to air bubbles and other particles.

The joint discoveries of the vast sources of food supply in the sea were made by Dr. Gordon Riley at Yale University and Drs. E. R. Baylor and W. H. Sutcliffe at Woods Hole Oceanographic Institution, Woods Hole, Mass. Dr. Sutcliffe is now at Lehigh University. Research was conducted under grants from the National Science Foundation.

"We don't exactly yet know what these brown particles are," Dr. Baylor said. "But we do know they are mixtures of such things as fatty acids, proteins, carbohydrates and polypeptides."

These organic particles, all essential parts of the building blocks of life, are formed when dissolved organic matter in the sea sticks onto air bubbles. Drs. Baylor and Sutcliffe discovered this process in the laboratory and found that continued bubbling resulted in the buildup of larger clumps of particles.

In the ocean, Dr. Baylor said, the process works something like this: As waves break across the ocean and form white caps, they drop foaming water twice as deep into the sea as the wave is high. Churning air bubbles provide a surface upon which the dissolved substances of the sea adhere to form larger particles.

As the air bubbles rise to the surface of the ocean, the wind blows the foam into long lines or windrows of spume and brings the particles together in a film which might be a molecule thick.

This film is pushed around by the wind and the waves and becomes wrinkled, piled up and folded over to form aggregates of particles which are large enough for the tiny sea animals, called zooplankton, to eat.

Some of these particles begin to sink slowly through the ocean, said Dr. Riley, and as they drop, more dissolved matter adheres to them. All this forms part of the "marine snow" which has been often reported but never until now understood.

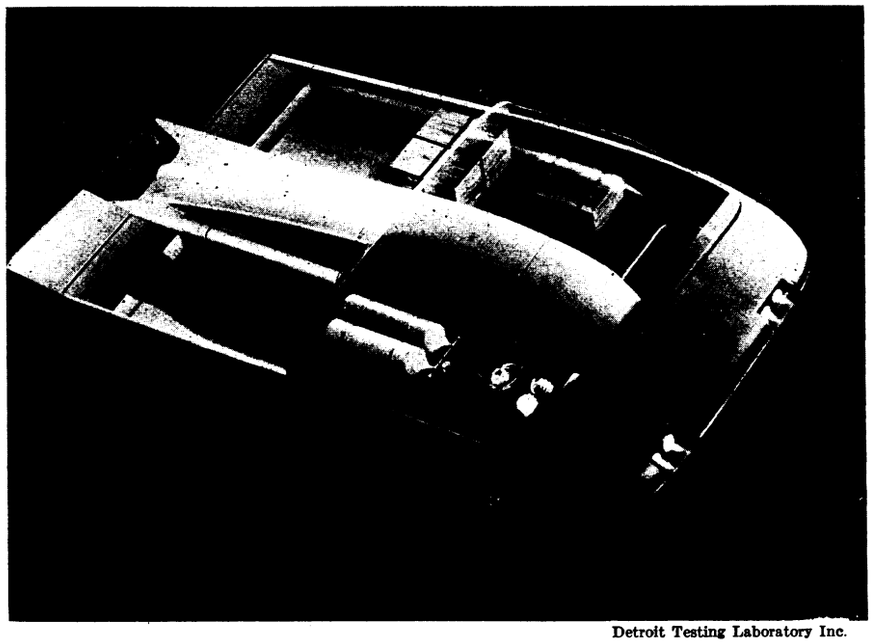
For the past 100 years, scientists believed that the tiny sea animals ate only tiny sea plants, and that these plants absorbed the inorganic matter that came from decomposed fish and other sea creatures. In other words, they believed that the cycle of life was fed only by life or remains of life. They understood part of the great cycle of the sea. They knew that the dead remains of creatures were decomposed by bacteria into inorganic material such as nitrogen, hydrogen, oxygen, sulfur and other compounds, which were then assimilated by the sea plants.

Now scientists understand that the zooplankton eat accumulated particles of organic non-living material.

This explains the former mystery of how zooplankton could live during the winter months when the supply of photoplankton was depleted and how they could live in the deep dark water beyond the depth of the tiny plants which need sunlight for their life processes.

Long aware of large quantities of both dissolved and clumped organic matter in the oceans, scientists have estimated the total non-living organic content of sea water to be at least 50 times larger than the living portion.

• Science News Letter, 86:245 October 17, 1964



Detroit Testing Laboratory Inc.

FOR PLEASURE OR RESEARCH—The artist's concept shows a two-man submarine designed by the Detroit Testing Laboratory, Inc., that allows the operators to go off swimming while it maintains a certain location and depth for as long as 10 hours and up to 300 feet deep.

BIOCHEMISTRY

Vitamin Synthesized In Seawater by Plants

➤ VITAMIN B-2, or riboflavin, has been discovered in seawater, synthesized by the marine eelgrass and big seaweeds, Russian scientists report.

A group of biochemists of the Institute of Biology of the South Seas, Academy of Sciences in Russia, under the leadership of A. T. Suprunov, reported that the sea plant Zostera and the seaweeds Ulva and Cystoseira are synthesizing the vitamin along the coast.

Vitamin B-2, essential for promoting growth in humans, is important to plants as well. A special group of fungi, the Actinomyces, for example, cannot exist without riboflavin, the Russian scientists reported in the journal Nauka i Zhiznj (Science and Life), 5:53, 1964.

When only a small quantity of seawater with the vitamin was added to the medium containing the special Actinomyces, the fungi began to grow actively.

• Science News Letter, 86:245 October 17, 1964

DENTISTRY

Wisconsin Survey Supports Fluoridation

➤ A SURVEY of 757 Wisconsin school children gives further evidence that fluoridated water cuts down tooth decay.

The children were separated into three groups according to their past exposure to fluoridated water. The group with the longest exposure had significantly less decay than the others. The longest exposure to fluoridated water was 10 years.

Dr. Michael C. Arra and Charles Lemke, both of the Wisconsin State Board of Health, Madison, reported the survey in the Journal of the American Dental Association, 69:460, 1964.

• Science News Letter, 86:245 October 17, 1964