

MARINE BIOLOGY

Animals Breathe Own Air

In a new apparatus, air breathed by experimental animals enters Teflon membrane units which diffuse out the carbon dioxide and make the air rebreathable.

➤ A STEP HAS BEEN TAKEN toward simplifying the process of underwater breathing for people planning to live in the sea as "algae farmers."

An apparatus developed by a young doctor at the University of Chicago School of Medicine allows experimental animals to continually rebreath their own air.

The next step, using salt water deep down in the ocean, will be a long one since Dr. Richard H. Strauss, the developer of the apparatus, has had to leave his university work for Navy duty. He plans to return eventually to work on the apparatus.

Dr. Peter V. Moulder, a cardiovascular surgeon at the university who collaborated with Dr. Strauss, told SCIENCE SERVICE that he believed their work was a "very heartening step" toward practical application by humans working in the sea.

Guinea pigs were used in the preliminary experiments, reported in *Nature*, 207:532, 1965, and the animals were fastened to the apparatus above water for convenience. Oxygen was diffused into a pool filled with tap water, into which the breathing apparatus was submerged. The air exhaled by the guinea pigs entered the Teflon mem-

brane units of the apparatus, which diffused out the carbon dioxide, making the air rebreathable.

The way such an apparatus would work in the ocean would be to utilize the oxygen in the salt water, but much more work remains to be done, Dr. Moulder pointed out. The experimental apparatus was submerged only a little more than a yard in the tapwater-filled pool.

Air pressure is also a problem. As a diver goes deeper the air pressure within his chest must equal the increasing water pressure. Nitrogen furnishes four-fifths of air pressure, but as the total chest pressure is increased, the percentage of nitrogen within the system also increases. As nitrogen would diffuse from expired air to water, it could not be used to maintain a high pressure within the system.

This means that a physiologically inert gas must be found, and Dr. Moulder said he and Dr. Strauss were working on this problem when their experiments were interrupted by the Navy.

"I believe Silastic will work better than Teflon in seawater use by humans," Dr. Moulder said.

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Smithsonian Institution

PHILADELPHIA—Built in 1776, the 55-foot *Philadelphia*, recovered from Lake Champlain almost intact and with all her armament, is the oldest and most complete remnant associated with the naval history of the Revolutionary War. Philip Lundeberg, a Smithsonian naval historian, describes features of a revolutionary cannon ball for Frank A. Taylor (right), Director of the U.S. National Museum.

PALEONTOLOGY

New Species of Dinosaur Claimed by Chinese

➤ THE BONES of a "new" species of huge plant-eating dinosaur that roamed the Chinese mainland some 140 million years ago have been assembled and named by Chinese scientists.

Called *Mamenchisaurus Hochuanensis* and measuring about 72 feet long and 11 feet high, it is the biggest and best preserved fossil dinosaur ever discovered in China. Chinese paleontologists believe it is among the few relatively complete fossil dinosaurs of such gigantic proportions that have been so far discovered.

The bones were unearthed in Szechwan Province in southwest China, transported to Peking, and sent to the Institute of Vertebrate Palaeontology and Palaeoanthropology for study last year. Dr. Yang Chung-Chien and fellow researcher Chao Hsi-Chin estimate that the animal probably weighed between 30 and 40 tons when alive.

The creature may have spent most of its time in water in order to reduce the consumption of energy by its gigantic body and to avoid the attack of carnivorous dinosaurs. It lived on algae, soft plants and mollusks, and came to dry land only to rest and lay eggs.

The scientists also detected signs of a disease not found in other dinosaurs. The disease signs were found on the neck, caudal vertebrae, femur and tibia bones.

After the beast's bones were studied and assembled, the reconstruction work was completed in just three and a half months. Another fossil dinosaur, discovered in 1952 near the same excavation spot, belongs to the same family and species. On display at the Peking Natural History Museum, it measures 36 feet long and is the second largest in China.

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OCEANOGRAPHY

New Sounding Device Aids Sea-Floor Charting

➤ A NEW DEEP SEA sounding system is providing more accurate measurements of the ocean floor than ever before obtained, the U.S. Coast and Geodetic Survey office in Rockville, Md., reported.

The system is called narrow-beam transducer sounding (NBT).

Field trials of the NBT were made first aboard a Coast and Geodetic ship named "Surveyor" and later operational soundings were taken as part of the North Pacific Ocean survey program.

Geodetic Survey scientists report that the narrow beam of 4.5 degrees compared to about 60 degrees in older systems "makes it possible for the first time to detect topographic detail directly below the ship." They said that in older systems, echo returns tended to average out the bottom over the full sweep of the beam, filling in valleys or narrow canyons. The NBT produces far sharper results.

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