GEOPHYSICS

Plan to Bore Ocean Hole

Facts would replace speculation concerning the earth's density, composition and age if plans to bore a three-mile deep hole in the ocean floor succeed.

➤ PLANS TO BORE a hole three miles deep in the ocean floor have been made by a special committee of the National Academy of Sciences-National Research Council, the nation's top scientific body.

The idea is to drill down through all the layers of sediment covering the ocean floor in order to get a history of the earth from its very beginning.

The plans for obtaining the earth's private diary were approved by members of the AMSOC committee, which formerly was known as the Moho Committee of the American Miscellaneous Society.

Techniques for doing the job have already been developed as part of the normal progress of oil-well drilling and rock mining. The National Science Foundation has approved a request for $30,000 to finance the first stages of operation.

Early studies made from a Pacific atoll showed this approach presented extreme difficulties, so the AMSOC committee has now decided to try drilling the three-mile hole from an ocean-going vessel. One suggestion is that the hole be dug in the Gulf of Mexico northwest of Cuba. Weather there is good and the help of scientists from oil companies drilling for offshore oil would be available.

Scientists believe there is probably no better project that would provide more information concerning the broad picture of the earth as a planet than drilling a hole through the sediments and the basalt layer and finally into the upper mantle.

Obtaining samples from such a bore hole would replace speculation by facts concerning the earth's density, composition, bulk and mineral phases, radioactivity, age and isotopic composition.

These samples would be from below the Mohorovicic discontinuity, known as the Moho, the boundary between the earth's mantle and its surface rocks. At the Moho, a very sharp change occurs in the velocity with which the earthquake waves travel.

The Moho is found at an average distance of about 20 miles below the surface under the continents, but may be as close as two and a half or three miles under the ocean floor.

The AMSOC committee, whose chairman is Dr. Gordon Lill of the Office of Naval Research, consists of Drs. Carl O. Alexis and Arthur E. Maxwell, also of ONR; Dr. Maurice Ewing, director of Columbia University's Lamont Geological Observatory, Palisades, N. Y.; Dr. Harry H. Hess of Princeton University, Princeton, N. J., and Drs. Harry S. Ladd, William W. Rubey and Joshua Tracy of the U. S. Geological Survey, and Dr. Roger Revelle, director of Scripps Institution of Oceanography, La Jolla, Calif., and Dr. Walter Munk, also of Scripps.

The over-all properties of materials through which the drill hole would pass could be measured to great advantage. For example, figures could be obtained on the temperature gradient and conductivity, and from these should come a better understanding of heat flow.

A complete sedimentary column might also show the appearance of the first life in the sea and, perhaps, a clue to its origin.

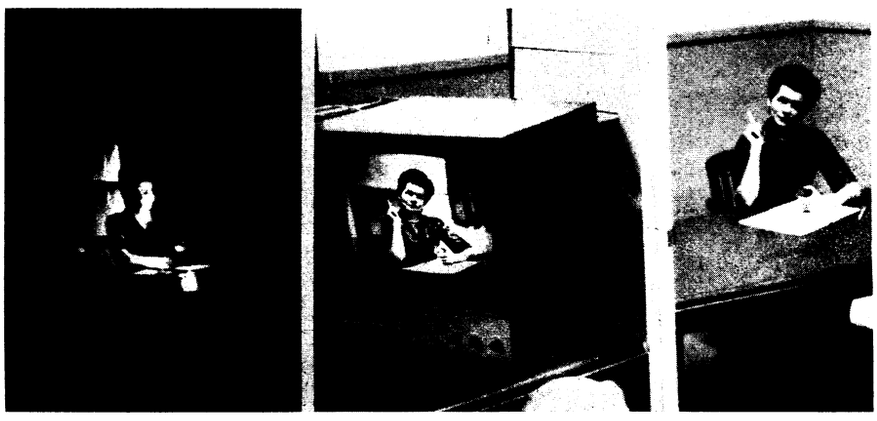
Committee members pointed out that in probing into such new and unexplored territory as a hole miles deep in the ocean floor, unexpected discoveries might play a large part in determining the final value of the work.

Drilling the hole would also give a seismic velocity log that could contribute to better understanding of earthquake waves. The magnetic properties of the materials in the hole could be determined, and various types of electric logging could be done in connection with laboratory measurements of the samples.

Knowing the magnetic properties would lead to a much better means of interpreting the magnetic anomalies at sea. The direction and sign of the remnant magnetism of the rock samples progressively down the hole could be determined, perhaps shedding some light on paleomagnetic problems.

Another question that might be answered concerns the composition of the layer immediately above the Moho discontinuity. Although it is generally thought to be basalt, there is no evidence to support this hypothesis except that the velocity of earthquake waves through this layer is appropriate. Some information might also be gained about the origin of this layer.

Science News Letter, October 18, 1958



DARKNESS PENETRATED—A closed-circuit television camera developed by the General Electric Company will penetrate almost total darkness. The right half of the composite photograph was taken with normal lighting. On the left, with the lights out, the camera still transmits a picture using only the glow from a cigarette lighter.

FOOD TECHNOLOGY

Research Provides Better Food Public Demands

➤ SCIENTISTS are playing a bigger role in providing food products in the space age. An important reason for this is that Americans are becoming more nutrition-conscious.

At the same time they are asking for foods that are easier to buy, carry, store and prepare. They also want seasonal foods all year round.

These observations of Dr. Byron T. Shaw, administrator of the U. S. Department of Agriculture's Agricultural Research Service, were made at the National Association of Food Chains meeting in Chicago. Dr. Shaw said many major new methods in food processing, preservation and production were developed with USDA cooperation.

Beef cattle with more lean, tender beef, dairy cows that produce milk with more solids and less fat, potatoes with more vitamin C, and sweetcorn with more sugar that does not turn to starch quickly are all possible through research, he said.

Although more studies are needed before irradiated foods are on supermarket shelves, Dr. Shaw believes irradiation is economically feasible as a way to give fresh foods a longer useful life.

Tests with fruits, vegetables and meats show that antibiotics are effective in controlling many of the organisms that cause rotting, discoloration, shriveling and both internal and external spoilage.

The next big development in the food-processing industry will come in the field of concentrated products, Dr. Shaw said. At the USDA, the main emphasis is on the development of a dry whole milk that will taste like fresh milk, store well and dissolve instantly when water is added. Already USDA scientists have developed several fruit and vegetable juice powders that have their natural, full flavor.

Science News Letter, October 18, 1958