

be growing shellfish, fish and "ores" with methods gleaned from oceanographic research.

The United States has already made a big step in this direction. The U. S. Navy, along with its anti-submarine systems, now route ships through ocean lanes where waves offer the least resistance. The U. S. Weather Bureau has an experimental floating weather station that once hinted when Hurricane Diana was brewing off the coast.

Scripps Institution of Oceanography scientists have a remote-controlled "robot" patrolling the Pacific Coast fringes, while scientists from Project Mohole have already penetrated the once-mysterious volcanic layer underlying the soft ocean bottom sediments.

MEDICINE

Acids Linked to Immunity

► VIROLOGISTS have a new dimension to use following discovery that free viral nucleic acids are infectious.

Dr. Roger M. Herriott, professor of biochemistry in the Johns Hopkins University School of Hygiene and Public Health, focuses attention on properties of viral nucleic acids that may lie behind the reasons for permanent immunity.

The resistance of infectious nucleic acids to antibodies, Dr. Herriott reports in *Science*: 134, 256, 1961, may explain some conditions that are at present baffling.

The infective nature of viral nucleic acids (the stuff of life) was discovered first in plant viruses and then demonstrated for poliomyelitis and a variety of diseases.

The scientist points out that after recovery from certain virus-caused diseases such as polio or yellow fever, individuals are permanently immune to the agent.

"To account for this," Dr. Herriott says, "it has sometimes been thought that perhaps

These feats have been matched by Woods Hole Oceanographic Institution scientists who are planning to string a line of unmanned monitored buoys from Cape Cod to Bermuda to continuously collect oceanographic data.

The sign that oceanography came of age was reflected in President Kennedy's 1961 budget request to Congress for \$97,000,000—nearly double the amount spent on oceanography last year. Bills pending before Congress would give President Kennedy's program a further push.

"Knowledge of the oceans is more than a matter of curiosity. Our very survival may hinge on it," the President declared in a special message to Congress.

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in these cases there is a very low level infection maintaining a stimulus for antibody formation."

The infectious nucleic acid provides a model for maintaining an infection in the presence of antibodies, he says. "Released nucleic acid would infect a few susceptible cells and maintain the infection. The larger range of cell hosts for the nucleic acid may be particularly important in this connection."

Summarizing, Dr. Herriott says, "Viral nucleic acids have been found to be infectious for tissues and animals, yet are nonantigenic and resistant to antibodies against whole virus."

"The release from infected tissues of even a small proportion of total virus as free nucleic acid could, in an otherwise immune individual, lead to a low level of infection which would, perhaps, explain permanent immunity."

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PSYCHOLOGY

"Climbers" Prone to Illness

► "NONHAZARDOUS" occupations can be dangerous for men who work their way up.

Eighty-four out of 139 young men between the ages of 22 and 32 who had attained managerial positions showed more illness than 55 co-workers who stepped into the same kind of job right out of college.

Dr. William N. Christensen and Lawrence E. Hinkle Jr., both of the departments of medicine and psychiatry, New York Hospital-Cornell Medical Center, reported in the *Journal of the American Medical Association*, 177:247, 1961, that the men who had worked their way up displayed both acute and chronic symptoms, including signs indicating eventual high blood pressure and hardening of the arteries.

The physicians tested diet and smoking habits, hereditary factors and social back-

ground among other points to show that illness is caused by complex biological interactions taking place between man and his environment.

The men who were sick more often were sons or grandsons of immigrants. Their fathers had been skilled and unskilled laborers. They had grown up in modest to substandard neighborhoods in low-income families where the fathers generally had a grammar-school education or less.

As a result their climb up the ladder of success was full of challenges, threats, demands and other factors of a domestic and financial nature. The place they gained at the top was unfamiliar to them.

The college graduates, with few exceptions, were fourth-generation Americans, the sons of managers and other types of white-collar workers who had acquired at least a high-school education and often

more. They had grown up in families of middle to high income, in medium to substantial neighborhoods, the researchers found.

This meant that the college men were living and working in a social environment with which they had a lifetime familiarity.

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PHYSICS

Ancient Principle Might Have Saved Capsule

► THE SPACE-AGE capsule lost after the U. S. second successful manned space shot probably might have been saved by applying a scientific principle advanced more than 2,000 years ago by the Greek philosopher, Archimedes.

According to Archimedes' principle, the Liberty Bell 7 capsule, even flooded with water, would weigh less in water than it did in air, due to the buoyant effect of water. By releasing more cable and letting the capsule sink a few feet below the ocean surface, the rescuing helicopter probably could have held on until help arrived.

During actual rescue operations, the capsule was cut loose from a hovering helicopter when its motor overheated as it was trying to lift the capsule.

Archimedes noted that lighter, or less dense, material is more buoyant in water than heavier materials. Scientists now wonder whether the vacuum-packed instrument packages, the padded fiber-glass space seat, and other lightweight materials within the capsule could have helped lessen the average density of the submerged metal capsule, making it much more buoyant or lighter than in air.

National Aeronautics and Space Administration scientists are meanwhile keeping silent as to the exact materials contained in the Liberty Bell 7 capsule.

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PHYSICS

Solid Matter Viewed Directly by X-Rays

► A METHOD for direct visual observation of the interior of solid materials, such as metals, was reported to the American Crystallographic Association in Boulder, Colo.

Drs. G. W. Goetze and Abraham Taylor of Westinghouse Electric Corporation, Pittsburgh, said the system is an improved method of X-ray diffraction—a means for observing the patterns formed by passing X-rays through a crystal. The diffraction pattern of a material is its "fingerprint," a positive identification of the nature of the material and the alignment of its crystals.

In the new system, the diffraction pattern strikes a photosensitive surface, from which an identical pattern of electrons is released. The electrons in turn strike an amplifying surface, the emission of which excites a photosensitive output surface, creating a visible image some 100 times larger than the original. Greater magnifications are possible with larger and more powerful X-ray sources.

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