ELECTRONICS

Frog Sees Moving Objects

THE FROG'S EYE is a sophisticated information processor and works independently of the light level, a team of researchers at Massachusetts Institute of Technology at Cambridge have found. It processes a visual scene four ways and sends this processed information along the optic nerve to the frog's brain.

The research showed that the retina in the frog's eye is mapped by four sets of detectors:

Sustained contrast detectors spot sharp edges of objects lighter or darker than the general background. If the light blinks off, then on, these detectors again perceive the sharp edge. Convexity detectors, considered the most remarkable, spot small moving objects. But if a shadow momentarily falls across the object, the image is erased in the frog's eye until the object moves again. The more the "bug" curves outwardly, such as a hump made by wings; the stronger becomes impulses from these detectors. Objects lighter in color than the background produce almost no response unless they cast a shadow. Moving edge detectors spot large moving objects. If the object does not move, these detectors ignore it. Net dimming detectors are highly sensitive to changes in light levels. These spot shadows cast by overhead birds.

The research was conducted at M.I.T.'s Research Laboratory of Electronics by Dr. J. Y. Lettvin, H. R. Maturana, W. S. McCulloch and W. H. Pitts. It is reported in the Proceedings of the Institute of Radio Engineers, 47:1940, 1959.

Dr. Lettvin says it is difficult to describe what the frog's brain actually sees, after his eyes process the visual information. Such vision lies outside human experience. It is difficult to say whether human eyes also process the visual scene to extract specialized information. This is because of a lack of knowledge of the actual workings inside the human eye. In the painless experiment on the frog's eye, a delicate electronic probe was used to touch various fibers in a living frog's optic nerve. Signals transmitted along the fibers were displayed electronically on an oscilloscope.

Science News Letter, February 27, 1960

A SIP OF VACCINE—A University of Miami co-ed sips the new oral polio vaccine as Dade County's program to immunize 520,000 eligible residents begins. She is one of more than 7,500 students at the University who took the vaccine as they registered for the Spring semester.

PUBLIC HEALTH

Dade County Gets Vaccine

MORE THAN 500,000 residents of Dade County are participating in the live virus polio vaccine program now underway.

Each participant in this study group, consisting of those under 40 years, will swallow a cherry-colored and flavored trivalent vaccine developed by Dr. Herald Cox of Lederle Laboratories, Pearl River, N. Y.

The vaccine, it is hoped, will deliver a three-in-one punch. It will trigger each person's body to manufacture antibodies that fight all polio cripplers, types I, II and III.

Antibody levels of participants have been previously determined from 10,000 random blood samples. The antibody counts of these samples will later be compared with those taken after the program is complete to measure the effect of the vaccine.

Dade County, Fla., which includes Miami, has a longer polio season than most areas in the country, due to its warm weather. Although the incidence of polio has declined in the county through use of the Salk vaccine, that vaccine does not offer the hope of eradicating the disease or preventing its spread through the community.

Salk vaccine, made from killed viruses, is between 70% and 90% effective. Immunity produced by this vaccine is suspected to be shorter than the estimated five to seven years for the live virus vaccine.

The live polio virus vaccine project is sponsored by the Dade County Health Department, the Dade County Medical Association and the University of Miami School of Medicine.

Early in February more than 7,500 students swallowed the same vaccine in a mass feeding and pre-test at the University. The entire program should be completed by the end of April, although the vaccine will be offered to newborns and new residents on a continuing basis.

Science News Letter, February 27, 1960

ROCKETS AND MISSILES

Three-Nation Space Probes Are Planned

THE U. S. HAS tentative plans to buy British rockets to be filled with American instruments and launched by Australians at their Woomera range, an official of the National Aeronautics and Space Administration said.

Arnold W. Frutkin, director of NASA's office of international programs, told members of the Inter-American Defense Board in Washington that NASA "hopes" to complete this unusual multi-lateral program for studying the upper atmosphere.

The rocket to be purchased is the Skylark, a solid propellant type, unguided, and capable of carrying a 65-pound payload.

Mr. Frutkin also said the Australians have proposed they instrument some American rockets and satellites for special studies. He reported that Britain has already tentatively agreed to instrument perhaps three U. S. satellites during a two- to four-year period.

Science News Letter, February 27, 1960

GEOLOGY

1960 Iceberg Crop Is Expected to Be Light

FEWER ICEBERGS than usual will plague shipping off Newfoundland's Grand Banks this year.

Extremely light field ice conditions off Labrador indicate that this year's crop will be rather small, Lt. Cmdr. Robertson P. Dinsmore of the International Ice Patrol at Woods Hole, Mass., told SCIENCE SERVICE.

He said, however, that it is really impossible to predict exactly how many icebergs will float south of the 48th parallel and into the world's busiest shipping lanes each year.

Field ice conditions and iceberg conditions go hand in hand, he said, even though the two have entirely different origins. Field ice, small chunks of frozen sea water, never rises very high in the water. Icebergs, huge pieces of glaciers that break off into the sea, may tower high above the surface of the water despite having about 85% of their mass beneath the surface.

Their height above water makes icebergs especially prone to erosion by heavy waves. Heavy field ice tends to keep the water calm so that wave action on the bergs is kept to a minimum. The lack of much field ice off Labrador at this time, therefore, would indicate a rather light iceberg season.

The Ice Patrol, supported by 16 nations and run by the U. S. Coast Guard, maintains a close surveillance on the icebergs that enter the Grand Banks area throughout a season that runs roughly from late February through August. The Patrol was formed in 1914, two years after the Titanic had been sunk by collision with an iceberg.

Science News Letter, February 27, 1960