

## BIOLOGY

**Scientists Underestimate Plants' Powers**

SCIENTISTS have been grossly underestimating the living plant's ability to carry on photosynthesis.

Photosynthesis, the remarkable process by which the plant changes the energy of sunlight into usable chemical energy or food, is still largely a scientific mystery. Researchers have been trying to solve the mystery so that man might duplicate this process in the laboratory and increase his food supply. Today, plants are a kind of "middle man" in the food cycle.

Now, a team of biologists reports, it seems that by studying plants in the laboratory, scientists have neglected an important factor, turbulence.

Turbulence, or rapid and irregular movement of the air or water, is probably responsible for higher photosynthetic rates in nature, the scientists report in *Science* (July 31).

Most previous estimates of photosynthetic yield have been based on experiments with tiny water plants enclosed in bottles. These results were then extended and said to apply to plants living under natural conditions. This is not so, Drs. Jacob Verduin, E. Eloise Whitwer and Bruce C. Cowell of the Bowling Green State University (Ohio) report.

They sampled water plants at five different depths in a channel where the water was about 27 feet deep. Photosynthetic activity was measured and compared with similar plants confined in bottles as in the earlier "classical" experiments.

Photosynthetic activity in the bottled plants was less than half that of the plants grown under natural conditions, the scientists found.

*Science News Letter, August 15, 1959*

## EDUCATION

**Ohio State Revises Electrical Courses**

A SLOW TREND toward five-year engineering curriculums will catch up freshman electrical engineering students at Ohio State University in August.

Instead of the traditional four-year college course, they will face a broadened course lengthened by one year. But good students will be able to win masters' as well as bachelors' degrees in this period.

At present, only eight percent of engineering colleges in the United States offer five-year courses, excluding those having cooperative programs. (Under a cooperative program, a student effectively works one year and goes to school four years over a five-year period.) All engineering colleges offering five-year programs do not have them for all disciplines.

The broadened program at Ohio State is divided into two parts. A two-year pre-professional curriculum, common for all branches of engineering, will stress English, mathematics, physics, chemistry, engineering drawing and mechanics, history and

literature, with electives in economics, sociology, psychology, philosophy and the arts.

For the first time at Ohio State, all engineering students will be required to complete at least five quarter hours of work in a biological science.

The three-year professional curriculum will also be broader and deeper. It will emphasize mathematics and basic science "at the expense of 'know-how' courses on specific types of machinery or processes," said Dean Harold A. Boltz of the University's College of Engineering.

More effort will go into teaching the young engineer to apply classroom theory to the synthesis, design and analysis of integrated systems. In this process, he should come to appreciate design compromises that must be made for reasons of economics, reliability, safety, maintenance and manufacturing feasibility, the dean said.

*Science News Letter, August 15, 1959*

## FISHERIES

**Aerial-Acoustical Method Helps Russians Spot Fish**

RUSSIAN scientists have developed an ultrasonic method for locating schools of fish from a helicopter. It has proved to be far faster and more accurate than visual or acoustic methods using shipboard instruments.

To locate herring, anchovies, and the larger tunny or horse mackerel, the helicopter hovers about 50 feet above the water. A sound projector, or microphone, is lowered into the water on a wire. Thirteen to 20 feet above the microphone, a streamlined float is attached by wire. The wire from the float leads up to the helicopter, where it is attached to a depth-sounding instrument.

The float and microphone are towed over the area at speeds ranging up to ten miles an hour while a technician at the instrument panel watches tracings sent up from the microphone and recorded on tape.

Interpretation of the received ultrasonic signals yields the size and shape of the fish schools, their depths, and the species of fish.

This information then can be radioed to nearby fishing boats. When the fishermen know the amount and kind of fish below the surface, they can prepare the proper trawl or seine gear for the fish they expect to catch.

This method of fish finding, reported by the Fish and Wildlife Service of the Department of Interior, has several advantages: A helicopter can cover a fishing area much faster than a patrol boat; the fish are not frightened by the helicopter as they might be by a surface vessel; and a helicopter can operate over rough water that would slow the efforts of a patrol boat or make surface readings inaccurate.

The method reportedly is being used to locate herring in the Caspian Sea; cod and herring in the Barents Sea and in Far Eastern waters; and anchovies, sprat, scad and horse mackerel in the Black and Azov Seas.

*Science News Letter, August 15, 1959*

**IN SCIEN**

## PHYSICS

**Interpret Radio Waves From A-Bomb Explosions**

A RUSSIAN SCIENTIST has calculated how atomic explosions result in the emission of radio waves.

Prof. A. S. Kompaneets of the Institute for Chemical Physics, U.S.S.R. Academy of Sciences, derived a theory showing the radio waves detected from atomic blasts are due to the presence of a current in the ionized air. The duration of the pulse due to the electronic current is one or a few microseconds (millionths of a second), thus giving radio waves with a wavelength of about three feet.

Standard AM broadcasts at 1,500 kilocycles have a wavelength of approximately 660 feet.

Prof. Kompaneets' report appears in *Soviet Physics JETP*, a translation of the *Journal of Experimental and Theoretical Physics*.

*Science News Letter, August 15, 1959*

## GEOGRAPHY

**North and South Poles To Go North on New Map**

THE EARTH'S two magnetic poles will be moved a little northward on a new map to be published early next year by the U. S. Navy's Hydrographic Office.

Since the old isogonic map was published in 1955, the North Magnetic Pole, north of the Canadian mainland, apparently has moved about 100 miles due north across Viscount Melville Sound from Prince Wales Island to a point just off the southwest tip of Bathurst Island.

The South Magnetic Pole will be shown near Adelie Coast, Wilkes Land, in Antarctica. Its most recently computed position will be about 100 miles north and west of the 1955 location.

Although some movement of the poles themselves is believed to have occurred, the apparent movement may be a result of better instrumentation for measurement, said J. H. Nelson, chief of the U. S. Coast and Geodetic Survey's geomagnetism branch.

Coast and Geodetic Survey gathers the data for these periodic Navy maps. The Survey compiles 125,000 observations, obtained in part through exchanges with other countries, on degrees of compass-needle variation in pointing to true north. The isogonic map thus enables its user to determine true north based on his compass reading anywhere in the world.

Officially the 1960 North Magnetic Pole will be shown at 74.9 degrees north latitude and 101.0 degrees west longitude; the South Magnetic Pole will be at 67.1 degrees south latitude and 142.7 degrees east longitude.

*Science News Letter, August 15, 1959*

# CE FIELDS

## PHYSIOLOGY

### Sounds Can Produce Physiological Responses

SOUNDS that you hear, both pleasant and unpleasant, produce complex physiological responses, including hormonal changes.

This is reported by Dr. Robert Henkin of the University of California Medical School, Los Angeles, who holds degrees in both music and medicine.

In an early investigation Dr. Henkin was able to demonstrate a measurable physiological response of an individual to a given piece of music that could be correlated with how the individual rated the piece as to the degree of pleasantness or unpleasantness.

The physiological measurement was the galvanic skin response, an important component of the lie detector test.

In more recent experiments he has shown a relationship in animals between sound of a given frequency and intensity and production of corticosterone, one of the hormones produced in response to stress.

These results indicate that the auditory pathway is a complex one. The appreciation of sound is not just a matter of energy traveling from the ear to brain hearing centers for complex hormonal changes are also involved.

Unpleasant sounds may produce a hormonal picture characteristic of stress. Pleasant patterns of sound, such as music, may produce or maintain an organized hormonal situation.

Music that you do not understand appears to have no different physiological effect than silence, the UCLA investigator said. In other words, if you do not understand it, you may not perceive it as music.

Science News Letter, August 15, 1959

## FORESTRY

### Import German Beetles To Save Fir Forests

BETTER FROM BADEN may help control a forest-destroying insect in the United States.

Approximately 20,000 beetles known to prey on the balsam woolly aphid are being imported from West Germany, mostly from the Baden area near the city of Freiburg. Live beetles are being released by U. S. Forest Service entomologists on the most heavily infested trees in a small control test in Maine.

Some of the imported beetles will also be used to establish a colony in North Carolina. Severe losses of fir trees as a result of aphid infestation have already been reported in Washington, Oregon, Maine and North Carolina.

The balsam woolly aphid damages trees by attaching itself to the trunk and feeding on the sap. Mass infestations injure

the trees so severely, the U. S. Department of Agriculture has reported, that trees die in about two years.

Aerial sprays of insecticides do not reach the aphids and ground spraying is too costly. Researchers are hopeful that using insect predators will solve the problem.

The Canadian department of agriculture has donated 200,000 tiny flies, scientifically known as *Aphidoletes thompsoni*, that also prey on the aphid. The Canadians have been very successful in their work with both the flies and the beetles (*Laricobius erichsonii*) which they imported, released and colonized in the New Brunswick area.

The British Commonwealth Institute of Biological Control is assisting the USDA's Agricultural Research Service and Forest Service in their aphid control plans.

Science News Letter, August 15, 1959

## SOCIOLOGY

### Humor Is Safety Valve For Hospital Patients

LAUGHTER is a "safety valve" for hospitalized patients.

Humor provides not only an outlet for hostility and discontent in the hospital setting, but it also allows the patients to entertain, reassure, and communicate with one another.

Thus, laughter has an important social function, according to Dr. Rose L. Coser, reporting in the British social science journal *Human Relations* (Vol. XII, No. 2).

Institutionalized patients, like many other groups, such as soldiers and secretaries and even nationalities, have their own brands of humor. The jocularity of patients, Dr. Coser says, can be understood in terms of their anxiety, submission to hospital authority, and the rigid routine.

A typical feeling reported to her by one patient was: "I was very apprehensive. I was frightened to death. I did not know what to expect."

The humor serves as a means to ward off danger, to rebel against authority, and to obtain relief from mechanical routine.

Much of the humor takes the form of griping. For example, a patient told Dr. Coser, "Dinner was no good; what I cook is better." A few minutes later, however, she told a fellow patient, "Those hamburgers today were as hard as rocks; if I'd bounced them against the wall they'd come right back." The patients responded with laughter.

This type of jocular gripe might not tickle another group, but it has its purpose in the hospital setting, Dr. Coser says. ". . . It helps patients to regain their identity through collective triumph over their weakness and at the same time to release their grudges in 'substitute complaints.'"

Dr. Coser concludes that a "story well told, which, in a few minutes, entertains, reassures, conveys information, releases tension, and draws people more closely together, may have more to contribute than carefully planned lectures . . . toward the security of the frightened sick."

Dr. Coser is a sociologist at McLean Hospital, Belmont, Mass.

Science News Letter, August 15, 1959

## PHOTOGRAPHY

### Infrared Computer Cuts Blur in Aerial Photos

AN INFRARED computer, which automatically controls the movement of film running through a camera, is being developed to prevent blur in aerial reconnaissance photographs.

The object of the computer is to compensate for altitude changes. In flying over hilly terrain, for example, the aircraft's altitude in relation to the ground is constantly changing. The closer the ground is to the aircraft, the faster it seems to be moving and the more it blurs on photographs.

To overcome the blur problem, two airborne infrared scanners are aimed at the ground, one slightly ahead of the other. They determine altitude changes and feed the information into a computer. The computer figures, almost instantaneously, the ideal speed of the film moving through the camera. A servomechanism then adjusts the speed.

As the ground moves closer to the aircraft the camera automatically speeds up. It slows down as the ground recedes.

Developmental work is being done at the Avion division of ACF Industries, Inc., Paramus, N. J., under contract to the Air Force's Aerial Reconnaissance Laboratory, Dayton, Ohio.

Science News Letter, August 15, 1959

## DENTISTRY

### Incidence of Dental Decay Will Drop During Century

THE INCIDENCE of dental decay will drop sharply during the next 100 years, the president of the American Dental Association has predicted.

Dr. Percy T. Phillips of New York spoke to colleagues gathered in Niagara Falls, N. Y., for the centennial anniversary of the Association's founding. His prediction was based upon the role now played by water fluoridation, which he referred to as "one of the most significant public health developments in our era."

As dental decay problems decrease, there will be need to place increased emphasis on preventive measures for diseases of the gums, he added.

Looking to the second century of American dentistry, Dr. Phillips forecast a number of changes in the profession.

They will come about, he explained, because of increased stress on scientific research as well as growing concern by the people over their dental needs.

One of the major problems facing dentistry will be to make dental care increasingly available to larger segments of the public, he added. He called for sound programs to provide more care for the aged as well as institutionalized and homebound persons.

Need also was cited for establishing dental departments in more of the nation's hospitals.

The profession's chief concern is prevention of dental disease in children, he declared.

Science News Letter, August 15, 1959