RADIO

Saturn Radio Waves Show It's Cold on Planet

➤ CLEAR RADIO WAVES from the planet Saturn and from a remote, gas-surrounded dying star have been measured for the first time. The University of Michigan's head of radio astronomy, Prof. Fred T. Haddock, reported the University's pioneer measurements to the 13th General Assembly of the International Scientific Radio Union in London.

The scientists used the University's 85-foot radio telescope. The data showed Saturn's atmospheric temperature is minus 283 degrees Fahrenheit. The gas-surrounded star—called planetary nebula, New Galactic Catalog 6543—is 3,000 light years away.

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HORTICULTURE

Tracers Seek Cause Of Brown Core in Pears

➤ USING RADIOACTIVE "TRACERS" that map chemical action, Oregon State College researchers are trying to determine how carbon dioxide given off by pears during storage causes the fruit core to turn brown.

Radioactive carbon isotopes may be able to trace the carbon dioxide pattern of attack in the fruit. So-called brown core in pears has become a problem in recent years with the widespread use of sealed plastic bags for storing pears through the winter. The sealing slows down respiration or oxidation of the fruit and thus prolongs its life.

The big problem is that the carbon dioxide builds up in the bag. Pear packers have solved the problem, in part, by punching holes in the plastic bags to permit some escape of carbon dioxide, but this shortens storage life of pears by about one month.

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FORESTRY

Natural Root Grafts Form "Tree Society"

➤ MANY FOREST TREES join themselves together through natural root grafts, forming a "tree society" in which the members can in effect support one another, but they can also compete strongly for the available nutrient supply.

Theodore T. Kozlowski, a University of Wisconsin forester, and John H. Cooley, a U. S. Department of Agriculture research forester, found such grafts common with several Wisconsin evergreens and broad leaf trees. But the natural grafts take place only between trees of the same species, with possible rare exceptions, they said.

The natural grafts result in an actual union of the live tissues of the trees, permitting sap to pass from one tree to another, the researchers said. Roots as small as an eighth of an inch in diameter form natural grafts, and the unions usually take place where roots are growing more or less at right angles with each other.

The findings of the two men also suggest that wind sway helps to promote grafts on trees growing in soft ground or bogs.

Where trees of different species grow close together, the roots may mingle but grafting ordinarily does not take place. Even when growth pressure in the mingling root is great, a bark layer stays between the roots of the different species.

Mr. Kozlowski and Mr. Cooley said this natural root grafting brings up new questions in forest management and disease control. Diseases such as oak wilt, as well as parasitic diseases, can spread from one tree to another through the root grafts. And weed-killing chemicals applied to kill specific trees may also kill nearby trees by traveling through the joined root system. The researchers said that new disease control practices will have to be adjusted to these chain effects.

In their studies, the two foresters found natural root grafts on sugar maple, red maple, yellow birch, paper birch, balsam fir, eastern hemlock, northern white cedar, pin oak and bur oak.

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PSYCHOLOGY

Porpoise Locates Food With Built-In Sonar

➤ THE PORPOISE is remarkably good at "seeing with its ears," Dr. W. N. Kellogg of Florida State University in Tallahassee reported in Chicago to the American Psychological Association.

The porpoise has a built-in "sonar" which scores from 98% to 100% correct in locating objects, Dr. Kellogg said.

In one experiment he tested the animal's ability to distinguish between available food fish and other fishes blocked off from him by an invisible barrier of plate glass. Unerringly, the porpoise would go to, catch and eat the free fish and never try to reach the equally attractive fishes behind the glass barrier. In 202 tries not one error was made.

The porpoise sonar, Dr. Kellogg said, works on the same principle as the sonar of the Navy. The animal emits trains of sound-pulses. The echoes of the sound-pulses are later picked up by the animal after they are reflected back by the various objects in the water. The porpoise can distinguish between various fishes by the patterns of echoes reflected by the fishes.

In many ways, Dr. Kellogg said, the porpoise sonar is superior to the best that man has yet been able to devise. Navy scientists and other research scientists are studying the porpoise sonar in the hope of improving the Navy instrument.

In order to prove that the porpoise does not depend on smell or taste to find his way to the available fishes, Dr. Kellogg devised another experiment. The porpoise was required to swim through one of two doorways or openings in a submerged net of one-eighth-inch wire. One of the doorways was blocked by an invisible barrier of heavy transparent plastic. The porpoises were 98% correct in picking the open doorway.

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IN SCIEN

ICHTHYOLOGY

Prize Musky, Like Tree, Reveals Age by Its Rings

➤ A FISHERMAN can tell the age of his prize musky by counting the rings in its vertebrae, in its fin bones or on its scales, according to Leon D. Johnson, fishery research biologist for the Wisconsin Conservation Department.

The vertebrae of a cooked muskellunge are easy to separate, Mr. Johnson said. The circles on the ends of the vertebrae can be counted as year rings, much as the rings on a stump are counted to tell the age of a tree. The rings will be more evident after the bones have dried for a time, than on the fresh vertebrae.

A microscope is needed to count the rings in a cross section of the fin bones, after sawing off cross sections of the dried fins about the thickness of cardboard with a jeweler's saw. Light bands in the fin bone show the winter growth and dark bands the summer growth in the rings in the bone.

A microscope will be needed to count year rings on the scales. There is a wide summer growth and a narrow winter growth, the latter showing up as a thin line marking one annulus, or one year of growth.

Mr. Johnson warned that sometimes, if food becomes scarce during the summer, the musky may lay down a false year ring, and in very old muskies, the growth may become so slow and the rings placed so close together that it is hard to count them.

According to the U. S. Fish and Wildlife Service, the average musky (*Esox masquinongy*) is three and one-fourth feet long and weighs about 15 pounds. The biggest catch on record was over five feet long and weighed 70 pounds, four ounces.

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PSYCHIATRY

Mental Hospital Aged Increase Alarmingly

➤ THE PROPORTION of older persons in mental hospitals is increasing at "a disturbing rate," the Senate Subcommittee on Problems of the Aged and Aging reports. One out of three patients in public mental hospitals is 65 or over.

Sen. Pat McNamara (D.-Mich.), chairman of the Subcommittee, said in releasing the report, "By 1970, it is estimated there will be a 34% increase over 1959 in the number of aged patients in mental hospitals."

He asked for more investment in community mental health facilities and in research and training programs. Otherwise, present trends will burden taxpayers and bring a tragic end to thousands of the aged, the Senator said.

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CE FIELDS

NUTRITION

Desert Snail's Juice Can Save Stranded Men

➤THE SPECIES of snail called Ehrenbergi Roth may rank in the future with the St. Bernard dogs as friends of travelers in distress. These snails can stave off death from thirst among survivors of aircraft crashed in a desert, tests have shown.

The large white snail is found in the Negev, the desert in southern Israel, and in the scrub desert along the north African coast. In its shell it carries up to half a teaspoonful of "water," actually its body fluids.

In times of drought, the snail can seal itself up and last as long as four years. A crashed airman can stay alive about four days in similar circumstances.

Interest in the snails began when a Royal Air Force instructor in the desert survival school in Libya trod on one and noticed it contained moisture.

The Royal Air Force at El Adem collected thousands of Ehrenbergi and sent them in sacks to Flight Lt. John Billingham of the Royal Air Force Institute of Aviation Medicine, Farnborough, England.

Lt. Billingham fed the fluid to two rats, which actually put on weight on the new diet. Analysis showed that the juice contained no dangerous parasites or microbes and no toxic substances.

The Ehrenbergi's juice contains a high quality of protein, and Lt. Billingham, putting it to the test, found that four pints of it a day were enough to sustain him. In his simulated test of a desert crash, Lt. Billingham was shut up in a chamber in which the temperature was sometimes as high as 118 degrees Fahrenheit.

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ORNITHOLOGY

Radiation Clouds Blamed For Changes in Feathers

➤ SCIENTISTS working in the department of zoology and comparative anatomy of St. Bartholomew's Hospital Medical College in London have found strong evidence that birds which have been arriving in Britain with strange plumage have had the colors of their feathers changed by flying through radioactive clouds.

The work has been carried out by Dr. Brian Lofts, aided by Dr. A. J. Marshall, head of the department, and by Prof. J. Rotblat, head of the medical college's department of physics. It was begun when a doctor and amateur ornithologist in southeast England found a strange bird in the estuary of the River Medway early last winter.

Dr. James Harrison of Sevenoaks, Kent, came across the bird, a redshank, in Milfordhope Marsh. It was identifiable by its bright orange-red legs which give it its name. But Dr. Harrison was surprised to see that the bird had its spring feathers—with chestnut tints and black streaks which are never normally seen until March or April at the earliest.

Dr. Harrison was baffled until he read a report of similar out-of-season plumage on birds in Kenya. John Williams of Nairobi had found several birds with the "wrong" feathers. The birds discovered in East Africa were found to have come from Russia. Mr. Williams believed that they might have flown through a radioactive cloud resulting from one of the Soviet Union's nuclear bomb tests.

A month after his discovery of the redshank, Dr. Harrison found another bird shot down in southeast Sussex which had its summer plumage in mid-winter. This, too, had probably come from northern Europe.

The second bird was sent to Dr. John Loutit of the radiobiological research unit at the British Atomic Energy Authority's establishment at Harwell. He found that the bird was radioactive.

The whole case was then given to the St. Bartholomew team, who have found that they can artificially change birds' feathers by submitting them to radiation.

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MEDICINE

Public Health Service Has Polio Problems

➤ BEFORE THE SABIN oral polio vaccine is used in this country, several problems should be resolved, the National Foundation indicated in calling a special meeting of its Advisory Committee on Virus Vaccines.

The Foundation's March of Dimes program has long helped battle polio. Its funds paid for the development of the earlier Salk vaccine and now the new Sabin vaccine. The Sabin vaccine was named by the U. S. Public Health Service on Aug. 24 as the live-virus polio preventive suitable for Government license.

The Foundation committee met in New York Sept. 14 to discuss viremia—the presence of polio virus in the blood—after administration of the Sabin vaccine. Some of the strains in live vaccines have been found to cause this condition on occasion.

With viremia the likelihood of the vaccine affecting the central nervous system is greater. Dr. Thomas M. Rivers, the Foundation's vice-president for medical affairs, has indicated there is need for further evidence on the subject.

The Foundation is also sponsoring further research on the problem of reversion, or the extent to which weakened vaccine viruses regain some of their original strength after passing from vaccinated to unvaccinated persons.

The Foundation's recommendations may affect the Public Health Service's writing of rules to govern the use of the new vaccine. The vaccine was developed by Dr. Albert B. Sabin of the University of Cincinnati. Four drug companies are preparing to bring it to market by the middle of 1961.

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BACTERIOLOGY

Worms Test for Poison From "Golden Staph"

➤ WORMS CAN probably serve as laboratory animals in testing for enterotoxin, the the food poisoning material produced by *Staphylococcus aureus* organisms, University of Wisconsin studies in Madison, Wis., indicated. The worms used are called soil nematodes and are just large enough to be seen with the naked eye in strong light.

Bacteriologists Myrtha Rosas del Valle and Elizabeth McCoy said the nematode test looks extremely promising. They pointed out that nematodes can be mass produced and easily controlled in laboratory cultures. Because of this, it is possible to use more of them in testing than if more expensive animals were involved, thus increasing the accuracy of the test.

Results of the test are easily interpreted by watching the nematodes which had been eating the food to be tested. If mildly affected, they lose their snake-like motion temporarily; if severely poisoned, they die. The minimum time for producing a reaction on the nematodes is 30 minutes; readings are confirmed after one hour, and if no effect is shown after four hours, negative results are reported.

While the University of Wisconsin tests were concerned primarily with milk powder, the bacteriologists said that food poisoning cases have been traced to the *Staphylococcus aureus* enterotoxin in many foods. Man carries the bacteria in light scratches and in deeper infections such as boils.

University bacteriologists are continuing their studies, to make sure the nematode test is specific for enterotoxin, and plan to study ways of controlling the production of enterotoxin.

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MEDICINE

Mental Patients Sleep With New Pill, Hyptran

➤ MENTAL PATIENTS can get a good night's sleep with new tablets called Hyptran, which contain a combination of a barbiturate and a slow-acting tranquilizer.

Dr. Oscar Rozett, medical director of Fair Oaks Hospital in Summit, N. J., reported that the tranquilizer used is phenyltoloxamine. In studies conducted for more than a year, Dr. Rozett and his associates experimented with several tranquilizing drugs, and finally found one that worked well in combination with secobarbital, a slow-acting but safe barbiturate.

Hyptran tablets contain a small amount of secobarbital and a divided dose of the tranquilizer. Sleep is induced within an hour and anxiety is controlled by the release of the tranquilizer from an inner core two hours later.

The average duration of sleep for 112 patients who took Hyptran tablets was seven and a half hours. Nine per cent of the patients woke during the night, but second doses returned them to sleep.

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