BOTANY

Parasitic Evergreen Tree Found in New Caledonia

"SOMETHING NEW to science" has come out of the forests of New Caledonia.

It is a parasitic evergreen shrub, one that differs from all other evergreens, Dr. David J. deLaubenfels of the University of Georgia reports. No gymnosperm, a plant bearing naked seeds such as those in a pine cone, had been known to have a parasitic relationship to other plants.

The unusual species, *Podocarpus ustus,* has been rarely collected and probably never studied in its natural surroundings. One of the difficulties in studying this shrub is the "uncooperative habit" of its fleshy red or purple scale-leaved branches: they disintegrate when preservation is attempted.

The shrub's fleshy red branches were a clue to its parasitic nature, Dr. deLaubenfels says. In New Caledonia, an island off the northeast coast of Australia, one of these shrubs was actually found growing out of the base of another evergreen. The larger of its emerging stems was about one-half inch in diameter, compared with the host stem diameter of three inches.

Most of the parasitic shrub's woody roots travel up the host's trunk, imbedded in the bark between the cork cambium and the vascular cambium. No normal phloem—the tissue that conducts food materials—was produced, Dr. deLaubenfels reports in *Science* (July 10). There was no fusion of tissues of host and parasite as might occur if the plants had become naturally grafted together.

Since the parasite usually grows on the open forest floor, the one studied may not be typical. Probably most of these shrubs are root parasites. Its preferred host may be a rare, unnamed conifer, Dr. deLaubenfels says. This specimen's host was common in the area studied, yet few parasites were found. This seems to point to an unknown host.

Science News Letter, July 25, 1959

PUBLIC HEALTH

Strontium-90 in Milk Increased in 1958

RADIOACTIVE STRONTIUM-90 deposited in the bones of children in the New York area in 1958 was about twice as much as during 1957.

This increase is due largely to the heavy nuclear bomb test schedule of the U.S.S.R., Dr. Merril Eisenbud, manager of the Atomic Energy Commission's New York Operations Office, charges.

Strontium-90, a by-product of nuclear bomb explosions, reacts chemically in the body just as calcium does, concentrating in the bones. In sufficient amounts, this radioactive chemical stored in bones could cause cancer.

Dr. Eisenbud estimates that the total world-wide fallout of strontium-90 increased from 1.9 megacuries to 2.6 megacuries during the period from June, 1957, to October, 1958. A megacurie is a million curies, the curie being a unit for measuring radioactivity.

During this same period, the amount of strontium-90 in the stratosphere, some 50,000 feet and higher above the earth's surface, has increased from 1.4 megacuries to 4.3 megacuries. Radioactive debris stored in the stratosphere sifts slowly earthward over a period of years. How much time is needed to remove a given amount of it is still not known definitely. Dr. Eisenbud estimates that 90% of the stratosphere debris will fall out in the next ten years.

Using these figures, Dr. Eisenbud calculated that children in the New York area will develop a skeleton having 5.5 micromicrocuries (millionth of a millionth of a curie) of strontium-90 per gram of calcium. This is about five percent of the dose due to natural radioactivity from cosmic rays and other sources, Dr. Eisenbud reports in *Science* (July 10).

Lifetime exposure to strontium-90 at an average level of 80 micromicrocuries is believed not to cause appreciable bodily injury to a human being.

Science News Letter, July 25, 1959

ENTOMOLOGY

"Hatched" Adult Insect Continues Maturing

WHEN THE HONEY BEE stops being a larva, it does not start right in as a full-blown adult bee.

Contrary to some theories on insect metamorphosis, development of the adult insect is not an abrupt changeover from, for example, caterpillar to butterfly. Important biochemical changes continue to occur that influence such things as flying ability, color and sexual maturity.

Studies of enzyme activity in the adult worker honey bee provide evidence for this long-term maturation process, Dr. Morris Rockstein of New York University-Bellevue Medical Center reports.

There is probably a relationship between the bee's developing function of flight and changes in its biochemistry, particularly in the enzyme cholinesterase's activity in the brain.

Other adult "metamorphoses" reported by Dr. Rockstein include the development of pigment in the adult cockroach and the role of the corpus allatum in post-emergence maturing. The corpus allatum produces the so-called juvenile hormone, believed responsible for maintaining insects in the pre-adult stage. However, Dr. Rockstein says he has learned from researchers in the field that this organ also may be responsible for changes other than sexual maturation. The corpus allatum appears to regulate body metabolism in general.

Dr. Rockstein's comments on "metachemogenesis," the biochemical maturing of insects after they have emerged, appear in "Studies in Invertebrate Morphology" published by the Smithsonian Institution in honor of Dr. R. E. Snodgrass, one of the world's foremost insect morphologists.

Science News Letter, July 25, 1959

IN SCIEN

CHEMISTRY

Future Houses to Change Color on Hot Days

SOME DAY HOUSES may change color from a verdant green to a pale yellow under a hot summer sun.

This color change, effected through "automatic" chemistry, would help keep the house cool. The lighter color would reflect more of the sun's rays. In winter, the house would retain its dark color to absorb the sun's warm rays.

This possibility was suggested by Space Technology Laboratories, Inc., following development of a chameleon-like coating for satellites.

Devised by Rudolf X. Meyer of the Laboratories' Physical Research Laboratory, the coating has been designed to keep satellite temperatures relatively constant to prevent certain instrument failures.

The scientist found about 35 substances have the "chameleon" ability. In the case of polymer compounds, automatic reversible transition from the "sol" state to the "gel" state accomplishes the color change as temperature goes up.

Science News Letter, July 25, 1959

ANTHROPOLOGY

Games Related to Society and Environment

GAMES MAY BE CONSIDERED exercises in mastery over the supernatural, the social system, and the environment or the individual himself.

As theorized by three anthropologists, games may be placed in three classes: strategy, chance and physical skill. The prevalence of one class depends upon a people's peculiar culture and geographical location.

The theory holds that:

Games of strategy, such as chess, are found mostly in complex societies. They enable the individual to exert symbolically his mastery over the social system.

Games of chance, such as shooting dice, appear to be associated with religious activities among primitives, who attribute their "luck" to supernatural intervention. Mathematical theories of chance have somewhat displaced this feeling in more advanced cultures.

Games of physical skill, such as foot races, provide the individual with a sense of mastery over himself and his environment. Such games vary with geographical location, temperature, humidity, and other factors.

The theory is suggested in the forthcoming *American Anthropologist* by Drs. John M. Roberts, Cornell University; Malcolm J. Arth, Harvard University, and Robert R. Bush, University of Pennsylvania.

Science News Letter, July 25, 1959

CE FIELDS

CHEMISTRY

New Table Devised for Abundances of Elements

A NEW TABLE for the abundances of all the chemical elements has been drawn up by a Canadian scientist.

His revision of previous estimates on the proportions of the 92 naturally occurring elements is based partly on the thermonuclear reactions by which stars are stoked. Dr. A. G. W. Cameron of Atomic Energy of Canada Ltd., Chalk River, Ontario, found that many of the prior figures for abundances did not have to be revised at all.

Hydrogen, for instance, is still the most abundant element, although Dr. Cameron finds it not quite so prevalent as others have thought. Next most abundant is helium, followed by oxygen, carbon, nitrogen and silicon, in that order.

However, in the rare earth region, the 15 elements of atomic numbers 57 to 71, substantial changes were made. Dr. Cameron's table is a revision of one reported by Drs. H. E. Suess and H. C. Urey, both now at Scripps Institution of Oceanography, La Jolla, Calif. Their table was based on abundances as found in meteorites.

Dr. Cameron's new table is the result of investigating the nuclear reactions that accompany the burning up of carbon by thermonuclear reactions in hot stars and is reported in the *Astrophysical Journal* (May).

When a star is formed out of the gas and dust in interstellar space, it consists mostly of the light gas, hydrogen, the most abundant element. As the star's center heats up, the hydrogen is converted into helium. After the hydrogen is exhausted the helium is changed to carbon by a new set of thermonuclear reactions.

Science News Letter, July 25, 1959

MEDICINE

Russia Can Supply Live Virus Vaccine to World

RUSSIA IS CAPABLE of making enough live virus polio vaccine to supply the world, and would probably be only too glad to do so, the developer of one of the vaccines told SCIENCE SERVICE.

Drug companies in the U. S. should get on the job and make the vaccine so it will be on hand, even though the Public Health Service now refuses to issue a license releasing the vaccine for general use in this country, Dr. Albert Sabin of the University of Cincinnati said.

If and when the PHS should license the Sabin vaccine, it would be the first license issued by that Government agency on the basis of Russian tests and data.

On July 15, all inoculations with the oral vaccine were to be halted in Russia. At that time, 6,374,000 persons in the U.S.S.R. will have received the vaccine, which can be manufactured at one one-hundredth of the cost of the Salk vaccine.

A special advisory committee to the National Foundation recently decided not to recommend the Sabin live virus vaccine for general use in this country at this time.

The questions raised by the PHS and the Foundation concerning the safety of the vaccine can be answered by the field trials being carried on in Russia and Czechoslovakia now, Dr. Sabin said in a private interview. The questions will not be answered by further tests in monkeys or other laboratory procedures, he emphasized.

The Foundation assured Dr. Sabin that a group of American scientists would be sent to those countries to inspect for themselves the methods by which the Russian tests were carried out. The Russian scientists, visiting the U. S. for the recent weeklong live virus polio conference, expressed a willingness to have the American group visit the Soviet labs and inspect their production and testing techniques.

Dr. Sabin testified before a Government operations subcommittee on the future of international medical research, chaired by Sen. Hubert H. Humphrey (D.-Minn.).

Science News Letter, July 25, 1959

PEDIATRICS

Newborns See Better Than Formerly Thought

NEWBORN BABIES can detect motion more sharply than was formerly thought.

A test of the detection of motion, by 100 babies, some less than one day old, revealed that their eyesight was much better than doctors had previously thought.

Each baby's eyesight was tested by placing him or her under an arc of paper. A pattern of equally wide black and white stripes, printed upon the paper, was then rolled across the arc above the baby's head, simulating the effect of a rotary cylinder.

The effect created by the motion of these stripes resembles what doctors call opticokinetic nystagmus. This is simply the same as the effect of looking through a window in a moving train. The eyes of the passenger follow the passing telegraph poles in a rhythmic pattern, three Harvard University researchers explain in the *Sight-Saving Review* (Summer).

Previous rough estimates on the acuity of infants placed it at 20/2500 at four months and 20/400 at six months. (As the child grows older, his acuity improves and eyesight approaches perfection, 20/20 vision.) The results of these tests indicate that newborn infants have 20/450 acuity, or roughly, vision that was believed to take six months to acquire. A large portion of the newborn did even better by registering acuity at 20/350.

The major value of the apparatus, constructed by Drs. John J. Gorman, David G. Cogan and Sydney S. Gellis, will be to provide the physician with a definite clue to an infant's need for more examinations and treatment.

Science News Letter, July 25, 1959

BIOLOGY

NSF Grants $1,500,000 For Unique Laboratory

A UNIQUE LABORATORY, probably the only one of its kind in the world, will soon give botanists and zoologists a chance to get together in some interesting research.

They will be able to study plants and animals in environments of the scientists' own choosing. Plans for the new controlled-environment laboratory, being constructed with the help of a $1,500,000 grant from the National Science Foundation, include some 30 artificially lighted growth rooms. Areas for sterilization, harvesting, photography, as well as equipment and space for nutrient culture work will be provided.

The animal study section will contain rooms with precise control of temperature, humidity, light, noise, air velocity and atmospheric composition and pressure. Closed circuit television viewing of plants and animals will also be possible.

The laboratory, to be built at the University of Wisconsin, will permit "individual control of a whole range of climatic variables," Dr. Alan T. Waterman, NSF director, said.

Physiological, ecological, pathological, behavioral and climatological problems can all be studied at the new facility, he pointed out. "The laboratory will be available for use by all qualified investigators, and living facilities will be made available by the University for those who come to use the laboratory for extended periods."

Science News Letter, July 25, 1959

ELECTRONICS

Loudspeaker Combines Tweeter-Woofer Hi-Fi

A FLAT LOUDSPEAKER has been developed in Israel that combines the vocal virtues of your hi-fi set's tweeters and woofers.

Several prototypes have been built by electronic engineer R. Gamson and Dr. Ephraim Frei of the Weizmann Institute of Science at Rehovot, Israel.

The inventors believe their space-saving "Isophase Speaker" design is particularly suitable for hi-fi monaural and stereophonic equipment and television receivers.

The flat speaker is said to act like electrostatic (tweeter) and electrodynamic (woofer) speakers for best reproduction in one unit of high and low notes, respectively.

Gone is the bulky paper cone which takes so much power to shove in and out for window-rattling kettledrum booms. The cone is replaced in the new design by a thin membrane having a zig-zag electric circuit printed on it.

The membrane vibrates to and fro in a magnetic field created by thin strips of powerful ferrite magnets, it was reported to SCIENCE SERVICE.

The membrane swings in unison over its entire area, giving sound waves that exactly match the pattern of electric current applied.

Science News Letter, July 25, 1959