

FORESTRY

Scientists Breeding New Shade Trees

➤ BREEDING new and better shade and ornamental trees for home and street planting is the aim of a planned breeding program under the guidance of the U. S. Department of Agriculture.

One of the first results is a narrow, pyramidal hybrid of red and silver maple. Developed at the National Arboretum, scientists hope it will carry the good qualities of both parents.

Other new trees now being developed in nurseries and botanical gardens throughout the country include lower growing maples, columnar cherry, globe linden, golden sycamore and eucommia, a hardy rubber tree.

It will be several years before any of these trees are generally available, Dr. Henry T. Skinner, director of USDA's National Arboretum, Washington, D. C., cautions. Short supply of propagating material, new selections represented by a single tree, trees that do not reproduce true to form from seed, and seeds that do not germinate, all slow down the breeding process, he explained.

The new trees are gathered from both here and abroad.

Although many of the shade and ornamental trees now on the market are excellent, they are limited in use because of their special soil and climate requirements. It is hoped that by planned breeding, highly desirable and more universal trees can be offered to the public.

Science News Letter, April 20, 1957

CHEMISTRY

Cellulose Molecule Made Fireproof

➤ FIREPROOF TEXTILES have been made by remodeling the chemical structure of cotton and viscose rayon by introducing changes in some of the original parts of the molecules.

Robert F. Schwenker Jr. of the Textile Research Institute, Princeton, N. J., and Dr. Eugene Pacsu, Princeton organic chemistry professor, told the American Chemical Society meeting in Miami how built-in flame resistance and smolder-proof properties had been obtained.

Most fire-retardant textiles have a chemical coating to combat burning. The new process follows a mechanistic theory for the decomposition of cellulose at elevated temperature.

Experiment and theory have indicated that a suitable chemical modification (of the primary alcohol group at the 6-carbon of the glucose anhydride unit) of the cellulose chain should impart flame and glow resistance.

It was also possible to introduce elements, including bromine and iodine, to suppress flaming and afterglow as well as alter the reaction path. In the cotton and

rayon fibers this was done without impairing essentially the textile properties of the original materials.

The chemists expect the same methods can be used to produce flame-resistant wood pulp products, such as fiberboard and insulation.

Cellulose derivatives that show a high degree of flame resistance were also reported by Dr. Elias Klein and James E. Snowden of the Southern Regional Research Laboratory, New Orleans, La. The new textile fibers were made by replacement of hydroxyl groups in the cellulose of cotton. They are expected to have practical uses.

Mildewproof and rotproof cotton suitable for use in awnings, tenting, tropical clothing, ironing board covers and sandbags are promised for the future by the process known as cyanoethylation now used on a small scale. Acrylonitrile, produced from natural gas and used in production of the synthetics Orlon and Acrilan, is joined with cotton in this process.

A method of reducing costs of cyanoethylation was reported by Norbert M. Bikales of the American Cyanamid Co., New York.

Science News Letter, April 20, 1957

METEOROLOGY

South Pole Hits Low of 89 Below

➤ THE LOWEST TEMPERATURE yet recorded at the South Pole was 89 degrees below zero Fahrenheit on April 2. (See SCIENCE NEWS LETTER, Jan. 12, p. 19).

Since this record was reached at a time roughly corresponding to September in the Northern Hemisphere, temperatures are expected to plunge even lower, perhaps to 120 degrees below zero, within several weeks.

Results of the first temperature soundings, made on March 27, at the 10,000-foot high IGY Amundsen-Scott South Pole Station were announced by Dr. Joseph Kaplan, chairman of the U. S. National Committee for the International Geophysical Year.

Temperatures of 71 degrees below zero Fahrenheit at the surface, 38 below at 3,300 feet and 62 below at 11,500 feet above the surface were recorded by a radiosonde balloon on March 27.

Meteorological observations are an important part of the scientific studies being conducted in the Antarctic as part of the world-wide International Geophysical Year. They are expected to show how the polar ice cap affects world weather, and also the world's climate over a longer period of time.

Comparison of the relatively clean air of Antarctica with the atmosphere of coal- and oil-consuming regions is expected to give information on the suspected "greenhouse" effect caused by the release of large amounts of carbon dioxide.

Results of the first South Pole sounding were given to Dr. Harry Wexler, chief scientists of the United States-IGY Antarctic program, by Edwin C. Flowers, the Weather Bureau's chief meteorologist at the South Pole station.

Science News Letter, April 20, 1957

IN SCIEN

AERONAUTICS

Board Proposed For Air Safety

➤ ESTABLISHMENT of an Airways Modernization Board to test and evaluate systems for improving the safety of the nation's airways has been proposed to Congress by President Eisenhower.

He urged "early enactment" of legislation setting up the three-man Board, which would be an independent agency reporting directly to the President.

Recommendation for its establishment was made in an interim report by Edward P. Curtis, President Eisenhower's special assistant for Aviation Facilities Planning and vice-president of Eastman Kodak.

The final report, scheduled for May 1, is expected to call for far-reaching changes in the Government's system for controlling aviation matters, now divided between the Defense and Commerce Departments.

The Airways Modernization Board would tie in with these long-range plans, but is being handled separately because of the gravity of present and future air traffic problems. Its members would be a chairman appointed by the President, and representatives of the Defense and Commerce Departments.

Such problems as what computer is best adapted for handling air traffic information to speed up flights would be investigated and settled by the new Board.

Science News Letter, April 20, 1957

PUBLIC HEALTH

Cattle Caught in Fallout Cancerless

➤ NONE of the cattle accidentally exposed to heavy radioactive fallout from the 1945 atomic explosion in Alamogordo, N. Mex., have developed cancer, Col. Carl Tessmer, chief of the radiation injury section, Armed Forces Institute of Pathology, told the International Academy of Pathology meeting in Washington.

The cattle received unknown but heavy doses of beta radiation as the fallout dust settled and remained on their backs, Col. Tessmer reported.

Although graying and loss of hair, extensive crusts and prominent overgrowths were present on their hides, the absence of cancer 12 years after exposure, when the animals are nearing the end of their life span, is a reassuring development, he said.

Human Marshall Island inhabitants who were inadvertently exposed to fallout from the Eniwetok atomic explosion in March, 1954, have also shown no serious consequences of their exposure, he added.

Science News Letter, April 20, 1957

CE FIELDS

RADIO ASTRONOMY

Watch Radio Waves From Comet Rivaling Halley's

► THE COMET Arend-Roland predicted to rival or outshine Halley's in brightness is being scanned for radio waves. (See p. 250.)

The Government's largest radio telescope, a sensitive, 50-foot antenna at the Naval Research Laboratory in Washington, is tuned in at a frequency near 1667 megacycles, and aimed at the comet's expected position in the sky.

The Naval Research Laboratory scientists are looking for the hydroxyl group, OH, in the comet's tail. This group has been seen optically in comet tails, and is predicted to emit radio waves at about 1667 megacycles. If the hydroxyl is found, it will be the first time that its radio waves have been detected from any heavenly object.

Science News Letter, April 20, 1957

ASTRONAUTICS

"Snooper" Ship Feasible Now for Exploring Space

► A SPACE SHIP that can be made cheaply with the know-how and materials on hand was described at the American Rocket Society meeting in Washington.

Called the "Snooper" by its designers, the space ship is a non-return, robot rocket propelled by ions, electrically charged atoms and molecules. Armed with television, radar, communications equipment and auxiliary power supply systems, the ion-propelled rocket could easily snoop about in outer space and conduct long-term reconnaissance of the planets and sun.

"This exploration vehicle," claim its designers M. I. Willinski and Mrs. Elsie C. Orr, research engineers of Rocketdyne, a division of North American Aviation, Inc., "will be propelled by a nuclear-powered, extremely high specific impulse, ion rocket. Such a propulsion system obtains its thrust by the electrical acceleration of ionized gases to extremely high velocities (657,000 feet per second)."

The nuclear reactor is used to produce the electrical field necessary to accelerate the ions. It would also supply power for the three-quarters of a ton of instruments to be carried by the vehicle which has been estimated as weighing one and one-half tons.

The Snooper as seen by its designers would look somewhat like a giant moth with wings spreading out for 66 feet from the back end. The wings would dissipate the excess heat generated by the nuclear reactor.

A contract to study the possibilities of ion propulsion has been awarded to Rocketdyne by the Air Force.

The designers propose lifting the ion rocket into an orbit around the earth by chemical fuels similar to those suggested for an intercontinental ballistic missile.

After the Snooper reaches its orbit, the wings are spread and the instrument section is extended far forward of the nuclear reactor to avoid radiation damage.

Since the Snooper will be unmanned, there will be a great saving in weight and cost, the engineers reported.

Science News Letter, April 20, 1957

MEDICINE

Method Preserves Eye Corneas for Two Years

► THE CORNEA of the eye can be preserved for as long as two years, reported Dr. John Harry King Jr., consulting ophthalmologist to the U. S. Surgeon General, at the Sight Saving Conference of the National Society for the Prevention of Blindness and the Pan-American Association of Ophthalmology meeting in New York.

The eye tissue, which is dehydrated in glycerine in the new process and can be stored at room temperature, has already been used in cornea transplant operations, Dr. King said.

The process of dehydration is an inexpensive and simple one and does not cause cell damage as did the freezing process previously attempted in England.

Conventionally treated corneas become useless within a few days after their removal from the donor's eyes, Dr. King said, but if they are dehydrated, they remain alive for an indefinite amount of time.

Although eye banks serve an excellent purpose, the demands for corneal transplants still overshadow the supply. Sight-restoring operations are now limited because donor corneas are not available when they are needed, and unused corneas must be discarded several days after removal.

Science News Letter, April 20, 1957

ASTRONOMY

Supernova Found in Far-Distant Galaxy

► A SUPERNOVA, a star that suddenly blazes forth at 100,000,000 times the sun's brightness, has been spotted in a far-distant galaxy known only by its number, NGC 5033.

The brilliant object, of magnitude 15, is located in the constellation of Canes Venatici, the hunting dogs, seen nearly overhead about mid-evening. The supernova was discovered by Dr. Edwin F. Carpenter, director of the University of Arizona's Steward Observatory in Tucson.

Information on the discovery was distributed by Harvard College Observatory, clearing house for astronomical information in the Western Hemisphere.

Science News Letter, April 20, 1957

OCEANOGRAPHY

Chemical Elements Tell History of Seas

► THE SEA contains all the chemical elements and a large variety of organic substances, Dr. Dayton E. Carritt, Johns Hopkins University oceanographer, told the American Chemical Society meeting in Miami.

Analysis of sea water for its constituents, often performed on a rolling ship at sea, is helping scientists understand what is happening to life, currents and other aspects of the ocean, he explained.

The weathering of rocks of the earth's crust and the release of volatile substances from the earth's interior determine the oceans' chemical composition, Dr. Edward D. Goldberg of the Scripps Institution of Oceanography, La Jolla, Calif., told the chemists. What happened in the oceans of past geological periods can be known by the deposits laid down by the sea in those ancient times.

Science News Letter, April 20, 1957

BIOLOGY

Growth Hormone Affects Living Cells Directly

► EVIDENCE that shows for the first time where the growth hormone exerts its power to stimulate growth is reported in SCIENCE (April 5).

The work of two University of California researchers indicates that the growth hormone has its effect in the individual living cells, making them multiply and manufacture protein. In the past scientists have questioned whether growth hormone acts indirectly through some gland of the body.

Growth hormone is one of a number of secretions—ACTH is another—produced by the pituitary, the master gland at the base of the brain. In the case of ACTH, it has long been known that this secretion acts on the adrenal glands to stimulate cortisone production. But the mode of action of growth hormone has remained unclear.

Dr. Henry D. Moon and Leone St. Vincent of the University of California Medical Center, San Francisco, supplied growth hormone to one of two batches of rat embryo cells being grown by standard tissue culture methods.

At the end of four days the number of cell nuclei and the amount of protein material in the cultures receiving growth hormone were significantly larger than in the cultures that did not receive hormone.

The scientists said the growth increase in the hormone-cultured cells was from 3% to 20% greater. Although the 3% growth increase is not a statistically significant amount, the rate of growth as a whole was consistently greater than in cells not treated with the hormone. The variation in the increase indicates that other, unidentified factors were also influencing cell growth rates, the scientists said.

Science News Letter, April 20, 1957