

BOTANY

Plant Growth Substances Confuse Sex in Flowers

► PLANT GROWTH SUBSTANCES have confused the green world so thoroughly that some plants are producing flowers of the opposite sex.

Dr. E. W. Weston of the University of London reports in *Nature*, 188:81, 1960, that female hop plants have produced male flowers after being sprayed, during early stages of growth, with low doses of a weakly active plant growth substance, alpha (2-chlorophenylthio) propionic acid.

Other researchers, Dr. Weston notes, have reported female flowers on male plants after spraying with other growth substances, 2:4-dichlorophenoxyacetic acid and indoleacetic acid.

The difference in which way the sex change goes depends upon whether the plant to be sprayed is a short-day plant, like poinsettias and chrysanthemums, or a long-day plant, such as hop plants and spinach.

Short-day plants are those that begin to flower when the days begin to shorten and the nights become longer. Long-day plants behave just the opposite.

High auxin (plant growth substance) levels in short-day plants might promote pistillate or female structures, Dr. Weston asserts, while high auxin levels in long-day plants enhance staminate or male structure formation.

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MEDICINE

"Sick" Parties Can Cure Desire for Alcohol

► ALCOHOLICS known as the "bucket brigade" are getting together for daily drinking parties that end when everyone is thoroughly sick. The parties last less than an hour and the main cocktail is plain water.

Drs. Ernest C. Miller and B. Anthony Dvorak and third-year medical student Don W. Turner, all of the Tulane University School of Medicine, New Orleans, La., explain that the experimental parties are designed to teach the alcoholics that any alcoholic beverage will make them vomit. Drugs that enhance emesis (vomiting) when alcohol is consumed are used to help the patients along.

When the party begins, each patient enters the room with a bucket and a towel. He is given a water glass and a jigger glass. On a spotlighted table is an array of vodka, Scotch, bourbon, gin, rye, rum, wines, 95% ethyl alcohol, a liqueur and beer.

After drinking two glasses of water, each patient gets an injection of a drug mixture containing emetine and is then asked to pour a drink for himself. At frequent intervals each man sniffs at his glass, and only when gagging begins, or when it seems likely that the individual is about to vomit, is he asked to drink the liquor. Between bouts of emesis the patients are encouraged to drink large amounts of water, and as many different beverages as

possible are included in the pour-sniff-drink routine.

The group is not released until "all doubt is dispelled from the mind of each participant that he cannot tolerate any of the alcoholic beverages on the table." This usually takes 30 to 45 minutes a day for two weeks.

The power of suggestion—that the smell, taste or even the sight of alcohol produces nausea and vomiting—is very strong among members of the group. In many cases, the researchers report in the *Quarterly Journal of Studies on Alcohol*, 21:424, 1960, it is advantageous to include a "ringer" or previously conditioned member in the group.

The project has been in operation eight months, and to date, five of the 20 patients treated have remained abstinent, three have had brief lapses of from one to three days of drinking and two patients have returned to their old habits. The other ten have not been followed up.

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ENTOMOLOGY

Pestiferous Face Fly Across Mississippi River

► FACE FLIES, the enemy agents that invaded New York from Nova Scotia in 1953, have succeeded in pushing their psychological warfare campaign across the Mississippi River into the central states.

Although not known to be carriers of a fatal disease, these pests can worry a horse or cow to a frazzle by lapping up fluids around the eyes and nose and around open wounds. There are reports that horses are particularly hard to handle after irritating attacks from face flies, and that cows refuse to feed properly and their milk production drops.

The face fly stayed in the New York state area until 1957-1958. Now, in three years, it has spread to every state east of the Mississippi River as far south as Tennessee and West Virginia, and it is making a bee-line for the West Coast. Minnesota, Iowa, Missouri and Nebraska have reported the pest. But western Pennsylvania is the hardest-hit area at present.

Entomologist W. G. Bruce of the U. S. Department of Agriculture admits that not too much is known about the fly. There is no known effective control, but a mixture of syrup, water and DDVP is doing some good. DDVP is dichloro-diphenyl-vinyl-phosphate.

This fly does not attack in the shade, inside barns and other buildings. It usually stays out in the bright sunlight except in the fall when the temperature drops.

Some Canadian investigators believe the pest is associated with outbreaks of pink eye (infectious keratitis), but this has not been proved.

One reason the face fly has such a head start is that it looks much like the common house fly. Farmers ignore it at first. There are differences, however, in the head anatomy and in the veins of the wings. There is also a difference in the mouth parts, since the face fly does not bite, but rather laps up fluids.

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IN SCIENCE

METALLURGY

Cuban Nickel Inferior To That of Other Places

► IN CLOSING its \$110,000,000 nickel plant at Nicaro, Cuba, the United States is closing off a major source of nickel—but an inferior one. The U.S. has announced it is ending production at Nicaro because of "confiscatory taxes and harassment" by the Cuban Government.

In recent years the U.S. has imported more than 20,000 tons of oxide powder and sinter (cinder-like material) from Nicaro. In the same years, imports from all countries totaled about 30,000 tons of oxide powder and sinter plus between 60,000 and 100,000 tons of pure nickel.

The powder and sinter came from Cuba and Canada. The pure metal came from five European countries and Japan. The nickel powder and sinter produced by the Nicaro plant had more impurities than has the Canadian.

When there was a big demand for nickel, buyers accepted the Cuban nickel gladly, but during 1958 an oversupply of nickel developed. Buyers began to look for higher grade material. A research program was directed toward improving and diversifying the Nicaro products, but increased activity of the Cuban revolution in the Nicaro area in the last part of 1958 ended the research.

The major use of nickel, exclusive of scrap nickel, in the U.S. has been for stainless steels.

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MEDICINE

Blood Preserved for Use Up to Thirty Days

► THE PROBLEM of preserving whole blood for use when needed was considerably eased with the announcement that a recently developed preservative can keep enough red blood cells alive to permit safe blood transfusions with blood 30 days old.

Dr. John G. Gibson II, associate in medicine at Peter Bent Brigham Hospital, Harvard Medical School, said clinical tests showed the preparation can be safely stored in routine hospital blood bank practice up to 30 days after collection. The preservative, Citrate-Phosphate-Dextrose, was developed at Harvard Medical School in 1956.

Dr. Gibson said the School's laboratories have now used the preservative to store blood from 27 to 32 days with an average red blood cell survival of 75%. The accepted safe minimum survival of red blood cells for transfusion is 70%.

Earlier this year Peter Bent Brigham Hospital used CPD-preserved blood in open heart surgery. No harmful reactions were recorded. Dr. Gibson tagged the cells with chromium.

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CE FIELDS

MEDICINE

Superior New Antibiotic Attacks Staph Infection

► A NEWLY DISCOVERED antibiotic, demethylchlortetracycline (DMCT), shown to be nearly twice as effective against staphylococcal infection as the older antibiotic tetracycline (TC), is reported in a study of its merits in the *British Medical Journal*, Oct. 1, 1960.

The report on this antibiotic, by a Boston and London medical team, states the new antibiotic may be "entirely new or prove to be related in structure and action to another already known." Research has been in progress since DMCT was first reported three years ago by Dr. J. R. D. McCormick and his associates at the Lederle Laboratories, Pearl River, N. Y.

Drs. Maxwell Finland of Harvard Medical School and L. P. Garrod of the University of London, aided in part by a National Institutes of Health grant, report observations after studying voluminous works of researchers, published and unpublished.

Although the final merits of this new antibiotic have not been decided, the investigators point out the following advantages:

1. DMCT has high stability.
2. Its activity against most bacteria exceeds that of TC by approximately twofold. (Only two daily doses are required, which is an important advantage for patients requiring sleep.)
3. Urine elimination is less than half that of TC, allowing healing concentrations of DMCT to remain in the blood for a much longer time after a dose.

DMCT is available by doctor's prescription. Lederle Laboratories supplied its products "declomycin" and "ledermycin" for the studies. Lederle is the only pharmaceutical company licensed to produce DMCT.

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BACTERIOLOGY

Fluorescent Enzymes Help Bacteria Make Food

► TWO SUBSTANCES that show up as eerie, blue fluorescent lights inside living bacteria are involved in helping these tiny plants change carbon dioxide to food. The discovery brings researchers one step closer to solving the mystery of photosynthesis.

Dr. John M. Olson of Brandeis University, Waltham, Mass., reported at the Symposium on Recent Developments in Research Methods and Instrumentation in Washington, D. C., that in purple bacteria the two chemicals that help "drive photosynthesis" are pyridine nucleotides known as DPN and TPN. DPN is diphosphopyridine nucleotide and TPN is triphosphopyridine nucleotide.

The purple bacteria contain chlorophyll that is active in the presence of far-red light of 8,000 to 9,000 angstroms wavelengths, invisible to the human eye. When the bacteria are receiving none of this red light, the DPN and TPN show a blue fluorescence of relatively weak intensity. When the red light is beamed at the bacteria, the intensity of the blue fluorescence increases. Gradually, after a red light is switched off, the brightness of the blue dims again.

The changes in intensity, Dr. Olson believes, indicate that the carbon dioxide is being "fixed" or reduced to food by the chemicals, which are enzymes.

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AERONAUTICS

Experimental Radar Shows Aircraft Height

► AN EXPERIMENTAL RADAR has been set up at the Federal Aviation Agency's National Aviation Facilities Experimental Center in Atlantic City, N. J., to show how high planes are flying near the Center's landing field.

Conventional radar equipment at airports tells traffic controllers the direction and distance of aircraft, but not the height. FAA officials believe the height-surveying radar may help eliminate crashes in the heavy air traffic near airports.

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ASTRONOMY

Many Stars "Near" Sun Remain Undiscovered

► THERE are probably many stars "near" the sun still to be discovered, Dr. Olin J. Eggen of the Royal Greenwich Observatory, Herstmonceux Castle, Sussex, predicts.

The undiscovered stars belong to two stellar groups known as Hyades and Sirius. The Hyades group is about 130 light years from the sun, and contains about 350 stars, some 200 more than previously believed. A light year is the distance light, traveling at 186,000 miles a second, covers in a year, or about six million million miles. The closest star to the sun is Alpha Centauri, four and a third light years away.

Just as the rails of a track seem to converge in the distance, so the parallel paths of stars in a stellar group are directed toward a point if the cluster is moving away from the sun. This perspective effect is particularly noticeable in the motions of stars of the Hyades cluster.

By analyzing the known motions of all stars, Dr. Eggen found 200 new members of the Hyades group. "There are probably many undiscovered members" of this group and of the Sirius group, near the sun, Dr. Eggen reports in *Monthly Notices of the Royal Astronomical Society*, Vol. 120:563, 1960.

Dr. Eggen found that stars of the Sirius group are younger than those of the Hyades group. Members of the Sirius group in the past were assigned to the Ursa Major stream, which contains the bright stars of the Big Dipper.

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MEDICINE

"Instant Energy" From Blood's Thyroid Hormone

► WHEN YOU EXERCISE strenuously, your body may tap circulating blood reserves of thyroid hormone necessary to produce energy without the need of stepping up thyroid gland production.

This is the belief of Drs. J. Thomas Dowling and J. T. Nicoloff of the University of California Medical School, Los Angeles, and Los Angeles Veterans Administration Center, who have been studying transport of the hormone in the blood. The hormone, thyroxine, is transported through the blood stream in a sort of "towing" operation by special proteins to which it is bound.

Although the thyroid hormone is involved in many bodily processes, thyroid gland production schedule is relatively constant, they point out. Since the gland never seems to step up production appreciably, scientists have been puzzled as to how sudden demands for the hormone are met.

Human volunteers were asked by the doctors to run various distances. Samples of their blood were taken immediately after the exercise and again after they had rested. After they had run as little as 100 yards the binding of thyroxine to proteins was found to be considerably reduced.

This suggested that a small portion of circulating thyroxine was suddenly "cut loose" from its "towing" proteins in order to meet sudden energy demands. Changes in the character of the blood, perhaps acids produced in the exercise process, are responsible for the "cutting loose" of the hormone. An hour after completion of the exercise, binding and "towing" processes returned to normal.

Thus the body may meet temporary needs for thyroxine without sudden strains on the thyroid gland.

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METEOROLOGY

Sealed Orders Help Explore Rain Secrets

► SECRET ORDERS, in sealed envelopes, on cloud-seeding were issued to a University of Chicago weather research team, trying to unlock the secrets of the raindrop this summer.

The ten-man team, headed by Roscoe R. Braham Jr., associate professor of meteorology at the University, used this secrecy as part of a special process to "randomize" the order in which days are selected for seeding clouds with silver iodide.

The weather team was on location in the Missouri Ozarks for its weather spying under a National Science Foundation grant. The object of its research is to identify and isolate physical processes associated with production of rain in summer cumulus clouds and to study the rain-producing effects of the cloud-seeding with silver iodide.

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