

PLANT PHYSIOLOGY

Opposed Growth-Control Chemicals in Sugarcane

➤ THERE IS in sugarcane, and apparently in other plants as well, a substance that checks growth as well as a substance that speeds growth. Plants thus seem to be in the same situation as Alice in Wonderland, who, it will be recalled, made herself taller by nibbling one side of a mushroom, and shorter by nibbling the other side.

Existence of this pair of opposed growth-control substances has been demonstrated by two botanists at the University of Hawaii, Dr. Charles J. Engard and Avaro H. Nakata, who succeeded in extracting them separately by exceedingly careful differential methods. They tested their effects on oat seedlings, which are the plant physiologist's guinea-pigs for growth-control compounds. Existence of anti-growth as well as growth hormones had been indicated in several earlier researches; the present work definitely establishes the fact.

Presumably the growth-inhibiting substance or substances function in establishing a plant's natural size and proportions. As a practical matter, hereafter it will be necessary for experimenters to seek out and separate both kinds of substance, where in the past the discovery of a growth-promoting substance only has been considered sufficient.

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MEDICINE

Rough Motion, Not Mind, Causes Plane Sickness

➤ IF YOU GET airsick, it is because the air is rough, not because you are frightened about flying or expecting to be sick.

Psychological factors may play some part, but not as much as has been claimed for them.

This debunking of psychological factors in air or motion sickness came from a professor of psychology, Dr. G. R. Wendt, of the University of Rochester, to the Aero Medical Association meeting in Atlantic City.

The character of the motion has a lot to do with whether a person will get sick, Dr. Wendt found from studies of persons in an elevator-like cab that was moved up and down in "waves" of different sizes, frequency, form and acceleration.

A 32-cycle wave that was really "rough" and which the people in the

cab expected would make them sick did not cause sickness in as many as a 22-cycle wave. This was one unexpected finding and one which tended to debunk the psychological factors.

The posture of the head had an effect on motion sickness, as did certain drugs.

"The view that airsickness is 'all psychological' is a defeatist position," Dr. Wendt charged. He said that a strong effort should be made to disseminate the evidence that the kind of motion and the state of the body are more important than the state of mind in causing air sickness.

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NUCLEAR PHYSICS

Heart of Atom Holds Three Science Mysteries

➤ THE HEART of the atom and its great energy hold three major mysteries for scientists these days. They are:

1. What holds together the protons and neutrons in the atomic nucleus? (Protons are positively charged and should repel one another.)

2. Why are electrons or electrical particles ejected from the atomic heart which does not contain them?

3. Just what is the meson or mesotron? (This particle discovered in cosmic ray studies lives only a few millionths of a second and then probably reverts to an ordinary electron.)

Giant high voltage machines are being built to solve these atomic secrets, Dr. G. W. Dunlap, General Electric nucleonics engineer, explained in listing the atomic problems.

One of the six kinds of these machines, the synchrotron, will produce energies running into billions of electron volts (an ordinary X-ray machine used in doctor's offices uses a few thousand volts.) One synchrotron proposed will reach ten billion.

Other atom smashers are: Betatron which accelerates electrons to produce high-energy X-rays. Cyclotron, best known among atom smashers, which is a sort of merry-go-round for atomic particles. Synchro-cyclotron, which can produce almost unlimited energies by applying frequency modulation principles to the input. Linear accelerator, which is an "unrolled cyclotron" and for very high voltage could be 100 feet or more long. Electrostatic accelerator, also known as the Van de Graaff machine, the pioneer atom-smasher.

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IN SCIENCE

ICHTHYOLOGY

Parasitic Protozoan Causes Fish Disease

➤ A NEW and serious disease that spoils many fish intended for South African markets, and which can be detected by a ghostly glow given off by infected specimens under ultraviolet light, has been studied by Rees Davies and E. Beyers of the Low Temperature Laboratory in Cape Town, South Africa. Causal organism is a parasitic protozoan, a microscopic one-celled animal that gets into the muscle fibers of the fish and makes the flesh soft and inedible.

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AERONAUTICS

Duplex Planes for Cargo And Passengers Discussed

➤ AIR TRANSPORTATION now has growing pains similar to those of railroad traffic decades ago. The question is: Should passenger planes carry mail, express and freight, or should this "dead" material be hauled exclusively in cargo craft?

Established airlines can handle passengers, mail, express and freight with efficiency and safety, the Society of Automotive Engineers was told by Charles P. Graddick, of United Airlines, Chicago. This combined traffic would justify the operation of more daily flights, and thereby provide air transportation service otherwise not available to smaller communities.

Separate planes for cargo would constitute unnecessary duplication, making traffic and management problems more complicated.

"The airlines," he said, "are perfecting interchange arrangements which will permit patrons to ship over any combination of air routes . . . between any two points in the United States."

Airplane service is not comparable with that of truck and bus lines. These offer service that can not be duplicated by the railroads. Trucks can be loaded anywhere in a city, and unloaded directly at stores or warehouses in other cities. They are not confined to fixed terminals as are both railroads and airplanes.

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E FIELDS

MEDICINE

Will It Be Boy or Girl Answered By New Tests

► PROSPECTIVE parents wondering whether the expected baby will be a boy or a girl no longer need wait nine months for the answer.

Some of them will be able to get it much sooner by two new tests announced at the meeting of the Association for the Study of Internal Secretions. The tests were developed by Drs. H. E. Nieburgs, H. S. Kupperman and R. B. Greenblatt of the University of Georgia School of Medicine.

One of them is a chemical test made on the expectant mother's blood. The test is for the ratio between two kinds of hormones, chemicals produced by the pituitary gland at the base of the brain, which affect the sex glands. One is called FSH hormone, the other LH hormone. When the expected baby is going to be a boy, the amount of LH is greatly increased in proportion to the amount of FSH in the mother's blood, the Georgia scientists find.

The second test is made by staining and studying through a microscope the cells shed by the tissues lining the opening to the uterus, or womb. In some cases there are definite types or patterns of these cells. Where the types are definite, the Georgia doctors can tell with 85.4% accuracy whether the baby will be a boy or a girl. Where the types are not definite, no predictions as to sex can be made.

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PLANT PHYSIOLOGY

Chemical Tests Seeds For Ability to Sprout

► SEEDS CAN be tested for their ability to sprout by a new chemical method in a tenth of the time required by the old-time germination test. The new method, which was further developed in Britain, and is described in *Nature* (May 31) by H. J. Cottrell of the research laboratories of May and Baker, Ltd.

Chemicals belonging to the group known as tetrazolium salts are used in the test. They form colorless solutions in water, but when acted upon by the

enzymes that are present in germinating seeds change into insoluble red dyes.

Representative samples of seeds to be tested are first soaked overnight in water, then split lengthwise so as to expose the embryo or growing point. One half of each seed is then placed in a shallow glass dish and just covered with the colorless tetrazolium solution. They are left in the dark, at moderately warm temperature, for four hours. At the end of that time, seeds of good viability will be stained bright red in the region of their growing parts. The area stained differs, of course, from species to species, but any good botanist or agronomist will know where the red should show up if the seed is good.

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OCEANOGRAPHY

Corals and Algae Build Atolls Very Slowly

► ATOLLS like Bikini are built up by the corals and algae that form them at a rate not more than one-tenth of an inch a year, state Dr. M. C. Sargent of the Scripps Institution of Oceanography and T. S. Austin of the Navy's Hydrographic Office.

A chemical test shows whether an atoll is growing or on the downgrade, they add. High oxygen content in the water shows that organisms are being born; high phosphorus content indicates decay.

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ENGINEERING

Reversing Gas Turbine For Ship Propulsion

► A REVERSING gas turbine in which the flow and temperature of the driving gases do not fluctuate during reversal is offered by C. R. Waller of Trenton, N. J., for patent 2,421,445. It is claimed to be peculiarly well adapted for use in ship propulsion. Patent rights are assigned to the De Laval Steam Turbine Company.

The principle involved is very simple. Driving gases are supplied through a ring of nozzles set at an appropriate angle for forward motion. There is a second ring, with nozzles pointed at an opposite angle. Both rings are movable; so to reverse, the "forward" nozzles are pushed out of the way, and at the same time the "reverse" nozzles are brought to bear. The turbine operates at lower efficiency in reverse, but that is a matter of relatively minor importance.

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MEDICINE

Alcohol Controls Allergy Of House Ivy Poisoning

► SOMETHING different in the way of ivy poisoning came in for discussion at the meeting in Atlantic City of the American College of Allergists.

This is skin trouble from house ivy, the plant housewives keep growing in pots or in ornamental jars of water to decorate the living room or sun porch. Fortunately, it is a rare condition, not many persons being sensitive, or allergic, to this plant.

One case was successfully controlled by treatment with an alcoholic extract made from the house ivy leaves, Dr. Samuel E. Rynes of Philadelphia reported.

The extract, of course, was given by hypodermic injections under the skin, as hay fever victims are desensitized to pollen by injections of pollen extracts.

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INDUSTRY

Byproducts Can Cut Cost Of Manufactured Gas

► MANUFACTURED gas for cities in the northeastern quarter of the nation may cost less in the future, Alfred R. Powell of Koppers Company, Inc., Pittsburgh, told the Production and Chemical Committee Conference of the American Gas Institute.

Biggest hope for lower gas costs in areas where gas is made from soft coal is from new byproducts and new uses for products obtained in the manufacture of gas. The value of the byproducts in making gas from coal is already greater than the return from sale of the gas. New uses and new byproducts are the best bet for smaller gas bills, Mr. Powell declared.

Other factors which can cut the cost of manufactured gas include increased capacity of present equipment for producing gas; greater heat efficiency from present methods; and cheaper plant construction.

Complete gasification of coal, by processes developed in Germany and elsewhere, is not satisfactory for city gas, Mr. Powell warned. He said the processes were planned for special gases and more research will be needed to determine the real value of complete gasification of coal.

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