AGRICULTURE

Rain Leaches Food From Plant Leaves

See Front Cover

➤ RAIN washes away food from the plants themselves, besides leaching plant food from the soil, a team of Michigan State University scientists have discovered.

Using radioactive materials in the plants as tracers, they found that up to 71% of the potash in leaves was removed in four hours of simulated rain. Chemical analysis of the leaves also showed that nitrogen, calcium, magnesium, boron, manganese, iron and copper may be lost in rain.

These findings indicate that continued rain on plants may reduce their growth rate severely, requiring use of supplemental fertilizer for satisfactory crop yields, Drs. W. G. Long, D. V. Sweet and H. B. Tukey told the Conference on Radioactive Isotopes in Agriculture in East Lansing, Mich.

Also described at the meeting were the changes in petal coloring and plant structure that occur in snapdragons grown in radioactive environment.

Norman D. Williams of the University of Nebraska grew the purple snapdragon flower which is shown on the cover of this week's SCIENCE NEWS LETTER at Argonne National Laboratory, Lemont, Ill.

It shows a mutant area or white streak presumably due to a hereditary change caused by radioactivity emitted by carbon 14 supplied to the growing plant.

Science News Letter, February 11, 1956

GENERAL SCIENCE

Honorable Mentions Listed in Talent Search

➤ HONORABLE MENTIONS in the Fifteenth Annual Science Talent Search have been announced by Watson Davis, director of SCIENCE SERVICE.

The young scientists honored go to school in 150 communities, located in 38 states and the District of Columbia. They were chosen from among 20,828 entrants, 3,375 of whom completed the science aptitude examination, submitted recommendations and scholarship records and wrote reports on scientific experiments they had devised and then conducted.

Of the 260 outstanding seniors in the list, 49 are girls and 211 are boys, the ratio being determined by the number of girls and boys who completed entries in the competition.

Forty highest-ranking boys and girls already have been notified that they are winners of all-expense trips to Washington. (See SNL, Feb. 4, p. 69.)

All selected for honors will be recommended for scholarship awards by the nation's colleges and universities.

Students in the honorable mentions list invariably rank high in their high school graduating classes: 35% of the boys and 49% of the girls stood first, second or third in their high school classes.

The honorable mentions did not win their places merely by keeping their noses in books. Without exception they show records of participation in extracurricular activities. Science clubs have attracted 216 of these students. Most of these clubs are affiliated with Science Clubs of America.

Nearly half of the honorable mentions have had experience in local, regional, or state science fairs. Four of them have been finalists at the National Science Fair, also conducted by Science Clubs of America.

State Science Talent Searches in 29 states and the District of Columbia are being conducted concurrently with the national competition, using entries in the National Science Talent Search turned over to the state judging committees.

From their entries they will honor state winners with scholarships to various state colleges and universities, or otherwise assist them with their further study of science.

Science News Letter, February 11, 1956

SURGERY

Surgeon Urges Return Of Walking Canes

➤ A RETURN to the use of walking canes was advocated by the president of the American Academy of Orthopaedic Surgeons at the organization's meeting in Chicago.

Describing the cane as a valuable medical aid, Dr. Walter P. Blount of Milwaukee pointed out that it is particularly helpful as a means of preventing fatigue and for persons who have had bone and joint injuries.

He claimed the cane has fallen into general disrepute because people tend to think of it as a sign of deterioration.

"A fat lady may waddle like a duck when she laboriously walks a few steps, but she resents the suggestion that she carry a cane. She would look much better with a stick than with a limp, and with support she could walk enough to get some exercise. More walking would help with weight reduction," he explained.

In his presidential address, Dr. Blount pointed out that the main purpose of the cane was to relieve stress.

He called for a propaganda war of education to bring the walking cane back into the public favor. Patients with residuals of poliomyelitis need canes, and early degenerative hip disease may require no treatment other than a cane, he said.

In popularizing the cane, Dr. Blount advised, it has to be both efficient and good-looking.

It should hang from the forearm to free the hand, but should remain within easy reach. Canes might be sold like cars on the basis of novelty features. Hidden swords are no longer permissible, but many ancient cane accessories could be revived. Flashlights, bottles, umbrellas and built-in seats would be useful.

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IN SCIEN

FORESTRY

Fewer Fires Burn Out More Acreage

➤ FEWER FOREST FIRES burned out more acreage on Federal lands in 1955 than in 1954, the U. S. Forest Service has reported.

A total of 8,160 fires ate through Government forest land in 1955, compared to 10,462 reported in 1954. These 20% fewer fires, however, consumed almost two and one-half times as much timberland.

In 1955, 365,905 acres burned as compared to 142,253 acres the previous year. California, which had the largest area swept by fire, lost almost half the U. S. total and more than the 10,462 fires altogether burned out in 1954, or 183,525 acres.

Science News Letter, February 11, 1956

SURGERY

Radiation-Sterilized Bones Transplanted

➤ SUCCESSFUL AND SAFE transplantation to human patients of bones sterilized by high intensity gamma radiation from radioactive cobalt was announced by Drs. Paul DeVries, Carl E. Badgley and J. Ted Hartman of the University of Michigan, Ann Arbor, at the American Academy of Orthopaedic Surgeons meeting in Chicago.

Bone sterilized in this way was used in 80 transplant procedures on 67 patients, of which 62 were spinal fusions. Of these, 76 healed without wound infection and without unusual body reaction. Drainage that eventually healed without chronic inflammation of the bone marrow developed in four patients after the operation.

Although the treatment with radioactive cobalt killed any bacteria and viruses that might have been in the bones, there was no residual radioactivity. The character of the bone and its capacity for further growth were not changed.

The bones, which can be taken from dead bodies, are cut into various shapes and sizes by a heavy duty band saw. They are then freeze-dried and sealed in glass tubes under vacuum.

The radiation comes from cobalt rods held in a cylindrical frame and shielded in a water well within a concrete cave.

To sterilize the bone, it is simply necessary to place the tubes containing the bone within the concrete cave and, by means of a remote control winch, raise the source from its well into the radiation chamber.

At the end of a 20-hour period, the cobalt is returned to the well, and the bone removed and stored at room temperature.

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CE FIELDS

MEDICINE

Predicts Less Heart Disease in Ten Years

➤ A PROPHECY that heart disease in young and middle aged people throughout the world will have been markedly reduced ten years from now was given by Dr. Paul Dudley White of Boston, consultant to President Eisenhower's physicians, at the opening of the American Heart Association's 1956 Heart Fund campaign in Chicago.

The prophecy was qualified by the statement "if we go about the task vigorously and adequately."

A plea for funds to extend the study of diseases of the heart and circulation to countries all over the world was also made by Dr. White.

Such studies, he said, "not only can be valuable for the people of the world outside this country, but may actually be more valuable for our own citizens than much of the work that goes on in the laboratories and hospitals in the U.S.A. today."

"President Eisenhower's recent illness," Dr. White said, "has focused the attention of the American people, as never before, on the seriousness of the problem of heart disease.

"It is a national problem, your problem and mine. And the solution can only come through expanded research, education, and the application of the knowledge we already have through programs in the community."

The message from the President which Dr. White read stressed the fact that the President is especially gratified that "hope, rather than fear, is the keynote of the program" of the American Heart Association's campaign.

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BIOCHEMISTRY

Food Eaten May Cause Mental Illness

➤ THE FOOD a person eats may subtly affect his mind up to the point of deranging it.

Studies suggesting this and also suggesting better methods of treating, or even perhaps preventing, mental sickness are under way at the Galesburg State Research Hospital, Galesburg, Ill. (See pp. 84 and 85 for related stories.)

The studies are being made by Dr. William T. Sullivan, and the benefits to come from them are still in the future.

So far, working with animals, Dr. Sullivan has found that very small amounts of anti-vitamins and of anti-amino acids, which all of us normally eat in our food, may block the vitamins and the protein-building amino acids.

In the case of one vitamin, niacin, the anti-pellagra vitamin, mental illness can result if people do not get enough of the vitamin, as has been known for years.

More recently it has been found that a chemical called 3-acetyl pyridine is the anti-vitamin that blocks niacin. An anti-chemical for the important brain chemical serotonin has also been found.

By feeding very small amounts of these chemicals to laboratory rats, changes in behavior such as might come in mental illness in human patients have developed. The animals were eating a good diet and did not lose weight or show any signs of sickness. The only sign that something was wrong was in their behavior.

Instead of coming to the front of the cage when a pencil is poked in, as a rat's curiosity would ordinarily lead him to do, the animals getting the anti-serotonin chemical retreated to the back of the cage and sat there like patients with the mental disease, catatonia. They were obviously constantly frightened.

Perhaps, the scientists now are speculating, some such body chemical situation is responsible for some cases of mental illness. Some people may be more susceptible to small amounts of anti-vitamin and other anti-metabolites than other persons. This would result in their getting mentally sick on apparently good diets.

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FORESTRY

Billions of Board Feet Are Lost to Disease

➤ TREE DISEASES in the West cause an estimated annual loss of 890,000,000 board feet and a loss to growth of about 3,400,000,000 board feet, a total loss impact of 4,300,000,000 feet, F. H. Raymond, state forester from Sacramento, Calif., reported at the 46th Western Forestry Conference in Portland, Ore.

"As villains, diseases are responsible for more than 10% of the loss in western stands and about 65% of all growth losses. The annual growth loss is equivalent to 22% of the 19,700,000,000 board feet of lumber produced in 1952. This represents a value of $64,500,000," Mr. Raymond said.

Heart rot accounts for almost half the growth impact losses. Root diseases, found on Douglas-fir and pine, are the greatest killers. Stem parasite, like dwarf mistletoe and white pine blister rust, also rank high in causing losses. Pole blight on western white pine and needle cast on ponderosa pine are also causing concern.

To cope with the silent killers, Mr. Raymond suggested expanded and improved disease surveys, developing forest practices to aid control, studying rate of deterioration of killed timber, developing further fundamental information on important diseases, developing resistant tree races and studying economic limitations of control.

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GENERAL SCIENCE

Foreign Travel Support To Scientists Urged

➤ CONGRESS should give aid to scientists for travel to scientific conferences abroad as it justifiably gives aid for foreign trips by Congressmen and the cast of Porgy and Bess, the American Association for the Advancement of Science's journal, *Science* (Jan. 27), suggests editorially.

Since July, the National Science Foundation has had no money to help send American scientists to international scientific meetings, although it had funds during the three previous years.

A resolution by the AAAS council at its recent Atlanta meeting asked Congress to approve budget requests for travel funds for the coming year.

Among important meetings affected would be the International Genetics Congress in Japan next September.

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METALLURGY

Study Reasons Why Airplane Metals Fail

➤ IF ENGINEERS can keep the metal in airplanes from getting "tired" or design them to provide adequate safety, one out of five airplane accidents such as have occurred in the last six years will be avoided.

This is the plan of an International Conference on Fatigue in Flight Structures held at Columbia University.

Engineers can now detect microscopic changes produced in metals, such as aluminum, by fatigue stresses, Dr. P. J. E. Forsyth of the Royal Aircraft Establishment, Farnborough, England, said.

Before the use of the electron microscope and electrolytic polishing, Dr. Forsyth reported, definite signs of metallurgical damage to the structure were unseen.

Now it has been shown there is a difference in the appearance of slip bands produced in annealed aluminum by fatigue and those produced by static stress. These slip bands, which are the first step to failure of the metal, are produced under static stress only at high temperatures.

In cold-rolled aluminum, the effects of failure are even greater, and are often associated with regions where the aluminum has recrystallized.

It is believed that fatigue stress depends on atomic rearrangements leading to soft zones in the material.

Prof. W. A. Wood of the University of Melbourne, Australia, reported that fatigue follows from a special deformation initiated by a "fine slip" in the metal. Static stress on the material brings on what is known as a "coarse slip." The "fine slip" is uninhibited because it does not build up local strain-hardening.

Eventually, slight to-and-fro motions produce fatigue cracks that result in failure.

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