GENETICS

Gives Disease Resistance

➤ BOMBARDMENT BY nuclear particles can cause inheritable resistance to diseases in disease-prone plants.

Dr. Calvin F. Konzak, biologist with the Brookhaven National Laboratory, Upton, L.I., has induced resistance to oat rust in one oat variety by subjecting seeds to bombardment by neutrons, which are uncharged atomic particles, from the laboratory's reactor. The oat variety was previously very susceptible to the disease.

Another experiment, described by Dr. Howard J. Curtis of the Brookhaven Laboratory, indicated that resistance to both oat rust and oat blight can be caused by exposure of seeds to neutrons.

These are some first fruits of the Brookhaven Laboratory's program of research on the effects of neutron exposure on plant heredity.

Most all atomic radiation can lead to changes in the genetic arrangement of plants and animals. In the majority of cases, geneticists find that the changes are harmful rather than beneficial mutations. By subjecting large numbers of seeds to irradiation, then carefully watching for desirable mutations and discarding the harmful mutations, plant breeders have a powerful tool in their search for better varieties of plants.

Experimental stations and universities from Florida to Alaska are working with the Brookhaven Laboratory on the project. The 42 cooperating centers send various kinds of seeds to Upton, where they are exposed to neutrons in the reactor.

After exposure, the seeds are returned to the home research centers where they are planted and the grown plants studied for genetic changes. Plants showing useful mutations are then checked over several generations to see if they have practical value in plant breeding.

Mutations arising from gamma and X-ray irradiation have also been studied, the laboratory reported. The physiological condition of the seeds is a controlling factor in mutations with radiation. Using neutrons, however, this factor is avoided and results are more uniform from large number of seeds.

This makes it appear that neutron exposure is two to four times as efficient in plant mutation studies as irradiation with gamma and X-rays, the laboratory said.

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PHYSIOLOGY

Too High for Humans

➤ A CAT may not hear the deep rumble of a passing truck or thunder as well as a man can, but the cat's hearing is much better when it comes to an insect's high-pitched squeak or a bird's chirp.

The cat's hearing span was measured by Drs. William D. Neff and Joseph E. Hind of the University of Chicago's Laboratories of Physyiological Psychology and Otolaryngology. Results are reported in the *Journal of the Acoustical Society of America* (May).

For sound waves below 500 cycles per second, a cat's ears may not be as sensitive as man's. The lowest notes to which man is sensitive are actually felt rather than heard. A frequency of 20 per second sounds not like a tone, psychologists have found, but like a low fluttering sound. Notes too low to be heard are sometimes felt as vibrations on the body.

From 62.5 cycles per second to 2,000, the sensitivity of cats and men is much the same. For frequencies higher than 2,000, the cat begins to show its superiority.

Man hears his best between 2,000 and 4,000 cycles per second. Beyond 4,000, his sensitivity rapidly drops. The upper limit is reached at about 20,000 cycles per second, the frequency of the violin's highest notes.

A cat's hearing is best at about 8,000 cycles per second and its hearing is good up to 40,000 cycles per second. The upper limit is not reached until 60,000 cycles.

Previous experiments on cats' hearing have explored only the range from 20 to 10,000 or 20,000 cycles per second, the psychologists making this study explain. Because of their findings, they recommend extending the range to 60,000 cycles.

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VETERINARY MEDICINE

Swine Disease Defies Experts

➤ A SWINE DISEASE that has spread into almost every section of the United States in the last ten years has the experts stumped.

Both cause and cure for infectious atrophic rhinitis in swine is unknown, Dr. B. T. Simms, chief of the Department of Agriculture's animal disease research section, said.

Farmers are now learning to live with the costly disease, which attacks facial bones, especially among young pigs, giving the animals a "dished-in" appearance. Pneumonia often follows in its wake, the American Veterinary Medical Association has reported.

Although not so destructive as diseases such as hog cholera, infectious atrophic rhinitis cuts the weight and growth of infected swine, often leading to expensive 20- to 30-day marketing delays.

No attempt has been made to control the disease by quarantine and no eradication projects are under way, Dr. Simms said. Preliminary experiments at the Agricultural Research Center, Beltsville, Md., indicated control might be effected by raising young pigs free from exposure and keeping them on clean ground.

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BIOCHEMISTRY

Biochemical Test For Mental Illness

➤ A BIOCHEMICAL TEST for diagnosing the common mental disease, schizophrenia, has been developed by two Chicago physicians.

The test, which involves the effect of insulin on blood samples of the patients, was reported by Drs. Ivan Boszormenyi-Nagy and Francis J. Gerty of the College of Medicine of the University of Illinois in the *American Journal of Psychiatry* (July).

After adding a small amount of insulin, the blood is centrifuged to remove white cells. Ice water is added to the red cells to break down the cell walls. Then the tendency of the resulting red-cell cream to form enzymes is measured.

The test gives different results with the blood of schizophrenic patients and with the blood of student nurses used for comparison. Schizophrenic blood is deficient in enzyme formation. Blood of patients with mental diseases other than schizophrenia gives normal results.

There was some tendency, however, for normal results to be obtained on the blood of schizophrenic patients in whom the disease had a slow, insidious development instead of the sudden onset typical of simple schizophrenia.

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