

ELECTRONICS

"Perceptron" Thinks

► THE FIRST non-living mechanism able to "perceive, recognize and identify its surroundings without human training or control" has been developed for the U.S. Navy.

The electronic device, which officers hesitate to call a machine because it is so much like a "human being without life," has been demonstrated in a preliminary form.

"Perceptron," as it is called, needs no "priming." It is not necessary to introduce it to surroundings and circumstances, record the data involved and then store them for future comparison as is the case with mechanical "brains" in their present stage of development.

The Perceptron literally teaches itself to recognize objects the first time it encounters them.

It uses a camera-type lens to scan objects or survey situations, and an electrical impulse system patterned point-by-point after the human brain does the interpreting of the information.

The device was developed under an Office of Naval Research contract by Dr. Frank Rosenblatt, research psychologist,

Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y.

An actual working machine will be completed in about one year. The concept of Perceptron was demonstrated on a conventional IBM 704 computer, the same type of computer used to develop the concept.

In one early experiment, Perceptron was shown 100 squares located at random either on the right or left side of cards. In 100 trials, Perceptron was able to "say" correctly 97 times whether a square was located on the right or left. Researchers said it was "obvious" after the machine had seen only 30 to 40 squares that it had learned to recognize the difference between right and left, almost the same way a child learns.

Printed pages, longhand letters and even speech commands are within reach of the device.

Only one more step of development, a difficult step, is needed for the device to hear speech in one language and then reproduce it either in writing or verbally in another language.

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in some and therapeutic failure in others. The toxicity was a criterion for the adequacy of the dose, Drs. Richard T. Smith, William P. Peak, Kenneth M. Kron, Irvin F. Hermann, Russell A. DeToro and Mr. Meyer Goldman, all of the Benjamin Franklin Clinic in Philadelphia, report in the *Journal of the American Medical Association* (July 5).

Individualized programs induced remissions in 82% of 347 patients, between 12 and 18 weeks after commencement.

The aim of the individual program is to build a level of gold in the body of the patient sufficient to produce remission while maintaining a level that will induce permanent remission. Much of the gold administered in group therapy was lost or excreted by some patients while retained by others, the doctors point out.

Urinary excretion of gold was carefully charted and toxicity symptoms were recorded until the required dosage was able to be computed for individuals.

In general, variations in patient response to gold salt therapy are due to the wide differences in the retention and excretion of the gold, the scientists conclude.

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AGRICULTURE

Test Rust-Resistant Wheat

► ONE OF the nation's worst wheat diseases, leaf rust, has been reduced from 75% severity to a bare trace in crops of hybrid winter wheat.

While these results were obtained in experimental research, they are promising. Research in growing rust-resistant wheat is proceeding at cooperative stations where the U. S. Department of Agriculture works with state scientists in solving various agricultural problems. Every year, in every wheat-producing state, leaf rust destroys between five percent and 30% of the wheat crop.

The gains made in controlling leaf rust are based on the work of Dr. E. R. Sears, USDA plant geneticist at Columbia, Mo., who has succeeded in transferring rust resistance from goat grass to common wheat. Goat grass, or *Aegilops umbellulata*, is a distant relative of wheat that is practically immune to leaf rust.

Researchers in six states are using the rust-resistant wheat developed by Dr. Sears in breeding commercially useful wheat. The resistant wheat is not in itself breeding stock; it does not have the other necessary characteristics of high production, hardness and so on. However, a number of hybrid lines of winter wheat have been bred, using the resistant wheat. They are now being tested for the farmers' crops.

The minimum time for a breeding cycle for wheat is eight years. This is the amount of time scientists need to tell if they have a reliable hybrid, one that will continue to produce wheat with the desired qualities.

In Kansas, where researchers obtained almost a 75% reduction in leaf rust, about three years have been spent in the program.

It will be another five to 12 years before the farmer can expect to grow leaf-rust-resistant wheat.

Dr. Sears recently was awarded one of the nation's highest honors in agricultural research, the \$10,000 Hoblitzelle National Award in the Agricultural Sciences. He was selected for the biennial award for his work in transferring rust resistance to wheat.

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MEDICINE

Rheumatoid Arthritis Helped by New Program

► An individualized program for gold salts therapy in rheumatoid arthritis patients has resulted in complete remission in patients who were formerly classified as failures.

Formerly, group therapy was used instead of individual programs, resulting in various side reactions and responses by individual patients.

An experiment conducted on 138 patients receiving gold salt injections revealed that the amount of gold excreted in the urine varied proportionately with the amount administered.

Since individual patients differed in their excretion rates for gold, any fixed dosage schedule must result in toxic symptoms



SUPER CUTTER—Electro-chemical machining, a technique in which chemicals and electricity are used for cutting instead of the ordinary metallic tools, is demonstrated by A. E. Howe, a laboratory engineer at General Electric Company's Schenectady, N. Y., engineering laboratory. There is no physical contact between the electrolytic cutting tool and the object being machined. The glass tube shown in the photograph never touches the metal plate below it, yet the metal is being punctured. In the future, engineers believe, this may be a practical method for machining the tough, heat-resistant metal alloys now being used in airplanes and missiles. Work continues to find the most effective use of the method.