

## MATHEMATICS

# Study Computer Memory

ELECTRONIC MACHINES one day may be able to tell why some children have difficulties in learning.

Tentative hope for this achievement was expressed at the International Conference on Information Processing in Paris.

Dr. David G. Willis of Lockheed's Missiles and Space Division reported that he has been running experiments in the field of creating "artificial intelligence" using electronic machines.

From experimental results, he predicted that a machine could be built which could duplicate the human brain in learning behavior. By working with such a machine, scientists could explore the workings of a child's mind with some degree of accuracy, perhaps solve learning problems, he said.

Dr. Willis, a mathematician, believes that the neuron—the "building block" of man's intelligence system—remembers what has happened to it in the past and that this permanently affects its behavior whenever subsequently stimulated. His theory differs

with most theories in that he believes a stimulus will actually cause changes within the neuron.

By retaining a record of their activities throughout their whole life, the neurons function as memory elements, he said.

In one experiment, he simulated a system of 288 "neurons" on a digital computer. By feeding in a stimulus he was able to force out a pattern of response. His results showed that when a pattern is forced by some particular excitation, it tends to repeat every time that particular excitation is applied.

But as more and more patterns are forced by other excitations, he said, the response patterns begin to interfere. The interesting thing is the way these patterns interfere with each other.

He likened this laboratory-obtained reaction to the way in which memories may be associated in the human brain.

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## ZOOLOGY

# Big Game for U.S.

A BIG GAME hunter in the United States can skip the safari to Africa and take to New Mexico where he will find a challenging new animal—the Barbary sheep.

A zoo rarity from North Africa in the 1900's, the Barbary sheep has thrived wild in the U.S. and in captivity. Now herds have been taken from the zoos and "planted" in the West. There are enough of these maned, big-horned sheep to provide good hunting, Herman A. Ogren, biologist with the New Mexico department of game and fish, told scientists.

Several private purchases of Barbary sheep have been made, most of them in New Mexico, he told the American Society of Mammalogists meeting in Washington. In 1955 the animal was declared "big game" by the New Mexico state legislature and the hunt was on. So far only one-half of the hunters who have stalked the sheep have succeeded in bringing home a trophy.

Right now, there is some controversy on the sheep's status, Mr. Ogren said. Cattle

raisers and wheat farmers have complained about the destruction caused by America's new big game animal. Hunters believe it will compete with the bighorn sheep—the "royal big game animal."

Those in favor of the Barbary sheep point to the growing numbers of hunters who are seeking game in the West. Also, they say, the Barbary sheep presents a challenge to the hunter. It inhabits extremely rough desert terrain and its color makes it difficult to see. As a trophy, the Barbary's horns rival the bighorn's record of 50 inches. On the practical side there is the fact that some 600 of 650 hunters questioned found that the sheep was good to eat.

By 1960, Mr. Ogren said, the life history of the Barbary sheep should be better known. Scientists should then be able to say if the animal would be found in large enough numbers to threaten cattlemen and wheat farmers.

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## PSYCHOLOGY

# Antarctic Affects Behavior

MEN ON ICE have special problems.

A U. S. Navy-sponsored study of 700 men isolated in the vast, white, cold Antarctic during Deep Freeze II and III operations found that:

Some men were more concerned about the lack of fresh fruit than the lack of women. Others sat for hours listening to phonograph records. Some became rumor mongers. Some slept most of the time and

others could manage only an hour a day for long stretches. Six of the men became so emotionally disturbed they had to be evacuated.

In charge of the study was a Georgetown University psychologist, Dr. John H. Rohrer. He reports his findings, made during his six months on the ice cap, in *Research Reviews*, published by the Naval Research Laboratory. The study's purpose was to

help the Navy in selection of personnel for duty in rigorous isolation.

Generally, the factors affecting a man's adjustment to isolation from all outside contact in an extremely harsh environment are the length of his tour of duty and the number of men he has to live with at his station (from as few as 12 men to more than 100).

Dr. Rohrer reports four stages in this adjustment:

1. New arrivals exhibit an increase in anxiety, which for men so predisposed is enough to trigger psychosis or hysteria. The six evacuees developed mental symptoms one to four weeks after getting on the ice.

For most of the men, the anxiety is relieved when they start working. In fact, work becomes the most meaningful social role. The cooks, who provide one of the few gratifications available, assume a higher social level than, for example, the scientists.

2. More depression appears during the winter, probably due to the cold (below minus 100 degrees Fahrenheit at times), the dark, the winds (often more than 100 miles an hour), and the lack of outside work.

This is the stage in which sleeping habits change. The men sometimes hallucinate, cannot concentrate, become irritable and sensitive to the slightest sounds, and suffer headaches (those with more intellectual jobs are more bothered by headaches).

Some men alleviate the boredom by inventing rumors. (One man found copper trimmings near a drill press, melted them and formed them into lumps. He surreptitiously deposited them in the filter of a snow melter and then told the operator that a doctor said a nearby volcano had erupted gold. When the nuggets were found there was a sudden increase in volunteers to assist in snow melting.)

3. With the coming of the sun, airplanes and airdrops, the men knew that isolation was about over. Their depression, boredom and other symptoms lessened. However, there were more headaches.

4. When they were nearly ready to go home, their routines were interrupted and they became less efficient. Once off the ice cap, they readily readjusted.

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## PUBLIC HEALTH

# Stratosphere Is Source Of Present Fallout

THE FALLOUT now sifting earthward comes entirely from the stratosphere, some seven miles above the earth's surface.

The fission products from nuclear bombs stored in the troposphere, about seven miles, remain there only a month or two. Studies by Drs. Lois Fry and P. K. Kuroda of the University of Arkansas show that the nuclear test explosions in the fall of 1958 caused a very large increase in strontium-89 and barium-140 in the atmosphere.

Their measurements of these radioactive by-products is reported in *Science* (June 26). They report that transfer from the stratosphere to the troposphere accounts for present-day levels of radioactivity.

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