

PHYSIOLOGY

Drug Improves Memory

► **EAGERLY AWAITED** DETAILS of the world's first known memory drug were disclosed. Trade named Cylert, the drug proved an unqualified success in enhancing memory in rats, two scientists from Abbott Laboratories of North Chicago reported at the American Association for the Advancement of Science meeting (see SNL 88:386 Dec. 18, 1965).

The next step is to test Cylert on humans which will be done as soon as the Food and Drug Administration gives its approval. This may take as long as a year.

Ironically enough, Europeans have been using the exact same drug for about five years as a stimulant, without knowledge of its memory improving qualities.

Cylert is a synthetic organic compound called magnesium pemoline. Its composition is 2-imino-5-phenyl-4-oxazolidinone and magnesium hydroxide.

The effects of the new drug on rats are impressive. Those given the compound learned four to five times faster than untreated rats. They also retained what they had learned longer, Dr. N. P. Plotnikoff, an Abbott neuropharmacologist, reported.

Dr. Plotnikoff used the classical buzzer and electric shock stimulation to train the rats. If the animals responded to the buzzer

by jumping out of the cage, they avoided the shock.

Besides learning faster and remembering longer, the treated rats also recovered more quickly from amnesia produced by electric shock.

Cylert was found by Dr. Alvin J. Glasky, a biochemist also with Abbott Laboratories, who tested many compounds before he hit on magnesium pemoline. Dr. Glasky reported that this compound, unlike any other stimulant he tested, speeded up RNA (ribonucleic acid) formation. RNA is the body chemical responsible for synthesizing protein in the building of new cells. Scientists thought RNA aids memory by easing the formation of brain cells.

Dr. Glasky concluded that faster development of RNA would correspond to improved memory.

By extracting a test tube sample of enzymes from the brains of rats, Dr. Glasky was able to study the rate of RNA synthesis and observe the effects of magnesium pemoline. He found the compound increased RNA formation by two or three times its normal rate.

It is probable Cylert will first be used on old people and retarded children.

• Science News Letter, 89:6 January 1, 1966

PSYCHOLOGY

Rats Attack When Hurt

► **FIGHTING AGGRESSION** results from pain inflicted on an individual—at least in rats.

But if an adversary is not immediately available, a rat will learn to avoid the pain, if he has warning of trouble to come.

Aggression in animals, and probably in man, is an immediate and natural outgrowth of pain, Dr. Roger Ulrich, professor of psychology at Western Michigan University, reported to the American Association for the Advancement of Science meeting.

It occurs as a reflexive reaction to pain and should be considered in any system of punishments, whether criminal or parental.

Dr. Ulrich used an electric foot shock for a pain stimulus. He found that when two rats were together in a cage, the rat receiving the electric shock would immediately attack the other.

The more frequent the shock, the more regular the fighting. Also the fighting depended on floor space. It decreased with larger space and increased with cramped quarters.

But one of Dr. Ulrich's most dramatic findings was the difference in behavior between isolated animals and rats that had company. Rats alone developed a more "rational" method of handling shock.

The experimental cages contained a bar which, when pressed, would stop the shock. A bell signaled the coming pain. If an animal was alone, he would sit close to the

bar and work it consistently. But, when the trained animal was put together with another rat, he started fighting, said Dr. Ulrich. Though the animal knew how to stop the shock, he often did not.

This indicates that in the social setting, aggression tends to displace learning and reasoning, concluded the psychologist.

The social situation also appeared to retard learning. A rat alone learned the bar response much faster than two rats together.

Aggression as a reaction to pain has been found in monkeys and other species, besides rats. This suggests the findings can be applied to man as well, said Dr. Ulrich.

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BIOCHEMISTRY

Molecular Abnormality Seen in Brain Disease

► **THE DEATH** of a six-year-old boy from a disease involving a disturbance of the brain's white substance has led to a post-mortem examination that could have a bearing on other diseases of the brain or central nervous system.

The disease, called MLD, or metachromatic leukodystrophy, was a late infantile type. At autopsy, two University of Southern California scientists removed the fatty substance called myelin, which normally covers nerve fibers, from the white matter of the boy's brain. When they analyzed the

fatty composition, they found what appeared to be a chemical abnormality.

Although the fatty, or lipid, content of myelin was almost normal, the scientists found that it contained three to four times the usual amount of a compound called cerebroside sulfate. It also contained only one-third the percentage of cerebroside found in normal myelin. Cerebroside is one of a class of phosphorus-free lipid compounds containing galactose, a crystalline sugar.

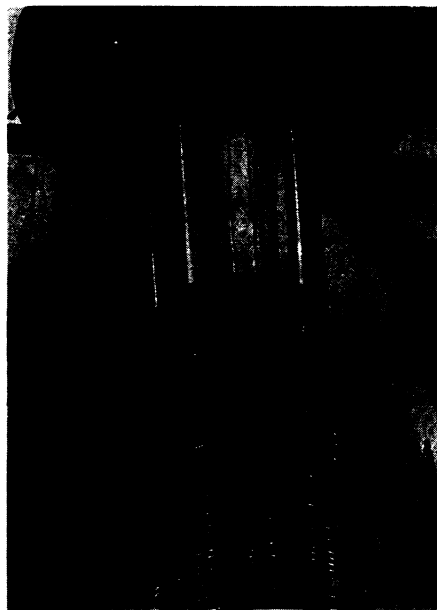
The results indicate that central nervous system myelin is chemically abnormal in MLD, but this does not necessarily mean that all the myelin in the central nervous system is abnormally constituted, the researchers said.

Because the boy was in the late stages of MLD, the scientists could not tell whether or not the myelin in this disease was abnormal at the time of its original synthesis. More must be learned about myelin at earlier stages to decide this point, they believe.

Drs. John S. O'Brien and E. Lois Sampson of the division of chemical pathology of the University's Medical School, Los Angeles, reported the study in *Science*, 150: 1613, 1965.

They pointed out that MLD is one of the inborn errors of metabolism. The molecular abnormality of the myelin membrane in this disorder indicates that other similar diseases might also involve the formation of chemically abnormal myelin.

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Ohio State University

GIANT THERMOS—Standing about 70 feet high, this 5.5-million electron volt Van de Graaff accelerator belonging to Ohio State University, Columbus, is a powerful tool for basic research in nuclear physics. The total cost of the device, the building in which it is housed and supplementary equipment was nearly one million dollars.