CHEMISTRY

Advances in Chemistry

How certain drugs affect the brain, development of a new "rubber" compound and effects of antibiotics on cattle feed were among research reported to a chemistry meeting.

NEW LIGHT has been thrown upon the manner in which certain mental drugs affect the brain through research using the brain cells of a rat.

To find out how the production of a key substance in the brain, coenzyme-I, is affected, a tranquilizer, a "psychic energizer," and an hallucinogenic drug were added to a mixture of the brain cells. The vitamin niacin and another chemical were added to preserve the coenzyme when formed.

The hallucinogenic drug, lysergic acid diethylamide, was found to more than double the rate of formation of coenzyme-I, the tranquilizer, chlorpromazine, increased it slightly, while the psychic energizer had no effect.

A scientist told the Southwest Regional meeting in Baton Rouge, La., of the American Chemical Society, that this was new evidence that some drugs may act upon the brain to cause changes in behavior by influencing the enzymes in the brain.

Dr. Donald A. Rappoport, who is a biochemist at the Baylor University College of Medicine, Houston, stated the importance of coenzyme-I in the brain is not known at present, but that the present results indicate a direction for further research.

Coauthors of the report with Dr. Rappoport are Father Albert S. Moraczewski and Arthur Gross, also of Baylor.

Rubber Plastic

A MATERIAL that can be molded, melted, and milled like a plastic, but is also rubbery, making it suitable for use in shoe soles, floor tiles, and coverings for cables and golf balls, was reported by the American Chemical Society.

The material is a polybutadiene, that is it consists of long chains built up of molecules of butadiene, a chemical closely allied to the building blocks of natural rubber.

The man-made rubber was reported by J. R. Haws of the Phillips Petroleum Company, Bartlesville, Okla., to be not as elastic as natural rubber, but equal in hardness and resilience. It may also, like natural rubber, be vulcanized to give substances varying from a soft rubber to hard inelastic materials.

The material is called high-trans polybutadiene, according to Mr. Haws, who also explained that the high-trans part of its name implied that the atoms making up the chain were arranged in a definite repetitive order.

Mr. Haws is senior group leader in the Research Division of Phillips Petroleum Company. Coauthors of the report were H. E. Railsback and C. R. Wilder, also of Phillips.

Chemistry for Cattle

"GOOD QUALITY, odor and acidity," together with increased flavor appeal and resistance to spoilage through fermentation, may be imparted to silage, or cold weather fodder for cattle by treatment with an antibiotic called zinc bacitracin, Dr. L. L. Rusoff of Louisiana State University reported to the chemists' regional meeting.

Preservatives presently in use, such as molasses or sodium bisulfite, ward off spoilage by promoting the growth of acid-forming bacteria, since good silage production depends on a good acid environment, according to Dr. Rusoff. Zinc bacitracin apparently works by "inhibiting the protein splitting bacteria and favoring the lactic-acid producing bacteria," he said.

Cattle have, in tests, shown a preference for silage produced in this way rather than by the two conventional methods mentioned. Flavor and quality of milk of cows tested were said to be not affected.

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OIL STANDARDS—The viscosity of different oils used as National Bureau of Standards' standard samples is calculated by measuring the time of flow at various temperatures in a viscometer and multiplying this value by a constant. R. C. Hardy fills the viscometer. NBS is now distributing some 60,000 samples of standard materials a year to other laboratories.

MEDICINE

Common Aspirin Queried

THE UBIQUITOUS aspirin tablet has caught the doctor's eye. A fourfold increase in peptic ulcers over the general patient population at the Mayo Clinic has been reported in a group of patients receiving salicylate therapy for rheumatoid arthritis.

Results of a study of 2,114 rheumatoid arthritis patients were outlined by Dr. Lloyd G. Bartholomew of the Mayo Clinic, Rochester, Minn., before colleagues attending the American Medical Association meeting in Dallas, Tex.

The incidence of peptic ulcer during 1954 and 1957 in these patients with rheumatoid arthritis is "three to four times as great as the incidence in the general patient population at the Mayo Clinic," he told them.

Referring to recent reports indicating that aspirin may influence the incidence of gastrointestinal bleeding, Dr. Bartholomew commented:

"We do not know whether salicylate therapy, which was common to both steroid-treated and the non-steroid-treated patients in our series, could account in part for the more than fourfold increase in the incidence of peptic ulcer over that found in the general patient population."

The incidence of peptic ulcer among patients in general runs between one and two percent in any given year. The incidence of peptic ulcer in rheumatoid patients in 1954 and 1957 was 8.1 percent. In 1947, before steroids, the percentage was 3.3.

The Mayo findings did not show any great increase in incidence of peptic ulcer among those patients treated with steroids. The incidence for those who received steroids was 6.7 percent for 1954 and 8.4 percent for 1957.

"If steroid therapy is a major factor in the increased incidence of peptic ulcer, we might expect the largest increase to be among patients with hypercortisonism, an abnormal condition resulting from an excess of cortisone hormone.

"However, the incidence of 8.2 percent among patients having hypercortisonism in our series is not greatly different from the incidence of 7.3 percent for the entire group of steroid-treated patients and the incidence of 8.1 percent for the patients who did not receive steroids systemically," he concluded.

It is possible that either the incidence of peptic ulcer is rising in rheumatoid patients or that the frequency with which it is recognized is increasing.

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