CHEMISTRY

Chemistry on the Home Front

New mold treatment for obtaining more alcohol, sulfa drug which may aid one type of shock, production of fuels from plants among subjects at meeting.

➤ AMERICAN CHEMISTS discussed all phases of chemistry at the 107th national meeting of the American Chemical Society in Cleveland. Here, on pages 243-247 and 252-253 of this SCIENCE NEWS LETTER, are stories on some of the papers presented as reported by Dr. Frank Thone, Science Service's representative at the meeting:

More Alcohol for War

➤ MORE ALCOHOL for smokeless powder, synthetic rubber and the thousand other uses of war can be produced from a given quantity of grain through a new mold treatment than with the traditional malting method, M. Roberts, S. Laufer, E. D. Stewart and L. T. Saletan of the Schwarz Laboratories, New York City, disclosed in a paper presented before the meeting of the American Chemical Society in Cleveland.

Before grain can be turned into alcohol, its starch must be converted into sugar. This has long been done by treating it with malt, which contains a digestive ferment or enzyme. It has been discovered, however, that a species of mold, a botanical cousin of the one that produces penicillin, turns out a superior kind of enzyme which turns the starch into sugar more rapidly and completely than the time-honored malt. This mold is cultivated on masses of bran, dried and ground up before being added to the grain mash.

The four chemists making the report stated that the increase in alcohol yield under the mold-bran method amounts to as much as 10% to 15%.

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Acid Improves Milk "Wool"

SYNTHETIC wool-like fibers made from milk can be improved by treatment with acid, A. E. Brown, W. G. Gordon, Edith C. Gall and R. W. Jackson of the Eastern Regional Research Laboratory, U. S. Department of Agriculture, reported before the meeting. Acetylation did not increase the strength of the fibers, the chemists stated, but the treatment did make the material more resistant to boiling, and rendered it more nearly similar to wool in its behavior in the dye vat.

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Coal Tar Treasures

➤ COAL TAR, that familiar magician's hat of chemical industry, is still turning out new and valuable things, the meeting of the American Chemical Society heard from F. E. Cislack, director of research for the Reilly Tar and Chemical Corporation of Indianapolis.

Under the stimulus of war needs, a relatively neglected group of tar compounds, that have hitherto been only laboratory curiosities, have become the mass-production sources of a wide range of substances, from synthetic rubber to a vitamin used in enriching bread. The synthetic rubber, reported the speaker, is the nearest approach to the natural article that has yet been made; it is known as vinylpyridine. The vitamin is synthetic nicotinic acid; the new process makes it much more cheaply than the former method of extracting nicotine and subjecting it to chemical treatment.

A vital contribution to the wartime production of steel is made by these coal tar bases, Mr. Cislack said, in their use in the acid baths that dissolve the scale on steel formed during the rolling process. The acid ordinarily attacks steel as well as scale; addition of coal tar bases to the acid inhibits their action on the steel while leaving their effectiveness as scale removers unimpaired.

Other useful jobs for coal tar bases enumerated by the speaker included waterproofing material for cloth, fungicides and germicides. Notable among

SPRAY-GUNNING RUBBER—Bronze propellers fitted to steel shafts on wooden vessels, such as U. S. Navy sub-chasers and minesweepers, produce an electrolytic action through the union of two dissimilar metals in salt water, with the result that the shaft is so eaten away within a few months that it cannot stand up under high-speed operation. The first successful solution to this menace was found to be Thiokol synthetic rubber flame-sprayed onto the shafts, as shown in this picture from the Schori Process Corp. of Long Island City, N. Y.

the latter is sulfapyridine, one of the most important of the sulfa group of medicines.

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More Rubber From Grain

➤ MORE synthetic rubber from a given quantity of grain, and quicker, was the promise held forth before the American Chemical Society by Dr. Donald F. Othmer of the Polytechnic Institute of Brooklyn.

The conventional method, now in use, involves fermenting the grain into ethyl alcohol, and then converting this into butadiene, one of the two basic materials for the kind of synthetic rubber now being mass-produced for war purposes.

By a different kind of fermentation, recently developed but quite well known, grain can be turned into a compound somewhat more complex in its structure than ordinary alcohol; this liquid is known as butylene glycol. It resembles glycerin in some of its properties. Butylene glycol can be converted into glycol diacetate by treatment with acetic acid—the stuff that makes vinegar sour. Glycol diacetate can then be changed into butadiene.

The contribution of Dr. Othmer and his associates has been the development of a series of new solvents that wash the glycol out of the fermentation liquors, and a simple new technique of distillation. The process has been tried out on a pilot-plant scale at Lawrenceburg, Ind.

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"Six Impossible Things"

➤ CHEMISTS attending the meeting of the American Chemical Society were invited to "believe six impossible things before breakfast," like *Alice Through the Looking Glass,* by Dr. Gordon M. Kline of the National Bureau of Standards, speaking on recent and prospective developments in the field of plastics.

"We should expect to see transparent glass-like plastics that are as crystal clear as glass but that possess an unexpected toughness and resistance to hot water," Dr. Kline stated. "This plastic will meet the requirements of curved windows for streamlined homes and transportation, of light and easily sterilized instruments and furniture for hospital use, and of tough transparent containers for foods and drugs, containers reusable in the home for canning purposes, tumblers, and other general utility applications."

Among other plastic products foreseen by the speaker are flameproof, waterproof, non-spotting, featherweight fabrics; draperies that let sunshine stream into the house by day but insure privacy at night; wear-resistant, non-absorbent, smooth (but not slippery) upholstery materials. He foretold also the coming of lightweight plastics for bonding lightweight plywood—stuff like "frozen whipped cream," many times lighter than wood and resistant to water, fire and fungus. In the enormously expanded field of electric power and electronic controls, plastic insulators, framework, casings, panelings, will entirely replace rubber, mica, amber and all the old natural products.

In all this prophesying, declared Dr. Kline, he was being quite conservative: "No use trying to go the White Queen one better! . . . We have equalled her record of conjuring up six impossible things—or are they?"

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Needs For Chemists

➤ A VERY SERIOUS situation arising in the present lack of chemists and engineers needed to replace those being drawn out of industry into the armed forces, H. T. Briscoe of the War Manpower Commission soberly told the meeting. Figures of the U. S. Employment Service, analyzed and reported by the National Roster of Scientific and Specialized Personnel, indicate that for a recent six-month period, some 15,000 typical firms engaged in direct war work employed 115,000 engineers and 20,000 chemists, and that they were in need of substantial increases in the numbers of both. Urgently needed additions to the ranks of these indispensable workers, Mr. Briscoe stated, would be in the neighborhood of 12,000 engineers and from 2,500 to 3,000 chemists in the first six months of 1944. But there is no warrant for expecting that these needs will be met.

Post-war chemical industry faces serious problems connected with these shortages in trained personnel, the speaker continued. If the war should end in 1944 or 1945, the situation might not be too serious; but if it goes on for several years longer, our failure to keep a steady stream of young people passing through our colleges and technical schools is bound to place American industry under a heavy handicap.

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NUTRITION

Food For China Seen As Partly a Chemical Problem

➤ FOOD for the millions of China was posed as a problem in chemistry before the American Chemical Society meeting in Cleveland by a former American professor in a Chinese University, Dr. William H. Adolph, now of Ithaca, N. Y., at one time head of the department of biochemistry at Yenching University, Peking.

Proteins, the foods that form muscle, blood and nerves, are chronically de-

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