CHEMISTRY

Rubber Output Speeded

Putting things in a ferment is how a bacterium, whose real name is a secret, helps speed synthetic rubber production for the allies.

➤ THIS is really the story of a war worker who specializes in putting things in a ferment and thereby helps win the war. His name is a secret because he is engaged in important chemical undercover work. He is a bacterium, a little active organism whose great multiplying virtue is that he makes possible the production of one of the two main ingredients of synthetic rubber Buna S.

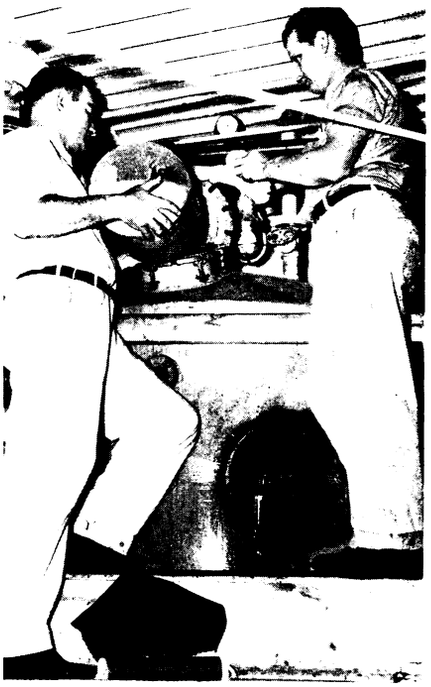
Suppose we call him "Buty" because he makes possible the making of butadiene from the starch of grain. "Buty" works at the Schenley Research Institute of Lawrenceburg, Ind., eliminating the usual need of first making alcohol in the manufacture of butadiene.

Early work on the butadiene short-cut process began at the Iowa State College and Northern Regional laboratory of the U. S. Department of Agriculture at Peoria, Ill. Government and industrial laboratories have pooled their research findings.

The special bacterium ferments the grain mash to form a glycol called butanediol, which is then esterified and then "cracked" by heat to form the butadiene. This, combined with styrene, another chemical made from petroleum, gives the principal synthetic rubber.

Not more than a quarter of the postwar rubber will come from tree-grown natural rubber, Dr. A. J. Liebmann, director, Schenley Research Institute, predicted in explaining that the present pilot plant, producing about 5,000 pounds of butadiene a week, is just a beginning of faster and more economical synthetic rubber production.

Science News Letter, July 24, 1943



BACTERIAL WORKER—Here the anonymous bacterial war worker goes on the job as a "new shift" is dumped into a tank. The workman on the right stands by with sterile cotton and chemicals to prevent infection of the bacteria. In the tank, the bacteria will multiply thousands of times and then will be added to grain mash to convert it into butanediol, intermediate step in the production of synthetic rubber.

BACTERIOLOGY

Penicillin Grown Faster

Vinegar-making process using tall cylinders filled with wood shavings is adapted for the large-scale production of important mold growth.

➤ PENICILLIN, the germ-killing drug produced by one kind of common mold, can be turned out on a relatively large scale by an adaptation of a process long used for making vinegar, states Prof. C. E. Clifton, Stanford University bacteriologist (*Science,* July 16).

In the so-called "quick" method for producing vinegar, a tall cylinder is filled with wood shavings on which a mass culture of acetic acid bacteria is induced to flow. Cider, wine or some other weak solution of alcohol is trickled down through the shavings, while air is seeped upward. Vinegar comes off at the bottom.

Prof. Clifton has set up several such columns in his laboratory, making them out of rubber and glass, so that everything can be thoroughly sterilized before operations begin. One difficulty in penicillin production seems to be interference from bacterial contamination.

It was also found advisable to use rather coarse shavings, to prevent clogging and enable the air to pass upward readily.

The shavings were well wetted with a food solution consisting of 4% glucose and 0.1% yeast extract in water, then "planted" with spores of the mold, *Penicillium notatum.* After 24 hours the nutrient solution was slowly dripped in at the top and permitted to trickle through.

The liquid coming off at the bottom was tested on cultures of *Staphylococcus aureus,* the germ responsible for common boils, one type of food poisoning, and a particularly dangerous kind of blood infection. Its ability to kill "staph" germs compared very favorably with that of penicillin produced by the slower, more laborious method which has been in use heretofore.

Science News Letter, July 24, 1943

ANATOMY

Lack of Anatomical Chart Fails to Stump Instructor

➤ A LIEUTENANT instructor was detailed to give lessons in first aid in case of dangerous bleeding from severed arteries, relates the *Infantry Journal* (July). There wasn't any anatomical chart showing the location of the blood vessels, such as every well-equipped schoolroom can display before its pupils.

The young officer was nothing if not ingenious. Singling out a long, lean soldier from his class, he ordered him to strip. Then with a piece of lipstick he traced the human arterial system on the private's goose-pimpled hide. With such a large-as-life-and-twice-as-natural chart, the lesson was a great success.

Now lipstick is standard equipment in that outfit.

Science News Letter, July 24, 1943