CHEMISTRY

New Rubber Plant

Government-owned factory for making synthetic product suitable for tires and tank treads is twin plant, operated by Carbide and Carbon and U. S. Rubber.

See Front Cover

➤ SYNTHETIC RUBBER of the Buna S variety, good for tires all the way from jeep to super-bomber sizes, as well as for tank treads and other Army uses, will flow at the rate of 90,000 long tons a year out of a huge new plant set-up in Charleston, W. Va., which has just gone into full-scale production.

Government-owned, the new installation consists of two separate but closely integrated plants, each under the management of a well-experienced industrial organization. The first plant, where the raw materials are produced, is managed by the Carbide and Carbon Chemicals Corporation; the second, where they are converted into the final product, by the United States Rubber Company. The two plants stand side by side, so that a casual observer would think they were one; short pipe lines carry the raw materials from one to the other.

Scarcely over a year ago, there was nothing on the broad, flat plain by the Kanawha river but farm and pasture land adjoining a small airport, near the suburban station called Institute, from the presence there of a state teachers' college. Now the place is an industrial giant, capable eventually of making rubber to rim 16,000,000 civilian car wheels every year.

Buna S is the synthetic rubber made by mixing two organic compounds, butadiene and styrene. Butadiene in turn can be made from either petroleum or alcohol; at this plant alcohol is used. The alcohol is brought up the river by barge or in railroad tank cars; it comes from the great Ohio valley distilleries that have stopped making liquor to devote their entire capacities to war-alcohol production. A "tank farm" with a total storage capacity of 750,000 gallons insures a constant working supply.

Styrene, the other ingredient, is made at the Charleston plant by combining benzene and ethylene. Benzene is produced in abundance near by; it is a coke-oven by-product, and there are many coke-ovens in the valley. Ethylene is one of the lighter petroleum fractions.

Both butadiene and styrene must be brought to a high degree of purity before they can successfully combine to produce Buna S. At this place, the Carbide and Carbon Chemicals plant brings the butadiene to 98.5% purity and the styrene to 99% before putting them into the pipe lines to go over to the United States Rubber plant.

Both chemicals are limpid, water-clear liquids as they flow into the great mixing vessels. As soon as they are well in contact, however, they combine to form a milky fluid—a true latex, filled with billions upon billions of submicroscopic rubber particles.

These are held from combining with each other because all have electrical charges of like sign. The latex is flowed into another great vat, where a salt-water solution containing a little sulfuric acid is mixed in. The salt removes the electrical charges, and the rubber particles stick together in grains or crumbs.

These are put through a mechanical shredder and washed thoroughly, to remove all chemicals that may still cling to them. Finally the raw rubber particles are showered down into the oblong mold of a powerful press, that squeezes them into 75-pound loaves. These are packed in cartons for shipment to the tire factories.

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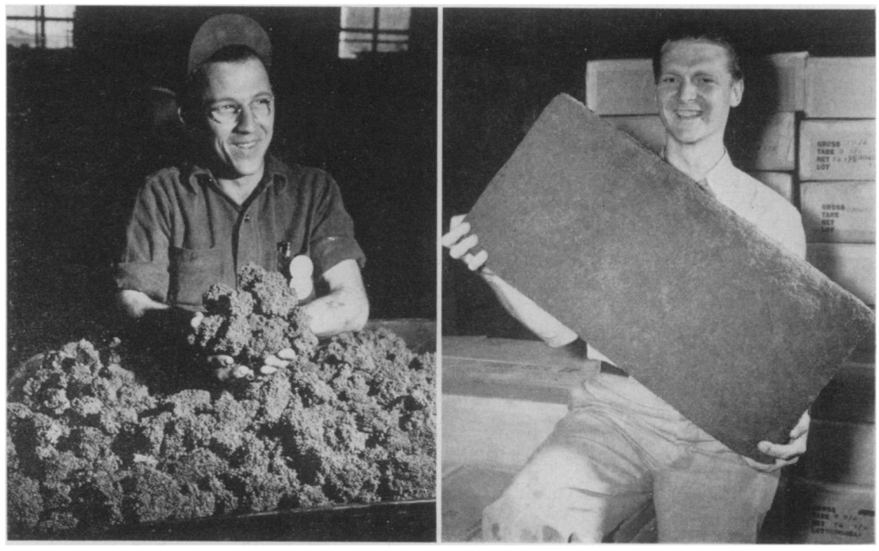

RUBBER—At a new buna S synthetic rubber plant in West Virginia, this rubber is being produced for use in tires and tank treads. When the Government-owned plant is in full production, enough rubber to make 63,000 tires will be produced daily. At the left is shown the rubber after removal of the electrical charges causes the particles to stick together. At the right rubber has been dried and pressed into loaves.

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Resin Aids Production of Rubber from Castilla Tree

➤ RUBBER from the castilla tree, abundant in the American tropics, may be made more easy to prepare through the use of a resin extracted from another warm-land American plant, related to the common morning-glory, known as moonvine or Nacta. Researches pointing to this possibility are reported by three Department of Agriculture scientists, S. G. Wildman, A. V. McMullan and Rosamond Griggs, who worked in the laboratories of the Bureau of Plant Industry (*Science*, May 21).

Castilla latex, although a good source of high-quality rubber, has been difficult to handle commercially because it would not respond to the chemicals used in coagulating the latex of the Hevea tree. Reports from the tropics that natives used moonvine juice to get rubber from Castilla inspired the search for a chemically controllable process based on the same plant.

Fortunately, the moonvine grows in