

plenty in southern Florida as well as in the tropics, so that the three researchers could get all the fresh material they needed. A long and patient series of chemical extractions finally produced a clear, yellow, resin-like substance. This was tried on Castilla latex gathered in Mexico, and brought out the rubber quite satisfactorily, at least for small-scale laboratory conditions.

The three researchers treat their preliminary results with proper scientific caution. They say:

"These data are suggestive of the use that this resin may find in the commercial production of Castilla rubber. Since, however, absolutely fresh latex has been unavailable, we are hesitant in predicting the coagulative powers of Nacta resin under field conditions, and for this reason, we are withholding comment and interpretation of the data contained in the tables until the results of further trials on fresh latices have been ascertained."

Science News Letter, June 5, 1943

PUBLIC HEALTH

Workers' Health Guarded

Accomplishments of science in the synthetic rubber industry set a new record for protection of workers, Hygiene Association is told.

➤ AMERICAN science has achieved a new high in protection of industrial workers' health by its accomplishments in the synthetic rubber industry, F. S. Mallette of the Firestone Tire and Rubber Company, Akron, Ohio, declared at the meeting of the American Industrial Hygiene Association in Rochester, N. Y.

In striking contrast to what has happened all too often in the past when new industrial processes were developed, industrial hygienists did not wait until after the synthetic rubber industry was fully going and workers had become sick before investigating the hazards and finding ways to correct them.

"In the great biological research laboratories of the National Institute of Health, the Mellon Institute and the Dow Chemical Company, study of the physiological effects of butadiene, styrene and acrylonitrile, used in the synthesis of Buna S and N types rubber, was begun before Pearl Harbor," Mr. Mallette stated. "By the time the government plants, managed by top-ranking rubber companies, were ready to produce for America's war needs, methods had been perfected for the control of vapors incident to the synthetic process."

In his report, Mr. Mallette did not minimize the potential dangers to synthetic rubber makers, but he did describe clearly the methods and tests for protecting them fully.

Each of the three basic ingredients of synthetic rubber may cause trouble. Acrylonitrile is a cyanide, "a toxic compound comparable to a molecular equiv-

alent of hydrocyanic acid." Each of the ingredients has a characteristic odor that might warn of its presence, but, Mr. Mallette cautioned, this cannot be relied on because the sense of smell gets tired and may fail to signal danger in time.

Fortunately, the almost complete enclosure of the Buna S manufacturing process prevents exposure of the workers to all but low concentrations of the vapors, Mr. Mallette said. Butadiene is harmless apparently in all concentrations below the lower explosive limit. Low concentrations of both it and styrene can be detected by a benzol indicator. For higher concentrations, the explosimeter or combustible gas indicator are effective. Mr. Mallette advised a combustible gas alarm for permanent protection of areas such as pump houses, storage depots and the like, where vapors might accumulate.

Scientists do not believe, from their extensive animal studies, that workmen are in any danger of sickness from cumulative action of butadiene after inhaling small amounts repeatedly.

Styrene might irritate eyes, skin and breathing apparatus, but the scientists who have studied it have set a tentative permissible limit of 400 parts per million as being safe.

For acrylonitrile the permissible limit has been set at 20 parts per million. No practical method or instrument for detecting this substance in the air of workrooms is yet available, but tests of the workers' blood and urine for thiocyanate provide a useful means of checking the

degree of exposure. This biological test has been used as a guide in planning ventilation control for the protection of workers in Firestone's "Butaprene" plant. Periodic examinations have shown that these synthetic rubber ingredients have no blood damaging effect, such as that produced by benzol.

The points of potential exposure to the chemicals in the synthetic rubber manufacturing processes are in the handling of raw materials, coagulation, centrifugation and drying, Mr. Mallette stated. He concluded with the following warning:

"Adequate local and general exhaust ventilation must be provided for coagulating tanks and centrifuges. The escape of vapors from the dryers can best be prevented by maintaining a slight negative pressure within them. It may be necessary to provide hoods over the dryer outlets to control vapors of styrene and other substances driven off at this point."

Science News Letter, June 5, 1943

PHYSIOLOGY

Destroyer of Blood Cells Ever Present in Body

➤ A DESTRUCTIVE enzyme which destroys the vital red blood cells during certain diseases may be ever present in our bodies. Ordinarily an inhibitor in the tissues and blood serum holds the enzyme in check.

Evidence that this mechanism exists is reported in the British journal, *Nature* (Feb. 27), by Brian Maegraith, G. M. Findlay and N. H. Martin of the West African Force.

Certain tissues, such as the lung, liver and kidney, will destroy washed red blood cells suspended in salt solution, the scientists observed. But this action is checked by adding blood serum. Addition of a minute bit of the poisonous chemical, sodium cyanide, or heat application also inhibited blood cell destruction.

Men, monkeys and guinea pigs have been used in the experiments. So far it appears that the cell destroyer in an animal acts only on its own species, while the inhibitor will also protect the blood cells of other animals.

Discovery of this action, if substantiated, will aid those trying to combat lytic anemias, such as the mysterious blackwater fever to which the armed forces are exposed in tropical areas.

Science News Letter, June 5, 1943