

## CHEMISTRY

**Synthetic Rubber Now Stands on Its Own Merits**

➤ SYNTHETIC rubber is here to stay on its own merits, and it will no longer be used merely as a substitute for natural rubber, reports E. F. Riesing, chairman of the National Division of Rubber and Plastics of the American Society of Mechanical Engineers, and chief automotive engineer of Firestone Industrial Products Co., at a meeting of the ASME.

He pointed to the superiority of the synthetics in specific physical properties such as resilience, efficiency, low-temperature flexing, low-temperature brittleness, high-temperature stability, oil resistance, resistance to ultraviolet rays, ozone, acid, gas diffusion and other important properties.

The facts presented by Mr. Riesing were based upon extensive tests simulating temperature conditions in the African desert and in Alaska. One type of synthetic rubber, a polybutadiene compound, will not freeze or become brittle under stratosphere low-temperature conditions. This particular type of rubber freezes at 100 degrees below zero Fahrenheit.

*Science News Letter, March 3, 1945*

## ENGINEERING

**Jet Engines Require Much Less Time and Labor**

➤ JET propulsion engines for propellerless airplanes, like the P-59 Airacomet require less than a fifth of the time and labor necessary to maintain a conventional motor, reports Staff Sergeant Earl Kohler, a jet crew chief at Air Technical Service Command headquarters, Wright Field.

The jet engine built by General Electric has only about one-tenth as many moving parts as does the conventional airplane motor. This explains much of the savings in maintenance.

"Most mechanics are surprised to learn that there are only 11 bolts holding the engine in place," Sgt. Kohler commented.

He pointed out that it is possible to take one of the jet engines off the P-59 in 35 minutes, and that four men can remove both jet engines and install new ones in a day.

"Where we used to spend five days doing a certain job on a conventional plane, we can do the same thing for a jet in a day. Where other mechanics use 25 wrenches for a job, we generally use five," he added.

In the jet engine, air comes in the front and goes through the compressors, mixes with kerosene in the combustion chambers and is ignited. It blasts out through the flame pipe, and that is all there is to it.

The jet engine does not have to be warmed up. A minute after the starter button has been pressed, the pilot is ready to take off. Ground crew men also report that the engine cools off very quickly. Once a flight is over, the engine is cool enough to be taken out by the time they remove the cowlings that surrounds it.

*Science News Letter, March 3, 1945*

## METALLURGY

**James Douglas Gold Medal Awarded to Dr. R. F. Mehl**

➤ THE JAMES DOUGLAS gold medal of the American Institute of Mining and Metallurgical Engineers was awarded to Dr. Robert Franklin Mehl, director of the metals research laboratory of the Carnegie Institute of Technology, Pittsburgh, and head of its department of metallurgical engineering.

The medal, established in 1922, was given Dr. Mehl "for distinguished achievement in physics and physical metallurgy; and especially for his development of gamma-ray radiography and for conspicuous success in his metallurgical investigations involving diffusion and crystal structures."

For improving the process of making Bessemer steel, the Robert W. Hunt Silver Medal and Certificate for 1945 was granted E. Chester Wright, chief metallurgist of the National Tube Co., Pittsburgh. The particular type of steel with which Mr. Wright worked is used in making seamless steel tubes, especially the type of steel pipe used in transporting oil, as in the "Big Inch" pipe line.

The J. E. Johnson, Jr., award was granted Carl Gustav Hogberg, assistant to the chairman of the Blast Furnace Committee of the U. S. Steel Corporation "for his contributions to the science and art of smelting iron ores in the blast furnaces," it was announced at the meeting of the board of directors.

For research work leading to the improvement of methods of production of brass cartridge cases, William Marsh Baldwin, Jr., chief metallurgist of the Chase Brass and Copper Company, Euclid, Ohio, was given the 1945 award of the Institute of Metals Division (A.I.M.E.).

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**IN SCIENCE**

## AERONAUTICS

**Deadlier Dive Bomber Blasts Japs in Raid**

➤ A NEW and more deadly model of the Navy's SB2C dive bomber has been revealed, following its use in the recent carrier-based raid on Tokio. Carrying one of the greatest loads of destructive power ever mounted in a single-engine airplane, its fighting rig includes two 20-millimeter cannon mounted in the wings, five-inch rockets mounted under the wings, half a ton of bombs, also mounted under the wings, and more than 1000 pounds of bombs in the bomb bay.

Newest addition to the family of "Hell-divers," the Curtiss-Wright plane has a powerful radial air-cooled engine and a four-bladed propeller.

"Swiss cheese" perforated flaps on the wings break down the speed of the plane in a dive without excessive buffeting of the tail, thus permitting less experienced pilots to make a truer dive.

*Science News Letter, March 3, 1945*

## MEDICINE

**Anti-Germ Substance from Athlete's Foot Fungus**

➤ VICTIMS of athlete's foot may find it hard to believe, but the fungus that causes them misery produces an anti-germ substance very much like penicillin.

Discovery of the penicillin-like substance in the athlete's foot fungus was made by Dr. Samuel M. Peck and Dr. William L. Hewitt of the National Institute of Health in Bethesda, Md. They give their findings in *Public Health Reports*, (Feb. 9).

The same anti-germ substance, or antibiotic as it is termed technically, was found in a number of other fungi that cause skin trouble, including one that causes ringworm.

It is active against streptococci, staphylococci and pneumonia germs as penicillin is. Like penicillin, its production is enhanced by corn-steep liquor, and there are other similarities between the two antibiotics. The fungi, however, produce their antibiotic in very low concentrations so they are not expected to become a practical source of the material for use in treatment of infections.

*Science News Letter, March 3, 1945*

# CE FIELDS

AERONAUTICS-METEOROLOGY

## Picturesque Scene at U. S. Army Air Force Base

See Front Cover

► NEAR GERMAN LINES, the B-17 Flying Fortress shown on the front cover of this SCIENCE NEWS LETTER, is blanketed with snow that has fallen during the night.

The serenity of the scene will not last long, however, for within the hour the bomber will be roaring eastwards, high in the icy sub-zero skies, taking part in the day's bombing attacks on German lines of communication behind the western front.

*Science News Letter, March 3, 1945*

ENGINEERING

## Prefabricated Hospital Transported by Air

► PREFABRICATED postwar homes and small buildings may be transported by air to the site where they are to be erected, as a result of the development of a portable hospital shelter which can be transported by air in two-thirds the cargo space of a C-47 airplane. It weighs 3,700 pounds complete, and can be erected by a four-man team in two hours.

Two types of shelters have been developed. One is for use in warm, tropical climates, and provision for adequate ventilation has been stressed in its design. The other is for use in the Arctic, and suitable insulation has been incorporated into its construction.

Each unit has two rooms, one 16 by 16 feet and the other eight feet square. Windows can be opened or closed. Provision is made for the use of electricity, and there is a stovepipe outlet in the gable. Each unit has three doors, one to the outside from each of the two rooms, and the third connecting the rooms.

Developed by the Equipment and the Aero Medical Laboratory of the Air Technical Service Command, the small eight-foot entry room is large enough so that when a patient is brought in, the outer door can be closed before the inner door is opened. In cold regions this feature conserves heat, and in the tropics it keeps out insects and other pests. Each unit can accommodate 12 patients on lit-

ters, with enough space left to use for operations and as a dispensary.

If much space is needed, the units can be set up in combinations to meet the requirements of the local situation. Probably one of the greatest uses of the hospital shelters will be at advanced air bases. Here they can be erected near the airstrip so that a hospital plane can taxi up to the shelter and the patients, still on the original litters, can be loaded into it.

*Science News Letter, March 3, 1945*

GENERAL SCIENCE

## Freedom of Science Needed To Maintain World Unity

► MAN MUST be free to think, free to conduct research, free to develop his ideas, free to invent and to produce, declares Brig. Gen. David Sarnoff, special consultant to the Communications Branch of the Public Relations Office, Supreme Headquarters of the Allied Expeditionary Forces, and president of the Radio Corporation of America. For this reason, he asserted that there should be a fifth freedom added to President Roosevelt's Four Freedoms, the Freedom of Science, since it, like the other freedoms, is essential to the maintenance of world unity.

"Political and social limitations and expediencies must not fetter the application of scientific knowledge, nor stop the quest for it," Gen. Sarnoff advised.

He called attention to a new science, "Chemotronics", a combination of electronics, supersonics and chemistry, through which scientists may learn the secrets of creating many new products.

General Sarnoff declared that today scientists are on the edge of new discoveries in the realm of electronics. He pointed to evidences already at hand of man's ingenuity to create new products to fill his basic needs by mastery of nature through science.

"Civilization today cries for new Edisons and Marconis, for young men and women to explore the uncharted wilderness of the ionosphere with its cosmic rays and its mysteries as myriad as the stars," he observed.

"Why should man let the heat from the greatest furnace—the sun—go to waste? Why should he let its light be dissipated? The day may come when research will discover how to bottle the heat and light from this great natural reservoir for man to use . . . Science will harness them so that the precious rays will be on tap for use at will, like electricity, and gas," he declared.

*Science News Letter, March 3, 1945*

TECHNOLOGY

## New Courses at MIT Include Textile Research

► TEXTILE RESEARCH, food technology and electronics step to the front in the new program at the Massachusetts Institute of Technology in the recent establishment of intensive and extensive courses of study and investigation in these three subjects, based on developments of the past, including the great forward strides under war impetus, the present needs of the armed services and civilians, and future world-wide production and needs. New laboratories and equipment will be available for the work.

The textile investigations will have the use of a new laboratory known as the Samuel Slater Memorial laboratory, named in honor of the man who, in 1790, built the first cotton spinning machinery and started the first cotton mill in the country. It will pioneer in the application of the most advanced scientific knowledge to research on fibers, yarns, and fabrics.

In food technology a far-reaching program to study postwar problems of world food production will be undertaken. It will include the improvement of products and methods for retaining natural flavors and nutritive elements in processed foods, and a study of packaging food products to provide better protection against the ravages of time and climatic conditions. It will make use of the developments of new food products in the past few years, and the accelerated progress in food technology due to the needs of armed services in many different parts of the world.

A new laboratory, bearing the name of Samuel Cate Prescott, will be used by the food technology division. It will be fully provided with food processing equipment and other facilities to carry out its program. The course will cover five years, during which men will spend considerable time in some of the country's great food manufacturing plants and in the research laboratories maintained at these plants.

In the new professional course in electronics, in which their application to television and highly developed production methods will be emphasized, the Institute will have the cooperation of the Philco Corporation of Philadelphia. Under this cooperative course, selected students will spend alternate terms at the Institute and at the Philco plants.

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