MEDICINE

Army Doctors Important

Physicians play decisive role in both war and peace. Disease has struck down more soldiers in former wars than the enemy's weapons. Stimulates research.

➤ MILITARY doctors play a decisive role in war between nations and in mankind's peacetime fight against disease. Their triumphs in both kinds of war were reported by Col. Edgar Erskine Hume, of the Army's Medical Field Service School at Carlisle Barracks, in a public lecture at the New York Academy of Medicine.

"Half a million men can turn the tide of a war, even in these days of huge armies," Col. Erskine declared.

The United States, he pointed out, might have had that number of men put out of action in World War I, not by enemy guns but by a single disease, if our Army had not been effectively protected against typhoid fever. In the first World War there were only 1,500 cases of typhoid fever instead of half a million as would have been expected on the basis of the numbers affected by this disease in our war with Spain in 1898, before doctors knew how to vaccinate against typhoid fever.

"In all past wars disease has struck down more soldiers than all the combined effects of the enemy's weapons," Col. Hume declared. "The soldier's duty is to fight, not to die, for his country. The army's medical department has the task of keeping him fit, 'To Conserve Fighting Strength,' to quote the motto of the Medical Field Service School, Carlisle Barracks, Pa."

Recalling that the disastrous ending of Napoleon's Russian campaign was the result of an outbreak of typhus fever, to which the Russians were immune but the French and their allies were not, "Who knows but what something of this kind may not happen in the present war in Russia?" Col. Hume asked.

"Horrible though war is, it has stimulated medical advances," he continued. "Some of the world's great medical discoveries have been made by military surgeons, particularly in connection with field service. Every war has added to the sum of medical knowledge."

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tect explosives plants and oil storage from lightning.

Cellulose acetate now completely replaces silk as an insulation for telephone wires with considerable improvement.

A blanket made of two layers of rubber, one vulcanized, the other one sticky, was just coming into general use for temporary protection of telephone cable splices when the rubber shortage intervened.

The same type of two-faced rubber but in the form of tape is used after telephone wires are spliced together to make them re-usable.

Transoceanic telephone cables now seem to be practicable due to the invention of a telephone repeater which can be built into the cable structure itself.

Method of wiping lead joints on telephone cables was brought into use, which saves about 60% of the usual requirements of tin.

Typewriter cylinders in which the rubber has become hard and shiny can be rehabilitated by sand blasting them.

A method of producing X-ray photographs that show three dimensions on a single film was demonstrated.

Levulinic acid was made available in commercial quantities.

Automatic soundings of the upper atmosphere made it possible to predict best wavelengths for shortwave radio.

An Office of Production Research and Development was set up within the War Production Board.

Merchant shipbuilding facilities were expanded to the point where there are more than 60 yards, with 300 ways and nearly 2,000,000 workers, producing 8,000,000 tons of shipping in 1942.

Cargo ships of 10,500 tons were completed from keel laying to launching in 4 2/3 days and from launching to delivery in eight days.

Side-launching of ships was used extensively in war shipbuilding program.

Dr. Paul Dyer Merica, vice-president of the International Nickel Company of Canada, discoverer of many alloys and of a principle of precipitation hardening, was awarded the Franklin Medal by the Franklin Institute.

S. A. Schelkunoff of Bell Telephone Laboratories was awarded the Morris Liebmann Memorial Prize of the Institute of Radio Engineers for his contributions to the theory of electro-magnetic fields in wave transmission and radiations.

Gerard Swope, president of the General Electric Company, was awarded the Hoover Medal.

Dr. Willis Rodney Whitney of the General Electric Company, was awarded the John Fritz medal.

INVENTIONS

Patents Mark Progress In Arts of War and Peace

Notable and interesting inventions patented during the year include:

Use of crushed rock materials to extinguish incendiary bombs by melting and smothering them.

Steel cartridge cases, especially for fixed artillery ammunition, releasing great quantities of brass for other war uses.

Rifle bullets that indicate point of impact by flashes or smoke-puffs.

"Unjammable" secret radio communication, using phase modulation instead of amplitude or frequency modulation.

An automatic radio repeating station that receives, amplifies and re-transmits messages without human attention.

An electric furnace for the production of gas-mask charcoal.

A lifeboat that can be held at deck level while loading.

For torpedo tubes: a recoil system to lessen jar, a "wad" to follow torpedo in discharge, a special light-construction type for mosquito boats.

Air raid sirens that give short barks or yelps, instead of the long, continuous howls now familiar.

Silver linings for machine bearings.

A new primer for setting off explosives, in which a lead compound is substituted for fulminate of mercury.

Double-decked dining cars, with kitchen "amidships" on lower deck.

An improved mill for getting rubber out of guayule plants.

"Repeating" flashlight bulbs, good for several photoflashes; also non-shatterable flashlight bulbs made of plastics, in handy flat, square shapes.

MATHEMATICS

Progress Made in Mathematical Research

It was demonstrated that every *sufficiently large* integer can be expressed as the sum of not more than 23 fifth powers of integers, and also as the sum of not more than 36 sixth powers of integers; the lowest values previously known were 28 and 42, respectively.

The ordinary Euclidean algorithm, which is used to find the highest common factor of two or more numbers, was given a remarkable extension to a similar algorithm for vectors, with many applications.

A postulate system for Post algebras was given, and the algebras generalized, somewhat similar to the extension from 2-element Boolean algebras to n-element algebras.

The sandwich theorem, which states that any three volumes can be simultaneously bisected by a single plane, was generalized to figures in spaces of higher dimensions.

A considerable extension was made in the class of functions for which it is known that the Fourier-Bessel expansion is valid.