MEDICINE

Arthritis Pain Relieved

Muscle spasm and disability resulting from rheumatoid disease are lessened by a new treatment, which consists of injections of the drug, neostigmine.

➤ A NEW treatment of rheumatoid arthritis which swiftly relieves the painful muscle spasm and consequent disability is reported by Dr. Philip R. Trommer and Dr. Abraham Cohen, of the Philadelphia General and Jefferson Hospitals. (*Journal, American Medical Association,* April 29)

The treatment consists in hypodermic injections three or four times weekly of the drug, neostigmine, also known as prostigmine. Out of 19 patients with rheumatoid arthritis and similar related conditions, 13 gave a favorable response to the treatment.

One patient had been bedridden and unable to feed or care for herself for a year. She had a pronounced deformity of her knees and feet, a rigid spine and "claw hands." Her right knee was held bent at a 90 degree angle and the left one was bent to 110 degrees. The hamstring tendons were shortened on both legs. All previous treatment with salicylates and gold salts had failed to help.

Within 15 minutes after a test dose of the neostigmine, she was able to extend her right knee to 130 degrees and to cross it over the left. As the treatment was continued, she was able to open and close her hands, to get out of bed and into a wheel chair without help, to wash her hands and face and comb her hair and could put her arms and hands in back of her head. In this patient's case the limit of improvement was reached after three months of treatment because of the partial abnormal union of the bones of the joints. Other patients showed similar improvement even when the disease had been present for years.

Although the neostigmine does not affect the diseased condition of the joints, it does relieve the accompanying muscle spasm which the Philadelphia doctors believe is one of the primary sources of the severe pain and deformities in rheumatoid arthritis. More attention should be given to this symptom of the disease, they say, advocating also wider experimental use of neostigmine.

The idea of using this drug came from a report by Dr. H. Kabat and Dr. M. D. Knapp, of the Mayo Clinic, of encouraging results with it in subacute and chronic infantile paralysis, another disease in which muscle spasm is said to play a prominent part.

Besides the hypodermic injections of the drugs three or four times a week, some patients may require doses by mouth three times daily to give a more prolonged effect. Atropine is given to prevent undesirable side effects.

Science News Letter, May 6, 1944

CHEMISTRY

Two New Kinds of Rubber

Lactoprene, developed in a government laboratory, is made from sour milk acid. Other new synthetic product uses butadiene and secret chemical.

➤ TWO NEW KINDS of synthetic rubber, one developed in a government laboratory, the other by a private industry's chemists, were announced at the New York meeting of the American Chemical Society's rubber division.

Lactoprene is the name of the government chemists' compound, which was first produced at the Eastern Regional Research Laboratory of the U. S. Department of Agriculture near Philadelphia. Leaders in this research were C. H. Fisher, W. C. Mast, C. E. Rehberg and Lee T. Smith.

As its name implies, lactoprene is made from a milk product. The starting material is lactic acid, the stuff that makes sour milk sour. The molecules of lactic acid are polymerized, or chemically welded together, into bigger molecules of a compound known as methyl acrylate, which has long been used as a raw material for plastics of various sorts. The methyl acrylate is converted into the new synthetic rubber, lactoprene.

Lactic acid can be obtained through the fermentation of other things besides milk. Almost any cheap, abundantly produced carbohydrate, like molasses or starch, can serve as raw material. An especially ready material, however, is the milk sugar in whey, a by-product—almost a waste product—of that part of the dairy industry that turns out cheese and industrial casein.

The other new synthetic rubber, which as yet has no special name, made its bow under the auspices of G. W. Dolan, president of the Mathieson Alkali Works. One of its ingredients is butadiene, important constituent of the GR-S rubber now being turned out in quantity. The other principal ingredient was not disclosed, but it was stated to be "a new chemical produced from readily available raw materials." Although still in the development stage and far from ready for mass production, its cost was estimated to be about the same as that for GR-S on the same scale of manufacture.

Chief merit of the Mathieson synthetic, Mr. Dolan declared, is its ability to stand up under hard use that makes rubber hot. An acknowledged weakness of GR-S tires is their tendency to heat when run fast, which of course means more rapid wearing out and more frequent blowouts. The new synthetic was also declared to be highly resistant to cuts and abrasion.

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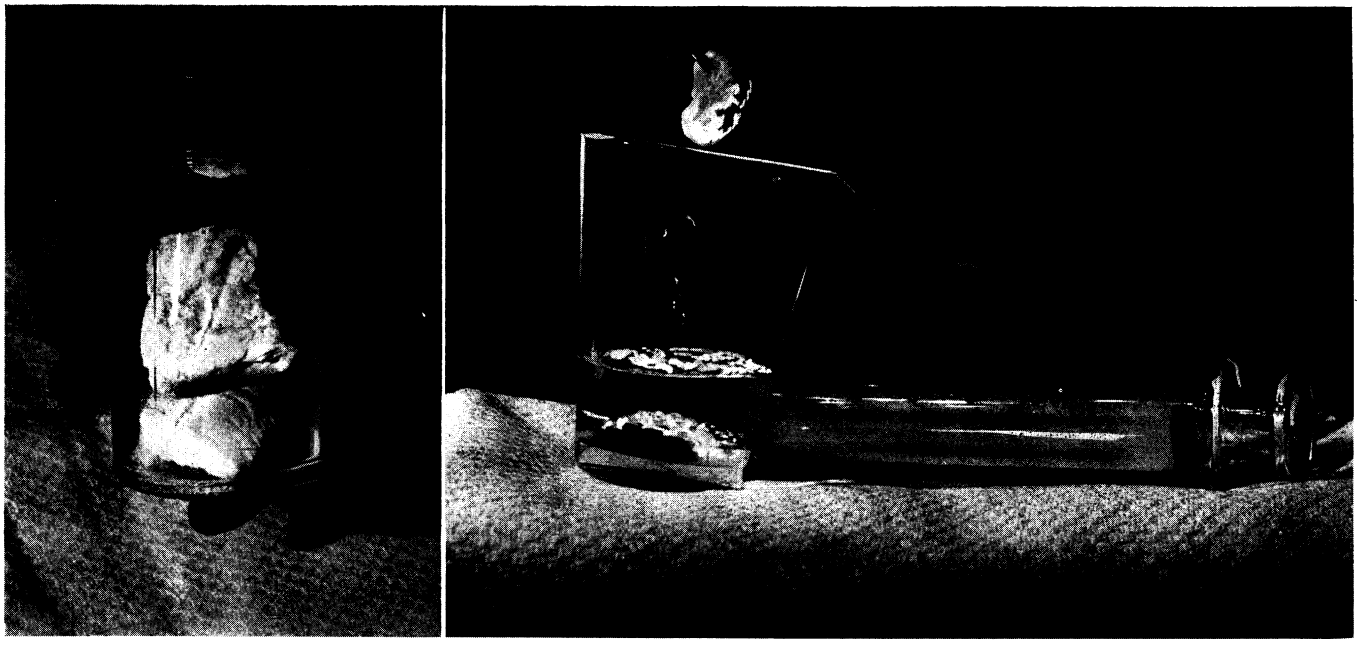
Heating Eliminated

➤ EXCESSIVE heating in automobile tires made of synthetic Buna rubber will probably be eliminated by the addition of certain non-black pigments of very fine particle sizes which have developed into reinforcement pigments, declared Alan R. Lukens, of Thompson, Weinman and Co., Cambridge, Mass., at the same meeting. These non-black pigments, he said, promote reinforcing without increasing the conductance of electricity. The new discovery promises to bring this synthetic into wider public use.

When the natural rubber was plentiful, he added, "we enjoyed rubber tires which gave us good mileage even at high driving speeds. The natural rubber made tires which gave these re-



RESEMBLING SEA-FOAM CANDY—The white material in the glass jar at left is made from blood—perhaps the blood you donated to help save the lives of our fighting men. From the fluid part of blood scientists are extracting not only albumin, used instead of plasma to relieve shock, but many other substances technically known as fractions. The fraction shown in the pictures taken at Walter Reed General Hospital in Washington, by Fremont Davis, Science Service Staff Photographer, is fibrinogen, necessary for normal clotting of blood. Fibrinogen is converted by thrombin, another blood constituent, into fibrin, the essential portion of the blood clot. The blood clot is nature's way of stopping bleeding. Fibrin foam on the forceps, right, is employed to help stop bleeding. These are the first pictures showing fibrinogen used in operations at an Army general hospital. Frequently the use of electro-cautery, which seals off the blood vessels the surgeon's knife has cut across as he opens the brain to find and remove a brain tumor, for example, is not entirely successful and fibrinogen comes to the rescue. A bit of the taffy-like stuff shown at left is dropped into water containing thrombin and with a forceps the surgeon lifts out the foam, which looks like a damp wad of cotton. The syringe is used in measuring the solutions of thrombin and saline. Put onto the bleeding spot in the patient's brain, this fibrin foam acts just like nature's blood clot and swiftly stops the flow of blood. The scientist primarily responsible for the development of fibrin foam is Dr. Edwin J. Cohn, in charge of the Office of Scientific Research and Development project at the Harvard Medical School's Laboratory of Physical Chemistry.

sults largely through the development and use of finer and finer sized carbon blacks. However, when these fine carbon blacks were used in Buna rubber, the increased fineness results in high tire temperatures."

Certain extender pigments will double the tensile strengths normally achieved with low proportions of the finer carbon blacks, he stated. "When smaller proportions of carbon blacks can be made to develop as much strength in this synthetic rubber as was obtained by the larger ratios now generally thought necessary, rubber articles can be made which have not only this necessary toughness but also a minimum of electrical conductance and internal heating when under continual use."

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PUBLIC HEALTH

Paralysis Foundation Spent More Than Million

➤ MORE than one million dollars, $1,278,836.04 to be exact, was granted and appropriated by the National Foundation for Infantile Paralysis last year in fighting this much-dreaded disease.

Virus research, after-effects research, education, medical publications, and epidemics and public health were the five main categories under which the funds were allocated, according to the Foundation's annual report. General administrative expenses totalled $84,970.53.

The money comes from funds contributed by the public during celebrations of President Roosevelt's birthday. Half the money remains with the local chapters which provide care for infantile paralysis patients in their areas, the other half going to national headquarters for use in fighting the disease on a nation-wide basis.

The Foundation's report reviews the support it has given the Kenny method of after-effects treatment and reveals that it has spent more than $500,000 in testing and evaluating the method and training doctors, nurses and physical therapy technicians in its use.

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Black ilmenite, a common mineral in the earth's crust, by an elaborate chemical process yields pure white titanium oxide, a versatile substance used in skin protectives, welding rods, white paints, and paper.