

which releases the gas compressed in a tiny steel vial.

On both navy and army planes, engine fires caused by bullets or backfires or leaking oil lines now can be smothered in full flight miles above the earth. A bottle of the compressed carbon dioxide is connected to perforated piping which loops around the engine, and a quick pull of a control handle shoots a cloud of the gas into every crevice of the engine compartment, smothering the flames despite the force of the slipstream. Some military planes have fire detectors which discharge the gas automatically, thus leaving the pilot's hands free. Engineers explain the action of the gas by saying that it cuts the air's normal 21% oxygen content to 14% or 15%, at which point gasoline or oil cannot burn.

Thus has a non-poisonous gas become one of the most useful adjuncts of a modern army and navy. And while research continues on other uses for this versatile vapor, so far much of the credit for perfecting the high-pressure uses of this gas goes to a New York engineer named Walter Kidde. His firm first demonstrated the commercial use of this fire-smothering vapor by invading the shipping capital of London, England, and renting an old cargo ship for a dramatic demonstration. After inviting London shippers aboard the vessel, they drenched the hold with gasoline, set it afire, and smothered the roaring blaze with a quick discharge of the gas.

Peacetime uses for carbonic gas are quick to develop, too. New York's Municipal Airport protects its commercial traffic with a counterpart of a gas truck designed for the navy. Factories and oil refineries are installing similar trucks and trailers which carry large quantities of carbon dioxide. Plant interiors are being fitted with wheeled gas extinguishers and, in many cases, with automatic built-in systems that flood whole rooms with the gas in event of fire. Already, commercial planes are protected against engine fires in the air by carbon dioxide systems.

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● RADIO

Prof. Ernst A. Hauser, of Massachusetts Institute of Technology will describe a new synthetic mica in discussing "New Materials from the Earth," as guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, July 11, 4:00 p.m., EDST, 3:00 EST, 2:00 CST, 1:00 MST, 12:00 PST.

Listen in on your local station. Listen in each Thursday.



IN ASBESTOS SUITS

Fearsome looking figures are these members of the Navy's mechanized fire-fighting unit, using carbon dioxide to battle flames.

NUTRITION

Japan's Rice Shortage May Bring Crisis in Fall

**Nature, Not China, Dealt Heaviest Blow at Nippon
When Different Regions Suffered Rain and Drought**

THE WAR of hunger is creeping near to Japan's door, as officials struggle to outwit a rice shortage, the first in Japan's experience in twenty years. If they can skimp till the new harvest in November, without a repetition of 1918 rice riots, they may be on firmer ground.

Nature, not beleaguered China, shot this damaging bolt at Japan, when too much rain and too little rain fell on different regions of the empire in the past growing season.

The result, analyzed by agricultural economists, spells a serious outlook for Japan's "staff of life." Ordinarily one of the world's most self-sufficient nations as to her entire food supply, Japan consumes about 25 billion pounds of rice a year, grows four-fifths of it on farms of Japan proper, gets the rest from her colonies of Chosen (Korea) and Taiwan (Formosa), plus a little from Thailand (Siam).

But the past season's rice crop in

Chosen was 40% less than the previous year, and Taiwan's crop the smallest in five years. By rigid economy, Japan is trying to reduce rice consumption this year by a full billion pounds, while banking on larger plantings and a better crop in the 1940-41 season.

Pinching and scraping to feed the Japanese includes such prospects as these:

Importing about three billion pounds of rice, some of which may force drawing on Japan's credits abroad, which she prefers to spend on war material. Some of the rice is being bought from Thailand (Siam), and some is reported coming from central China, despite China's own rice shortages.

Reducing Chosen's rice consumption 25% by a proposed rice distribution system there, and substitution of other foods.

Rice is being polished only about 70%,

since last December, in spite of Japanese aversion to eating brown rice.

Sake brewers have been restricted to half their ordinary production.

The ultimate possibility that Japan

may have to turn to potatoes, or some other staple more economical to produce than rice, is foreseen as one long range solution of Japan's food problem.

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MEDICINE

Calcium May Be Weapon for Defense Against Lead Poison

CALCIUM, bone-building mineral, may be the weapon for defense against lead poisoning, potentially widespread hazard due to contamination of "practically all common foods" with traces of lead.

"Increased amounts of calcium in the diet diminish the amount of lead which is stored in the body," Dr. Ludwig G. Lederer and Dr. Franklin C. Bing, of Chicago, announced. (*Journal, American Medical Association, June 22*)

Extra calcium in the diet, they discovered, retarded the deposition of lead in the bones of growing animals. The bones are the chief place where lead is stored in the body.

"Even minute amounts of lead may be detrimental to health if they accumulate in the body," the Chicago doctors pointed out in discussing the hazard of the small amounts of lead which recent studies have shown in common foods.

"To draw conclusions about the significance of the traces of lead that are ingested under ordinary conditions would require careful study and more data than now are available . . .

"On the basis of evidence now available, lead must be considered a potential hazard and all possible contamination of food products with lead should be guarded against."

How calcium acts to keep lead from accumulating in the bones is not definitely known. Apparently it is the result of chemical reactions in the intestinal tract. Presumably the lead is made insoluble so that it cannot be carried to the bones.

The calcium used in the study was calcium carbonate. Whether the calcium in milk would have the same beneficial effect cannot be stated without further experiments.

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skin due to impermeability to air with resulting perspiration and chemical absorption into the skin. The follicular-papular character of the eruption suggests a chemical effect on the hair follicles of a specific type. The dissemination beyond the site of contact also indicates chemical absorption rather than a purely mechanical irritation. The exact chemical that is responsible for this effect remains to be determined. Our assumption would be that 'elasti-glass' tends to hydrolyze when in contact with the moisture of the skin and that in this way irritating compounds of the tricresyl, tin or some other chemical group are produced.

"Further studies should be undertaken to determine the nature of the skin irritant, and the various steps in the manufacturing process should be checked for possible sources of error before this material is permitted to be used on a more extensive scale in articles of wearing apparel. In fairness to the manufacturers, it should, however, be stated that clinical trials on actual wearers of the finished products were carried out for some time before they were released and that only an occasional case of irritant effect was observed."

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CHEMISTRY

Get Marihuana Crystals More Powerful Than Drug

COLORLESS crystals more than 100 times as effective as marihuana have been isolated from this narcotic by a research team of California Institute of Technology.

This is the first time the active principle of the drug, familiar to young moderns as the active ingredient of "reefers," has been obtained in chemically pure crystalline form, Prof. A. J. Haagen-Smit and C. Z. Wawra, J. B. Koepfli, G. A. Alles, G. A. Feigen and A. N. Prater, state in their report. (*Science, June 21*)

The powerful crystals, which, needless to say, will only be available for scientific research, have been named cannin. Research to determine their chemical structure will be next on the program of nation-wide research efforts sponsored by the U. S. Treasury Department and looking toward the possible development of a narcotic-free hemp plant which would have industrial and agricultural value.

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About 16 million people live within 250 miles of the proposed *Green Mountain National Park* in Vermont.

MEDICINE

Cases Of Skin Disease From "Elasti-Glass" Garters

TWO CASES of skin irritation from wearing garters, suspenders, and wrist watch straps made of the new synthetic plastic called "elasti-glass" are reported by Dr. Erwin P. Zeisler of Chicago to the American Medical Association.

Various Chicago physicians reported an additional eight cases to Dr. Zeisler during the first three weeks of May. About 20 cases have been reported from various other parts of the country. At least 250,000 garters, wrist watch and suspender sets of this material have been sold, Dr. Zeisler states. (*Journal, American Medical Association, June 29. See SNL, Jan. 27*)

An increase of the skin trouble during hot weather is foreseen by Dr. Zeisler

because of the "impervious character of the material and the greater chance of chemical absorption."

As to the cause of the condition, he states: "My conclusion from observation of these two cases is that the dermatitis (skin irritation) is due to a specific sensitivity induced by intimate and prolonged contact with a heavy nonporous, impervious material. The negative patch tests are obviously not a sufficient criterion of noninjurious effects, as the ordinary method of applying the test material to the skin does not correspond to the effect of wearing a constricting band against the skin over a long period of time. The dermatitis, in my opinion, is the result of mechanical friction, overheating of the