

## MEDICINE

**Cobra Venom Stops Pain  
But is Not Habit-Forming**

**C**OBRA venom, in doses too small to be poisonous, relieves pain as effectively as morphine. But the venom of the death-dealing serpent is not habit-forming when given to relieve pain, as morphine is, and it does not produce the disagreeable and dangerous by-effects of the narcotic drug.

Experiments with cobra venom on laboratory animals and human patients, including a hundred sufferers from cancer in its late stages, were reported by Dr. David I. Macht, director of Pharmacological Research Laboratory, Hynson, Westcott and Dunning, Baltimore, at the meeting of the National Academy of Sciences. Dr. Macht was formerly lecturer in pharmacology at the Johns Hopkins Medical School.

Seventy-five of the cancer sufferers had their pain relieved by doses of cobra venom injected into the muscles, Dr. Macht reported.

The snake venom checks pain by acting on the higher nerve centers in the brain, he found from psychological and pharmacological studies.

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## FORESTRY

**Tree Seeds Harvested by  
Ton in Shelterbelt Area**

**S**HELTERBELT tree plantings in the Plains area are to be made in future from seedling descendants of trees already growing in the region and used to conditions there. At a meeting of biologists, Paul H. Roberts of the U. S. Forest Service told of a 1935 harvest of 57 tons of seeds and fruits of various Plains tree species, enough to supply 100,000,000 young trees for shelterbelt planting in future years.

Of this quantity, 85 per cent. came from trees in the shelterbelt area, 10 per cent. from trees in immediately adjacent regions in the West, and 5 per cent. from other sources, chiefly Chinese elm, a species claimed to be especially well adapted to cultivation in the West.

During the first shelterbelt planting season, just closed, 125 miles of shelterbelt were set out, besides 5,000 acres of farmstead tree plantings. Much of the stock, secured on an emergency basis from private nurseries, was not as suitable to the purpose as might have been desired, Mr. Roberts said, but even so,

between 70 and 85 per cent. of the plantings have survived.

There is in sight at present a total of 40,000,000 young trees for the 1936 planting campaign, enough for 1,400 miles of shelterbelt.

The entire area planned for shelterbelt development lies east of the "dust-bowl" region made famous—and obnoxious—by the great drought that reached its climax in 1934, Mr. Roberts explained.

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## MINING

**Compressed Air Replaces  
Dynamite in Coal Mining**

**C**OMPRESSED air, rather than blasting dynamite, is the newest safety aid for coal mining now being tried out in the Indiana and Illinois coal fields.

Large pieces of coal of the so-called premium variety are now being politely pushed out of place by air pressure instead of being ruptured violently by dynamite or other permissible explosive.

There is no question about the value of the new method in raising mine safety, according to officials of the U. S. Bureau of Mines. There are no dangerous fumes liberated as in ordinary blasting. And more than that, the blast is highly localized at the point where it will do the most good.

In contrast, dynamite blasting is a fast and violent shock which not only breaks up the coal but puts a severe strain on the overlying rock structures. These, on occasion, break and drop rocks into the mine tunnels.

In practice, pneumatic mining consists of drilling a hole in the mine face, inserting a cylinder containing air compressed to as much as 15,000 pounds to the square inch, and the release of this pressure at will. Air at 15,000 pounds to the square inch is at a pressure comparable with that set up when a charge of dynamite is exploded.

Specially designed steel cartridges with a disk which ruptures at the operator's demand are used in storing the air. The cylinders can be used over again, according to engineers of the General Electric Company, which makes the electrical controls and motors for the compressing unit (*General Electric Review*, Nov.).

U. S. Bureau of Mines officials state that the technique is a real advance in mine safety and is adaptable not only in the mid-western coal fields but in the eastern Pennsylvania and West Virginia regions.

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**IN SCIENCE**

## ENGINEERING

**Newark Airport to Get  
Runway of Cotton Sheeting**

**C**ONSTRUCTION of the world's first "cotton runway" will be undertaken next spring at the Newark Airport, it is announced by the Cotton-Textile Institute.

Cotton sheeting is already in use in the South in rural and secondary road construction where traffic is light. It is found to minimize erosion, cracking and wrinkling.

It takes from six to eight bales of cotton to construct each mile of an 18-foot road by the method. The Newark Airport installation will amount to about one mile and a half of such road.

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## CHEMISTRY

**Polymerization Adds  
To Gasoline Resources**

**T**HE PROCESS of making gasoline out of natural gas and waste refinery gas, known chemically as polymerization, has increased the nation's potential sources of motor fuel by 25 per cent., it was reported to the American Petroleum Institute.

With efficiencies now obtainable approximately 110 million barrels of polymer gasoline could be produced each year if necessary, speakers at the meeting declared. This is roughly 25 per cent. of all the gasoline consumed in the nation in 1934.

Polymerization is the chemical process whereby waste refinery gases are made to combine in such a way that two or more molecules join and form a larger molecule, known as a "polymer." Not only gasoline can be secured in this fashion, but also benzol, toluol, and xylol, all important solvents.

The very volatile "tops" of natural gasoline and even natural gas can be polymerized. It is estimated that more than three billion gallons of gasoline, or about one-fifth of the annual consumption, is available from natural gas without curtailing the more than one trillion cubic feet available annually for other domestic and industrial uses.

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# E FIELDS

## ENGINEERING

### Deep Oil Wells Tax Engineers' Ingenuity

**G**REATER demand for oil, leading to an increasing demand for oil wells 10,000 feet and more deep, is taxing the ingenuity of engineers, it was disclosed at the meeting of the American Petroleum Institute.

High pressures encountered at the extreme depths have added to the difficulty of finding pipe strong enough to lead the oil out, declared T. McLean Jasper of the A. O. Smith Corporation, Milwaukee, Wis.

The thickness of the pipe walls—the easier way to gain strength—cannot be increased indefinitely. Thick pipe means larger boring holes and is not economical for great depths. Already steel resisting pressures of 60,000 pounds to the square inch is needed at depths of 7,880 feet. For 10,000-foot wells steel pipes able to withstand 80,000 pounds to the square inch are used. For still deeper wells even stronger pipes are made by compressing the larger sizes into a smaller finished circumstance, resulting in pressure resistance of 95,000 pounds to the square inch.

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## PLANT PATHOLOGY

### Beans Resist Disease by Their Over-Sensitiveness

**R**ESISTANCE to disease by being over-sensitive, not too tough, is the unusual phenomenon reported by Dr. S. A. Wingard of the Virginia Agricultural Experiment Station, before the meeting of the National Academy of Sciences.

Dr. Wingard has been seeking varieties of beans able to resist the attacks of the bean rust fungus. Some of his most promising varieties showed, upon microscopic examination, that their cells, instead of standing up against the attacking fungus threads, immediately collapsed, thereby giving the fungus little chance to form the propagating spores that would carry the epidemic farther. The surrounding cells thereupon formed layers of hard substance around the in-

fect spots, cutting them off and forming small sterile flecks.

"Hence, the so-called rust-resistant varieties owe their ability to resist the rust disease to their hypersensitiveness rather than to the property of true resistance or immunity," Dr. Wingard remarked. "For all practical purposes, this type of resistance is satisfactory because the rust fungus cannot produce spores in sufficient quantity on such plants to cause severe damage."

In rust-susceptible beans, a paradoxical situation was found. Here, the tissues invaded by the fungus formed a sort of gangster cooperative society with them, thriving better than the uninfected surrounding tissue, and feeding at the latter's expense. But after the fungus had exhausted itself by producing its spores, the bean tissue turned on it and ate it up: the devourer had become the devoured.

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## PSYCHIATRY

### Holland's Queen Approves Warning Against War

**Q**UEEN Wilhelmina, ruler of the consistently neutral nation Holland, has expressed her approval of a warning against "war insanity" sent by psychiatrists of 30 nations to statesmen of the world.

Signed by 339 specialists in mental diseases, the document pointed out that the world is drifting towards a war psychosis, and that civilized 20th century man still possesses strong, fierce and destructive instincts which may break loose, when roused by the hypnotic speeches of leaders, and create chaos.

Queen Wilhelmina's "deep interest" in the document was expressed in a telegram to Dr. J. Roorda, honorary secretary of the Netherlands Medical Society's Committee for War Prophylaxis.

"This document, which tends to reflection," the queen's letter said, "has deeply interested me and I heartily agree with your practical and realistic point of view."

"I trust that this address will influence the mentality of peoples and statesmen. May God give that the different peoples, stimulated by clearer and sharper insight in the horrors of war, show themselves ready, in their own real interest to collaborate peacefully for the sake of humanity."

"This means a great task for the states, especially for those which are members of the League of Nations."

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## GENERAL SCIENCE

### Science May End War By Satisfying Hunger

**R**EGARDLESS of the outcome of Italy's present drive to carve out for herself a place in the African sun, the present war may be the world's last war of conquest. Science may at last provide the means for making conquest unnecessary as religion and moral philosophy long ago made the idea of conquest abhorrent to normal-minded men.

Science promises to accomplish this longed-for end by enabling men to satisfy their hunger and other basic life-needs without encroaching on their neighbors' property and other rights, is the thesis set forth by Sir James Jeans, noted English physicist, in an essay published in the new annual report of the Smithsonian Institution, just off the press.

More than all other causes, hunger and the other needs of expanding populations drive nations to war, Sir James implies. If this cause drives, fear of the deadliness of "surprise" weapons in the hands of the enemy will not serve as an effective inhibition; nor is the possession of superior weapons on one's own part needed as an additional incentive.

Science is even now doing much to eliminate this potent cause of war by "enabling ever larger populations to live in comfort and contentment on the same limited area of land," Sir James contends. By the applications of science to the satisfaction of human needs, he says, "we may hope to restrain the pressure of population and the urge for expansion which, to my mind, are far more likely to drive the people of a nation to war than the knowledge that they—and also the enemies they will have to fight—are armed with the deadliest weapons which science can devise."

The problem of "technological unemployment" raised by the rapid application of science to production Sir James regards as curable on the principle of "using a hair of the dog that bit you." The remedy, in part at least, will come from research and discovery—and in the "pure" sciences at that. Such mammoth modern industries, employing millions of men and billions of capital, as automobiles, oil, aviation, radio, are with us today because research scientists during the nineteenth century made "useless" basic discoveries in the laboratory. It would be suicidal, the English science leader thinks, to follow the oft-repeated suggestion to declare a "research moratorium."

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