

MEDICINE

Nerve Gas Antidote for Low Temperature Shock

► **ATROPINE**, THE drug that is an antidote to nerve gas, may become standard low temperature protection equipment for sailors, flyers, mountain climbers and explorers.

Many of the sailors and flyers floundering in the icy waters of the North Atlantic during the early days of World War II would have had a better chance for survival if atropine had been part of their survival equipment.

Findings suggesting this were reported by Dr. Edward R. Baylor and associates of the University of Michigan at the meetings of the Federation of American Societies for Experimental Biology in Atlantic City, N. J.

Atropine, they found, prevents the often fatal shock that comes from extreme exposure to cold. The atropine acts by speeding circulation and destroying a chemical known as ACH, short for acetylcholine, which cuts down circulation.

The findings came from studies of the common water flea. When exposed to extreme cold in the dark, these fleas did not die. When the light was turned on, however, the fleas suffered sudden paralytic seizure and died.

The clue to their death was found in their sensitivity to light. This sensitivity caused increased production of ACH which cut down circulation.

While light does not affect man's circulation, extreme cold does. And extreme cold is enough to generate sufficient amounts of ACH to produce shock. For man, as for the flea, atropine is beneficial in this situation.

Science News Letter, May 1, 1954

TECHNOLOGY

Flameproof Cotton Fabric To Help Save Many Lives

► **AN ESTIMATED** 1,250 people die each year in this country when their clothing burns. Several thousand more are injured by burning clothing.

A practical method of flameproofing cotton fabrics to reduce this danger has been found at the Southern Regional Research Laboratory of the U. S. Department of Agriculture in New Orleans.

Dr. John D. Guthrie and Wilson A. Reeves have worked out a way of combining a crystalline compound, tetrakis-(hydroxymethyl)phosphonium chloride, THPC for short, with trimethylolmelamine so that a plastic-like resin is formed inside cotton fibers.

This resin flameproofs the cotton permanently without harming the other qualities of the fabric.

The fabric is padded with the resin-forming solution, and then dried at temperatures around 185 degrees Fahrenheit. The fabric is then cured at a higher tem-

perature, washed and softened. The softening prevents the process from reducing the tear strength of the fabric.

An additional important property of fabrics flameproofed with this method is that they are also glow-proof. The glow that persists after the flame of burning cotton is extinguished often completely consumes the fabric. The afterglow of this flameproofed cotton lasts less than two seconds.

The resin treatment also increases the wrinkle resistance of the fabric and its resistance to rot and mildew.

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MEDICINE

Blood Extender Tried As Remedy for Dropsy

► **DEXTRAN**, BEST known as a blood plasma extender or substitute as some call it, has been tried with some success as a remedy for dropsy.

Its use in eight cases, with "outstandingly good results" in three and some improvement in three more, is reported by Drs. Arthur W. Mollison and J. Basil Rennie of Stobhill General Hospital, Glasgow, in the *British Medical Journal* (April 17).

The patients all had had dropsy for a long time, with other signs of kidney disease. One of them had not been helped by a wide variety of other treatments.

In the three who had the best results, from 27 to 40 pounds of body weight was lost within one to two weeks, showing how much of the excess dropsical fluid was got rid of.

The good results were temporary in every case, and there was no sign that it had any effect on the underlying kidney disease. However, the treatment can be repeated if the dropsy returns. The doctors say they found it "consistently effective," and believe it valuable when other measures fail to relieve the dropsy.

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BIOLOGY

Sleep Different in Sexes Under Drug Influence

► **SEX MAKES** a difference in the effect of a sleep-inducing anesthetic drug. So does species. Females sleep four or five times as long as males when under the influence of the drug, hexobarbital. Giving the females male sex hormone and the males female hormone reverses this. Then the females sleep like males and the males like females.

These findings, made with rats, were reported by Miss Gertrude P. Quinn, Julius Axelrod and Dr. Bernard B. Brodie of the U. S. National Heart Institute at the meetings of the Federation of American Societies for Experimental Biology in Atlantic City, N. J.

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IN SCIEN

VIROLOGY

Some Viruses Can Break Cell Walls They Attack

► **SOME VIRUSES** can break down the cell walls of organisms they attack. Some remain dormant inside their hosts for many generations, but can be activated to destroy their hosts by sun-tanning ultraviolet light. And although viruses are parasites, some of them get only one-third of a vital chemical, phosphorus, from the living things they attack, getting the rest from the medium outside the attacked cells.

These facts are true for some of the viruses that attack bacteria. The bacterial viruses are being studied at the University of Chicago, because they may show more about the life habits and vulnerability of viruses that attack man, such as those causing common colds, influenza and polio.

The latest virus findings from the research were reported by Earl A. Evans Jr., Ray Koppelman, R. P. Mackal, Leonard Barrington and Lloyd Kozloff at the meeting of the Federation of American Societies for Experimental Biology in Atlantic City, N. J.

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PALEONTOLOGY

Large Extinct Animal Had Teeth of Huge Rat

► **CREATURES THE** size of large bears with incisor teeth like those of enormous rats were the extinct tillodonts that could be found in the Northern Hemisphere 55,000,000 to 45,000,000 years ago.

Dr. C. Lewis Gazin, curator of vertebrate paleontology at the Smithsonian Institution, has completed a thorough study of the strange mammals.

The tillodonts apparently represent a chance combination of characteristics that failed to meet the test of changing environment. Dr. Gazin found characters suggesting a half dozen types of present-day animals in the fossil bones.

These mammals left no descendants and there are no existing animals remotely like them, Dr. Gazin said. Despite their teeth, tillodonts cannot be classified as big rats and no relationship to carnivores such as bears exists.

After 10,000,000 years of existence, members of the order had become quite specialized. They may not have been able to cope with changes in their environment and so died out, Dr. Gazin said.

A few skulls and partial skeletons of the tillodonts have been found in the Rocky Mountain area, New Jersey, France and China.

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CE FIELDS

ENTOMOLOGY

Gypsy Moth Threatens New England Oaks Again

► NEW ENGLAND'S beautiful hardwood trees, stripped of leaves on a record 1,500,000 acres last year by the gypsy moth, are threatened with a possibly heavier attack this summer.

Preliminary surveys indicate this will be "a very bad year," E. D. Burgess, plant pest control branch, U. S. Department of Agriculture, said. Defoliation for several seasons kills trees.

Some experts in New England have predicted that so many of the eggs left by last year's record horde of moths survived the winter the attack this year will be greater than last year. In the past, gypsy moth peaks have run in eight-year cycles.

The caterpillar of the moth eats the leaves of oak and birch trees particularly, but it will devour almost any leaves, including evergreen needles, when hungry.

State authorities are planning extensive control programs to fight the insects when they start hatching out of their eggs around the first of May. Air spraying of DDT is most often used in attacking the pests in large forests. In Massachusetts, which had the heaviest damage last year, plans are being made for extensive spraying.

The Department of Agriculture will aim its control efforts at preventing the spread of the pest from the New England area. All of the New England states and the eastern part of New York are infested with the gypsy moth. The insect was introduced into this country around 1866.

The 1,500,000-acre total devastated in 1953 was more than double the previous high of 600,000 acres in 1937 and 1945.

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METEOROLOGY

Will Forecast Weather Routinely by "Brain"

► WEATHER FORECASTS for 48 hours in the future will be made routinely on a giant electronic "brain" in Sweden by this summer, Dr. Carl-Gustaf Rossby, director of the Institute of Meteorology, Stockholm, revealed in Washington.

The machine's computations will be the basis for 48-hour weather predictions during maneuvers of Swedish military forces at that time, he said.

In the U. S., the Weather Bureau, the Air Force and the Navy will start operating an electronic computer for daily predictions on a trial basis on July 1. (See SNL, April 3, p. 222.)

In Stockholm, the meteorologists are using the Swedish computer, BESC, which

stands for Binary Electronic Sequence Computer. It makes about 2,700,000 calculations in less than half an hour to yield the figures on which the 24-hour forecast is based.

Numerical weather forecasting, as the use of giant "brains" in weather predictions is termed, works like this on BESC:

Information on current weather conditions is fed into the computer. Using prescribed formulas, the "brain" computes the winds for one level in the atmosphere one hour in the "future." Then, working in one-hour jumps, these forecasts are repeated until, finally, a picture is obtained of the winds 24 or 48 hours from the time the original data were inserted.

Gathering, plotting, analyzing and feeding the necessary information for a 24-hour forecast into the machine takes about ten and a half hours, Dr. Rossby estimates, although the machine does its computations in about half an hour.

Eventually, he foresees, five-day and even longer forecasts will be made with the aid of a computer.

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FORESTRY

Pines That Face Storms Without Help Are Bigger

► PINE TREES that face winds and storms standing free on their own trunks grow bigger and stronger than trees protected with wire supports.

A 15-year experiment conducted in Australia by Dr. M. R. Jacobs, Forestry and Timber Bureau, Canberra, has shown that the radiata pine, *Pinus radiata*, left free to sway in the wind develops a stronger and bigger trunk than protected pines.

After two years of support, the protected trees were no longer stable. The trees collapsed when their guy-wires broke in storms. None of the free-standing trees were felled by winds.

The greatest difference in diameter was at the base of the trunk, Dr. Jacobs reports in the *Australian Journal of Botany* (Feb.). After 10 years, the increased growth due to sway in the free-standing trees could be measured up to 25 and 30 feet on the trunk.

The protected trees grew faster in height during the first two years than the swaying trees, but afterward differences in upward growth were not significant, Dr. Jacobs found.

There was, however, a difference in the relationship of height to diameter between the two series of trees. For trees of the same diameter at a point about four feet above the ground, the protected trees were six to seven feet taller than the trees that were not protected.

The effect of wind sway on the tested trees was greater in a plot cleared of all other trees than in a relatively well stocked test area. Dr. Jacobs believes there may be a connection between the growth response of the individual tree to swaying and the appearance of single trees that dominate an area.

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BOTANY

New Plant Genus Has Green and Purple Flower

► ANNOUNCEMENT OF the discovery and christening of a new plant genus, bearing a bright green flower with purple splotches, which grows in remote mountains of northeastern Mexico, has been made.

The plant was identified as a new genus by Dr. Lincoln Constance of the University of California's Berkeley campus and Dr. C. Leo Hitchcock of the University of Washington. It was named *Mathiasella bupleuroides* after Dr. Mildred Mathias of the University of California at Los Angeles.

Dr. Constance and Dr. Mathias are two of the outstanding authorities on the family of plants to which the new flower belongs. This family, the *Umbelliferae*, numbers such plants as carrots and parsley.

The plant was named for Dr. Mathias because of her 25 years of contributions to plant classification and because "her personal qualities have been an important influence in promoting good will among botanists all over the United States."

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AGRICULTURE

"Shots" May Increase Cocoa Bean Yields

► CHEAPER COCOA may come from insecticide "shots" injected directly into cocoa trees in the Gold Coast, a British African colony that ordinarily supplies 40% of the world's cocoa.

The swollen shoot virus disease of cocoa trees, carried by the common mealybug, has cut cocoa bean production by as much as three-fourths in some Gold Coast areas.

The resulting world shortage has forced the price of cocoa beans to an all-time high. Candy eaters have observed this in the form of shrinking chocolate bars.

One of the principal methods of fighting the disease has been control of the mealybug. A. D. Hanna of Pest Control, Ltd., and J. Nicol of the West African Cacao Research Institute, both in Tafo, Gold Coast, devised an insecticide injection method to eliminate the necessity for constant spraying to kill the bugs.

Numerous holes three and a half inches deep are drilled into the trunks of the trees. These are filled with the modern insecticide, dimefox, and capped. The chemical enters the circulatory system of the tree, destroying the insects whenever they suck on a leaf. An injection lasts about eight weeks.

The strongest injection reduced the number of mealybugs to one per tree, while untreated trees averaged 3,770 bugs, the scientists report in *Nature* (April 17).

Further experiments are in progress to see if repeated application of the chemical has any harmful effect on the growth and yield of the trees.

Science News Letter, May 1, 1954