

MEDICINE

Penicillin More Useful Through Chemical Treatment

► **PENICILLIN**, material from mold which has proved to be a potent weapon against disease germs, can be made even more useful for treatment of disease by chemical treatment, it appears from a report by Dr. Karl Meyer, Dr. Gladys L. Hobby and Dr. Eleanor Chaffee, of the College of Physicians and Surgeons, Columbia University, and Presbyterian Hospital, (*Science*, Feb. 26).

Penicillin has been difficult to use as a remedy, they point out, because it is an unstable compound and is rapidly excreted from the body. By the chemical process called esterification, however, the New York scientists have been able to overcome the difficulty caused by the instability of penicillin.

Very small doses of the ethyl ester of penicillin which they prepared gave mice complete protection against 20,000 to 100,000 lethal doses of hemolytic streptococci. Considerably larger amounts of penicillin itself were needed to achieve the same results.

The ethyl and methyl esters of penicillin are so much more stable than penicillin itself, preliminary experiments suggest, that it may be possible to give the remedy by mouth as well as by hypodermic injection.

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MEDICINE

Biotin Plays Role In Resistance to Malaria

► **THE DISCOVERY** that one of the vitamins, biotin, plays an important role in resistance to malaria is announced by Dr. William Trager, of the Rockefeller Institute for Medical Research at Princeton, N. J. (*Science*, Feb. 26).

Whether the discovery can be used to build a diet for making soldiers fighting in malaria regions and inhabitants of such regions more resistant to malaria cannot be stated at present. Dr. Trager's discovery was made in experiments with chickens and ducks and he does not know yet whether the findings apply to malaria in humans. They may, however, explain why some individuals are more susceptible to malaria than others.

When ducks and chickens were on a raw egg-white diet for two or three weeks to deplete their body stores of biotin, they developed a more severe malaria than chickens and ducks that

were not deficient in biotin. The number of malaria parasites in the biotin-deficient fowl after experimental inoculation rose to higher levels than in the controls, stayed at higher levels for several days longer, and more animals died of the malarial infection.

The greater susceptibility to malaria of the biotin-deficient fowl was not directly connected with any general weakness resulting from the deficiency, Dr. Trager found. Moreover, the deficiency which reduced resistance to malaria was not very severe. Chickens getting enough biotin, which is a growth factor, to grow well and to be quite normal except for a mild scaliness on the feet developed more severe malaria infections than chickens provided with more nearly adequate amounts of biotin.

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INVENTION

Magnets Speed Teaching Of Emergency Code

► **BY SLIDING** small alnico magnets around on a steel plate representing the earth, instructors now prepare panel code messages 200 times faster than formerly and hurry-up the training of Army flying cadets, report high-ranking officers of the Army Air Forces Advanced Flying School at Brooks Field, Texas.

When other means of communication is lacking or inadvisable, airmen rely on code patterns constructed on the ground by grouping rectangular pieces of canvas. Looking like rows of over-size stretchers, these code patterns can be read from a height of 10,000 feet.

To learn to read the signals, cadets studied model panels on a blackboard in ground school. The models are pinned and repinned in various code positions as many as a hundred times during a single class period, thus wasting much time.

Now a steel plate replaces the blackboard and alnico magnets, developed by the General Electric Company, serve as models. These can be shifted from one code pattern to another in only 1/200 of the time required to pin the old models.

Perhaps the first use of this ingenious method of classroom instruction was made by Dr. A. F. Blakeslee, at the Carnegie Institution of Washington laboratories at Cold Spring Harbor, N. Y. Years ago he hit upon the idea of sliding flat bar magnets about on an iron sheet to show his students the arrangement of chromosomes, the heredity-carrying bodies in living cells.

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IN SCIEN

AGRICULTURE

New School of Tropical Agriculture Being Built

► **A NEW SCHOOL** of tropical agriculture, to be known as the Escuela Agrícola Panamericana, is now being built in Honduras, on an endowment fund established by the United Fruit Company. It will be headed by Dr. Wilson Popenoe, well-known student of tropical plants and their uses. Generous provision is being made for scholarships to be granted to young men from Middle American republics.

One of the principal aims of the new institution will be the establishment in this hemisphere of cultivation centers for the production of tropical plant products hitherto imported from the Far East.

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ZOOLOGY

Zoologist Debunks Old American Snake Lore

► **RATTLESNAKE** lore comes in for a bit of debunking by Dr. Raymond B. Cowles of the University of California at Los Angeles. Rattlesnakes don't always warn before they strike, he declares. But they seldom, if ever, attack a man unprovoked. And they don't have to coil in order to strike.

"The old tale that the mate of a killed snake comes to avenge it," Dr. Cowles states, "is explained on the basis of scent. In the mating season, the trail of the snake killed may be readily followed. The revenge idea is nonsense."

Birds are not "hypnotized" by snakes, the California zoologist continues. Some birds "freeze" to avoid detection if an enemy approaches. That explains part of it. The rest may be due to birds' imperfect vision, which possibly makes them poor judges of distance, and hence tolerant of the approach of a snake.

King snakes do not attack and devour rattlesnakes as invariably as they are supposed to. But the California road-runner, a long-legged, aggressive bird, does prey on snakes.

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CE FIELDS

AERONAUTICS

New Torpedo Bombers Have Dual Purpose in Combat

See Front Cover

► THE AVENGERS, U. S. Navy's new torpedo bombers, are capable both of hedge-hopping waves for a torpedo attack and of flying high above enemy targets to drop tons of high explosives. They are carrier based.

An official U. S. Navy photograph of the Avenger is shown on the front cover of this week's SCIENCE NEWS LETTER.

The Avenger is made by Gruman and is heavily armed and armored.

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ORNITHOLOGY

Game Birds Use Weed Seed As Major Winter Food

► WEED SEEDS are turned into meat by game birds; they form the chief winter food of several species, studies by Philip S. Baumgras of the Michigan Department of Conservation indicate (*Journal of Wildlife Management*, January).

The bane of hayfever sufferers, low ragweed, turns out to have some use after all. It yields the biggest supply of winter seed for the birds, as indicated not only by a study of pheasant crop contents but by careful hand harvesting and weighing of ragweed seed from a number of typical Midwestern field environments. Wheat stubble fields were an especially rich source, yielding an average of 205 pounds an acre in October.

Other weed seed serving as winter food for wildlife species include foxtail grass, lambsquarters, black bindweed, smartweed, barnyard grass, finger grass, and pigweed.

Wild birds and small game animals are good gleaners of grain left in the field after harvest. In the fields studied by Mr. Baumgras there was an average of nearly seven bushels of corn left unpicked by the mechanical harvester. Most of this was salvaged by livestock; the remainder was used by wildlife.

Pheasants especially like corn, though it is not always the best food for them. Squirrels go after it, too, especially when the crop of acorns and beechnuts is short.

Wheat fields cut with a tractor-drawn binder yielded nearly two and one-half bushels of waste grain per acre, and oat fields a bushel more than that. This scattered grain was picked up mainly by starlings and blackbirds but to some extent by pheasants and ducks.

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ASTRONOMY

Million Mile Per Hour Gas Stream on Distant Star

► EVIDENCE that luminous hydrogen gas is streaming from a faint star known to astronomers as HD 242257 in the constellation of Auriga, the Charioteer, at the rate of 1,200,000 miles an hour, has been obtained by Dr. Paul W. Merrill of the Mount Wilson Observatory. If the sun were expanding with the same speed it would swell to the size of the earth's orbit in three days.

The evidence is based upon photographs of the spectrum of the star taken with the 100-inch reflecting telescope. Dr. Merrill suggests that possibly forces are at work in the atmosphere of the star similar in nature to those that cause sudden eruptions of vast clouds from the surface of our sun.

"So far as I am aware, no other star except a nova is known to be surrounded by an atmospheric shell of hydrogen expanding at so tremendous a rate," said Dr. Merrill.

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INVENTION

Bag for Throwing Grenades Invented for War Use

► A PATENT on a grenade-throwing bag has been issued to R. A. Dobbelaar of Plainfield, N. J. It is really an adaptation of the stone-and-sling with which David knocked out Goliath. The grenade is placed in a little bag with a drawstring, in the loop of which is a large wooden or plastic bead which rolls off the thrower's fingers, making it easy for the soldier to let go. The centrifugal effect of the overhand swing is claimed to give the throw greater range.

The long wooden stick of the German "potato-masher" grenade presumably gives the same effect, but it is stiffer to handle, awkward to carry, and interferes with accuracy of the missile's flight.

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PHYSIOLOGY

Carrot Diet for Flyers May Be in Offing

► A CARROT diet for high-altitude flyers may be in the offing, it appears from experiments reported by Dr. D. Nelson, Dr. S. Goetzl and Dr. A. C. Ivy of Northwestern University Medical School, Chicago, to the Society for Experimental Biology and Medicine. Dr. Ivy, now on leave from Northwestern, is scientific director of the Naval Medical Research Institute.

The experimenters kept a group of rats for 10 days on a diet of nothing but fresh carrots and tap water. They were then put in a low pressure chamber simulating the atmospheric conditions of 30,000 feet altitude for two hours. Of 107 carrot-fed rats, 85 survived the oxygen lack at this simulated high altitude, whereas only 23 of 107 rats on a normal diet survived.

The experimenters warn against conjecturing, from facts obtained under one condition of oxygen lack and altitude, what would happen in different conditions, but state that clear-cut results of acute studies are valuable in suggesting possibilities to be verified in chronic and less severe states.

Experiments are now under way to find what factors in carrots are responsible for their protective effect against high altitude oxygen lack.

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GEOLOGY

Evidence of Wet Spell 120 Million Years Ago

► EVIDENCE that there was a long wet spell between the second and third divisions of the Age of Dinosaurs (Jurassic and Cretaceous, to geologists) is found in the presence of widespread deposits of the fine clay known as kaolin in the Southwest, Dr. Luna B. Leopold of the University of New Mexico has pointed out (*Journal of Geology*). They seem to have been formed from the weathering of feldspar in extensive upland mountains, washed down into wide, shallow bodies of water, either freshwater lakes or arms of the sea.

Aside from its purely scientific interest as evidence of an ancient climate, these white, fine-grained deposits are of possible use in telling oil geologists when their borings have reached the boundary between two important oil-bearing systems of rocks.

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