

MEDICINE

More Medical Conquests

New vaccines, antibiotics and drugs active in test tube against fungi, tuberculosis bacilli and diphtheria germs have been presented to the world.

► **FOUR MORE** medical conquests have been presented in their preliminary stages to the world:

1. Vaccine to protect against parrot fever or psittacosis.
2. Vaccine to protect against rabbit fever or tularemia.
3. A new antibiotic (penicillin-like) drug active in the test tube against fungi, tuberculosis bacilli and diphtheria germs.
4. A possible treatment for anthrax infection.

These new weapons against disease, not yet ready for front-line use by physicians, were discussed at the first postwar meeting of the Society of American Bacteriologists in Detroit.

In addition to these promises for the future, eight preventives or remedies of major disease plagues have been made available in the war years since 1944 when the bacteriologists last met. These are disease weapons actually in use or proved and ready for early use. They are: (1) Vaccine against influenza; (2) Vaccine against rinderpest, dread cattle disease; (3) Vaccine against dengue fever, mosquito-borne malady; (4) Globulin from human blood to protect children against measles; (5) Globulin for protection against infectious hepatitis, popularly known as jaundice from one of its symptoms; (6) Vaccine against typhus fever; (7) Two new remedies for malaria better than quinine, and (8) Streptomycin for one kind of meningitis, urinary tract infections and possibly tularemia, undulant fever and other unconquered diseases.

Food, most pressing problem in this hungry world today, may become more plentiful or more nourishing through studies by the scientists. Micro-organisms in the soil help crop plants grow. Others reduce the food supply of the world by the spoilage they cause. Still others, some of those that live in the intestinal tract of man and animals, produce some of the vitamins needed for good nutrition. New useful knowledge may be expected on these problems and the related one of what food germs themselves need for best growth so that scientists can study them outside the body to devise new ways of killing them, new vaccines

to protect against their attack, and reap bigger harvests of antibiotics like penicillin and streptomycin.

Possible Tularemia Cure

► **STREPTOMYCIN** may turn out to be a cure for tularemia, or rabbit fever, but hopes for a streptomycin conquest of tuberculosis are dwindling, it appears from reports to the meeting.

This anti-germ chemical from organisms that live in the earth saved from 80% to 100% of mice given killing doses of rabbit fever germs even when the germs had a 72-hour start on their deadly work. When treatment was delayed as long as 96 hours, the drug still saved almost half the animals.

These studies, with their suggestion of a cure for human rabbit fever victims, were made by Lieut. (j.g.) S. S. Chapman, of the Navy, Capt. Lewis L. Coriell, of the Army Medical Corps, Sgt. S. F. Kowal, pharmacist's mate W. Nelson and Miss Cora M. Downs at Camp Detrick, Md., where some of our defenses against germ warfare were forged during the war.

The ineffectiveness of streptomycin in tuberculosis is due to the fact that the drug only checks the growth of TB germs. To be effective in a disease like tuberculosis, a drug probably must be able to kill the germs, Dr. George E. Rockwell of Milford, Ohio, explained. He found the drug germ-checking but not killing in both test tube and laboratory animals.

The treated animals lived longer than untreated ones, but when the streptomycin was stopped, they began to decline and died. Examination after death showed they had as extensive tuberculosis involvement as the untreated animals.

Further evidence that streptomycin is unlikely to become a remedy for tuberculosis was reported by Dr. Guy P. Youmans of Northwestern University Medical School and Dr. William H. Feldman of the Mayo Foundation. Tuberculosis germs become resistant to streptomycin, it appears. Germs from tuberculosis patients who had been getting the drug

for a long period were able to grow in the test tube even when large amounts of streptomycin were added. Germs from the same patients before treatment were kept from growing in the test tube by one-thousandth the amount of streptomycin that failed to check growth of germs which had become used to the drug in the course of treatment of the patients.

Getting the germs off dishes, glasses and eating utensils in restaurants is more a matter of thorough soap and water washing to remove soil than of rinsing in very hot water, Dr. Murray P. Honwood of Massachusetts Institute of Technology reported.

If the dishes are washed really clean, they can be made "sterile" or germ-free by rinse water at 145 to 150 degrees Fahrenheit as well as at 160 to 180 degrees, he found.

Drug for Lockjaw

► **LOCKJAW**, which our grandmothers dreaded when someone stepped on a rusty nail or pricked himself with a rusty pin or needle, may soon be conquered by an antibiotic drug of the penicillin class.

The cause of this deadly ailment was not the rust on the nail or pin but a poison produced by germs called tetanus bacilli. They are found in the soil in many regions and could get on nails or pins lying on the ground. War wounds are also likely to become infected with these germs. Our troops and many children today are protected against these germs by shots of tetanus toxoid, a substance made from the germ poison and treated so it will not cause harm but will stimulate body defenses against the germs.

Now scientists have found that a chemical produced by a micro-organism will neutralize the poison of the tetanus bacillus. This discovery was announced by Dr. Bruno Puetzer and Dr. Thomas C. Grubb of the research laboratories of the Vick Chemical Company at the meeting.

The chemical they used is named clavacin. It is produced by an organism isolated from manure. Use of an antibiotic drug to neutralize a germ poison is a new way to use these substances. Heretofore they have been used as remedies that checked the growth of germs in the body or killed them.

From the soil around potted plants in a greenhouse, University of Pennsylvania scientists have obtained two new anti-

biotics which show promise of developing into remedies against typhoid and paratyphoid fever, dysentery, cholera, anthrax and tuberculosis, and also of being active against organisms that cause rosy bread and much loss of foodstuffs thereby.

As remedies these antibiotics, known only as A-10 and A-105, have not progressed beyond the test-tube stage except for one disease. They have been tried with good results in laboratory animals as treatment for the pneumonia caused by Friedlander's bacillus, Drs. Albert Kelner, Walter Kocholaty, Renate Junowicz-Kocholaty and Harry E. Morton reported.

Especially encouraging is the fact that as chemists have purified these antibiotics more and more, their action against germs has increased but their toxic effect has not. It would take 50 times the remedial dose to cause toxic symptoms.

Bacteriologists are actively searching for new antibiotics because, as reported at this meeting, some germs develop resistance to streptomycin as well as to penicillin. When these drugs lose their power to cure a patient, it is hoped one of the newer ones may be ready to take over.

Eumycin, announced by Dr. Edwin A. Johnson and Kenneth L. Burdon of Baylor University College of Medicine, is another of these promising new antibiotics. It is active against diphtheria and tuberculosis germs and also against fungi such as cause athlete's foot.

Recovery from type three pneumonia and from anthrax was brought about in laboratory animals by still another new antibiotic, subtilin, Drs. A. J. Salle and Gregory Jann of the University of California reported. This very powerful drug had a definite suppressive effect on experimental tuberculosis in guinea pigs. Its remarkable safety is shown by the fact that it is 20 times more poisonous to staphylococcus germs than to chick heart tissue.

Typhus from Pets

► A NEW HEALTH threat coming from the family pet dog or cat has been discovered by Dr. J. V. Irons, Miss Oleta Beck and Dr. J. N. Murphy, Jr., of the Texas State Health Department.

Fleas harboring typhus fever germs were found on five kittens intimately associated with five human cases of typhus fever. Fleas from rats have been known for some years as spreaders of typhus fever in this country. Now it appears

that the fleas on kittens and puppies can give the disease to their masters.

Antibiotic from Saliva

► FUTURE SUPPLIES of a penicillin-like antibiotic drug may come from a germ found in human saliva if practical development can be made from a discovery reported by Dr. Richard Thompson and Madoka Shibuya of the University of Colorado School of Medicine at the meeting.

Green streptococci, ordinarily harmless germs, produce a substance that stops diphtheria germs from growing in the test tube. The presence of the streptococci in the mouth probably would not give protection against diphtheria since there are other substances in saliva that interfere with the antibiotic action.

If the material can be obtained from the saliva organisms, however, it might become another antibiotic remedy. That is a problem for future work, Dr. Thompson said.

Clue to the saliva antibiotic came from a German report of a germ-checking substance they had found in saliva and called inhibine. They thought it was like lysozyme, an anti-germ chemical in saliva, tears and other body fluids discovered by Sir Alexander Fleming years before he discovered penicillin.

The Colorado workers, following the German lead, were investigating saliva, trying to learn more about this germ-checking action, when they stumbled on the fact that it was the green streptococci in the saliva that were producing it.

New Attack on Cancer

► FIRST STEPS toward a new line of attack on cancer were reported by Dr. Evelyn L. Oginsky and Dr. O. N. Allen of the University of Maryland and Dr. Hugh T. Creech of the Lankenau Hospital Research Institute and the Institute for Cancer Research, Philadelphia, at the meeting.

Still in the test tube stage, the work so far consists in linking cancer-causing coal tar chemicals with albumin from horse blood to see whether a vaccine against these coal tar chemicals could be developed. Vaccines or immunizing substances are usually made from germs that have been living organisms. Germs, even when they have been killed, can stimulate the body to produce antibodies to fight invasion of living disease germs. But the coal tar chemicals that cause

cancer in mice when painted on the animals' backs are inert materials that do not ordinarily stimulate antibody production.

When the coal tar chemicals were linked with horse or human blood albumin and then injected into rabbits, the rabbit blood was shown by test tube experiments to contain antibodies against the coal tar chemical injected and against cancer-causing chemicals of similar structure.

Whether that means that the coal tar-albumin material could be used to protect animals against coal-tar-caused cancer has not yet been determined, but the results so far, the researchers re-

SCIENCE NEWS LETTER

Vol. 49 June 1, 1946 No. 23

The weekly summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St. N. W., Washington 6, D. C. North 2255. Edited by WATSON DAVIS.

Subscriptions—\$5.00 a year; two years, \$8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents.

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Entered as second class matter at the post office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5666 and 360 N. Michigan Ave., Chicago, STAt 4439.

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ported, "make desirable" further study of the possibility.

Coal tar chemicals in soot were believed to be the cause of a kind of cancer that attacks humans and was known as "chimneysweep's cancer." The chemical relationship between these cancer-

causing substances and other naturally occurring substances in the human body, such as the sex hormones, has led many scientists to hope for at least a partial solution of the cancer problem through studies of the coal tar cancers in animals.

Science News Letter, June 1, 1946

HYDROPONICS

Soilless Farms for Japan

In Japan the world's largest soilless gardens are under construction to supply green salad vegetables for our occupation forces.

► The world's biggest soilless gardens, where vegetables are raised in long beds of gravel on water solutions of fertilizer chemicals, are now under construction in Japan. Details of the gardens, which will supply green salad vegetables for our occupation forces, were disclosed by Lt. Col. Ewing Elliott of the Eighth Army, in charge of the project, who is in Washington for a short time, to arrange for further work.

Over-all area of the gardens (or perhaps farms would be the better word) is 80 acres, divided into two sections—55 acres at Chofu, near Tokyo, and 25 acres near Otsu, about six miles north of Kyoto. Each consists of a series of long, shallow concrete troughs, filled with washed river gravel, through which the solution of chemicals is flowed every two days, to maintain moisture and feed the plants.

In similar but much smaller gardens used during the war, tomatoes, lettuce, radishes, cucumbers and green peppers were grown successfully. To this basic five Col. Elliott expects now to add green onions, carrots and spinach for salad purposes. Japanese labor will be employed throughout; it is expected that 1,000 men will be kept busy raising greenstuffs for the American forces in Japan.

This method of producing vegetables was adopted for two reasons: Japanese methods of cultivation make it unsafe to eat any of their produce raw, and in any case Gen. MacArthur wants every acre of Japanese farm land devoted to the task of staving off famine among the Japs themselves.

Japanese agricultural scientists are very much interested in the project, seeing in it a possibility of increasing food production in their over-crowded country. The universities of Tokyo and Ky-

oto are cooperating, as well as the Ministry of Agriculture. Col. Elliott's principal assistant is Dr. Tyozaburo Tanaka, emeritus professor of horticulture at the Imperial University of Taihoku, Formosa. Fifty university graduate students have asked to be taken on as laborers, to get a chance to learn the technique.

Soilless gardening got its first large-scale try-out on barren Ascension island, just south of the equator in mid-Atlantic, where there was a large American air-base during the war. The area of this garden, however, was only two and one-half acres, as compared with the 80-acre installation in Japan.

One two-acre soilless garden is now in operation on Iwo Jima, and additional moderate-sized ones are planned for some of the other Pacific islands where American troops are stationed.

Science News Letter, June 1, 1946

ENTOMOLOGY

Spiders and Butterflies Wanted Wholesale

► IF YOU HAVE any tarantulas—really big, poisonous brutes, with all their legs attached—Ward's Natural Science Establishment in Rochester, N. Y., will make you an offer. This firm, pioneer in the business of supplying schools and colleges with specimens of all kinds, regularly does business with some 200 professional collectors of spiders, insects, and other many legged creeping things.

Ward's regularly issues a "desiderata"—a list of things they want. The current list requests wholesale lots of about 200 North American insects in all stages of development. Certain kinds of moths and butterflies are wanted in quantities of 100 or more.

Science News Letter, June 1, 1946

Wintergreen and chocolate top the list of preferences of spicy odors, a recent group test indicates.



TARANTULA—Close-up portrait of a tarantula, poisonous spider collected in the Southwest for Ward's Natural Science Establishment, Rochester, N. Y., suppliers of natural science specimens for educators and collectors. Only the biggest specimens are taken for the establishment's stock of over 400,000 insects.