

MEDICINE

Vaccines by Ultraviolet

New method promises better agent for protection against bacteria, and virus diseases. Germs are killed in less than one second.

➤ A NEW METHOD for completely and almost instantly killing germs of both bacteria and virus classes with ultraviolet light has been developed by Dr. Sidney O. Levinson, Dr. Albert Milzer, Dr. Howard J. Shaughnessy, John L. Neal and Dr. Franz Oppenheimer, of the Michael Reese Hospital and the Illinois Department of Public Health.

The work, done under contract with the Office of Scientific Research and Development, is reported in the *Journal of the American Medical Association*, (June 24).

More powerful vaccines against a number of diseases seem likely to result from the work. Killed vaccines for typhoid fever, pneumonia type 1, and *Salmonella enteritidis*, one of the germs that causes food poisoning, have already been prepared.

"In preliminary scout experiments," the scientists report, these vaccines "appear to be equal or superior in antigenic potency to heat-killed vaccines prepared from the same bacterial suspensions."

Rabies vaccine produced by the new technic "consistently induced a higher degree of immunity in mice" than vaccines in which the germs had been killed by phenol. The vaccine did not lose its potency after six months' storage at a temperature somewhat above freezing.

Mice also acquired a high degree of immunity from a vaccine prepared by the same method against St. Louis encephalitis, popularly known as sleeping sickness.

A newly developed ultraviolet lamp was used. This lamp is a powerful source of both total and extreme ultraviolet light, the extreme being below 2,000 angstroms. Suspensions of bacteria and viruses containing about one billion germs in a teaspoon of fluid are killed in less than one second when exposed in continuously flowing thin films to this light.

While the new lamp killed 100% of the germs, two commercial ultraviolet lamps used under the same conditions killed only 18% to 20%. A third commercial lamp killed 98% of the bacteria but further investigation showed much of the killing was due to the heat gen-

erated by the lamp and not to its ultraviolet light.

Ultraviolet light has been used in the past to inactivate germs, but it was impossible with the old technics, the scientists state, to avoid over-irradiation. This results in destroying not only the germs but also their immunizing property. Too little irradiation is dangerous, since it may not destroy the disease-producing property. Ultraviolet irradiation has up to now, therefore, been impractical, the scientists point out, for production of uniformly safe and potent vaccines.

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MEDICINE

Chemicals Tested for Fighting Tuberculosis

➤ NEW CHEMICALS for fighting tuberculosis, which ranks with typhus, malaria and dysentery as a pestilence of war, are now being tried as fast as they come out of the chemical research laboratories.

Most promising of the many tested so far is promizole, a distant relative of sulfa drugs. Comparison of its effects with older chemicals on guinea pig tuberculosis was shown by Drs. William H. Feldman, H. Corwin Hinshaw and Frank C. Mann, of the Mayo Clinic, in an exhibit which won the gold medal at the meeting of the American Medical Association.

Promizole has been given to human patients, but scientists are so far unable to tell what the results will be. The drug is very difficult to prepare and each patient requires about one pound a month. This has limited the clinical trials.

Besides promizole, the antibiotics such as penicillin, gramicidin and other germ-fighting chemicals from molds, fungi and other microorganisms "have not been overlooked" in the search for a tuberculosis remedy, one of the scientists cautiously admitted.

Although scientists cannot yet tell which chemical this may prove to be, the Mayo Clinic group feels one eventually will be discovered.

Less hopeful, at least so far as sulfone

chemicals such as diasone and promin are concerned, was the report of Dr. Harry J. Corper and Dr. Maurice L. Cohn, of the National Jewish Hospital at Denver. The effect of diasone on tuberculosis in guinea pigs, they find, is due to the drug's ability to deplete the oxygen supply of the guinea pig's blood and tissues. This retards the growth of the tuberculosis germs in the animals' bodies. Humans, however, are more sensitive to oxygen deficiency than guinea pigs. Doses of diasone sufficient to affect tuberculosis germs in human bodies, Dr. Corper believes, would be dangerous for the patient.

Science News Letter, July 1, 1944

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Ultraviolet Helps Reveal Chemistry of Vitamins

➤ ULTRAVIOLET light is helping scientists learn more about the complex chemical structure of vitamins, viruses and other proteins. As a result, viruses may be robbed of their disease-destroying power and made into vaccines to give resistance to disease.

These applications of physics to solution of biological problems for better health were reported by Prof. Gladys A. Anslow, of Smith College, to members of the American Physical Society meeting in New York.

Different chemicals absorb ultraviolet rays in different ways. Some absorb rays of one length, others absorb those of another length. This difference in absorption is apparently related to the structure of the molecules of the different chemicals. Some of the molecules



DUCK STAMP — Stamp collectors and sportsmen, as well as hunters, have eagerly awaited the issuance of this Federal migratory-bird hunting stamp for the 1944-45 season, taken from a drawing by Walter A. Weber.