

MEDICINE

World-Wide 'Flu Epidemic Could Start at Airports

➤ A WORLD-WIDE influenza epidemic like that of 1918-19 may get started at one of the staging areas for international air travel, Dr. Stuart Mudd, professor of bacteriology at the University of Pennsylvania, warns.

Conditions he saw on his own air travels to Russia last summer are the basis of his warning, appearing in a report in *American Scientist* (July 15).

He and Mrs. Mudd, he relates, were grounded by bad weather at Shannon and again at Gander. There they found scores of people from every part of Europe and America mingled in common rooms, all breathing the same confined air. As they breathed it, they exchanged microbes that each had harbored in his nose and throat, brought from home or picked up on his travels.

If any of these microbes belonged to a strain capable of causing disease, all the travelers would have been exposed to it.

Within a few days, as they continued on their travels, they would be spreading the disease germs all over Europe and the Americas. The spread would have been so far and so fast that it would be impossible to protect populations by vaccination. Some of the germs might be of a kind against which there is as yet no vaccine.

The situation, Dr. Mudd declares, is so serious that the World Health Organization and the international airlines should take action.

There is a remedy for it. This is to disinfect the air by ultraviolet lights or germ-killing vapors. "Adequate installations of ultraviolet radiation or of germicidal vapors in all staging bases," Dr. Mudd states, "would greatly reduce the probability of an epidemiologic catastrophe, should another respiratory disease agent like that of the 1918-19 influenza pandemic appear in the future."

Science News Letter, July 26, 1947

METALLURGY

Manganese for Steel Near Shores of Old Seas

➤ NEW FACTS about the ores of manganese, chemical element important in alloy steels, were discovered through years of research and won for Dr. A.

Betekhtin one of this year's Stalin Prizes.

Exploration of manganese deposits during and since the war has been aided by Dr. Betekhtin's finding that sediments of ancient seas are richer nearer their shores in manganese suitable for making ferro-manganese, which is an essential in steel making. As the old sea basins increase in depth, the manganese deposits lessen in oxygen content and have more of other elements, such as phosphorus, which makes them less desirable for metallurgical use.

An exhaustive study by Dr. Betekhtin on "Manganese Ores of the U.S.S.R." has been published. His fundamental researches were done upon the noted Chiatyry manganese deposits of the Georgian Soviet Republic.

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RADAR

Chemical Smoke To Stop Radar Waves Predicted

➤ CHEMICAL SMOKE that can stop radio waves as present-day smokes stop light, thus sharply limiting the usefulness of radar, is the prediction of Col. M. E. Barker, commandant in the U. S. Chemical Corps School. Writing in *Chemical Corps Journal* (July) he points out how radar had made concealing smokes largely useless by the end of the war, being used to direct artillery fire at invisible targets.

The comeback of smoke, to stop radar, he pictures as a smoke "that will bounce a radar beam like a duck's back turning a thin stream of water. That means that smoke is going to be mighty effective even against guided missiles, as well as against gun-laying and bombing radars. You can't go to sleep in this scientific race or you will find your long-range missiles being returned to base instead of proceeding to the expected target."

Col. Barker also foresees the return of poison gas, which was absent from World War II. But there'll be changes made—radioactive ones: "Certainly all will have to be prepared against it, and that is going to be some job when arsenic, phosphorus and sulfur can be made highly radioactive and so impart this property to war gases in addition to the usual toxic qualities. . . . Radioactive toxic gas may be even more effective against strategic targets than atomic bombs."

Science News Letter, July 26, 1947

IN SCIENCE

ENGINEERING

Liquefying Natural Gas For Small-Space Storage

➤ A CHEAP method of converting natural gas into liquid form for storage in small-space tanks was revealed by Northwestern University. Under the new method 800 cubic feet of gas can be stored in one cubic foot of space.

The development is the result of studies by Prof. L. F. Stutzman and Instructor George H. Brown of the University's Technological Institute. Basically the process reduces the temperature of natural gas to 260 degrees below zero Fahrenheit by bringing it into contact with liquid nitrogen at a temperature of minus 320 degrees.

Through the use of refrigeration equipment and insulated storage tanks, they show that large storage tanks of the sort now used for holding natural gas can be eliminated, or used perhaps to hold for immediate use gas obtained from the liquid form. The liquid gas is returned to vapor form merely by reducing refrigeration. The method of liquefying can be used in oil fields to save gas now allowed to escape because of present costs of recapture and shipping.

Science News Letter, July 26, 1947

BACTERIOLOGY

Viruses Protect Plants From Bacteria in Soil

➤ BACTERIA that cause plant diseases are seldom found in the soil, though fungi and other troublemakers often lurk there. Dr. R. C. Thomas, of the Ohio Agricultural Experiment Station, believes he has found out why.

Bacteria are plants, though very small ones, and like all other plants are subject to virus diseases. Viruses that prey on plant-disease-causing bacteria, Dr. Thomas states, are formed in soil when organic matter is present. The bacteria are not necessarily killed, but they at least lose their virulence. Soils poor in organic matter harbor lower concentrations of these particular viruses, hence the bacteria are more likely to survive in them.

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E FIELDS

BIOCHEMISTRY

Growth Hormone Speeds Penicillin Production

► **PENICILLIN** production from a given batch of mold has been more than doubled through the addition of a few hundredths of one per cent of phenylacetic acid, by Drs. R. D. Coghill and A. J. Moyer of the U. S. Department of Agriculture, working at the Northern Regional Research Laboratory at Peoria, Ill. The same effects are obtainable also with salts and esters of the acid, they state in the preamble to patent 2,423,873.

At the same laboratory, Dr. S. A. Morell has developed a method for converting furfural, the now well-known "make-all" compound derived from oat hulls and corncobs, into tertiary amino pentanols and their esters. These are useful as intermediates in the preparation of certain drugs. His method has received patent 2,424,184.

Rights in both patents are assigned royalty-free to the government.

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MEDICINE

Fast Work of Cold Germs Halts Antibodies' Action

► **THE REASON** people go on catching colds and having attacks of influenza all their lives seems to be a matter of time. How this time factor comes into the picture was explained by Dr. Colin MacLeod, of New York University College of Medicine, at a recent conference at the Army Medical Center in Washington, D. C.

Influenza and the common cold are caused by germs of the virus class. But curiously, certain virus diseases never attack the same person more than once. Chicken pox, measles, mumps and smallpox are examples Dr. MacLeod gave.

The outstanding difference between these diseases, he pointed out, is in the incubation period. That is the period between the invasion of the body by the germs or virus and the development of the sickness. The virus diseases against which permanent immunity is obtained, the kind, that is, which at-

tack only once, have incubation periods ranging from seven to 26 days.

Resistance or immunity to disease depends on something called antigens. They may come from a disease germ or virus that invades the body on its own, or from the "shot" the doctor gives to protect against certain diseases. The antigen brings about production of antibodies to the disease by the body itself. Certain cells of the body apparently are detailed for this work. An antigen rouses them to action but this requires from seven to 10 days.

From then on, however, these antibody-producing cells remain on the alert. Their response to a second and very much smaller dose of the antigen will be much greater and much quicker—generally in from three to six days. That is fast enough to stop measles or mumps. But in the case of colds, grippe, 'flu and the like, with their very short incubation periods, even the much faster reaction is not fast enough. The malady can become established before the antibodies can get under way.

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CIVIL ENGINEERING

National Water Policy Urged for Better Program

► **A NATIONAL** policy for water conservation and use was advocated at the meeting in Duluth, Minn., of the American Society of Civil Engineers by W. W. Horner, consulting engineer of St. Louis.

"Water is as much a national resource as the country's minerals and just as valuable to the national economy and safety," he said. "It is unthinkable that we can continue indefinitely to suffer life and property losses, just because our irrigation, flood control, navigation, power and other programs are a hodge-podge."

The national policy would replace present "piecemeal development of water programs," and eliminate jurisdictional conflicts and confusion. The policy would be worked out by a committee of expert civil, mechanical, electrical, mining and chemical engineers. It would define positions of all subdivisions of government in a cooperative effort between states and federal government; with the public protected and assured of economic planning and construction of water projects by unbiased review by engineers who have no continuing interest in such developments.

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CYTOLOGY

Nerve Experiments Show Cells Grow Near Center

► **CELLS DO** all their growing in the immediate neighborhood of their nuclei, or centers of physiological activity. The new-grown living substance then migrates to the outside of the cell.

Evidence in support of this concept was presented before the Sixth International Congress of Cytology in Stockholm by Prof. Paul Weiss of the University of Chicago. It was obtained in a study of growth in nerve cells, which are peculiarly well suited for the purpose because nerve fibers, no matter how long, are integral parts of the cells from which they extend. Prof. Weiss and his co-workers found that nerve fibers renewed their worn-out substance and increased in length entirely by the migration of new living material from the cell nuclei.

Another phenomenon on which Prof. Weiss reported is induction, the specific influence by which one tissue imposes a definite character on a neighboring tissue. Past experiments in induction have been carried out with living tissue, but in Prof. Weiss' laboratory it has been demonstrated that the same effect can be obtained with tissues killed by freezing and drying. Frozen-dried cartilage induced growth of new cartilage at spots where it was grafted on.

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MYCOLOGY

Course of Wood Decay By Molds Is Traced

► **WHEN MOLDS** cause the decay of wood, there is a definite series of chemical steps, stated Prof. F. F. Nord of Fordham University before the Sixth International Congress of Cytology in Stockholm. These steps are: cellulose to glucose to ethyl alcohol to acetic acid to oxalic acid. What happens to the other main constituent of wood, lignin, is not so clear.

For a time it was thought that one complex compound, methyl-p-methoxycinnamate, resulted from the breakdown of lignin because it resembles other compounds that can be derived from that substance. Prof. Nord's studies, however, show that one organism can act on wood sugars, glycerol and ethyl alcohol, to produce it. This compound also, therefore, comes from the cellulose fraction of wood.

Science News Letter, July 26, 1947