

motors of militarism are responsible for the boundless misery which a new war is sure to bring.

International organization is now sufficiently advanced to enable statesmen to prevent war by concerted action.

Protestation of peace and the desire for peace, however sincere, do not guarantee the self-denying spirit necessary for the maintenance of peace, even at the cost of national sacrifice. If any statesmen should think that the apparatus to ensure peace is, as yet, insufficiently organized, we advise them to devote to

this purpose as much energy and as much money as is now being expended on the armaments of the various countries.

We cannot close without expressing our admiration of those statesmen who show by their actions that their culture and morality are so far advanced that they can lead peoples to a strong organization of peace. In our opinion they alone are truly qualified to act as the leaders of nations.

*Science News Letter, October 26, 1935*

MEDICINE

## Human Influenza Virus Grown Artificially in Glass

**T**HE virus that causes human influenza has been cultivated upon non-living food in a glass flask.

This important step in understanding a disease that has caused widespread epidemics in recent years is announced by Drs. Thomas Francis, Jr., and Thomas P. Magill of the Rockefeller Institute for Medical Research in a communication to the journal *Science* (Oct. 11).

Only last May Drs. Francis and Magill told the medical world that influenza virus, a substance beyond the reach of the microscope in size, had been definitely identified and that the same virus causes the disease in different parts of the world.

Now they have satisfied themselves by careful tests upon mice that the dangerous transmitting virus will thrive and multiply upon non-living material in a glass flask, or "in vitro," as the scientists say.

The infection used came originally from a human patient in Puerto Rico, and this virus is known as "P. R. 8." A mouse was infected and died of the disease. Material from his diseased lung was used to give the disease to another mouse and this was repeated until there had been 44 serial passages.

Then attempt to grow the virus in the laboratory, not in the living animal, in vitro instead of in vivo, was made. Lungs of the 44th afflicted mouse were ground, and then diluted with a special liquid, which was whirled at great speed and filtered through a fine porcelain substance to remove the slightest trace of anything that the microscope can detect. A few drops of this liquid were planted upon a special food—"medium" the scientists call it—made from chick embryos. Ordinary tests for

bacterial growth detected nothing.

But when mice were inoculated in the nose with the fluid from the first, the third and in all 20 serial transfers to the artificial medium, they contracted influenza just as surely as other animals who were inoculated with similar quantities of virus that has never had to grow outside the living body. So:

"These facts indicate clearly that the virus has multiplied in vitro."

Important to possible development in the future of anti-influenza procedure for use in human cases, is the fact that the artificially cultured virus is inhibited in causing the disease by the specific anti-influenza immune serum, demonstrated previously to be present in the blood of animals recovered from cases of influenza.

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PHYSICS

## Electric Lamp Lighted Without the Use of Wires

See Front Cover

**C**LEVER lighting and modern radio technique combine to provide the cover on this week's SCIENCE NEWS LETTER.

The General Electric scientist holds an ordinary electric bulb in his hands and makes it shine mysteriously without any wires to provide the ordinary electric circuit. Secret of the trick is a high-frequency radio transmitter hidden below the large ring at bottom of picture. The radio energy given off is picked up by the antenna system composed of the scientist's arms and body which form a loop.

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CHEMISTRY

## Super-Hard Glass Made In Sun Furnace

**A** NEW type of "glass" of super-hardness and with high resistance to acids was reported before the meeting of the Electrochemical Society by Dr. Willi M. Cohn of the University of California.

The "glass" is fused transparent zirconium dioxide ( $ZrO_2$ ) having a slightly yellowish tinge. It was made by melting compressed sticks of  $ZrO_2$  in a special sun surface which concentrates sunlight with a large mirror and quickly raises the temperature to 3,000 degrees on the Kelvin temperature scale. Three thousand degrees Kelvin corresponds to more than 2,700 degrees Centigrade.

The zirconia glass can be heated to incandescence and dipped into cold water without cracking, is highly resistant to acids and ranks next to carborundum in hardness.

The sun furnace, with which the zirconium dioxide sticks were melted and fused, is a new step in obtaining high temperatures, Dr. Cohn reported. While it is difficult to determine exactly what temperatures such sun furnaces will create, the theoretical limit is the temperature of the sun's surface at 6,000 degrees Kelvin, or 10,000 degrees Fahrenheit.

The sun furnace, which Dr. Cohn obtained from the Zeiss Works in Jena, Germany, consists essentially of a large plane mirror which follows the course of the sun and reflects the sunlight onto a 100-inch diameter searchlight mirror with a silver backing.

The heating takes place at the focus of the searchlight mirror. Arrangement is made for observation of the samples while being heated. If necessary the sample can be placed in a transparent container and its reactions studied in a reducing or neutral atmosphere or in a vacuum.

"Although this sun furnace means a step in advance as far as obtaining higher temperatures for exact work is concerned, it does not, however, enable us as yet to extend the upper limits of high-temperature research by more than one or two magnitudes over the older limits. Higher temperatures, in an oxidizing atmosphere, than those possible in the sun furnace may have been attained in the past, but, if so, it was for a mere fraction of a second and not for any length of time suitable for the fusion of relatively large masses of material," declared Dr. Cohn's report.

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