

PHYSICS-CHEMISTRY

# Nobel Prizes Awarded

Honors in physics and chemistry were won by a pioneer investigator of the ionosphere and a chemist who worked on the synthesis of penicillin.

➤ TWO leading British scientists, a pioneer in radio transmission and a chemist who worked on penicillin, have won the 1947 Nobel prizes in physics and chemistry.

The winners are Sir Edward V. Appleton, physicist and secretary of Britain's Department of Scientific and Industrial Research, and Sir Robert Robinson, Oxford University chemist. This year's other Nobel award in science was the prize in medicine and physiology, shared by the American husband-wife team of Carl F. and Gerty Cori of Washington University, St. Louis, and Dr. Bernard Houssay of Argentina. (See SNL, Nov. 1.)

Radio listeners throughout the world owe thanks to Sir Edward. His fundamental researches have contributed much to the clearness with which broadcasts from distant lands come through today.

A pioneer investigator of the ionosphere or "radio roof" surrounding the earth, Sir Edward proved by direct experiment the existence of the layer of ionized atoms 115 miles or so above the earth, present both day and night. This layer is the one that reflects shortwave radio waves at night.

The invisible reflecting layers of the ionosphere have been the subject of intensive research since their existence was proved. Today calculation of their height is important in determining the best frequencies to use in getting a broadcast through.

## High Frequency Waves

To determine their height, short pulses of high-frequency waves of different wavelengths are sent into the ionosphere. The time it takes the waves to go up and back is then determined. It is easy to tell how far a radio echo has traveled because the speed of radio waves is the same as light, which has been accurately calculated.

These layers change greatly from day to night, and from summer to winter. They are also greatly affected by activity on the sun. Changes in the layers, of course, in turn affect short-wave communication. When the layers are too thin,

radio signals fail to be reflected and broadcasts are blacked out.

The puzzle of how strychnine, powerful poison, is put together is the latest research on which Sir Robert has been working. At the International Chemical Congress in London this past summer he reported finding a close relation between quinine, the anti-malaria remedy, and part of strychnine's molecular skeleton. Unfortunately, there is no prospect in his opinion, of making quinine from strychnine because the natural molecules produced in the plants yielding these chemicals are molded in different ways.

## Synthesis of Penicillin

During the war, Sir Robert and associates at Oxford worked on the synthesis of penicillin. Chemicals with penicillin activity were obtained almost simultaneously by the Oxford group and American scientists, but the amounts were so small as to cast some doubt at the time on whether or not penicillin had been synthesized.

The difficulty of obtaining synthetic penicillin in large enough amounts for

medical use was explained by Sir Robert at the time he received the Franklin Medal of the Franklin Institute in Philadelphia last March as follows:

"Penicillin possesses a curious strained structure unique among natural products and this endows it with such reactivity that all the chemical processes tried (in synthesis) have so far proved too brutal. The molecule is of course stable enough to exist but it is easily thrown off its balance.

## Difficulties Involved

"A ball can rest on a narrow shelf but if that is narrow enough and high enough it might be possible to find that the attempt to throw the ball on the shelf, so that it would remain there, would succeed only once in a thousand times. It seems that our chemical processes are too energetic and we have no equivalent to the certain method of placing the ball on the shelf by hand."

Last year's first Nobel prizes in science since the war were swept by American scientists. Dr. P. W. Bridgman of Harvard won the physics award; Dr. J. B. Sumner of Cornell University won half of the prize in chemistry, with Drs. W. M. Stanley and J. K. Northrop of the Rockefeller Institute for Medical Research sharing the other half; and the medicine and physiology award was made to Dr. Hermann J. Muller of Indiana University.

*Science News Letter, November 22, 1947*



**NOBELISTS**—Sir Robert Robinson, Oxford University chemist, and Sir Edward V. Appleton, physicist and secretary of Britain's Department of Scientific and Industrial Research, receive awards.