

CHEMISTRY

Quinine Synthesized

Exact duplication of malaria remedy achieved for the first time by chemists. May point way to development of better anti-malarial than quinine or atabrin.

► FOR THE FIRST time in history quinine, important malaria remedy found in the bark of the cinchona tree, has been put together in the laboratory.

This total synthesis of quinine has been accomplished by two 27-year-old American chemists, Dr. Robert B. Woodward, of Harvard, and Dr. William E. Doering, of Columbia University, working for the Polaroid Corporation.

Their success in achieving what chemists the world over have attempted for almost 100 years was announced simultaneously with publication of details of the method in the *Journal of the American Chemical Society*. (May)

This chemical feat may point the way to another important achievement, the development of a better anti-malarial than quinine itself or the synthetic chemical, atabrine, now also widely used in malaria treatment. Although both quinine and atabrine are effective in treating malaria, neither of them is a true prophylactic or preventive of a malaria attack. This is because neither attacks the malaria germ in its earliest, pre-infective stage as injected by the mosquito. Nor is either of them very effective in preventing relapses.

The Woodward-Doering process for synthesizing quinine has already led to synthesis of another entirely new substance, an optical isomer of quinine. The structure of this substance looks like the reflection in a mirror of the quinine molecule. Tests to determine whether it has value as a remedy are planned.

The synthesis started with a coal-tar derivative, 7-hydroxyisoquinoline, and proceeded through nearly a score of chemical processes until the scientists had succeeded in creating quinotoxine. This chemical had originally been produced from quinine by Pasteur and in 1918 a German chemist, Rabe, had reconverted it into quinine. When Dr. Woodward and Dr. Doering, had reached the total synthesis of quinotoxine, they knew they could reach their goal by following Rabe's method for converting this chemical into quinine.

Whether the laboratory synthesis can be made commercially practicable has not

yet been determined. The Polaroid Corporation does not intend, states Edwin H. Land, president and director of research, to manufacture the products involved but to license the process, after consultation with government authorities, to such organizations as are best fitted to assure the broadest usefulness for the scientific discovery.

Commercial production of synthetic quinine might be pushed if we did not have enough atabrine and totaquine for military and essential civilian needs. Totaquine is a mixture of chemicals from cinchona bark and contains quinine.

When the Japs seized Java in March, 1942, they also gained almost the entire world's supply of quinine, which for about three-quarters of a century had come from the Dutch cinchona plantations there. At the same time quinine was desperately needed by American and

other United Nations forces fighting in the jungles of the Southwest Pacific and other malaria-ridden regions.

Cinchona trees, however, are native to South America, where the anti-malarial action of their bark was first discovered. Since the war steps have been taken to reestablish these cinchona plantations. Our supplies of totaquine are coming now from Latin America.

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VOLCANOLOGY

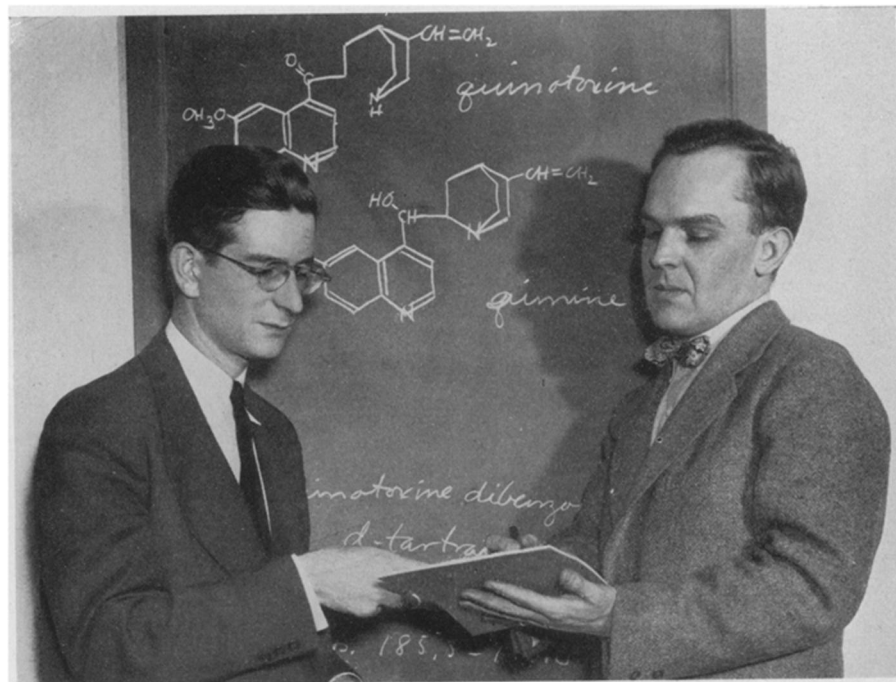
Lava From Paricutin Threatens to Engulf Town

By WATSON DAVIS

Writing From Mexico City

► SLOWLY CREEPING lava from Paricutin volcano is threatening to engulf the town of San Juan Parangaricutiro, nearly five miles away, and to drive 2,500 people from their homes. Engineer Ezequiel Ordonez, 77-year-old dean of Mexican geology, recently left on his 26th trip to Paricutin, to determine how soon the town must be evacuated.

Moving six feet hourly, the flow has now reached a little valley 120 feet wide



SUCCESSFUL—An exact duplicate of quinine has been synthesized by chemists Robert B. Woodward (left) and William E. Doering, working for the Polaroid Corporation. That very valuable natural drug had defied duplication for nearly a century. But after less than 14 months of work the two young chemists completed the synthesis.