

PUBLIC HEALTH

DDT May Control Malaria

Public Health Service tests show it is successful as mosquito control weapon in rural areas of the South. Spraying inside houses effective.

► DDT may solve the problem of malaria control in rural areas of the South, it appears from a test conducted by the U. S. Public Health Service in Arkansas. Results of the test, called "striking," were reported by Dr. F. L. Knowles, senior biophysicist of the office of malaria investigation, U. S. Public Health Service, at the meeting of the American Association of Economic Entomologists in New York.

A widespread Federal campaign, to combat the threat of malarial flare-ups resulting from the return of service men who have contracted malaria overseas, is expected to get under way as soon as sufficient DDT becomes available.

DDT supplies "will remain very tight through March and possibly April," John A. R. Rodda, in charge of insecticide allocations in the War Production Board, told the entomologists. "We are still working on military needs, which are consuming practically the entire production. Besides, the raw materials for manufacturing DDT have become critical and are granted only because of the military needs for DDT."

Describing the Arkansas DDT tryout in malaria control, Dr. Knowles pointed out that malaria is an unsolved problem in the southern states because regular control methods are too expensive.

"Spraying the insides of the houses is more effective. The unique residual toxicity of DDT should make it still less expensive and more practical.

"We picked 36 square miles in Arkansas near Helena. This is cotton country. Ninety-five per cent of the houses are of tenant or sharecropper type, shotgun-construction, newspaper-lined, inhabited by Negroes making only a marginal living. With two high school boys we sprayed the insides of these last summer, leaving every 25th house unsprayed as a check.

"Daily inspections of the sprayed houses throughout two months after spraying showed that for that long a period, there was a 94 per cent average reduction in the number of mosquitoes resting, alive, on the indoor walls."

What happened, he said, was that the mosquitoes came indoors at night, alight-

ed on walls and ceilings bearing an invisible residue of DDT, and were fatally poisoned. This effect takes several hours, but is rapid enough so that "there was an average 80 per cent reduction in number of living, resting mosquitoes from early morning to afternoon."

This technique, it was added, hits the mosquitoes at the strategic time: the night, when they are lying in wait indoors to bite sleeping victims.

The job used an average of .82 of a gallon per house of five per cent DDT solution. Per house it consumed 10 minutes, took .73 of a man-hour, and cost 74 cents for material and labor.

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ORDNANCE

Three Military Inventions Recently Patented

► INVENTORS of warlike devices have been active, as is evidenced by several patents. Two are by civilian employees of

the Army's great arsenal at Springfield, Mass. The first, by Vail W. Grant, is on a rear sight for rifles that is essentially a U-shaped spring, lying flat on the weapon, with the sight aperture at the end of the free arm. A rotatable block under this provides means for elevation, and the spring action keeps the sight snugly in correct position. This patent is numbered 2,364,067.

The second patent is numbered 2,364,103, and is on an improved spring-hydraulic recoil mechanism for firearms, the invention of C. E. Simpson. He states that it will make possible the shoulder-firing of weapons of .60 caliber and larger. A backward-projecting rod attached to the mechanism also provides means for making the breech mechanism automatic or semi-automatic in operation.

Another invention in the military field is by an Army officer, Maj. Robert Van Roo; it is covered by patent 2,364,113. Maj. Van Roo's invention is a machine for stacking the large, cylindrical "grains" of cannon powder (which are often as big as a man's thumb) in straight, even rows, insuring more uniform burning and hence better ballistic performance by the guns in which the charges are used.

Rights in all three of these patents are of course assigned royalty-free to the government.

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JETS EXPOSED—The 18 jets through which the propellant mixture in the V-2 rocket is sprayed into the combustion chamber are shown here. These RAF pictures (see also cover and facing page) were made of a rocket which fell in Belgium.

ORDNANCE

Chemicals Used in V-2

Hydrogen peroxide and potassium permanganate prevent the Nazis' new rocket from blowing up in their faces and give it brisance.

See Front Cover

► TWO CHEMICALS, hydrogen peroxide and potassium permanganate, prevent the Nazis' V-2 rocket from blowing up in the launchers' faces and also give it brisance, or extra power and speed. The 15-ton, 46-foot-long rocket is thrust through the air by a highly explosive propellant mixture of alcohol and liquid air. This propellant causes the V-2 to travel faster than sound to altitudes estimated at 60 miles above the earth.

The reaction of liquid air on alcohol produces a highly explosive mixture which ordnance experts call "unstable." Hydrogen peroxide and permanganate are both oxidizers and their use insures the maintenance of uniform combustion, and prevents danger from "flashing" or an explosion of the mixture inside the rocket which might ignite the entire rocket and cause it to be blown to bits. Scientists state that such use of hydrogen peroxide and permanganate makes them catalysts. That is, they are substances which, while apparently taking no part in the combustion of the liquid air and oxygen, nevertheless, by their mere pres-

ence control the speed of the combustion.

A sectional drawing of the V-2 released by official British sources shows that it contains in its body two large tanks, the forward tank holding alcohol and the rear tank holding liquid oxygen. Pipes from these tanks run into a turbine and pump assembly. Also leading into this assembly are pipes from the hydrogen peroxide tank and the permanganate tank. In the turbine, the four components of the combustible mixture are blended and by pressure from bottled air and bottled nitrogen they are released as a fine mixed spray through 18 jets which make up the forward end of the combustion chamber. Here, thanks to hydrogen peroxide and permanganate, the explosion is localized and the rapidly expanding hot gases are expelled through the jets at the rear, forcing the rocket upward.

Alcohol is capable of burning with liquid air, and therefore no oxygen from the outside is needed to insure combustion. This makes it possible for the jet mechanism to operate at stratospheric heights where there is very little air, and

where it is possible to get more power from less fuel. Alcohol is also used as a coolant in the V-2 to keep the jet from getting so hot that it would melt.

Peacetime uses of hydrogen peroxide include applications as a bleaching agent in the textile, felt hat and other industries; as a bleach for hair, making a dark brunette into a platinum blonde; and as a disinfectant. Potassium permanganate, a compound of manganese, the metal used to make tough steel for burglar-proof safes, is also an excellent disinfectant and bleaching agent.

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LANGUAGE

Dictionary for Aleuts Will Be Available Soon

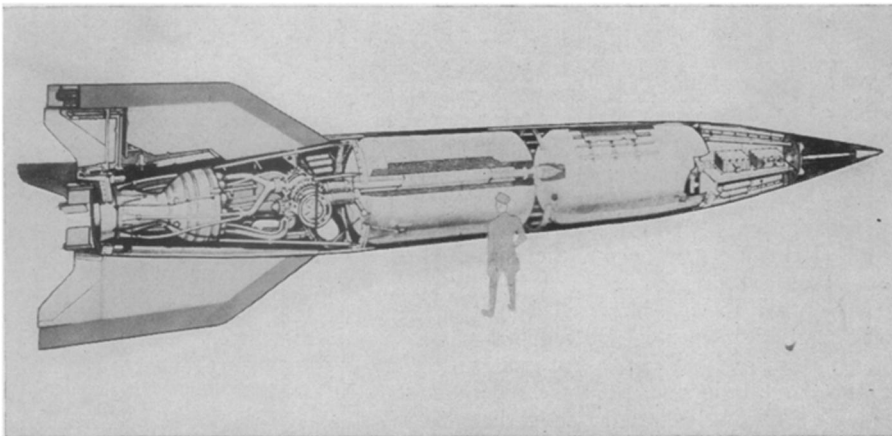
► A DICTIONARY for the Aleuts of the Aleutian islands and Alaska mainland, to be published soon by the U. S. Office of Indian Affairs, will be of assistance to these 6,000 American citizens in translating their strange language into English. At the same time it provides them with a new alphabet of 18 characters, the same kind of characters used in English, but often with different pronunciations.

The language of the Aleuts is difficult. It is one of the Eskimoid dialects, but due to isolation for centuries on these distant islands it is so different as to be almost entirely another language. Scholars familiar with other Eskimo dialects are unable to translate Aleut. Some of the Aleuts are able to talk Russian, which was the official language during the days of Russian control of Alaska, and some can now talk English.

The new dictionary is the work of two men, Ivan Veniaminov, a Russian missionary who later became Innokenti, Metropolitan Archbishop of Moscow, and Richard E. Geoghegan, an Irish scholar and a leading philologist, who for nine years was a linguistic consultant for the Japanese government and later the British vice-consul in Seattle and Tacoma. In 1902 he went to Alaska as an officer of the U. S. District court and remained there until his death in 1943. The final editing of the work was done by Miss Fredericka Martin, an associate of Mr. Geoghegan.

Veniaminov published in 1834 a *Dictionary of the Aleut-Fox Language* and gave the Aleuts an alphabet in Cyrillic characters, and a grammar. It is this dictionary that is now for the first time translated into English.

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INSIDE THE V-2—This cutaway drawing of the V-2 shows the location of the alcohol and liquid oxygen tanks (two large tanks in body) to the left of which, at the bottom, is the small hydrogen peroxide tank. Above the small tank you see the turbine mixing pump. At the left of the mixing pump is another small tank, the container for the permanganate. Pipes from the pump run to the combustion chamber, the unit that looks like an hourglass, where the liquids are exploded and the hot expanding gases released through the venturi jet. Note comparative size of the rocket and the man standing beside it.