

PUBLIC HEALTH

World Fight Against Malaria

With more than one billion human beings living under the threat of malaria, the World Health Organization has called for total eradication of the disease by 1968 if possible.

By GLORIA BALL

EIGHT YEARS from now, human malaria may be a disease of the past, completely wiped from the face of the earth.

This is the plan of the World Health Organization, which began its 12th year on World Health Day, April 7, with the slogan, "Malaria Eradication—A World Challenge."

Such an ambitious campaign, to eradicate, rather than merely control a disease, is an unprecedented "first" in medical history. At present, WHO has enlisted the support of 92 countries and territories.

The major portion of the campaign is directed at breaking the life cycle of the malarial parasite by eliminating the mosquitoes that transfer it from one person to another. This is being accomplished by spraying insecticides inside the houses of persons living in contiguous areas.

Formerly, national campaigns tried to annihilate the entire malaria-mosquito population. But later knowledge of the mosquito's habits indicated that such a costly procedure was unnecessary in most cases.

Malaria is transmitted only by the female of several species of mosquitoes belonging to the genus *Anopheles*. These insects are not only carriers, called vectors, they are also an essential host in which the malaria parasite must spend eight to 21 days developing from a non-infective into an infective form. If the mosquito should bite a healthy person before the parasite inside her body is mature, the victim would not contract malaria.

The anopheline, sometimes described as "pretty" and "dapple-winged," usually bites at night. She enters the house of the sleeping human host, in whom the malaria parasite usually lives about one and one-half to three years. After the mosquito has had her meal of blood, she is very sleepy and wants a nap in a windless spot.

The fact that the mosquito takes a nap inside the house is the key to the whole eradication program.

If the house has been sprayed with insecticide, the mosquito will pick up a deadly dose of it during the nap. She may not die immediately but she will not live long enough to transfer the malaria parasite to a healthy person.

In the Amazon basin of Brazil, most of the houses have no walls, consisting only of a roof supported by four poles. Under such circumstances the mosquito takes her nap outside and spraying inside the "house" does little good. To check malaria in this region, a Brazilian doctor suggested adding an antimalarial drug to cooking salt, similar to putting iodine in salt used by goiter-

susceptible populations. The drug attacks and kills the malarial parasite in the human bloodstream.

In view of the success of this technique, WHO experts have been asked whether it would not be simpler to distribute drugs to everyone living in malarious areas. Their answer is "no."

Antimalarial drugs only keep the blood parasite at bay for a short time, scarcely one week. An "immense and very efficient" organization would be needed for regular distribution of drugs over vast territories with widely-scattered, and often nomadic, inhabitants. The population would soon tire of coming so often for treatment. It would be difficult to persuade people who were not feeling ill to take drugs regularly over a long period. It would also be almost impossible to ensure that everyone, including children and infants, was getting the proper dose, the experts say.

There are other drawbacks. Quinine, an alkaloid first separated from the bark of the cinchona tree in 1820, has a very bitter taste. Atebrin, now officially known as quinacrine dihydrochloride (under the trade-mark "Atabrine"), is a synthetic anti-

malarial drug discovered in Germany in 1930. It is preferred to quinine because it acts faster. But it occasionally produces a temporary yellow discoloration of the skin.

Nevertheless, quinine and atebrin, like the newer drugs, plasmoquine, paludrine, chloroquine, the quinolines and the piperidyl quinoline methanols, are essential in the eradication program. They will be most valuable toward the end of the campaign when they will "mop up the last remaining foci of infection."

Malaria is the culprit, WHO officials believe, that for centuries has sapped the vigor of populations and held nations in bankruptcy by causing large-scale work and production losses.

In Ceylon, the disappearance of malaria has resulted in a saving of about \$30,000,000 per year. In French Guiana, infant mortality decreased by more than 50% since the large-scale antimalaria operations carried out in 1949-51. In the Philippines, uprooting of malaria has made possible many projects which previously were "out of the question," such as construction of roads, opening of mines and building of houses.

But the picture is not completely bright. The major problems involve mosquito resistance, manpower and money.

At the beginning, nations attempted only control of malaria by using sprays belonging to two chemical groups; one includes DDT, the other—dieldrin. But mosquito



MALARIA FIGHTERS—Spraymen set out on their daily rounds in Ceara Mirim, Brazil. They carry supplies for applying insecticides inside the houses.

populations began to develop resistance to the insecticides.

In 1951 Greece reported that one of its anophelines, *A. sacharovi*, had become resistant to DDT. By 1955 the United States reported resistance to dieldrin in Bolivar County, Mississippi. Since then 16 other nations, from Burma to Ecuador, have reported anopheline resistance to one insecticide group or the other.

It soon became obvious that control measures are not enough. The disease and the insect vectors must be completely wiped out before total resistance sets in.

The present plan is to use DDT in dieldrin-resistant areas, and vice-versa. But no one knows how long it will be before the mosquitoes become so strong that neither chemical group can kill them.

The campaign is now a race against time.

Getting experts and other workers to the key areas is the second hurdle. The whole world effort must be correlated into a military-type attack, and it is no small job for countries who have few experts and little money.

WHO's malaria fund needs \$50,000,000 within the next five years. Ninety percent of the cost of eradication programs is borne by the governments where malaria still exists. In many countries the money spent on the malaria campaign represents "an impressive percentage of the national budget."

The program will take one year of organization, four years of total spraying coverage and three years of surveillance to stamp out the stubborn spots.

If all goes well, there will be no malaria in the world in 1968.

Science News Letter, April 9, 1960

RADIO ASTRONOMY

Nine Radio Sources From Outer Space Identified

NINE NEW SOURCES of radio waves from outer space far beyond the Milky Way have been identified. This brings to 14 the number of extra-galactic radio stars now identified.

The new sources were pinpointed by a twin radio telescope with two 90-foot parabola antennas. The whole instrument is mounted on a 1,600-foot long railroad track oriented east-west 250 miles from Los Angeles. This particular telescope is reported to have a greater resolving power than any other instrument in the world.


Prof. John G. Bolton of the California Institute of Technology, who has directed studies with the telescope since it was put into operation two months ago, is now attempting to identify more than 100 extra-galactic radio sources which have been detected, but not precisely located.


This is accomplished by comparing the radio sound and direction with photographs of the area from which the sound comes.

Some bodies in space are difficult or impossible to see because clouds of gas get in the way and block the view. For this reason, an estimated 20% of the galactic and extra-galactic radio sources already detected will probably never be identified.

The Cal Tech studies are being conducted under contract to the U.S. Navy's Office of Naval Research in Washington.

Science News Letter, April 9, 1960

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