



WHO

Nodules, a sign of onchocerciasis, may be precursor of blindness. Fear of the disease empties whole villages.

FROM GENEVA

River Blindness Afflicts 200,000,000

Parasitic worm endangers sight in Africa and Central America; World Health Organization launches biological-medical-social attack.

Children are especially precious in many African villages. Almost all the adults are blind; the children lead them until their own eyes fail.

The cause is onchocerciasis, a worm infection known as "river blindness." The parasitic worm is carried by a fiercely biting black fly that breeds in rushing water.

The fly plants the worm eggs under human skin and the tiny larvae migrate to the eyes, where they cause a sclerosing lesion or inflammation of the cornea and iris. Elsewhere in the body, they cause wrinkling and discoloring of the skin, lymphedema and hanging lymph nodes of the groin.

More than 200 million people are afflicted, mostly in Africa and Central America. Most go slowly blind.

Surveys show a toll of more than 75 percent in some African villages, with lower figures in Guatemala, Mexico and Venezuela. In Africa, the northern boundary of the disease belt runs from Senegal to Ethiopia and the southern from Angola to Tanzania. New foci are reported in the Northern Sudan and Yemen.

Paradoxically, irrigation and hydro power development reportedly are

creating new breeding places. Some of the most fertile valleys are so infested by the fly, simulium, that they are abandoned by the people. In areas such as Lake Victoria, new tea cultivation and the exploitation of huge timber reserves are bringing in large numbers of new workers, exposing them to the danger. The savannahs of the Ivory Coast and Cameroon are old endemic zones.

Even aside from the suffering, World Health Organization doctors say, "the benefits of economic expansion projects will be greatly reduced if the authorities ignore the health aspects of such schemes."

Now the UN professional agency is stepping up its campaign against the insect vector in a combined biological-medical-social effort, like those long waged against the mosquito and tsetse fly.

Unfortunately, both the habits of the black fly and the nature of the disease are not yet understood. Biologists and physicians are therefore handicapped in vector control on the one hand and chemotherapy on the other.

Yet noteworthy projects are under way in both fields. WHO-recruited sci-

entists on multi-disciplinary teams are on the spot working up plans for afflicted nations. These include surveys of the entomology, meteorology and terrain, parasitology, clinical features of the disease and its prevalence—the natural history of onchocerciasis.

A global map and regional grid maps are needed to show the foci, vector distribution and flying range. These will be correlated with population density, water courses and different vegetation zones, enabling workers to spot potential transmission.

WHO is training specialists and supporting pilot control projects. It wants to mobilize international assistance for irrigation and power projects, ensuring cooperation among engineers, biologists and physicians, to avoid creating new breeding sites.

Better ways must be found to trap the fly. Local workers must sample the fly's blood-feeding activities in animals. But the best study, say experts, is the old "routine catches on human bait in typical sites."

Self-perpetuating colonies are needed to test new chemical repellents and to learn such basic facts as the longevity of the female.

Immunology can yield clues to control, say WHO specialists in that discipline. Immune reactions to the parasitic worm are "at the root of the variable pathology," they explain; some people are more resistant than others.

"The research needs," says Dr. N. A. Ansari, "are practically unlimited."

Repeated, prolonged exposure and genetics, age, nutrition and concurrent disease are suspected as etiologic factors. Measles, smallpox and other infections also cause blindness, complicating WHO surveys.

Prevention of river blindness also requires the cooperation of adjacent countries. Some types of black flies have a flight range of 50 miles.

Simulium, in both the adult and larval stages, is susceptible to DDT and can be exterminated where the species is the shorter-ranged *S. neavei*. A few years ago, the chemical was sprayed from the air over Leopoldville and wiped out the fly. In a Kenya district, too, DDT was put in the river and thus far the flies have not returned.

Rivers may be treated once a week with DDT through breeding seasons. In America, three months of aerial larviciding with DDT in fuel oil has been used effectively. But in Africa the flies breed under heavy forest canopies. Smoke bombs have been ineffective.

But great areas are infested with *S. damnosum*, the long-ranged species, on which basic knowledge is lacking. WHO is supporting research by several institutions, including the French Organisation de Cooperation Contre Les Grandes Endemies, now studying breeding sites.

One of their units in the Upper Volta has tested biologic control of the insects during its aquatic stage by different spillway designs, as well as various larvicides.

WHO biologist Dr. Alan Muir-Thompson says breeding places include not only rivers but rapids and waterfalls. "Eggs are laid in twigs in the turbulence and the larvae attach themselves strongly, right in the current," he says.

He does not think the black fly can be controlled by genetic means such as sterilization. "Maybe the tsetse or mosquito can, but I rather doubt this one can," he observes.

Drugs have not yet provided a comfortable therapy. Some have been tried, but strong allergic reactions of gastritis, nausea, itching and burning, however transient, bother the patients.

Many Africans prefer the disease to the side effects, because the eye lesion develops slowly, without trauma. They reject the drugs.

Eye lesions may be related to vitamin



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The young lead the blind, until they themselves become victims.



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Up to 25 operations a day are done in one village plagued by the disease.

or protein metabolism or vitamin A deficiency, WHO doctors suspect. In the savannah regions of Africa, the food is poorer than in the forests and

eye lesions more common. But this is not at all clear; well-fed Europeans acquire the disease if exposed to the fly.

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