

# New Push for Tropical Medicine

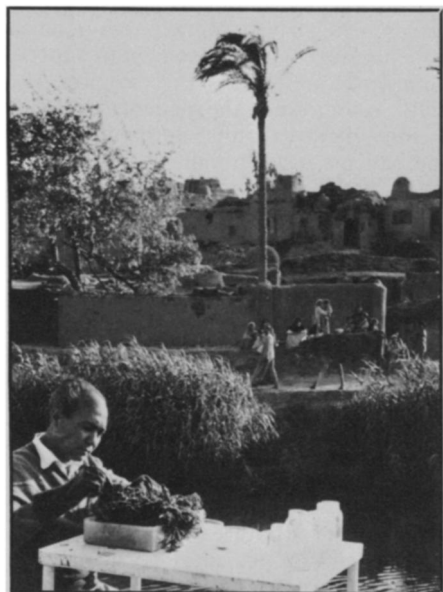
World Health Organization plans interdisciplinary institutes to attack ancient scourges with latest medical discoveries

by John H. Douglas



N'dola hospital, Zambia: Home of new institute for study of parasitic diseases.

One billion persons, mostly in the world's poorer countries, suffer from intestinal parasite infections; half a billion people have malaria; a quarter of a billion carry parasitic worms in their blood or lymphatic system or both. Leprosy affects more people today, because of population growth, than in biblical times, when it was one of the most widely described and dreaded diseases. These and other ailments, usually lumped together as "tropical diseases," have not benefited as much from the recent triumphs of biomedical re-



Searching along an Egyptian canal for snails that may carry schistosomiasis.

search as those illnesses more frequent in developed countries, and the World Health Organization (WHO) is preparing to launch a major new attack on these ancient scourges.

The reason behind the lag of tropical medicine is not hard to find: Only one percent (some \$25 million annually) of all the money spent on medical research is devoted to diseases of tropical and subtropical countries—though more than half the world's population lives in these areas. Increasingly, research in industrialized countries is directed toward the chronic diseases that afflict a population that lives longer than most inhabitants of poorer countries—heart disease, cancer and mental disorders. Even the potentially useful "spin-offs" of such research are often not applied to improving health in tropical areas because trained personnel and local facilities are missing. After looking into the problem, WHO's Advisory Committee on Medical Research concluded that "radical measures are needed to remedy this deplorable situation."

The proposed cure is as ambitious as it is radical. Noting the success of internationally sponsored, regional agricultural research laboratories—which produced the "Green Revolution"—WHO is planning a similar network of regional medical institutes that would conduct basic research, apply the results to practical health problems of an area, coordinate the work of national labs and train local personnel from technicians to postdoctoral-level re-

searchers. The annual cost of the new program, when operational, will probably run between \$10 million and \$15 million, far more than the present WHO budget will allow, so outside donors, including governments and foundations, are being asked to help. A meeting of potential donors is tentatively for March.

In an interview with *SCIENCE NEWS* at WHO headquarters in Geneva, medical officer Howard Goodman described the first step in implementing the program: establishment of a multidisciplinary research and training institute for the study (primarily) of parasitic diseases in N'dola, Zambia. The Zambian government has donated two upper floors of a new, seven-story hospital for the project and officials hope to get the institute operating next year. Goodman emphasizes that this is to be no "ivory tower science," but rather a directed effort to develop drug therapy and possibly vaccinations against a specific set of diseases.

Recent advances in the study of how the body's immune system recognizes the agents of infection and mobilizes antibodies to attack them may lead to new methods of treating and even preventing diseases involving protozoa, such as malaria and trypanosomiasis ("sleeping sickness"). The one-celled, animal-like protozoans are recognized in the body by certain surface substances called antigens, and research will concentrate on how to strengthen the immune response triggered by these substances. The main problem is that protozoa continually change their antigens and so evade the defending antibodies. Scientists at the new institute will thus concentrate on enhancing immunity by determining the pattern of antigen variations and finding out how various drugs affect these variations. Their research will also involve studies of cell membranes—now a popular topic in Western laboratories because of its importance to understanding the mechanism of cancer. Thus the flow of information between N'dola and established centers of research in developed countries should not be one-sided.

A WHO panel setting up research goals for the new program concluded that "rapid progress towards a leprosy vaccine is now possible," and recommended a major effort in this direction. Here, research will be concentrated on

"cell-mediated" immunity—the body's use of white blood cells to attack the invading bacterium. Having a research center established near an infected population is particularly important in the case of leprosy since public health measures must be coordinated with any clinical program. One of the biggest problems is overcoming public fear of the disease, which is only mildly infectious and no longer requires the traumatic isolation of a leper colony.

With the completion of the Aswan Dam and the resultant permanent flooding of large areas, incidence of the snail-borne disease schistosomiasis has reached epidemic proportions in some parts of Africa. Planners hope that research may find new ways of interrupting the life cycle of the blood fluke involved before it infects humans—who can become infected merely by wading in water containing the carrier snails. Again, study of cell membranes has led to an imaginative suggestion for preventing the disease: Receptors in the cell membranes of the parasite are involved in recognition and penetration of the host snail, and the suggestion is made that recent discoveries in how to make such receptors unresponsive could be used to interfere with the recognition process. The alternative is both expensive and environmentally undesirable: poisoning the water to kill the snails.

Other diseases scheduled for study at the new institute include filariasis and leishmaniasis. The more virulent form of leishmaniasis—called "black fever" or "dumdum fever"—has a 90 percent mortality rate if not treated, and the present treatment, involving compounds of antimony, is regarded as unsatisfactory. The body's first line of defense against the invading protozoa is, in this case, the "scavenger cells" or macrophages of the blood. Research will likely concentrate on finding new drugs that activate these macrophages. Filariasis is a deforming, crippling disease in which a mosquito-borne worm lodges and multiplies in the lymphatic system, causing fluid accumulation and grotesquely enlarged legs or scrotum ("elephantiasis"). At present, there is no specific therapy. Research probably faces a long, uphill fight.

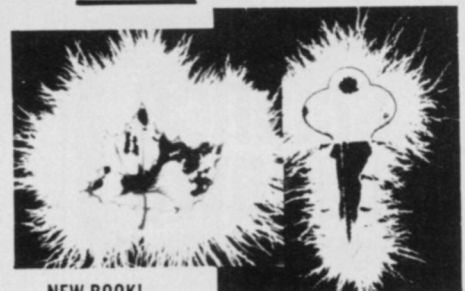
Taken together, these diseases represent a major obstacle to the development of many tropical countries. Not only does their treatment involve great expense—when it is available—but their chronic, energy-draining nature so weakens the "walking sick" that they can hardly fulfill their daily routines. Much of the supposed lethargy and laziness so long associated in Western minds with life in the tropics might disappear if the new concentrated attack on these cripples is successful. □

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