



WHO INTER REGIONAL TECHNICAL MEETING ON MALARIA ERADICATION
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THE ANOPHELINE WAR
THE STORY OF MALARIA ERADICATION IN IRAN *

"When future historians evaluate the Twentieth Century, international effort to improve world health will stand out as a great achievement. Diseases which were once the scourge of mankind will have vanished from the earth. One of these may be malaria, today the most wide-spread of all communicable diseases, and only recently the killer of two million of the world's people each year.

"Of all the multitudinous insects that inhabit the earth, none has been so persistently harmful to human life and health as the Anopheles mosquito, the carrier of malaria. Older than recorded history, malaria is not only a dreaded killer; it saps the vitality of millions who survive, leading to the highest economic cost of all the diseases that afflict mankind.

"A total global war has been declared upon the Anopheles the most dramatic public health campaign in world history. In the past, the mosquitos' breeding grounds in marshes and swamps have been attacked, and repellents and insecticides have been used on a relatively limited scale. But now the intention is, as far as possible, to kill enough of the infected Anopheles mosquitos long enough to wipe malaria off the face of the earth. Eradication activities are presently conducted in more than eighty countries and territories of the world. And in few countries has there been more striking success in this stupendous international effort than in Iran. Especially in the Caspian Sea area of northern

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Iran, the determined, dogged efforts of Iranian malarial experts working with international consultants and the local citizenry have brought spectacular results.

"Only a few years ago, travellers curtailed their visit to northern Iran during the warmer months for fear of contracting malaria. There is, in fact, a Persian proverb of ancient origin that states, "If you seek death, go to Gulan." This northern province embracing the Caspian Sea, a rich agricultural region so loved by Persians for its green and fertile beauty that it has been likened to the Garden of Eden, has long been ravaged by the deadly powers of the Anopheles mosquito.

"But today Iran's entire northern region with its 10,000 villages and six million people has been blessedly freed of this dread disease. The eradication program is in the consolidation or final stage here, with only occasional scattered cases brought to the region by migratory labor. That this is indeed a public health wonder of the modern world is shown not only by the sharply decreased death rate but also the great rise in production because of the population's increased vigor.

"It is the combined efforts of the Malaria Eradication Organization of the Iranian Ministry of Health, the United States' ICA, now called the Agency for International Development, the World Health Organization and the United Nations Children's Fund that are to be credited for malaria eradication in Iran.

"Success in this ambitious work has meant an insecticide spraying program of massive proportions. For if Iran is to win her all-out war against the Anopheles, literally every home in every city, town or village the ubiquitous mosquito frequents must be sprayed with DDT or other powerful insecticides.

"This spraying of walls, ceilings and furniture any and every surface where the Anopheles may alight - takes place once or twice every year. In four years time, if all goes well, the malaria parasite's life cycle, dependent upon continuous movement from person to person through the bite of the infected female Anopheles, is broken and the disease dies out. In Iran this has meant that the malady which until recently more than one million Persians contracted each year is now taking second place to hookworm and bilharziasis. Happily for Iran, the physical means to defeat even these two parasitical diseases are now at hand, and largely because of the efforts at malaria eradication.

"But Iran's total war against malaria is by no means won. The coastal plateau region, now in the attack phase of eradication, has reacted satisfactorily to the spraying program. But in south Iran the southern slopes of the Zagros, the alluvial plain of Khuzistan and the Persian Gulf littoral of Fars, Kerman and Baluchistan - difficulties have set in. As in human warfare, to every powerful new weapon there comes in time a counterweapon. And in this particular region the Anopheles mosquito has developed strong resistance not only to DDT but to the insecticide dieldrin as well. Insisting

on the survival of her species, which requires human blood for the development of her eggs, the female Anopheles has changed her behaviour patterns and adopted remarkable techniques of guerilla warfare.

"Problems in southern Iran are in fact so great that a strategic holding action has been taken until better methods of combatting the mosquitoes' resistance can be found. A buffer area is being created to discourage the disease from spreading to the north and curative drugs are being distributed monthly to every household among the three million people who inhabit the area. Meanwhile, 1965 is the tentative target date set for completion of the major attack phase against the Anopheles in Iran.

"Although malaria is a disease that was known even to pre-historic man, only now is it becoming fully understood. Some 60 years ago it was discovered that the mosquito is an indispensable part of the malaria contagion. And, interestingly enough, it is the female Anopheles only, this specific species alone and never the harmless Anopheles male, which transmits the malaria parasite from the blood stream of one human being to another. When the female mosquito bites a human infected with the parasite, these parasites then multiply in the insect's body.

"Two weeks later, persons whom she bites will become infected, and in another two weeks these persons will succumb to the disease. The result of this transmission, depending upon the resistance of the victim, is death or a population too enfeebled to work for weeks or months of the year.

"There is reason for confidence that eventually malaria problems in Iran will be overcome entirely through current research, through effective international cooperation and the development of increasingly better health facilities in Iran.

"It has been an expensive program. Early hopes that it could be terminated in a few years and funds allocated to other projects have not been borne out. It will continue to be expensive, with some forty-four million dollars tentatively allotted to the program from 1962 to 1968. An expenditure of nine million dollars has already been granted for this coming year.

"Meanwhile, that this scourge is well on the way to extinction is evidenced by the nucleus of highly trained persons that has sprung up throughout all of Iran - experts who, armed with a vast store of medical information, will eventually spread their activities into other fields of public health. The international groups so ably assisting Iran in her gigantic task of malaria eradication can take pride not only in the excellent progress achieved in this specific field; acclaim is also merited to the United States' Agency for International Development, the World Health Organization and the United Nations Children's Fund for the heartening fact that efforts at malaria eradication are already shedding new light on the broad fields of parasitology and entomology in Iran and throughout the world."