able leadership has played a most significant part in this wonderful and dramatic story. Three points need, however, to be stressed: (1) Rehabilitation starts with early diagnosis, for whenever a surgeon operates on a hand or a foot, to reestablish function, a physician has failed. (2) Too often, and of necessity, our operative and rehabilitative efforts, successful and dramatic though they be, can be likened to the ambulance at the bottom of the cliff, when what is really needed is a fence at the top. But until we know more about the theory and mechanics of deformity, the ambulance service must continue. This is essential and demands the full and most enthusiastic support of all workers in the field of leprosy. The dictum of one world-known orthopedist and rehabilitation specialist that "it is difficult and sometimes impossible to rehabilitate a blind hand" must be kept in mind. Therefore, the first essential is to train the patient to use the hand that is to be rehabilitated, before operation, and not leave physiotherapy to be stressed only after the operation is over. In this way, when the surgeon has completed his work, the patient is familiar with the exercises he has to do and the manner of life he must adopt. Thus permanently successful results are more likely to be achieved.

What more can I say? The saga of leprosy is as thrilling as it is hopeful. We have the means and we have the skill; all that is necessary is the determination to pursue our objectives with the unlimited enthusiasm of the early pioneers—Rogers, Heiser, Marchoux, Mitsuda, Wade, Ryrie, Muir, de Souza Lima, de Souza Campos, an international team of great eminence—until we achieve at last that which is possible, to dispel this grim shadow from the face of the world.

—R. G. Cochran

DDS and Malaria

The treatment of malaria by quinine is perhaps the prototype of successful chemotherapy. Remarkable as it has been in its results, however, physicians have never been satisfied with its efficacy, and for many years investigations have been in progress in the effort to discover still more effective specific antimalarial chemicals. Out of this continued research have come atabrine, chloroquine, primaquine and related drugs. The search goes on, accelerated from time to time by the recognition of new problems in the treatment of malaria.

During World War II, when malaria was a grave problem in the military forces in the islands of the South Pacific, and other parts of the world as well, the antimalarial effect of literally thousands of chemical compounds was investigated by research organizations in the warring countries. The antibiotics and sulfa drugs that had proved so successful in the treatment of bacterial infections were naturally among the earliest to be studied. Not surprisingly, the sulphonamide sulphanilamide was one of the first drugs actively investigated. Its remarkable record in a wide spectrum of bacterial diseases was good reason for its trial in other forms of infectious disease. A natural sequel of the investigation of the sulphonamides in malaria was a study of the closely related sulfones.

Even before these war-stimulated studies were in progress, malarialogists had made pioneer investigations of the sulfa drugs in experimental malaria. In the late 1930's and early 1940's numerous studies of this characteristic were reported, and trial of the compounds studied was soon extended to malaria in man. Apparent successes and apparent failures were reported. Coincidentally, and for very much
same reasons, the efficacy of the sulfonamides and sulfones in mycobacterial diseases was being investigated. Researches on tuberculosis by Feldman, Hinshaw and associates pioneered among these. Coincidentally, studies of the effect of sulfones on leprosy and leprosy-like diseases were underway. Doull made a painstaking review of these, with which readers of The Journal are familiar. Among the reports taken up in detail by Doull was the classic paper on the chemotherapeutic effect of promin on clinical leprosy by G. H. Paget and associates, which was reprinted in the preceding issue of The Journal. As is well known, the toxicity and inconveniences in the use of promin and other substituted sulfones led before long to the use of the parent compound, diaminodiphenylsulfone, or DDS, which soon became the standard drug in the treatment of leprosy. The pioneer work of Cochrane and associates in India, who used parenteral routes for the drug, Souza Lima in Brazil, Lowe and Smith in Nigeria and Flech and Destombes in French Guiana, who initiated oral use, started DDS on its long course and a wide use that has extended to a great many thousand leprosy patients.

Leprosy and malaria are coincidently endemic in many parts of the world. Inevitably, therefore, many leprosy patients have been treated with antimalarial agents, and many malaria patients with antileprosy drugs. From time to time a suggestion of cross therapeutic action has been reported. The first of these to which some prominence has been given, was a report by D. L. Leiker, at the time Chief of the Leprosy Control Division of the Department of Health in Netherlands New Guinea. Leiker noted that malaria was rare among DDS-treated patients in a leprosarium in an area in which malaria was endemic in the general population. Other reports of similar import have appeared, notably one by H. M. Archibald and the leprologist C. M. Ross in Nigeria. Not much attention has been paid to these reports, however, until recently, when the treatment of malaria by conventional methods has again run into difficulties, as a result this time of the development of strains of Plasmodium falciparum resistant to standard antimalarial drugs. This complication, also brought to the fore by military operations, this time in southeast Asia, and in particular in Viet Nam, has led to renewed search for effective antimalarial drugs. Old results with the sulfones have been recalled and new studies on their action have been initiated. Out of several on this subject two are cited here6,7 to point up the direction of studies and possible fruitful results to be anticipated.

The significance of the studies reported in these two papers, each of which was carried out among volunteering penitentiary prisoners, is the same, viz., that DDS is effective against experimental human infection by strains of Plasmodium falciparum that are resistant to conventional antimalarial drugs. The effective action is apparently most readily evident when DDS is administered together with some other types of antimalarial agents. How effective DDS and related drugs will eventually prove to be depends, of course, on thorough

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Field trials are under way, and preliminary reports should be available shortly.

An opportunity lies open to leprologists to contribute to this new quest for knowledge. Many carefully kept records on DDS-treated persons are at hand. One thinks, for example, of the several large studies on the prophylactic use of DDS. Hundreds of apparently healthy contacts have been treated with DDS in India and Korea with the hope of preventing leprosy; attention has been drawn to these studies from time to time in The Journal. In addition to these are the thousands of records of leprosy patients treated with DDS in leprosaria and outpatient clinics all over the world. Is it possible to determine the annual incidence and prevalence of malaria in such selected populations in comparison with rates in the general population.

Also leprologists should be able to add to information on the possible value against malaria of other antileprosy agents, such as the long-acting sulfonamides, the phenylthioureas, diethylthiocarbamate, and numerous other drugs reported as of more or less value in leprosy.

As a matter of fact there is no reason for limiting studies of this character to malaria and leprosy. Other diseases than malaria coexist widely with leprosy in many areas, and proper epidemiologic and statistical evaluation of DDS-treated contacts and patients might possibly yield surprising dividends for other diseases.

—E. R. Long