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Exercise loosens joints stiffened by leprosy in an African hospital. Modern treatments erase the leper's stigma.

HANSEN'S DISEASE

Science Cleanses the Leper

Mysterious disease yields slowly to drugs, vaccines and international control efforts.

by Faye Marley

Science is bringing leprosy patients out of the caves of superstition. The work is slow. Because of long-ingrained misconceptions born of ages during which leprosy made itself evident only when fingers and toes dropped off, many people still recoil in horror when the disease is mentioned.

The ancient Chinese and Egyptians isolated lepers or killed them. Biblical times were almost as rough. It was not until the early 1940s that drugs were available to treat the disease.

More than a year ago, early in 1966, a famous husband and wife team, Drs. Paul and Margaret Brand, who had spent 17 years in Vellore, India, treating leprosy, came to the Public Health Service leprosarium at Carville, La. He is an orthopedic surgeon and chief of rehabilitation; she is an ophthalmologist and chief of eye service.

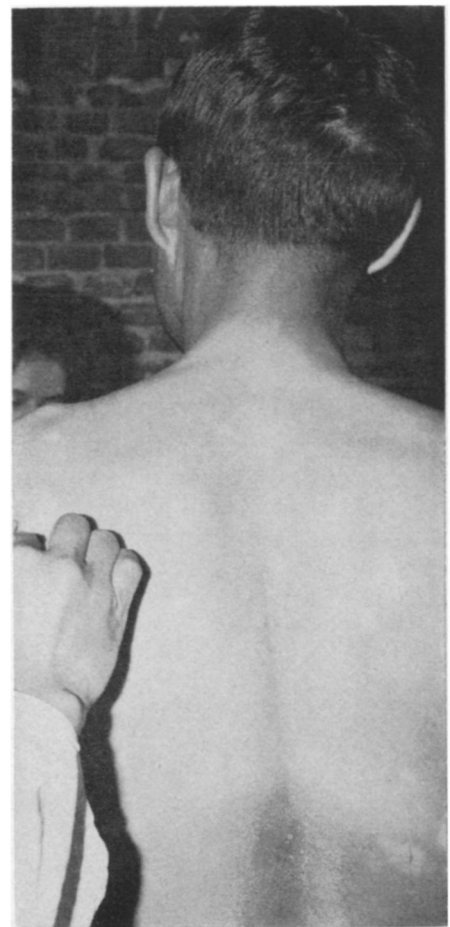
The shift from India to the U.S. has made them sharply aware of apparent genetic effects on the susceptibility to leprosy. White Caucasians are harder to treat for several reasons, Dr. Margaret Brand reports.

No one knows whether there is, in fact, a genetic reason for American Caucasians to contract the more serious type of leprosy, called lepromatous, more often than Indian Caucasians do, but it happens. Racial reactions differ throughout the world. Hawaiians are estimated to be 70 times more susceptible to the disease than white Caucasians in Hawaii. And Chinese get the lepromatous kind more easily than Africans or other darker-skinned races.

"It is disgraceful," Dr. Paul says, "that only one-fourth of the estimated 10 million to 20 million leprosy sufferers of the world are being treated, when two or three dollars a year will buy enough DDS (diamino-diphenyl-sulfone) for a leprosy patient.

"For \$10 a year, a leprosy patient can be made infectiously negative. You get a big return for your money."

Leprosy is not simply a tropical disease. It occurs as far north as Iceland, is known in Korea and other non-tropical countries, in spite of the fact that it is most widespread in Asia and Africa.



Frank/PAHO/WHO

Mexican victim shows symptoms.

Leprosy is present in New York partly because it is brought there from Puerto Rico; it is in San Francisco partly because it has been brought there from China. It occurs chiefly in poor countries with poor hygiene. Dr. Paul Brand deplors the lack of uniformity in laws about leprosy in the U.S. Some states require no reporting of the disease at all while others are so strict that patients must remain away from home until tests are negative for 12 successive months.

"Very little is known about the cause," he admits. "Research is going on in heredity and environment, in nutrition and other phases. Some scientists are working on the theory that leprosy is spread by insect vectors, fleas or cockroaches."

The U.S. Public Health Service has approved a cooperative program to help India and other countries where millions of leprosy patients need treatment.

The name leprosy has been retained as the scientific designation by the International Congress of Leprosy; "leprosy patient is preferred to leper."

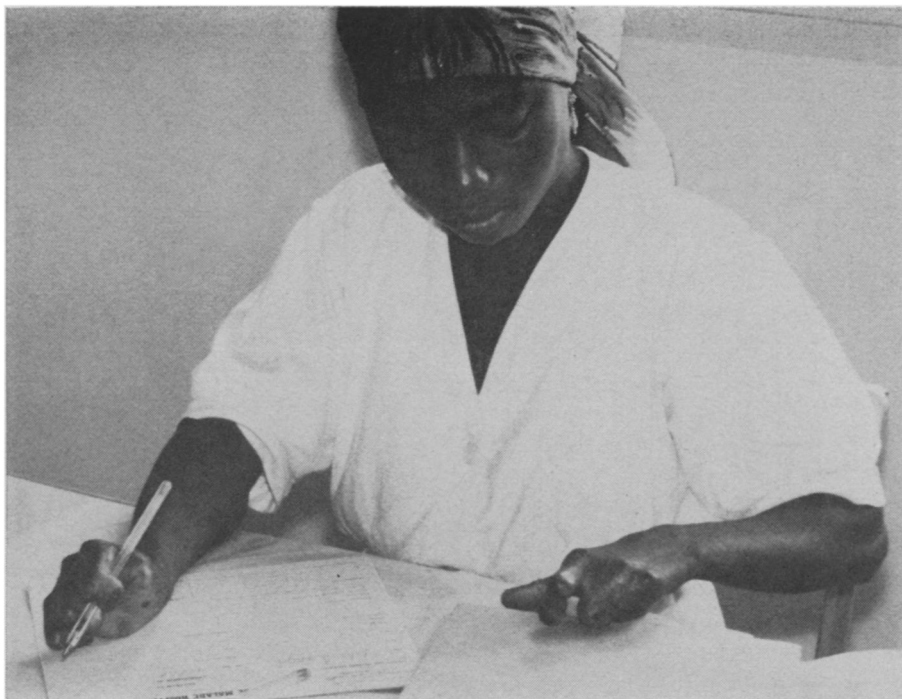
"Hansen's disease" is an even less offensive name to the leprosy patient. Dr. Gerhard Armauer Hansen, a Norwegian physician, discovered the *Mycobacterium leprae* in 1873. It is about the same size as *M. tuberculosis* in "cigar-bundle" clusters.

Leprosy develops in two principal types: the lepromatous (formerly called cutaneous) in which the patient manifests no resistance to the disease, and the tuberculoid (formerly called neural), in which he shows resistance to it. Tubercles resemble those of tuberculosis. In addition, there are the indeterminate group and the borderline group. The former is benign; the borderline is malignant.

Leprosy is so difficult to acquire that it was believed for some years to be hereditary rather than contagious. None of the Carville Hospital staff has contracted leprosy in all its 73-year history. Paradoxically, it's so easy to acquire, says Dr. Harry L. Arnold Jr., dermatologist in Honolulu, that nearly half the new cases are not aware of having had any contact with the disease.

The paradox can be explained, Dr. Arnold says, by the view that "leprosy is easily acquired by contact with lepromatous persons during transient periods of increased susceptibility to which some persons are subject."

Thanks to sulfone drugs, lesions of the eyes and throat in leprosy have become rare. But drugs do not cure quickly. Even if caught early, tuberculoid leprosy may not be arrested for two to four years. The lepromatous type may take four to eight years, during which the patients can suffer acute flare-ups.



Henrioud/WHO

Leprosy-maimed hands do useful work in a clinic. Drugs arrest disease.

Since resistance can develop to any effective drug treatment, a combined, or synergistic, therapy is often advised. SPECTRUM, published by Pfizer Laboratories, says one of the most promising adjunct drugs is a derivative of the aniline dye safranin, known as B663, and more recently by Geigy's number G30320. It is effective in lepromatous cases, and so far there have been few recurrences after this treatment.

The ill-starred sedative thalidomide has been used experimentally in some studies, and it appears to be another useful supplementary drug, in as much as it improves chronic lesions. Thalidomide has seemed to have a mitigating effect on one of the most unpleasant and mysterious aspects of leprosy, called the lepra reaction. This includes fever, neuralgia, proliferation of bacteria, exacerbation of old lesions and development of new ones.

To stamp out leprosy it is particularly desirable to find exposed cases in the home. The World Health Organization suggests that more "paramedical" aides and technicians be utilized in rural areas to reduce the risks of infectious disease stages.

Auxiliary workers can screen suspected leprosy cases through visits to patients' families. Physicians then can come to check the suspects and prescribe drugs that can be given by the assistants. A new treatment is being tried in Venezuela successfully, whereby one injection of DDS is given every 30 days in a chemical base that is slowly absorbed rather than more frequent traditional doses. Some 6,000

patients are now being treated following a successful trial on 300.

Very few soldiers in Vietnam have been reported contracting leprosy, although with 200,000 cases in Thailand and unknown thousands in Vietnam, more cases may appear if the war lasts much longer. The incubation period is as long as four or five years.

To exchange ideas on diagnosing and treating leprosy, a world congress on the disease is planned for London in September 1968. A seminar is planned for 1968 in Latin America, probably in Venezuela, which has a good program for leprosy, especially in the rural areas.

One encouraging prospect is the use of animal research. Inoculation of mice through their footpads was accomplished several years ago, giving researchers a test animal on which to check new drugs. However, this work did not produce the more dangerous kind of progressive lepromatous leprosy.

Dr. Richard Rees and a team of investigators at Mill Hill, England, headquarters for the British Medical Research Council, have done additional promising research with mice, including the lepromatous phase. If further research continues to reproduce the entire disease, a big step forward will have been taken.

BCG vaccine, used in many countries to prevent tuberculosis, has been apparently successful against leprosy in Africa, and is being tried in Mexico (SN: 7/15), but Dr. Paul Brand believes that early reports may have been over-enthusiastic.