

Mass Moroccan Rehabilitation

Scientists are studying the rehabilitation techniques that saved more than 9,000 Moroccans from a lifetime of paralysis due to poisoned cooking oil.

By JUDITH VIORST

► **BOYS AND GIRLS** run through the streets of Morocco today as usual. Men hawk their wares at the crowded bazaars and women weave wools into traditional carpet patterns.

Less than four years ago some 10,000 of these men, women and children were thought doomed to permanent paralysis. Adulterated cooking oil, sold at bargain prices, had caused irreversible damage to their nervous systems.

Morocco, in cooperation with international health authorities, undertook a massive rehabilitation effort, the greatest in peacetime history. It succeeded—through the application of many rehabilitation techniques—in returning 9,600 of these stricken people to activity.

International Assistance

An evaluation of the rehabilitation methods used in this giant program will be made public in April of this year. The findings will be the result of a two-year research project supported by a grant from the United States Office of Vocational Rehabilitation and carried out by members of the League of Red Cross Societies, the World Health Organization and the Moroccan Ministry of Health.

The report will begin with the fall of 1959, soon after the victims, most of them under 18 years of age, sat down to meals prepared with cooking oil diluted with an oil used to flush the engines of jet planes. The poisons in the oil—triorthocresyl phosphate and triaryl phosphate—caused paralysis, primarily in the hands and feet.

The 27 profiteering merchants who had sold the poisoned oil were prosecuted. Five were sentenced to death and the others sent to prison for life. But the Moroccan Government which had dealt out these sentences could not so readily deal with the mass casualties. With a population of some 10 million, Morocco had only 17,000 hospital beds.

On Sept. 23, after the first cases of poisoning had been recognized, the Moroccan Government requested help from WHO's Regional Office for Europe. Within three days, WHO experts, working with Moroccan health authorities, were investigating the precise cause of the paralysis. Later WHO joined with the League of Red Cross Societies in mobilizing the necessary international assistance.

Medical personnel and supplies from 16 countries began pouring into Morocco in unprecedented numbers. Wheelchairs, crutches, stretchers, sterilizers, treatment

tables, refrigerators and other apparatus were contributed by the United Nations Children's Fund. Training programs in physiotherapy were provided for Moroccan nurses. Six treatment centers were established, and most victims were handled on an out-patient basis, with transportation provided for those unable to walk.

A special children's center was set up at Fez for young poison victims whose parents could not help them. In addition to treatment, it offered clothing, schooling and pre-vocational training.

Plans were made to arrange for special classes at Meknes, designed for 15- to 30-year-olds. The classes would provide instruction in elementary reading and writing as preparation for an apprenticeship.

The rescue operation aimed at providing appropriate treatment and rehabilitation, braces and splints for everyone who needed them. But the results exceeded all expectations. By the time the international organizations withdrew—in June of 1961—four of the six rehabilitation centers had been closed and all but a few hundred patients had been discharged as cured.

Dr. Youssef Ben Abbas, Morocco's then Minister of Health, characterized the achievement as "unhoped for," "magnificent."

"When men join in a humane and un-

selfish undertaking," he said, "they can cooperate effectively and can triumph over the obstacles which may bar their way."

The rehabilitation methods studied by the research scientists include physiotherapy, invalid sports, alcohol injections of tendons, corrective plasters, surgical procedures and braces. Most of these methods were aimed at restoring function to the injured parts of the body. For although the damaged nerves could not be restored, the consequences of the damage—paralysis, spasticity, muscular contractures—could, to a greater or lesser extent, be altered.

Physiotherapy Applied

Physiotherapy endeavored to restore function by getting healthy but unused muscles to do the job of the old, injured ones. These muscles were strengthened and made mobile by massage, heat and hydrotherapy, as well as by a wide range of pulling, lifting and stretching exercises.

For training muscles that have never done a day's work to manage the unfamiliar task of crooking a finger or bending a wrist takes much time and patience. But the result, for many Moroccans, was a hand that could be used once again for dressing and feeding and earning a living.

Alcohol injection of tendons was used in Morocco to alleviate pain by the more or less permanent blocking of a nerve. This technique is not regarded here as sound medical practice, because of its destructive effect on nerves and tissues. No one expects the April report to revise current thinking on this subject.

Corrective plasters, more familiar here as



World Health Organization

STRETCHING EXERCISES—At internationally staffed clinics, poisoned Moroccans receive treatment for paralyzed limbs.

splints and plaster casts, played an important role in the rehabilitation effort. Limbs thrown into grotesque positions by the paralyzing poison were manipulated back into place and then set. After a period of time a foot pushed backward or twisted askew was returned to a more normal condition, where it could again function.

Braces posed something of a problem in Morocco. Although they have crucial rehabilitation value, they often tend to be hot, heavy and uncomfortable, made up of metal and leather devices sometimes reaching as high as the waist. Previous reports from Morocco said that the braces were frequently unused or broken by patients, probably because they were unaccustomed to wearing

anything so confining. To what extent the braces actually performed their intended task should be indicated in the April findings.

Dr. James Pert of the American National Red Cross had this to say about the Moroccan project:

"Because the disaster in Morocco occurred at the same time with the same effects from the same cause, it offers a unique opportunity to evaluate rehabilitation methods. Certainly it was a most unfortunate incident. But it will provide information about rehabilitation that could not otherwise have been obtained without many, many years of research."

• Science News Letter, 83:218 April 6, 1963

MEDICINE

Typhoid Fever in U.S.

► TYPHOID FEVER has struck both coasts of the United States but no epidemic is anticipated, health officials say. Dr. Alexander Langmuir, chief, epidemic intelligence service, Communicable Disease Center, Atlanta, Ga., told SCIENCE SERVICE that general vaccination is not recommended.

Several cases of typhoid, one each in New York City, Pittsburgh, Pa., Hartford, Conn., and Berkeley, Calif., have been linked with the epidemic in the ski resort town of Zermatt, Switzerland. The division of foreign quarantine, U.S. Public Health Service, said that health officials all over the country are following up passengers on planes from Switzerland.

The cause of the Zermatt outbreak, which has spread to St. Moritz in Switzerland as well as into Great Britain and The Netherlands, is believed to have been traced to an Italian construction worker who was responsible for its spread through the resort's water system.

In a Los Angeles, Calif., suburb, eighteen entirely unrelated cases of typhoid fever have been traced to a teen-age party where

contaminated chicken salad was blamed for the outbreak.

Dr. Norman B. McCullough, chief of the laboratory of bacterial diseases, National Institutes of Health, Bethesda, Md., said that there are enough typhoid carriers in this country to cause epidemics at any time if our water purification system should break down in the big cities.

"The big epidemics are water-borne," Dr. McCullough said. "A few cases still occur each year in this country but the number of deaths is small."

Only 21 deaths from typhoid fever occurred in 1960, according to Public Health Service reports.

Typhoid fever is an acute illness lasting several weeks and formerly resulted in the death of as many as 10% of the patients. It is caused by *Salmonella typhosa*, a parasite of man, infecting foods and water. The soiled hands of carriers such as the famous Typhoid Mary can transmit the disease. Epidemics have been caused by sewage contamination or shellfish.

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PUBLIC HEALTH

More Fallout in Foods

► RADIOACTIVE FALLOUT from the 1962 U. S. and USSR nuclear tests are now being found in this country's food.

The danger is from strontium-90 and cesium-137, since iodine-131 disappears two months after testing. However, further testing in 1963 would pose another iodine-131 danger.

Strontium-90 lodges in bone and remains there for many years, threatening leukemia, cancer of the blood-forming cells, as well as bone cancer.

Cesium-137 affects the whole body, and it can cause defective children in future generations.

The U. S. Department of Agriculture has a decontamination process that removes cesium-137 as well as radioactive strontium from milk. The cost of this treatment was ten cents per quart a year ago, but cost estimates are now down to nine-tenths of a cent per quart.

Fresh milk contributed 80% or more of

all the radioactive strontium in the total diet in most of the cities last year that got heavy doses of fresh fallout. Widespread use of the milk decontamination process would remove the danger from radioactive milk.

Tests made by Consumers Union, Mt. Vernon, N. Y., with the aid of a U. S. Public Health Service grant during the first six months of 1962, were the first measurements of radioactivity in the total diet to be made within a few months after a large series of nuclear detonations.

Samples of the total diet of teen-agers and infants showed the daily intake of cesium-137 by infants was only half that of teen-agers. But because one-year-olds weigh only about a sixth as much as adults, the concentration of the radioisotope in babies is three times as high. The greater sensitivity of children to radiation makes this difference important.

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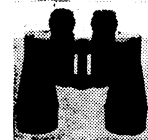
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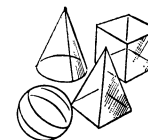
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