

The Solar Bath*

R. FOSTER

Kafue, Zambia

P. KATUMBI

Mwami

and

D. SMITH

Blantyre, Malawi

In a rural centre where a continuous electricity supply is not available, but where the sun usually shines, the solar bath has proved useful in the pre-operative management of leprosy patients with ulnar damage.

Introduction

Stiffness and contractures of the interphalangeal joints are common complications of ulnar nerve damage in leprosy. If wax baths are to be used for this condition in centres where electricity is not available, or is available only intermittently, some other heat source must be used. Open flame methods may result in serious accidents. This report describes a method of heat treatment that takes the place of the conventional wax bath, using the sun as a heat source. This "Solar Bath" has been in use for the past 5 years at Mwami Leprosarium, in the eastern province of the Republic of Zambia.

Development

A container of suitable dimensions was constructed, triangular in cross section; the hypotenuse face of the triangle is of glass, which can be directed towards the sun (Figs 1 and 2). The average temperatures obtained for 100 treatments given to 8 patients are shown in Fig. 3. No untoward effects from the use of the solar bath have arisen.

Temperature Comparison with Wax Bath

Temperature measurements were made with Yellow Springs Instrument Co. Tele-Thermometer model 43TD, and with a conventional mercury laboratory thermometer.

Solar-bath treatments are given indoors through an open or closed glass window, or (less often) outdoors. The patient washes his hands with soap and water, then rubs in peanut oil, two or three finger-dips, at room temperature. Both hands are then placed in the solar bath for 25 min. The 100 treatments,

* Received for publication 4 August, 1972.

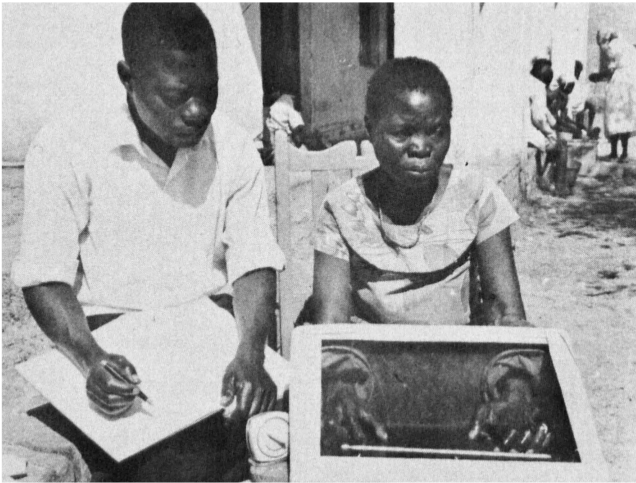


Fig. 1. The experimental solar bath. Recording the temperature at 5-min intervals.



Fig. 2. Group of patients using a battery of solar baths.

which furnished the average temperatures, were taken from mid-morning to early afternoon during the months of October to December 1967, and January, February and July 1968—months that include both the warm and the cold seasons.

Comparative temperature readings were taken with the same measuring equipment at Malamulo Leprosarium where electricity supply is constantly available to heat the wax in a conventional bath. The thermocouple and glass thermometer were fixed to the finger with an Elastoplast band (a ruler being used to protect the glass thermometer). The hand was then dipped into the wax bath

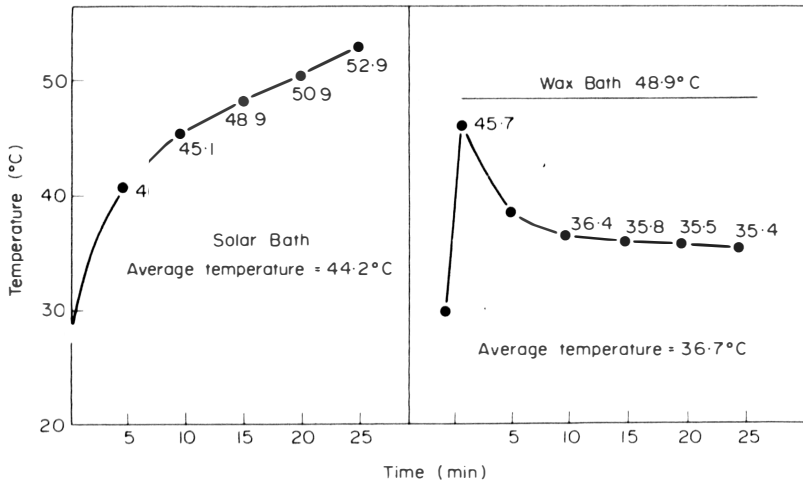


Fig. 3. Comparison between the average temperature of a solar bath and a wax bath.

10 times, wrapped in plastic covering, and covered with a pillow-slip. Temperature recordings were made before placing the hand in wax, the initial maximum temperature, and the temperature at 5-min intervals for a period of 25 min. The average temperatures for the 27 treatments given are shown in Fig. 3.

Discussion

The finding that the temperature in the solar bath continued to rise during the period of treatment caused some concern at first in case burns or blisters might occur in anaesthetic hands. Initially, therefore, a timer was used to ensure that the treatment was limited to 25 min. This is no longer considered necessary, however, since no blisters have occurred.

After treatment in the solar bath, a skin-tight plaster is applied to the fingers to mobilize them in maximum extension. Studies are in progress to ascertain if the solar-bath treatment has an influence on the time taken to mobilize the contractures.

The average temperature over the period of treatment is greater in the solar bath than that with the wax bath in our part of the world. This finding should be supplemented by studies of the blood flow in the forearm and fingers. Any softening effect of the wax on the tissues, and the rapidity with which the contracted tissues are mobilized, must also be taken into account.