

THE CONSTRUCTION OF AN INSTITUTION FOR THE HELIOTHERAPIC TREATMENT OF SURGICAL TUBERCULOSIS.

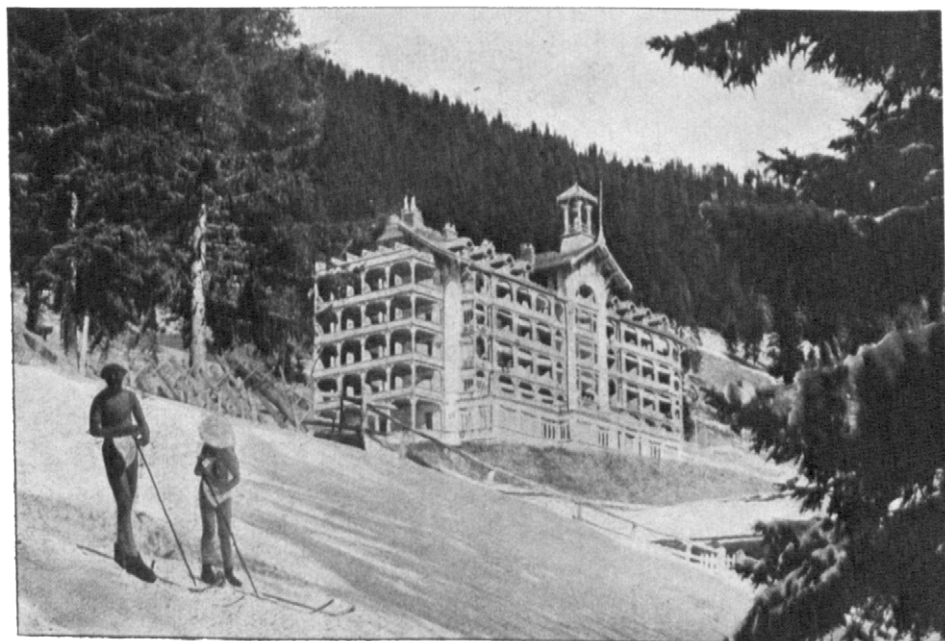
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DURING the seventeen years I have been engaged in the practice of heliotherapy at a high altitude, I have had successively to build thirty-six institutions, and therefore feel that I may be of service to others who are interested in this question by sharing with them the results of my experience.

In the first place the construction of palatial buildings is by no means necessary for the production of a perfect heliotherapeutic institution, since excellent results may be obtained with easily improvised arrangements. It is merely necessary that certain conditions should be fulfilled regarding climate, situation and management.

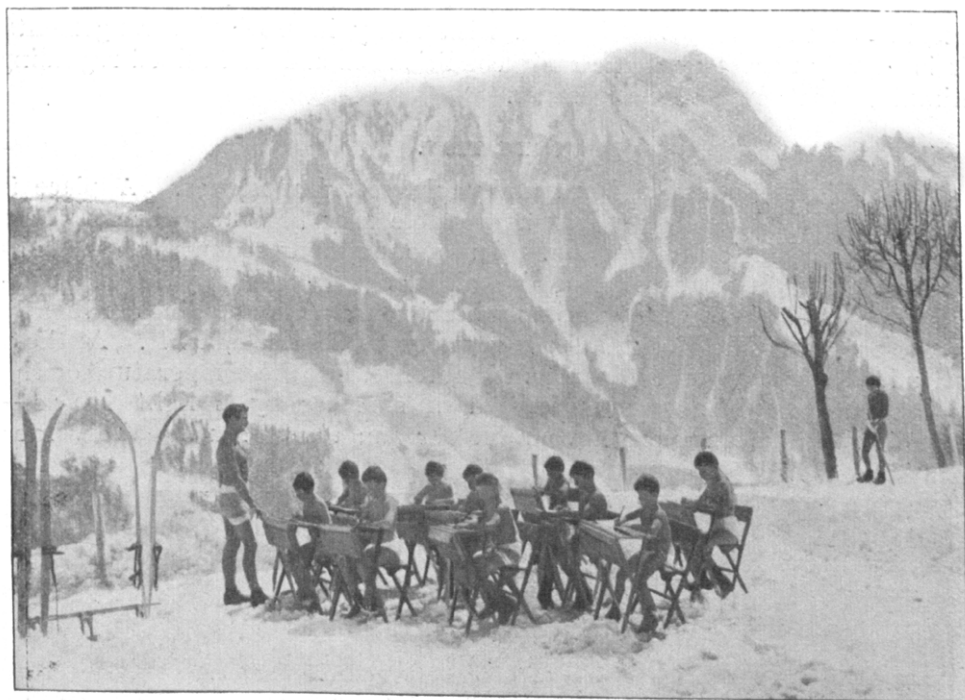
SITUATION.

The climate question is naturally of great importance. A place is chosen where as much sunlight as possible may be obtained and where the air is sufficiently bracing. In mountainous countries, such as Switzerland, it is obvious that a high altitude is indicated by these requirements, as there the air is remarkably bracing and the sun shines brilliantly in all seasons. The ideal height is between 3,000 and 5,000 ft. At these altitudes the radiation from the sun is intense, but the temperature of the surrounding air is always moderated in summer by a light breeze—conditions which are most favourable for sun cure. During the winter



the thermometer often rises above 100° F. in the sun. These high temperatures result from the fact that above a certain altitude the air, being free from dust and micro-organisms, offers but little resistance to the passage of the sun's rays, which thus reach the earth without appreciable diminution of intensity. Below 3,000 ft. on the other hand—and especially in really low country—the air is heavily charged with water vapour, dust and smoke. The mists which are so frequent in winter, both in country and town, form a screen which prevents the greater part of these useful rays from ever reaching the ground.

The construction and arrangements of the institution should have the same object in view. Finally, the site chosen must be sheltered from the wind.



The situation of Leysin (at 4,400 ft.), completely sheltered from the north wind and enjoying the sun for an exceptionally large number of hours during the day, was therefore selected as fulfilling these conditions. Owing to lack of space three of the principal types of building only will be described. These will indicate the main principles to be observed.

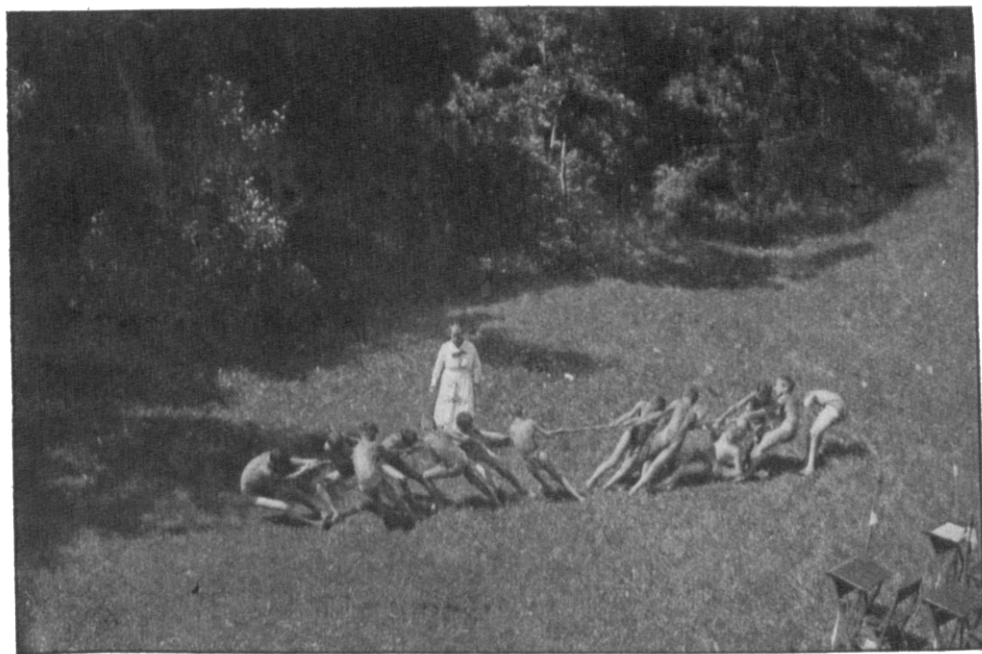
TYPE I.—MOUNTAIN CHALET CONVERTED INTO SANATORIUM.

Our first heliotherapeutic institution, opened in 1903, consisted of an old chalet at Leysin, on the south side of which wide balconies were constructed on to which the patients' beds could be wheeled. The children's house and its annex are provided with large balconies placed on the front of the house, in such a way as to be exposed to the sun's rays during almost the whole day. On the second floor the balconies were not wide

enough to accommodate all the patients from the adjacent rooms; we, therefore, had a spacious uncovered solarium made, on which our patients could carry out the sun-cure from morning until evening. This unassuming establishment has now become one of our free clinics. It may still serve as a model to those who wish to start a practical and inexpensive sanatorium.

TYPE II.—MOUNTAIN HOTEL CONVERTED INTO SANATORIUM.

"Les Chamois," our example of this class, was originally a tourist hotel built in a magnificent situation 5,000 feet above sea level. As it faces south-east it has the disadvantage of being out of the sun during the latter part of the afternoon; we got over this difficulty however by con-



structing a solarium for each floor on the south-west end of the building. Each solarium is in the form of a box and is arranged so that the patients can be taken to it without leaving their beds.

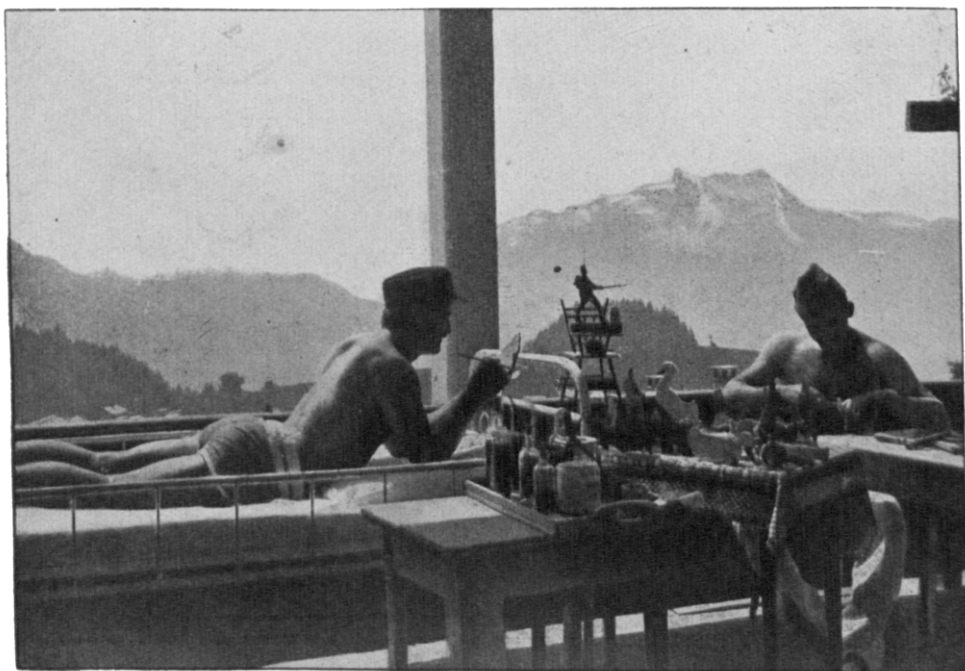
TYPE III.—A SPECIALLY CONSTRUCTED SANATORIUM.

Under this heading I will describe "Les Frênes," a sanatorium constructed and arranged entirely with a view to the practice of heliotherapy on our lines. This building consists of a central block and two large wings.

The central block faces due south. It contains on the ground floor the consulting rooms, radiographic and radiotherapeutic departments, rooms for orthopædics and phototherapy, bacteriological laboratory and offices. On the first floor are the dining room, billiard and smoking rooms, kitchens, &c. On the fourth floor, a room for surgical dressings

and an operating theatre are provided; the latter is only used for non-tuberculous infections, experience having shown us that in cases of tuberculosis of bone, operative interference is minimal. The other floors of the central block may be used for various purposes, such as the housing of visitors and staff.

One of the wings, the left, faces slightly east of south, the balconies of the different floors are open to the sky and thus make sun-cure possible, even at the summer solstice, when the rays fall almost perpendicularly. A slight disadvantage of these terraces, experienced by certain cases, is that they are but little sheltered from wind and intense sunlight; they are thus more suited to slight cases or to those already used to the cure. In summer the sun-cure begins here in the short hours of the morning.

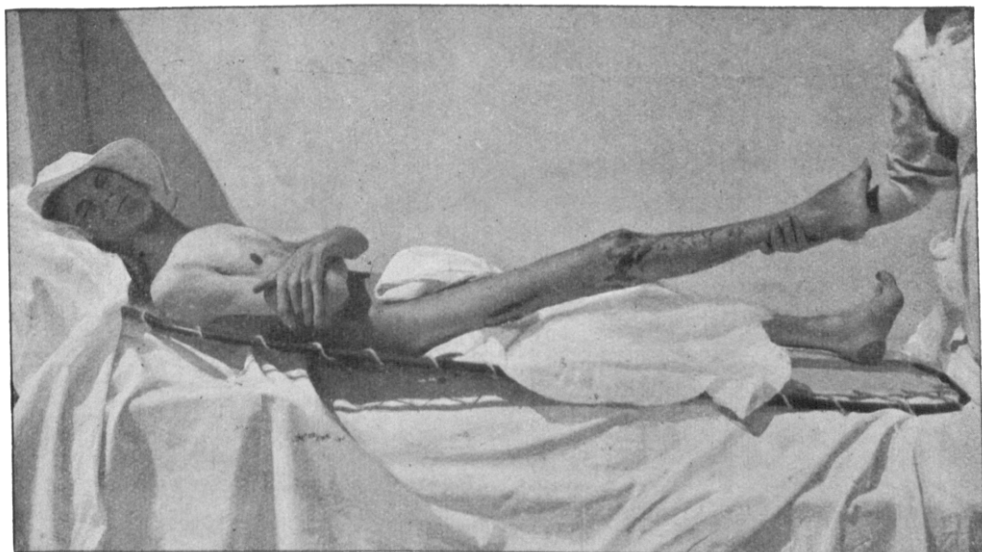


The right wing faces considerably west of south. Each room has its private balcony separated from adjacent ones by movable screens. These balconies are covered; the duration of sunlight is of course shorter here, but to make up for this they are more sheltered, this being an advantage in winter. On the first floor all the balconies are reserved for children; the partitions are usually removed so that the small patients can "cure" and play together and also enjoy the entertainments provided. A teacher attached to the sanatorium gives lessons on the balconies, these taking place in the fresh air and sunshine. Except in the case of quite small children, boys and girls are kept separate.

To counteract the relative shortage of sun on the covered balconies during the summer solstice, we have arranged an extensive solarium which covers the whole roof of the house. The importance of a solarium on the

roof is very great. It serves several purposes: in the first place it forms an ideal balcony for sun-cure, the maximum duration of sunshine being utilised. An arrangement of curtains gives the desired amount of privacy and shelter to the patients, who are brought up by the lift in their beds. The solarium is of course open to the sky, but it also includes a covered gallery where patients can obtain shelter in case of need. The solarium can also be used as a playground and is very useful for patients who are making their first attempts at walking and who then need absolutely flat ground.

A few notes on the patients' rooms and on their specially designed beds may be useful. One important point is that the floors of the rooms or dormitories should be exactly on a level with those of the balconies, so that beds may be wheeled from one to the other smoothly and without any jolting. This principle is carried out in all parts of the building so



that the patients may be wheeled everywhere in their beds—cinema theatre, smoking room, &c. The beds themselves, which we use in all our institutions, have certain indispensable features:—

(1) They must be high, thus facilitating the work of the nurses, preventing the interference of the balcony rails with the sun-cure or with the view.

(2) They are fitted with large and solid wheels (4 inches diameter and $\frac{1}{2}$ inch thickness) which run very easily and smoothly.

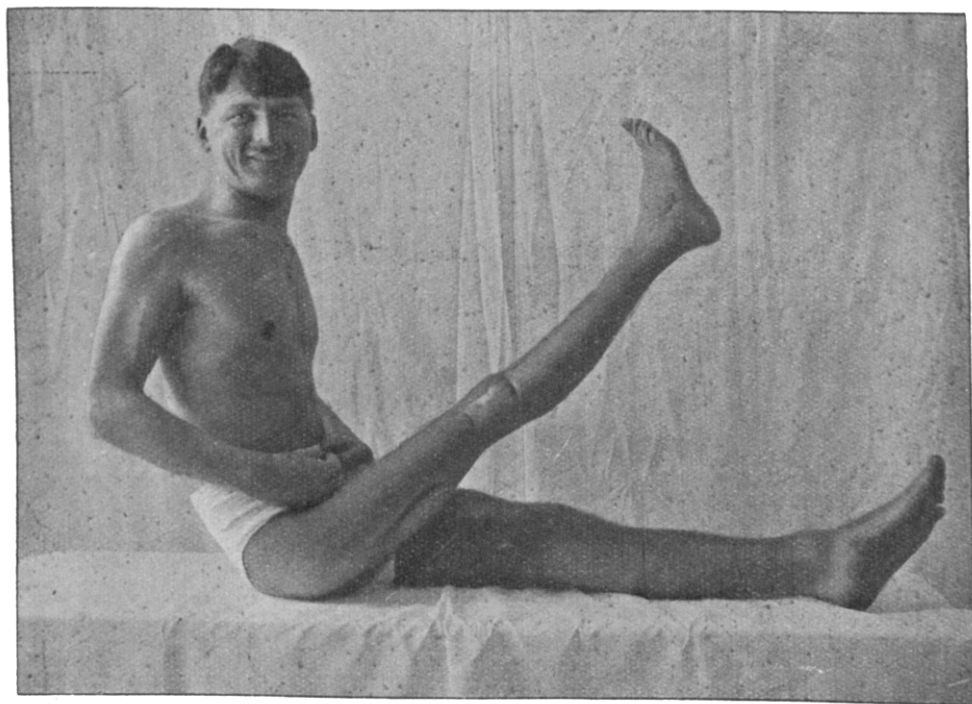
(3) Special mattresses must be used, and should be very hard so that there is no danger of the patients taking up a bad position, as may happen with too soft or springy a mattress. The spring mattress should be composed of strips of metal with spaces between them, which assure the permanent aeration of the mattress. The patient soon becomes used to the hardness and in a short time prefers it to a soft bed.

The beds are fitted with movable shades, the inclination of which can

be changed, so that the head of the patient may be shaded whatever position he may be in (dorsal, ventral, &c.).

In certain cases special apparatus is used for immobilising patients, especially children with spinal caries or hip disease. These devices are very simple: they consist of waistcoats or braces of linen which are fastened by linen straps to the bed itself. They can be opened or closed at will and cannot in any way interfere with the sun-cure. These arrangements abolish the use of plaster of Paris, which deprives the body of air and sun and thereby impairs the most important functions of the skin, and causes anæmia, destruction of the skin and atrophy of the muscles.

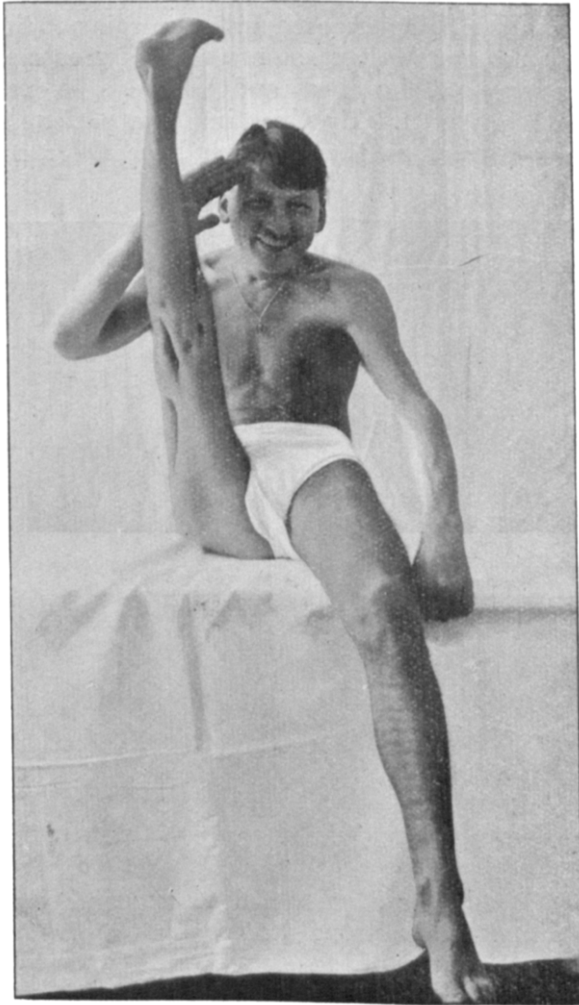
With regard to the choice of cases the sun cure is the most perfect fulfilment of the demands of orthopædic and conservative surgery, since



in almost every case it enables us to send back to their work individuals with limbs and articulations intact. It is only in quite exceptional cases that we have to resort to operative interference, its object always being to assist and not to replace heliotherapy. Tuberculous foci which have opened spontaneously or which have been incised, are in my experience much slower and more troublesome in healing than closed lesions; the latter being without communication with the skin, are protected from secondary infection of external origin. Closed foci, wherever situated, resolve more or less quickly, under the general and local application of heliotherapeutic methods.

A gradual increase in the duration of the sun baths must be made to suit individual cases and regulated according to the resistance of each patient, his age and the situation of the lesion. His individual tolerance

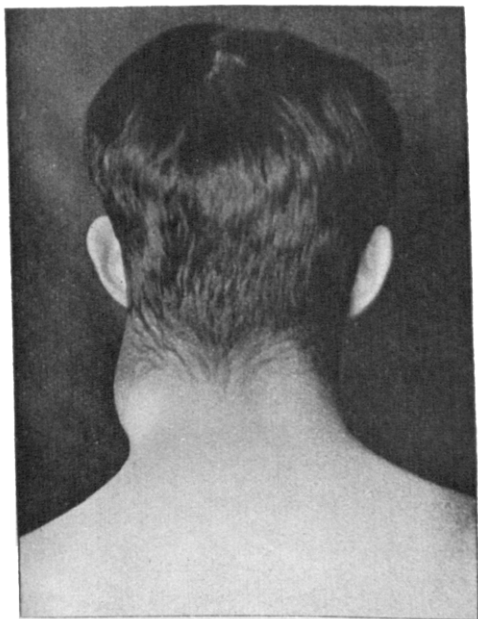
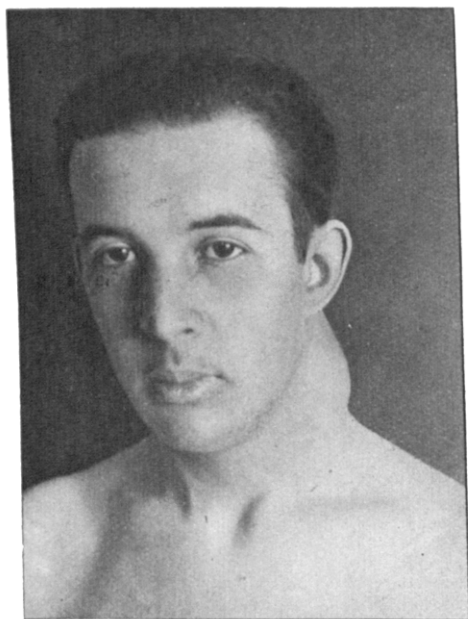
for sun must also be taken carefully into account. These accurately graduated doses of sun are the business of the doctor, who must observe a case, particularly to begin with, with the greatest care. He must take account of a patient's reactions, subjective and objective. The amount of exposure must be reduced or temporarily interrupted on the least sign of intolerance (increased elevation of temperature, too rapid pulse, general malaise, erythema, &c.). Besides the precautions peculiar to each case,



there are general rules governing the technique applied to every case, to which the patient must conform strictly. At the outset one should increase exposures very slowly, always beginning with the feet, then the legs, and subsequently the rest of the body. Exposures should only last for a few minutes to start with. As soon as the skin is pigmented (there are considerable individual differences in the time taken) two to three hours a day may be undergone without danger. The head and nape of the neck should always be protected by a white cotton hat. In summer it is essential that

the bath should be taken early in the morning as the mid-day heat is very relaxing.

This method of applying heliotherapy has been evolved during many years of experience ; it does not involve congestion of the internal organs and, at Leysin, has never resulted in accidents. The method should be followed particularly carefully when the patient is suffering from pulmonary tuberculosis, a disease in which sun-cure often greatly assists the classical fresh air treatment. Only afebrile cases can be submitted to this treatment. The progressive stages of exposure to the sun must be very gradual, the feet always being exposed first, according to the rule previously mentioned. It is not until after some weeks of treatment, without any exaggerated reaction, that the chest and back can be exposed (for two or three minutes only at first). By this time the patient has been accustomed to exposure of the legs, the thighs and the abdomen.



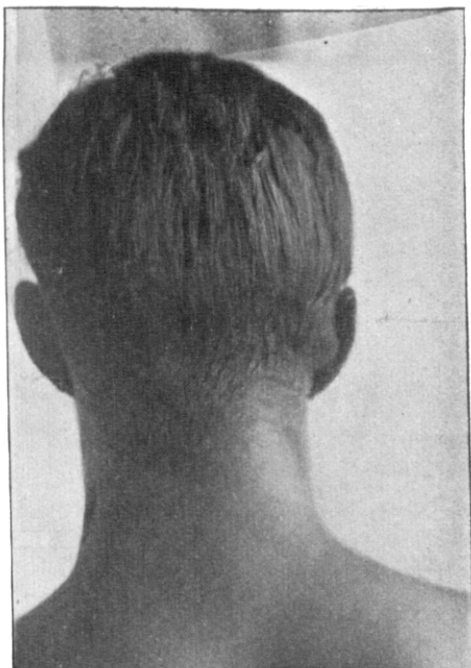
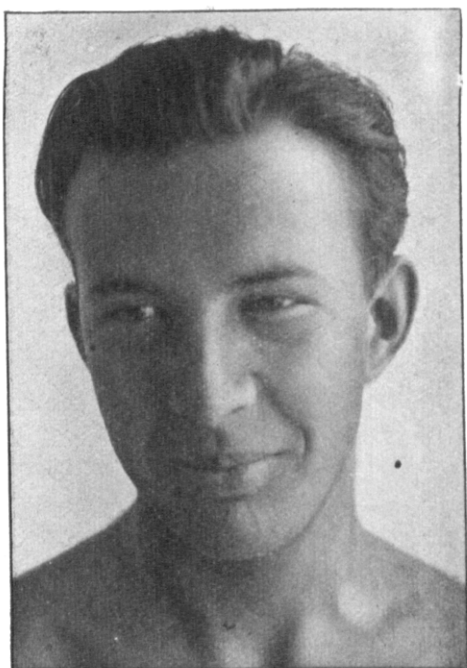
With patients gradually accustomed to exposure in this way, even though they be pulmonary cases with a tendency to hæmoptysis, the sun, far from causing accidents due to congestion, actually decreases this liability. If, however, sun-cure were applied without these precautions serious risks would be incurred.

Speaking generally I do not hesitate, in the treatment of osteo-articular tuberculosis, to call in the aid of other methods when I think that they may increase the effects of sun-cure and thus promote healing. In certain cases of peritonitis, adenitis and epididymitis, for example, and during exceptionally long periods without sun, I have obtained good results from radiotherapy and phototherapy (quartz lamp). In cases of secondary infection I sometimes use injections of lugol.

But among the *accessories of heliotherapy* there is one which has

yielded such remarkable results that it deserves a place apart—I refer to the *work-cure*.

The immobilisation, sometimes very long, to which cases of surgical tuberculosis are subjected, is apt to be detrimental to the patient's moral condition. I thought that if we could find for our patients work—at the same time regular and not tiring—it would help greatly in saving them from boredom, and would at the same time give welcome opportunities to poor patients to pay in part the expenses of their treatment. The experiments we have made at Leysin on this subject have fully confirmed this hope, and showed that the work-cure, when strictly supervised, by no means tires the patient and retards his progress, but, on the other hand, constitutes a therapeutic factor of primary importance. It forms a mental stimulant which has a most beneficial physical counterpart. The sale of

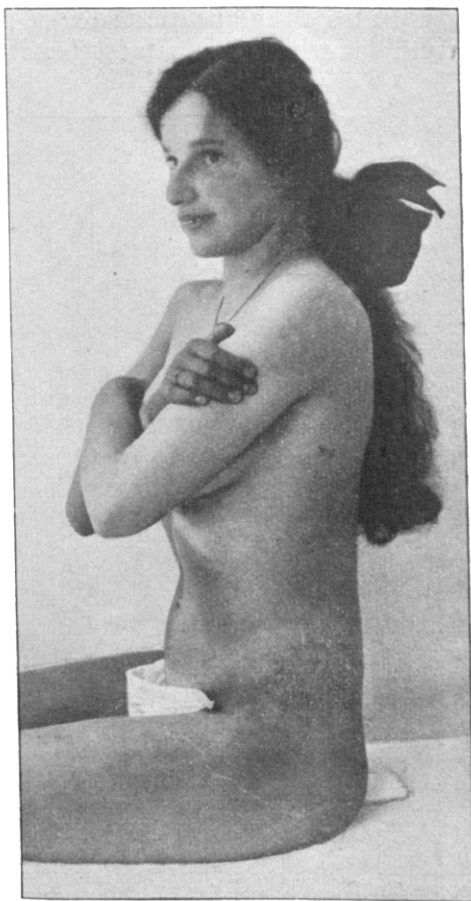
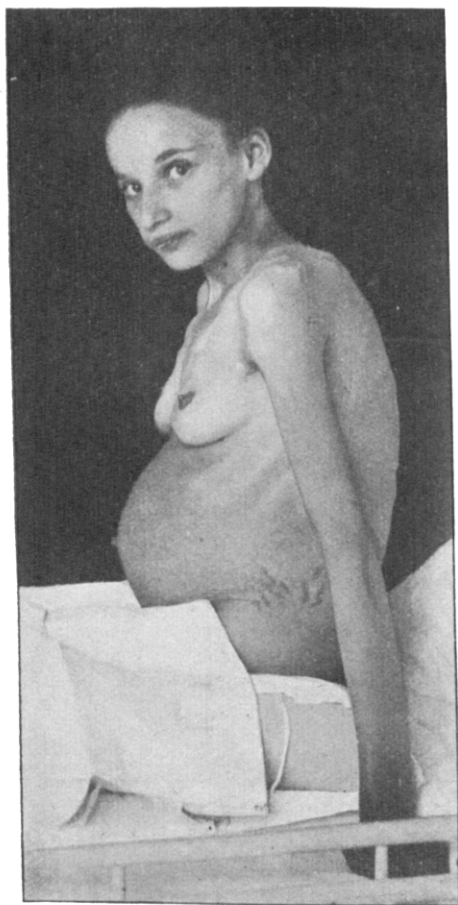


articles made by the patients at the military sanatorium at Leysin (basket-work, rope and toy-making, &c.) amounted in two years to more than 62,000 frs., the profit being about 35,000 frs.

Among the causes which make the prognosis of tuberculosis more serious (in addition to secondary infection) are: syphilis, arthritis, and alcoholism. The spread of tuberculous disease is particularly difficult to arrest in tissues previously prepared for its progress by syphilis acquired or hereditary, and this association has become more and more frequent since the war. Arthritis and various forms of rheumatism also tend to retard the cure of tuberculosis—this being the case in spite of the view which was for a long time accepted, that arthritic temperaments had an exceptionally strong resistance to tuberculosis.

This article would be incomplete without some reference to the place

of heliotherapy in preventive medicine. As is well known, infection with the tubercle bacillus almost always takes place in infancy or early childhood. The question as to whether it remains quiescent in the bronchial or mesenteric glands, or whether, on the other hand, it gives rise to severe and active lesions, is dependent on the resistance of the body against this form of infection. By placing a child in an environment which strengthens his natural resistance, we are therefore reducing to a minimum the chances of tuberculous infection. No more suitable conditions than life in the open air and sun at a high altitude can be



found. With this object in view we started an open-air school at Cergnat, near Leysin. This serves the double purpose of preventing tuberculosis in "predisposed" children, and also of forming a much needed half-way house to prepare our convalescents for their return to life on the plains. Our results here were so encouraging that we are convinced that an almost incalculable amount of good would be done were such schools universally established in towns and villages. We are as yet far from realising in our everyday life the great benefits which might be derived from fresh air and sun, our two most valiant supporters in the fight against disease.