SURGICAL " TUBERCULOSIS AND ITS TREATMENT BY HELIOTHERAPY.

By GUY HINSDALE,

M.D.,

Of Hot Springs, Va., U.S.A.; Associate Professor of Climatology in the Medico-Chirurgical College, Philadelphia; Secretary, American Climatological and Clinical Association; Fellow of the Royal Society of Medicine.

THE following short paper deals with the problem of the management of so-called "surgical" tuberculosis by heliotherapeutic measures, as tested at the chief Marine Sanatoria of the French coast and in centres of the Swiss Alps.¹

The French Sea Coast Sanatoria.

Following the pioneer work of Perrochaud and Cazin at Berck-sur-Mer, the later development of heliotherapy in France largely owes its efficiency to Dr. V. A. Menard, whose service has extended over twenty-two years at the Marine Hospital. It is interesting to note that as far back as 1857 Mme. Duhamel, who cared for scrofulous children at Berck, had them wheeled twice a day to the beach, and after bathing them and washing their open sores, refused to clothe the children completely, evidently with the idea that the unobstructed sun and air should be allowed to hasten their cure. Now at Berck, as at the Alpine sanatoria, the free access of sunlight is esteemed the essential feature of treatment. The long galleries, or balconies, at the Marine Hospital are constructed with the express purpose of carrying out the open-air method with *complete exposure of the body to the sunlight*.

In the new pavilions at Berck the patients confined to bed are wheeled from the sleeping wards out on the adjoining galleries at all seasons, except in bad weather or violent wind, where they spend the entire day. In summer the hours on the gallery are from 6 a.m. to 5 or 6 p.m. At night the windows of the wards are always open to the west, the side of the sea, or on the opposite side when stormy. The children remain unclothed from morning until evening, but at night have a slight cover. Operative wounds are exposed after the fifteenth day, but operations are exceptional, and performed only as a last resort. Abscesses are never opened but aspirated, followed or not by injections of suitable medication. Orthopedic treatment is accomplished by prolonged immobilization in plaster. All patients not bedridden are

¹ For further information the reader may be referred to the writer's article in *Interstate Medical Journal*, St. Louis, Missouri, U.S.A., March, 1914; and also "Atmospheric Air in Relation to Tuberculosis," Washington, U.S.A.: The Smithsonian Institution. 1914.

given exercise on the beach, and sea-baths are used in warm weather. The beach itself is wide and sandy and very favourable for children. There is also a large swimming-pool situated in the centre of the buildings, into which sea-water is pumped and heated by steam-coils to a suitable temperature for bathing at all seasons. Fresh and salt water is also available in the bath-tubs throughout the establishment. There is also a hydrotherapeutic department with hot air and steam cabinets.

Alpine Sanatoria for External Tuberculosis.

Turning now to the Alpine sanatoria, we find this open-air method carried out with remarkable success. Indeed, it was doubtless the encouraging results obtained by Rollier of Leysin that the open-air method was put into complete operation at Berck Plage. Both French surgeons and the Swiss surgeon Bernhard of Samaden had previously exposed the affected parts to the sun; but Rollier went further, and exposed the whole body, except where some light, removable plaster apparatus is used. Even here large fenestra are left, so that the sunlight may have free access to the diseased part, which is in greatest need of it. Plaster tends to check the function of the skin, and favours anæmia, softening and lowering of the nutrition of all the subjacent tissues, and restricts healthy tissue changes. Moreover, serious atrophy of muscles and ligaments results from the permanent plaster apparatus commonly employed. Rollier comments on the bad appearance and sometimes the œdema of the limbs of patients arriving with these immovable plaster dressings.

On his arrival, the patient is put to bed in a room, little by little the ventilators and glass doors are opened, and he is gradually accustomed to contact with the air. This is before he is exposed to the free outside air.

The next step is to wheel the patient on his bed to the large sun-gallery or outer balconies adjacent to the bedroom; and beginning with one hour the first day and two hours on the second, and so on, he begins his heliotherapy, properly so called. The temperature record is kept, with the pulse and respiration. The blood and urine are examined and general conditions noted. He is clothed in linen or white flannel, according to the season; he wears a white hat, and is protected from direct sunlight on the face by means of a screen, and wears smoked or yellow glasses.

And now comes the peculiar and interesting method of exposure. It makes no difference where the disease is located—whether in the hip, the spine, or the cervical glands—the invariable rule is to begin with the feet. These are exposed, at intervals of one hour, five times, and only for a period of five minutes. The next day the legs will be

exposed and the same method followed; the third day the thighs as far as the groin for five minutes three or four times; the legs for ten minutes three or four times; then the feet for ten minutes three or four times. On the fourth day the abdomen is exposed; on the fifth the thorax, when the precaution is taken to cover the heart with a damp cloth.¹

If the condition of the patient permits, Rollier presents first the patient's abdomen and next his back to the sun, increasing the number of exposures to six or eight. Finally, on the sixth or seventh day, he exposes the neck and head with careful supervision.

The whole system of heliotherapy aims at acquiring a progressive pigmentation of the skin. This is the underlying basis of the whole matter. It is nearly always proportional to the resistance of the patient, and enables him to bear the sunlight and cold air in a most surprising manner.

It would be very interesting to find out whether Rollier has ever treated any patients of the African race. We all know that negroes are prone to rickets, "scrofula," and tuberculosis, and the mortality is high among them.

Inherent or racial pigmentation does not seem to afford any advantage to the tuberculous subject. But it is evident from experience in heliotherapy that acquired pigmentation goes hand in hand with the cure of external tuberculosis. The sun's rays must confer other benefits than the mere increase of pigmentation. The actinic solar rays are antagonistic to the tubercle bacillus, and that is not to be denied. The illustrations show the bronzing of the skin; it varies from a copper to a chocolate colour. Without it no one could endure the sun cure for so many hours a day or engage, as some of them do, in winter sports with scarcely any protection at all. The illustrations show the young patients after months of treatment, hardy and happy in the snow of an Alpine winter.

There is one remarkable feature of the higher Alpine resorts, such as Leysin, Davos, and St. Moritz, and that is that there is a vast difference between the temperature of the air in the sunshine and in the shade. Although snow may be lying on the ground, temperatures of 95 to 100° F., or even higher in the sun, are not uncommon.

It has been calculated that the sunlight has considerably more actinic force at these mountain stations than at the seashore, and hence the time required for the solar cure is probably less than elsewhere.

¹ Dr. Rollier has put his ten years' experience into definite shape, and has published fourteen papers. The latest and perhaps the best of these was read at the last International Medical Congress at London, August, 1913, amplifying his elaborately illustrated paper, occupying the entire number of *Paris Médical*, February 15, 1913. Dr. Henry Dietrich's excellent description of Rollier's work appeared in the *Journal of the American Medical Association*, December 20, 1913.

But even Rollier and others in the Swiss Alps have strongly urged the adoption of the method of heliotherapy at the seashore sanatoria, and, as we have already seen, this is successfully accomplished. Rollier's record of about 1,200 patients and about 1,000 cures is one of the greatest contributions to modern surgical progress, and especially to the fight against tuberculosis.

Heliotherapy in America.

In this country there is every opportunity for practising heliotherapy for tuberculosis, but, as far as I know, only in two or three hospitals is there any attempt to practise it in the manner described.¹ On January 21 of last year I revisited Sea Breeze Hospital, Coney Island, New York, in order to see what is being accomplished. Six cases of hip disease were being treated by partial exposure of the body to the sun. The patients were in bed on the balcony with the usual extension apparatus in place. General exposure, beginning with the feet and gradually involving the entire body, is not adopted at Sea Breeze, as a rule, and only the area of abdomen, hip, and thigh adjacent to the diseased joint was exposed to the air and sun. Continued cloudy and unfavourable weather had prevented much progress in the newer patients who were then undergoing treatment; others who had been cured of serious tuberculous disease by the open-air method had recently been discharged. The fresh-air system is, however, well carried out, but not upon the naked body, as in Switzerland and France. The temperature on the open balcony next to the wooden wall of the building was 62° F. at noon in the sun. It was the first bright day after weeks of storm and cloud. It is probable that the very encouraging experience of the last two years will lead to the adoption of Rollier's method in all its details, as modified by the less favourable climatic conditions of this part of the Atlantic seaboard.

Results at Sea Breeze Hospital in the treatment of tuberculosis of the bones, joints, and glands have been so good that the city of New York has acquired a new location with 1,000 ft. of beach front on what is known as Rockaway Point, ten miles beyond Coney Island. The plot runs back about 600 ft. to Jamaica Bay, and cost the city, after condemnation proceedings, \$1,250,000. The plans include an arrangement of grounds and buildings which will involve a total outlay of \$2,500,000, and there will be accommodation for 1,000 patients in the eight pavilions. Two of these pavilions are now in course of erection.

¹ These are Sea Breeze Hospital, Long Island; the Crawford Allen Hospital, on Narragansett Bay; and the Pottenger Sanatorium, California.