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### ORIGINAL ARTICLES.

#### HELIO THERAPY IN GREAT BRITAIN: RECORDS OF AN EXPERIMENT.

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IN spite of good results reported from Berck-Plage, in the North of France, and from Alton in Hampshire, England, an impression appears to prevail among medical practitioners that heliotherapy is impracticable under conditions existing in our climate. The following brief account aims at describing lines on which it has been found possible to adapt the methods of Rollier and Poncet to climatic and other conditions in Great Britain and Ireland.

The work here described was carried out at Abergele, on the North Welsh Coast, where the Manchester Corporation have, on the same estate as their sanatorium for early pulmonary tuberculosis, established a bungalow accommodating ten beds for children suffering from non-pulmonary forms of tuberculous disease. The bungalow is an adapted building containing one fair-sized ward, kitchen, and offices. It is situated on shale, about three miles from the sea and 300 feet above sea-level, and is fairly well sheltered east and west by limestone bluffs.

No meteorological records are published of Abergele. Deganwy, fifteen miles away on the Conway estuary, in a distinctly less favourable position, has a sunlight record about equal to that of Bournemouth. Though the bungalow made a primitive hospital in many ways, one great initial advantage was that the ward opened, by means of large glass doors, on to the ground-level, so allowing the beds of bedridden patients to be readily moved into the open. The staff consisted of a charge-nurse, who worked under the direction of the matron from the sanatorium, and was relieved, when off duty, by one of the sanatorium probationers. The five essentials for the practice of heliotherapy were therefore to hand—namely, sunlight, dust-free air, a dry soil, shelter, and last, but far from least, intelligent, skilled, and conscientious nursing. In the course of the experiment, the highly desirable but not absolutely essential requirements were added—namely, open verandahs (French “terrasses”), special orthopædic apparatus and beds for cases of osteoarthritis, and suitable clothing.

The patients were, by an old-standing agreement with the Manchester Guardians of the Poor, nearly all sent by them, through the tuberculosis officer, from their children's hospital. Consequently, they were chronic cases in a late stage of the disease, and the majority had open lesions. The average duration of disease before admission was two years, the longest five, the shortest five months. Many of the cases came into the author's hands one to two years after admission.

### **Technique of Heliotherapy.**

The technique followed Rollier's plans in the main. Modifications dictated by the necessity of profiting as soon as possible by the brief British summer were as follows: (1) The “acclimatization” period was reduced to about a week, in good weather, in the case of patients ordered general heliotherapy (exposure of the whole body surface), and to less in cases ordered local heliotherapy (exposure of the lesions only). (2) The initial exposure was increased from Rollier's five minutes to ten minutes up to twenty minutes, according to the intensity of the light.

Attention was first directed to reducing the amount of clothing worn on ordinary occasions to the minimum necessary for comfortable warmth. This applied also to bedclothes. Only one garment—a cotton shirt or vest—was worn in bed. Part of the bed-covering required at night was removed in the day, regard being had in this, as in every other detail, to the individual differences of the patient. In the open, in sunlight and shelter, coverings were further reduced.

## PROGRAMME OF A PATIENT'S FIRST WEEK UNDER HELIO THERAPY.

Day.	Condition.	Duration of Exposure.	Parts Exposed.
1	In bed	In ward—free ventilation	
2	"	Out of doors	
3	"	" " 10' to 20'	Feet and shins
4	"	" " 20' " 40'	" " }
		" " 10' " 20'	Thighs
5	"	" " 30' " 60'	Feet and shins
		" " 20' " 40'	Thighs
		" " 10' " 20'	Abdomen
6	"	" " 40' " 80'	Feet and shins
		" " 30' " 60'	Thighs
		" " 20' " 40'	Abdomen
7	"	" " 10' " 20'	Chest
Each succeeding day	"	" " 20' " 30'	Whole body
	"	" " + 20' " 30'	" "

Rollier<sup>1</sup> gives an excellent method of representing these rules pictorially. Some patients finally enjoyed as many hours of exposure daily as Nature provided of sunlight. Others—the minority—had for various reasons to be limited to much less. The details requiring attention are best considered by reproducing the directions given the nurse. In the case of a large staff these would necessarily be written.

**Directions for the Practice of Heliotherapy.**

1. Expose according to the chart (Rollier's) provided, unless otherwise directed.
2. Expose in the earlier part of the day, if possible.
3. Choose a well-sheltered site for the bed.
4. Keep patient's head covered.
5. Do not expose a patient with headache or a temperature over 100° F. If a patient complains of headache or discomfort while he is exposed, he must be removed immediately into the shade.
6. Cover exposed parts immediately if bright reddening of the skin occurs.
7. If, in spite of all care, painful reddening or a burn should occur, report the fact, so that appropriate treatment may be taken at once.
8. Record all exposures on the temperature chart.

With regard to Rule 4, each patient was provided with a cotton hat, and each bedridden patient with a sunshade of the shop awning pattern, fastened to the end of the bed. Rule 5 was not absolute as regards temperature, if the patient seemed otherwise well: it was broken only on medical direction. With regard to Rule 7, it should be

<sup>1</sup> "La Cure de Soleil," p. 66.

noted that severe burns can ensue from an English sun in a surprisingly short time, especially in spring, before pigmentation of the skin is well established.

General heliotherapy (of the whole body) was generally preferred, but in cool or variable weather local treatment (of the lesion alone) had perforce to be substituted, and was carried out on the same plan, *mutatis mutandis*.

#### **"Open-Air Dressing" of Local Tuberculous Lesions.**

All open local lesions were, on arrival, cleaned with 2 per cent. sterile salt solution, with sodium bicarbonate (5i to 10i), or with an alkaline disinfectant (sodium phenate or lysol), and then dressed with the minimum number of layers of plain dry sterilized gauze. If granulating surfaces were present, Wright's perforated celluloid was interposed. The whole dressing was then kept in position, protected from external contact and yet left free to air by a sinus guard of Rollier's pattern. (A Cowan's wire vaccination shield does fairly well, but should be of stout wire.) Where the granulating surface was large or there were multiple adjacent lesions, I was not able, under war conditions, to get especial guards manufactured. Stout perforated celluloid, cut the required shape and size and bound at the edge with a thick padding, made a tolerable, though not ideal, substitute. Lesions of this kind were often dressed at night with 2 per cent. salt solution fomentation. Every discharging wound was dressed at least once a day. This method of dressing was used for all open lesions all the year round. In the case of sinuses or surfaces discharging very little or not at all the guard without gauze may be used. Protection from flies was provided by stretching one layer of gauze over the guard and by inunction with a mixture of alcoholic solution of camphor and olive oil used by Rollier for sunburn.

#### **Dietetic Considerations.**

Diet was of the usual sanatorium type. Marked improvement in appetite and digestion followed the reduction of the number of meals from four to three, except, of course, in such severe cases as required frequent light nourishment.

#### **The Conduct of Orthopædics.**

Space does not permit of any description of the very important subject of orthopædic methods and apparatus. These were necessarily based on Rollier's teaching, but were modified as occasion demanded. Practically the whole of the apparatus was made on the premises, some from my own design, some from the specifications of Colonel Sir Robert Jones, Calot, and Gauvain. Gauvain's "wheelbarrow" back-door splint proved invaluable in a case with multiple lesions in the

back, which developed the symptoms of cervical caries shortly after admission. The "prone" or abdominal decubites with a pillow under the chest is indispensable, apart from orthopædic advantages, in the heliotherapeutics of lesions on the posterior surface of the body and of convalescent spinal and hip-joint disease.

### **Nursing in Heliotherapy.**

An examination of the rules for the nurse will reveal that much of the details must be left to her judgment. Hence the absolute need of skill, intelligence, and conscience in the nursing staff. However one may standardize exposure (*e.g.*, by comparison between the tint of photographic printing paper exposed for a given time on any day, and a coloured scale giving an exposure time-limit for each of a number of tints) in our quickly varying weather, the decision at the moment must rest with the nurse. On her it depends whether asepsis and immobilization are maintained, whether odd hours of sunshine on rainy days are utilized, whether a sinus guard deserves its name or excoriates the surrounding epidermis, and other important details.

As a corollary it is questionable whether heliotherapy is practicable outside of *special* institutions and private practice in comfortable homes. Nevertheless, Poncet (quoted by Jaubert) had good results in Lyons attics, and I have seen in hospital out-patient practice one or two selected cases of cervical adenitis improve with "open dressing."

### **The Question of Clothing in Heliotherapy.**

The clothing, both bedclothes and personal, requires the direct supervision of the medical attendant. It should on all occasions be light and loose, consist of the minimum number of seasonable garments, and cover uniformly all the body surface. For the sunbath the children at Abergele wore bathing-drawers or slips, and in summer at other times cotton shirts or tunics and knickers. In winter the same garments were made of warm material, and washable undergarments were added. Each child was provided with a three-quarter length pilot-cloth cloak, with a detachable hood. They were well worth the initial expense, as they wear for an indefinite time, protect against all weathers in winter, are easily assumed or discarded in the cool evenings or mornings of summer, are equally suitable for ambulant and bedridden cases, and do not interfere with slings or splints. Two or three stock sizes meet all requirements.

### **Results of Heliotherapeutic Measures.**

In view of the small number of cases treated (twenty, including cases treated with aerotherapy alone) and the short duration (eighteen months) relative to the long course of the disease, it is not possible to

dogmatize about results. With this proviso it may be said: (1) That the practice of heliotherapy revolutionizes the routine treatment of the disease:

(2) The patients live in the open air, as distinct from a well-ventilated ward. After the erection of a roofed verandah enabled the children to stay outside even in showery weather and at night, their general health (appetite, sleep, nutrition) improved, and no cases of "relapse," coryza, nor dermatitis occurred. This corresponds to experience at the Royal Liverpool County Hospital at Heswall, where some of the wards are closed and others are open verandahs, and to reports from the Open-Air Military Hospital at Cambridge.

(3) Heliotherapy includes *pari passu* aerotherapy. The good effects of transference to the open may be (a) physical, due to increased air movement, and (b) psychic, due to more spacious outlook. The effects of general heliotherapy in improving the general condition are marked. An extreme example of this was a convalescent case of tuberculous enteritis, a girl of seven. She had been admitted in 1915 in a state of collapse, and for a year after the disappearance of acute symptoms remained stunted, anæmic, dull-witted, capricious in appetite, and flabby in musculature. From the time that general heliotherapy was started she began to add inches to her stature, became rosy, sturdy, eager for her meals, and, in the words of her nurse, "quite cheeky." But a similar, though less marked, improvement occurred in a girl of eleven years, a convalescent case of spinal caries, who with red hair and thin white skin failed to pigment, and therefore could not tolerate more than an hour's direct sunlight, but enjoyed air-baths in the shade.

(4) The "open-dressing" method enforces frequent aseptic dressing and attention such as similar lesions seldom get in a crowded outpatient department or workhouse ward. Example: A boy of nine years, admitted in September, 1916, had two granulating surfaces, one at the angle of the jaw, the result of a broken-down scar from gland-excision (performed in 1915), and one of equal extent on the chest from a ruptured subcutaneous abscess. The scar extended under the chin from one ear to the other. That part of the scar which had healed before admission was poorly vascularized, puckered, and showed numerous "tabs" of skin. Both wounds were dressed in the open method; no sunlight was available. By January, 1917, both lesions were firmly cicatrized. The cervical lesion, not being covered by the clothing, healed some weeks before the other. The contrast between the old cervical scar and the smooth, supple, and well-vascularized area, which had healed after admission, was remarkable. The cosmetic effects of "open dressing" were, without exception, good.

(5) It is true not only of open, but of all lesions, that it was possible on the briefest examination, and with a minimum of disturbance of the

patient, to judge the progress of a lesion or the effectiveness of apparatus.

The results of the revolutionary measures were therefore encouraging. How much of the sum-total was due to heliotherapy? Comparison between cases treated in winter and those which had heliotherapy, and between the same case in the presence and absence of sunlight, appeared to show—

1. That the rate of cicatrization of superficial granulations was quicker in sunlight than in air alone. Short sinuses reacted in the same way. In both discharge diminished progressively.
2. Superficial spongy granulations, laden with pus, rare with aërotherapy, were never seen with heliotherapy.
3. Sunlight acted as an anodyne on deep acute lesions. A girl of fifteen years, sent for observation, had acute pain and tenderness over the spine. The case proved to be one of late rickets. The symptoms disappeared quickly under general heliotherapy, though they had not yielded to rest alone. A boy of five years with early hip-joint disease developed acute pain with thickening over the great trochanter while he was immobilized in bed. The local symptoms disappeared with general heliotherapy.
4. Three deep closed cases (chronic peroneal tenosynovitis, hip-joint disease, astragaloid disease) appeared to slow down in the rate of absorption of infiltration during prolonged absence of sunlight. It was difficult, however, to be certain of the cause.

#### **The Cause of Some Comparative Failures.**

The girl with spinal caries mentioned above had a deep sinus from an old psoas abscess. The sinus remained obstinately *in statu quo* throughout. Beck's bismuth-paste injections failed equally, also iodine swabbing. This patient, as noted, could not tolerate the prolonged sunbath. A case of knee-joint disease had finally to be resected, because, though X rays showed fibrous union in good position, there was still synovial disease below the patella. This boy had had prolonged general heliotherapy, and had pigmented deeply. One case (acute hip-joint disease, abscess-formation, abscess evacuated and closed after admission) did well in the sunny autumn of 1915, but developed fresh abscesses early in the following spring. (At that time there were no verandahs, and the weather was very wild, the bedridden cases being confined to the ward for weeks.) Fever, toxæmia, and a subjective dislike of bright light prevented the use of heliotherapy. The limb, if not the life, was saved by incision, drainage, and constant irrigation with hypertonic salt solution. Heliotherapy, called in later, resulted in swift cicatrization with good cosmetic effect by January, 1917. The joint is now in plaster, and the boy ready for patten and crutches.

It may be said that the routine treatment for hitherto unopened collections of pus was aspiration. Repeated aspiration plus heliotherapy gave a better result than incision and suture, even if the skin finally gave way.

### **The Question of Pigmentation.**

In general the most successful cases showed the deepest pigmentation. The child with enteritis improved in pigmentation-power in the course of treatment. On the other hand, the girl with spinal caries, who refused to pigment, appeared in other respects to have a fair resistance, and a boy with tenosynovitis pigmented deeply, though his family history was exceptionally bad, and he suffered from recurrent symptoms suggesting bacillæmia—*e.g.*, glandular swellings and arthritis of the "rheumatoid" type in the hands. The view of Rollier, shared by Gauvain, that pigmentation-power is a measure of resistance seems in need of restatement.

The facts could be explained in the same way as one explains the progress of a case of syphilis which improves under iodides, and the failure to progress of a case which, being intolerant of iodides, cannot be treated with them.

It was found possible to start local heliotherapy as early as February and as late as November, general from April to early October.

### **On the Choice of a Site for Heliotherapy.**

Reference may be made to Jaubert's excellent little handbook for a discussion of suitable sites for the practice of heliotherapy. To what is said there and what is implied above may be added that the meteorological records show the east and south coasts of Great Britain to have the lowest rainfall and the highest sunlight records.

As regards Ireland, the south-eastern coast has a better average than any part of Wales.

In our windy climate, shelter is an important matter in proportion to the number of immobilized cases that it is proposed to treat. If wood provide shelter it should be of conifers, since these provide equal cover all the year round, and, having a minimum of decayed undergrowth, discourage the breeding of flies.

Any soil but a heavy clay is admissible in the last resort. A clay soil, by loading the atmosphere with moisture, makes cold weather raw, hot enervating, reduces the duration and intensity of sunlight, and shortens the season during which general exposure can be practised.

### **REFERENCES.**

- ROLLIER, A. : *Le Cure de Soleil*. Paris : Baillière et Fils, 1914.  
 JAUBERT : *La Pratique Heliotherapique*. Paris : Baillière et Fils, 1915.  
 CALOT : *Indispensable Orthopædics*. London : Baillière, Tindall and Cox, 1914.  
 GAUVAIN : *Lancet*, March, 1911.