

Report on artificial light and x-ray treatment.

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CORPORATION OF GLASGOW

PUBLIC HEALTH DEPARTMENT

REPORT

ON

ARTIFICIAL LIGHT

AND

X-RAY TREATMENT

GLASGOW:

PRINTED BY ROBERT ANDERSON, 142 WEST NILE STREET



COMMISSION OF GLASGOW

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CORPORATION OF MASSACHUSETTS

PUBLIC HEALTH DEPARTMENT

REPORT

THE STATE OF MASSACHUSETTS

YEAR 1905

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CORPORATION OF GLASGOW.

PUBLIC HEALTH DEPARTMENT.

REPORT ON ARTIFICIAL LIGHT AND X-RAY
TREATMENT.

To the COMMITTEE ON HEALTH.

Treatment by ultra-violet rays is now being carried out at several Centres, as follows:—

		Patients Treated.	Clinic.	Methods in Use.	
Robroyston Hospital,	...	Tuberculosis	Indoor	Arc Lamps (20 and 75 amperes)	Mercury Vapour Lamp
Reception House, Baird Street,		Tuberculosis	Indoor (24 beds), Outdoor	Arc Lamps (12 and 20 amperes)	Mercury Vapour Lamp
Ruchill Hospital,		Tuberculosis	Outdoor chiefly	—	Mercury Vapour Lamp
Public Health Office, ...	...	Rickets and Malnutrition in Children	Outdoor	Arc Lamps (20 amperes)	—

Treatment by X-rays is being carried out as follows:—

	Patients Treated.	Clinic.
Ruchill Hospital,	Tuberculosis (chiefly Glands)	Outdoor and Indoor

The details of the methods employed, the types of patients treated, and the general results are described in the following reports by the Medical Officers in charge of the various Centres.

As regards tuberculosis, the main types of disease under investigation are lupus and tubercular affections of the skin, and affections of bones, joints, and glands. Lupus is, as a rule, amenable to treatment by ultra-violet rays. It is too soon to say whether the curative results, which are in some cases rapidly accomplished, are permanent or not. A number of cases were formerly treated at Ruchill Hospital by exposure to X-rays, and, although good results were obtained in many instances, the possibility of malignant disease supervening has led to the abandonment of this form of treatment in favour of that by ultra-violet rays. In tuberculosis of other parts of the body, exposure of the body generally to the rays of the arc lamp, or of the diseased part itself to the mercury vapour lamp, appears to have been of considerable assistance, especially in combination with the other usual methods of treatment. In tuberculosis of the lung, careful and tentative experiments are being carried out in Robroyston Hospital on selected patients, as there is a distinct danger of aggravating the disease by the indiscriminate use of ultra-violet light.

Under the Child Welfare Scheme, encouraging results are being obtained in the treatment of rickets and malnutrition in children, at the clinic established for this purpose.

At Ruchill Hospital the Radiologist is continuing to treat chronic forms of tubercular glands of the neck by X-rays. The results, though slowly produced, are in many cases satisfactory. In 1923 the Committee on Health authorised a series of experiments at the Cancer Hospital, to determine the value of the more powerful deep X-rays in the treatment of tuberculosis, and the results were described in last year's Annual Report. It was found that, although very good results were obtained in a restricted sphere, the high cost of applying this procedure did not justify its continuance.

I have thought it advisable to present these reports in full, because the work is still largely in an experimental stage, and because they form a record of what has so far been accomplished.

(Sgd.) A. S. M. MACGREGOR,

Medical Officer of Health.

Public Health Department,
Sanitary Chambers, Glasgow,
9th January, 1926.

REPORT BY DR. SMITH ON ARTIFICIAL SUNLIGHT THERAPY AT ROBROYSTON SANATORIUM.

It has come to be generally recognised now that the treatment of tuberculosis, even when the local lesion is situated in glands or bones and joints, must be general and not focal in nature; and the results obtained by heliotherapy, or natural sunlight treatment, are far in advance of anything that can be achieved by the older surgical methods. In Northern countries, heliotherapy is difficult to carry out, because of the fitful appearance of the sun and the relatively weak actinic value of its rays. Even in the warmest and brightest summer days, it is possible for us at Robroyston to give exposures at least three times as long as Rollier employs in Switzerland, without obtaining the same results.

Thus it became apparent that, if light treatment were to be of any avail, some form of artificial sunlight must be sought. Finsen, and later Reyn, at the Institute, Copenhagen, elaborated a method whereby results equal at least to those of Rollier might be obtained. An apparatus was installed at Robroyston Hospital at the end of 1924, and was in working order in January, 1925, and since then daily treatment has been carried out.

Description of Apparatus.—The installation consists of two 75-ampere lamps and three 20-ampere lamps, running at 70 volts. In order that the lamps may burn smoothly, continuous current is essential. Robroyston Hospital is supplied with alternating current from the Clyde Valley Electrical Company, and a motor generator had to be installed to give the appropriate continuous current. The 75-ampere lamps are run only with pure carbon terminals. The 20-ampere lamps are sometimes used to burn pure carbon, or tungsten-cored carbon, as required.

At one time it is possible to treat eight sitting patients round the two 75-ampere lamps, while two recumbent or from four to six sitting patients can be irradiated by the three 20-ampere lamps. Each of the large lamps is controlled by a separate switch, but the three small lamps are controlled by a single switch.

We also make use, to a limited extent, of a small alternating-current hand-fed arc lamp, suitable for burning carbon or impregnated carbon terminals, and fitted with an electric radiator for resistance, so that the patient is not allowed to feel the cold.

A mercury vapour lamp is being installed.

A comparison of the spectrum of the sun and the carbon arc shows very slight differences. The tungsten arc is richer in ultra-violet light, but particularly in shorter wave-length rays. The mercury vapour spectrum consists of several broad lines, some of which occur beyond the end of the sun's spectrum. It is still a point of considerable doubt whether these short wave lengths are therapeutically efficient, especially in dealing with intractable tuberculous lesions of bones and joints.

Method of Exposure.—What follows applies particularly to the pure carbon arc. Treatment consists of a general irradiation, the patients being entirely naked save for very short pants. They sit at a distance of about one metre on either side of the lamps, which are uncovered by glass, because glass does not permit of the passage of ultra-violet radiations. The times of irradiation are carefully graduated. In most cases the initial exposure is one of twenty minutes, the patients being instructed to turn every five minutes, so that back and front are alternately exposed. Every fourth day an additional exposure of five minutes is given, until a maximum of two or two and a half hours is reached.

Patients must be considered individually, and any increase in the time of exposure must be carefully done until the response of the patient is estimated. In some cases twenty minutes of an initial bath would be far too long, and exhaustion, elevation of temperature and the other phenomena of toxæmia would result. Generally speaking, in afebrile patients of fair general condition a steady increase in the duration of the bath is possible.

Hydrotherapy.—All ambulant patients, save where there are special contra-indications, receive a tepid to cold spray on emerging from the light room. Bed patients are sponged down by the nurse. This, apart from its tonic effects, prevents the patients from catching cold.

It is essential that the eyes should be protected from the rays or an intense conjunctivitis will develop, sometimes eight hours

afterwards. Each patient is given glasses or a dark cloth eyeshade to wear.

Numbers and Types of Cases Treated.—In all we have treated 102 patients, falling into the following groups:—

Lupus Vulgaris,	...	...	...	...	13
Glands,	...	...	...	...	23
Joints,	...	...	...	...	30
Bones,	...	...	...	...	8
Mutiple,	...	...	...	...	6
Genito-Urinary,	...	...	...	...	3
Bowel,	...	...	...	...	1
Lungs,	...	...	...	...	10
Lungs and Larynx,	...	...	...	...	2
Miscellaneous (including short tonic exposures before and after operations),	...	...	...	...	6

At least 75 per cent. of these cases suffered from lesions of long duration, and many had defied years of treatment.

General Muscle Tone and Body Weight.—One of the most striking features of the treatment is the rapid improvement in general health experienced by the patients. Flabby muscles soon gain in tone, and the muscular atrophy which is such a common feature round tuberculous joints is not nearly so noticeable as in patients who receive the ordinary treatment without generalised light baths. Only in two or three cases did they not show a steady gain in body weight.

Pigmentation.—In from four to six hours after exposure an erythema of the skin results. This, provided that the exposures are properly timed, gradually gives way to a deepening pigmentation, resembling very closely the browning due to the sun, provided carbon arcs are used. The Mercury Vapour lamp pigments more quickly, but the pigmentation is tinged with a yellowish green, and a patient treated by the Mercury Vapour lamp could usually be distinguished from a patient treated by natural sunlight, whereas this would hardly be possible in the case of the carbon-arc lamp. Tungsten gives a pigmentation somewhere between the two.

As with natural heliotherapy all patients do not pigment equally. They may be roughly classified as (1) the pale "cachectic" type, showing practically no change in colour, and

only a faint erythema with a tendency to fine desquamation; (2) the ruddy type, showing an intense erythema, but not browning readily; and (3) those who become progressively browner and browner. Usually the pigmentation is uniform, but occasionally it suggests a marled appearance.

It is held by some authorities, including Rollier and Gauvain, that the benefit derived is roughly in proportion to the pigmentation, while others hold that pigmentation is of no value in prognosis, and that it is actually to be avoided, if possible, because it hinders the absorption of the rays.

At Robroyston we are of opinion that pigmentation merely protects the delicate blood vessels and scarcely influences the therapeutic value of the light baths at all. The majority of our patients do pigment, but all the "pigmenters" do not show the best results. Two of our most successful cases of bone and joint tuberculosis, where rapid and complete healing of the sinuses took place, and movable joints were eventually obtained, were pale "non-pigmenters," while the most intractable case of lupus occurred in a child who showed deep brown pigmentation. Of course, patients who pigment are more easy to expose because burning and blistering do not occur in them.

Lupus.—Thirteen cases have been treated, most of them of an extensive nature, and of long duration up to sixteen years. Carbon dioxide snow, sulphanilic picric acid, X-rays, &c., had been used without avail. All but three have shown very remarkable improvement, and six have been dismissed as fit. The most rapid response is met with in the catarrhal type, where the secondary infection soon clears up. The response in three cases might be described as dramatic. Two of these suffered from long standing lupus of the face, invading the buccal and nasal mucous membranes, and the third was a case of lupus of the foot and leg.

Fibroid lupus shows great reluctance to be influenced by any form of treatment, and it is in this kind of skin tuberculosis that Artificial Light Bath Therapy is disappointing. The reason seems to be that the patches have a poor blood supply, and most of the therapeutic value of radiation is due to the reactions it produces in the blood. Healing by light gives rise to a much more elastic scar with less contraction of tissue than can be obtained by any other method.

It has been suggested that repeated light baths may be dangerous in giving rise to malignant changes, such as resulted frequently in the days when X-rays were used extensively to treat tuberculosis of the skin. At the Finsen Institute large numbers of cases have now been treated, some of them many years ago, and malignant disease has not been a sequela.

Glands.—Twenty-three cases of glandular tuberculosis, mostly cervical, have been treated. Of these, eighteen had sinuses and surrounding scrofulous ulcers; two were complicated by abscess formation, and two, though extensive, had not broken down. In all improvement has resulted. In the sinus cases healing has been rapid, the scars firm and elastic, and puckering and contraction of tissue have been less noticeable than when ordinary routine measures were adopted.

Joints.—Thirty patients with tuberculous disease of joints have had treatment by artificial sunlight. They may be grouped as follows:—

				Complications.		
				With Abscesses.	With Sinus.	No Abscess nor Sinus.
Hip Joint,	...	...	...	—	2	1
Knee Joint,	...	...	...	1	3	6
Ankle Joint,	...	...	...	—	6	—
Elbow Joint,	...	...	...	—	8	—
Wrist Joint,	...	...	...	1	2	—

Excellent results have been obtained particularly with elbow, ankle, and wrist disease. In four of the elbow and two of the wrist cases not only have very chronic sinuses healed up firmly, but there has been practically complete restoration of function and mobility in the joint. Ankle joint disease has usually proved very intractable, and deformity and fixation have been common. We have had three successes where function was preserved. In one of them there was such a profuse and long-continued discharge that amputation was at one time considered.

Treatment has not been completed in most of the knee and hip cases, but the results are promising in some, and one case of hip disease with sinus formation has been discharged with the sinus firmly healed and the joint movable.

More time is yet necessary before the total benefit in joint tuberculosis can be estimated. We are of opinion that hope of

complete restoration of function is greater if light baths be given. It must be emphasised that fixation apparatus cannot be dispensed with, and patience over a long period, perhaps one or two years, is essential.

Bone.—Eight cases with bone lesions, all but one complicated by sinus formation, have been treated, and good results have been obtained, the response being quicker where the joint surface was not invaded.

Mutiple.—Six cases of multiple disease have been tried, and though improvement has been noticed, a longer period will be necessary before the effect can be adequately judged.

Genito-Urinary.—One case of tuberculous epididymitis with sinus has been arrested; one case of tuberculosis of the bladder and kidney benefited greatly, while the other, a post operation case, did not remain in hospital long enough.

Lungs.—Ten cases with pulmonary tuberculosis are undergoing treatment, and two patients with pulmonary and laryngeal tuberculosis have been treated. Great care in the selection of suitable cases and in regulating dosage is necessary with visceral disease, and the treatment must be of long duration. Our cases are gaining in weight, and improving in general condition, but it is not possible yet to foretell the ultimate results. Early pulmonary disease should be tried; but advanced febrile patients are more likely to derive harm from increasing toxæmia, than benefit. Laryngeal tuberculosis is said to be amenable to general light bath therapy; even when the lesions are advanced, pain and difficulty in swallowing are said to be relieved. We have not had long enough experience to express an authoritative opinion on this aspect of the problem.

In conclusion it may be said that in the so-called surgical manifestations of tuberculosis artificial sunlight therapy is, undoubtedly, of great value, but it is by no means infallible. In the treatment of pulmonary disease its value has yet to be proved. If used as a tonic and prophylactic measure for debilitated children, particularly those exposed to grave risks of tuberculosis from infected relatives, it would be almost invaluable.

(Sgd.) A. SMITH.

Robroyston Sanatorium,
Near Millerston,
9th January, 1926.

PRELIMINARY REPORT BY DR. MACPHEE ON
ACTINOTHERAPY CENTRE AT BAIRD STREET
RECEPTION HOUSE.

I—GENERAL.

In view of the increasing employment in recent years of "artificial sunlight therapy," an experimental clinic was established in Baird Street Reception House for the treatment of certain cases of tuberculosis. In view of the good results secured in various clinics where such lamps had been used, *e.g.*, that of Sir Norman Walker, it was determined to start with an installation of ordinary street arc lamps, and in April, 1925, six of these were installed by the Manager of the Lighting Department in one of the disused patients' dining rooms on the ground floor.

A clinic for male patients was held in the morning, and one for females in the afternoon, on five days each week. As the number of patients increased, the space round the lamps became crowded, and a second row of six was installed. It was also found that as the length of the sittings was gradually increased till the exposure lasted several hours, the patients became somewhat exhausted by the strain of maintaining a sitting posture, so couches were improvised from benches and old cot mattresses, on which the patients could lie extended alongside of the rows of lamps. This not only relieved the physical strain, but enabled a more uniform and more extensive radiation to be given, since the patient's body was closer to and at a uniform distance from one or more of the lamps, and parts of the body, such as the face and neck, and backs of the legs were exposed, which could not be successfully done with the patients sitting upright.

Besides the beneficial effects of better exposure and lessened fatigue, there is also to be considered the psychological effect; the nude patients do not require to sit practically touching each other, as each has his own couch. For this reason and also to economise space, it is hoped soon to have double-tiered stands for the new treatment room upstairs.

As a certain number of male patients for whom actinotherapy was recommended were working during the day, an evening clinic was opened for their benefit at the end of August, and has been well attended.

During the summer, observation of the work being done in other actinotherapy clinics and the literature on the subject showed that the general tendency was to employ carbon arc lamps more powerful than those ordinarily used for street lighting, and working on a somewhat different principle.

After consultation with Mr. Marshall, of the Electricity Department, permission was obtained to instal eight of these stronger lamps in a large attic in Baird Street Reception House; at the same time, arrangements were made for the accommodation of a total of 24 children as indoor patients, the general idea being to admit minor cases, in which, owing to bad home conditions or other circumstances, outdoor treatment at a tuberculosis dispensary was unlikely to give satisfactory results, but who would be likely to improve after a month or two of general hospital treatment, combined with actinotherapy; this would also avoid the occupation by such minor cases of beds in Robroyston Hospital which were required for more serious cases.

From the beginning of November till the end of the year, 19 cases had been admitted; one was admitted pending a vacancy in Robroyston, owing to bad home conditions, and has since been transferred; and another was removed to Ruchill the day after admission suffering from diphtheria, but, fortunately, no other cases occurred.

On 16/11/25, an evening clinic for women was opened, and on 4/1/26 an afternoon one for women and children.

A quartz mercury vapour lamp, of the atmospheric type made by Kelvin, Bottomley, & Baird, has also been installed in the upstairs clinic, and has been used so far in only a few cases, but with encouraging results, and it is hoped very soon to make more extensive use of it.

As regards admissions, patients are recommended from the various dispensaries by the Tuberculosis Officers, and are then examined by the doctor in charge of the actinotherapy centre, who arranges for their admission to a suitable clinic.

A table (I) is attached, showing the hours of the six daily clinics now in operation.

II—DESCRIPTION OF CARBON ARC LAMPS EMPLOYED.

(a) In the lower (original) treatment room, there are two rows, each of six lamps in series, such as are used for street lighting, suspended at such a height that the patients lie beside them on a slightly lower level, at an average distance of 18 inches from the arcs.

The lamps are of the magazine type, taking about seven amperes when hot. The carbons used at present are those used for street lighting, cored, and giving a yellowish flame; the tips form a V-shape; these carbons are 8 and 9 mm. in diameter, and one charge lasts a week. The cost is £2 per 1,000 pairs. The lamps are cheap, as they can be bought second-hand, although it is understood that prices have lately increased, owing to the demand.

This installation is connected to a special meter, so that current is obtained at power rates.

A total of 12-16 patients can be treated at one time, depending on their ages.

(b) In the upper treatment room, four groups, each of two lamps in series, are installed. These are suspended at a height which can be varied, the aim being to expose the patients at a slightly greater distance (30 inches), as the lamps are stronger, being similar to those used in the Child Welfare Clinic at 20 Cochrane Street.

In this case the carbons are inserted singly, vertically, tip to tip, and they are thicker than those described above. These lamps take a current of 20 amperes, and special resistances are required. This installation is also supplied with current at power rate.

The quartz mercury vapour lamp is installed at the far end of this room.

A total of 16-24 patients can be treated by carbon arcs at each clinic, and about the same number by the Q.M.V. lamp.

III—MODE OF TREATMENT.

In the lower treatment room a portion is screened off as a dressing-room. The upper room is screened to form a number of cubicles, in which are the various groups of lamps, and in which the patients undress.

On arrival at the clinic, patients undress and proceed to lavatories, provided with basins, which are adjacent to the treatment rooms. Here they have a hot sponge all over, and a thorough rub down. The objects of this preliminary bath are several—

- (a) To remove grease and particles of dead skin, which might prevent the passage of the ultra-violet rays to the skin;
- (b) By improving the circulation and nerve tone in the skin, to increase its activity, thus increasing the effects of the radiation, as the skin is the organ of the body which is acted upon by the rays; moreover, if the skin be not healthy, the general tone of the body is lowered, and the general health suffers;
- (c) To satisfy patients as to their personal cleanliness, and that of their neighbours.

(Many of the patients now have, in addition, a cold sponge on completion, as they find that this increases the tonic effect.)

The present system of sponging from a basin has so far proved adequate, but spray baths would be desirable if larger numbers have to be dealt with.

During the recent cold weather most of the patients complained of the low temperature of the lavatories, which were not artificially heated, but since an electric fire was installed in each there have been no further complaints.

Following the bath the patients return to the treatment room, where, clad only in bathing pants and tinted glasses, they undergo the "exposure." The duration of this is at first only a few minutes, but is gradually increased to an hour or more, as the patients become accustomed to the radiation. Unduly long exposure at first will produce quite severe "sunburn."

Further, unduly long exposure may produce fatigue, sleeplessness, and other undesirable symptoms, so that a careful watch must be kept for the appearance of any of these.

In addition, the ventilation of the treatment room must be watched, as the air tends to become vitiated by heat and fumes given off by the burning carbons, and by exhalations from the patients when a number are present.

In the upper room the conditions are satisfactory, but in the lower room the air tends to be rather stuffy, unless the windows are kept open. A roof ventilator fitted some ago improved the conditions.

IV—ATTENDANCE.

This has been very satisfactory, although a few cases have been very irregular; these, however, are of the type who do not attend the dispensary either. The aim from the start has been to get the patients interested in the treatment, and to feel that there is not too much formality about it.

A point which arises in connection with patients from a distance is that of expense; patients attend from *e.g.*, Bridgeton, Govan, Whiteinch. In one case a patient pays 6d. per attendance in car fares, and this might be a serious item in a family budget. The question might be considered of supplying car checks to patients who live beyond a certain distance, and whose financial circumstances are poor. Such a scheme is in operation in connection with the Edinburgh Royal Infirmary Clinic, where the railway fares of certain patients are paid.

V—ANALYSIS OF CASES TREATED.

As the effects of the treatment are produced slowly and after prolonged radiation, it is proposed to deal only with those cases who have undergone the treatment for a reasonable length of time.

Table III gives total numbers of patients treated, with lesion.

Table IV gives notes of cases who have completed over three months' treatment with low-ampere lamps.

Table V gives notes of cases who have completed over three months' treatment with high-ampere lamps.

Tables VI gives notes on in-patients admitted over two weeks. These have had daily treatment with 20-ampere lamps.

As regards results, records of weight are not available in all cases. The column "Well-being" refers to the patients' mental outlook and general feeling of fitness. It was noticeable that in practically every case the patient felt "better," after even a few weeks' treatment.

As regards "Condition of Lesion"—

"A." = Arrested.

"V.M.I." = Very much improved.

"M.I." = Much improved.

"I." = Improved.

"N.I." = Not improved.

Tables IV, V, and VI contain detailed analyses of the progress of 55 cases, but for convenience these tables may be summarised as follows:—

	Still under Treatment :				Dis- charged :	Total.
	Very Much Improved.	Improved.	Not Improved.	Arrested.	Arrested.	
Lupus of Face and Neck,	6	10	1	—	1	18
Lupus of Other Parts,	—	3	1	—	1	5
Glands, with Sinus,	—	7	1	—	—	8
Dactylitis, ...	—	2	—	—	—	2
Other Bones, with Sinus,	—	4	7	—	—	11
Abdominal Cases,	2	3	—	—	—	5
Other Tuberculosis,	—	2	—	1	—	3
Pulmonary Catarrh,	1	2	—	—	—	3
	9	33	10	1	2	55

In conclusion, it is desired to express appreciation of the invaluable help given by the Matron, Miss Johnstone, without whose enthusiastic co-operation it would have been impossible to develop the centre to the extent which has been done. From the first she has taken a keen interest in the work, and has, in addition to her ordinary duties, given great assistance in dealing with the patients and in supervising the various clinics.

(Sgd.) E. S. MACPHEE.

Public Health Department,
Glasgow, 8th January, 1926.

TABLE I.
ACTINOTHERAPY CLINICS.
BAIRD STREET.

Carbon Arc Lamp Installations.

Males.

Clinic No. 1,	...	Ground Floor,	...	9.30 a.m.
" 2,	...	"	...	1.30 p.m.
" 3,	...	"	...	6.30 p.m.

Females.

Clinic No. 5,	...	Top Floor,	...	1.30 p.m.
" 6,	...	"	...	6.30 p.m.

Children.

Clinic No. 4,	...	In-patients,	...	—
" 5,	...	Top Floor,	...	1.30 p.m.

Quartz Mercury Vapour Lamp.

Males and Females.

Top Floor, ... Afternoon and evening by appointment.

TABLE II.

Patients attending the various Clinics as at 9th January, 1926.

				Males.	Females.
No. 1,	...	...		13	—
" 2,	...	...		—	—
" 3,	...	...		12	—
" 4,	...	...		6	13
" 5,	...	...		1	17
" 6,	...	...		—	10
				32	40
				72	
Total,					

TABLE III.

Total Cases treated up to 31/12/25,—Males, 39
Females, 45

84

Discharged, ... 20

Remaining under treatment, 64

Distributed as follows:—

Clinic No.	1	2	3	4	6	Discharged :			Total.
						At own request. Well.			
Nos. under treatment at 31/12/25.	12	13	13	16	10	- 3 mos.	+ 3 mos.		
1. Lupus, Face and Neck,	5	6	4	1	3	2	2	1	24
2. „ Other Parts, ...	1	1	2	1	—	5	1	1	12
3. Glands, ...	—	—	—	—	—	1	—	—	1
4. „ with Sinus, ...	1	2	3	2	1	3	—	—	12
5. Dactylitis, ...	—	—	—	2	—	1	—	—	3
6. Other Bones, with Sinus,	2	3	2	3	4	2	1	—	17
7. Abdominal, ..	—	—	—	5	—	—	—	—	5
8. Malnutrition, ...	—	—	1	—	—	—	—	—	1
9. Other Tuberculosis, ...	2	1	—	1	1	—	—	—	5
10. “Pulmonary Catarrh,”	1	—	1	1	1	—	—	—	4
	12	13	13	16	10	14	4	2	84
	64					20			
	84								

Notes.

- 3 females stopped after a few attendances, as against 7 males.
- 1 Hip case, with Sinus of 10 years' duration, who has been 7 or 8 times in Hospital, became worse after 3 weeks' treatment; was removed to Hospital and spent 3 months resting in bed; and now appears completely healed.
- 6 of the cases at present under treatment have also Pul. Tub., with T.B. in sputum; lung condition was in each case inactive, and in none does it appear to have become active.
- A number of cases are almost ready for discharge.
- Since No. 5 Clinic was opened, most of the 20 odd cases on the waiting list have now begun treatment.
- In Clinic No. 4 (in-patients), bad home conditions in 8 cases.

TABLE IV.—PATIENTS TREATED BY LOW AMPERAGE LAMPS.

Case No.	Sex.	Age.	Site of Lesion. (See Table III)	Duration : Years.	Treatment Months.	Treatment (Hours).	Result of Treatment.					Condition of Lesion.
							Weight : + or - lbs.	Pigment-ation.	"Well being."	Appetite and Sleep.		
1	M	46	1	16	8	403	=	++	+	=	V.M.I.	Almost inactive.
2	M	44	1	14	8	397	+3	+	+	=	V.M.I.	Do.
3	M	19	6	5	8	286	+19	+	+	+	I.	Not yet healed. Attends Irreg.
4	M	43	1	3	8	323	=	+	+	+	V.M.I.	Arrested? Pulmonary Tuberculosis also.
5	M	15	1	13	8	291	+	++	+	+	V.M.I.	Arrested.
6	M	34	1	8	7	383	=	+	+	-	I.	Part healed.
7	M	28	6	8	7	350	+2	=	=	+	I.	Discharge less. Pulmonary Case.
8	M	17	4	8	5	145	+12	+	+	+	N.I.	Sinus dry but glands breaking down.
9	M	36	9	6	4	200	=	++	++	+	I.	Sinus dry, swellings less.
10	M	17	4	1	4	97	+5	+	+	+	M.I.	Sinuses healed.
11	M	23	4	3	3	62	·	=	+	=	M.I.	Gone away. Arrested?
12	M	54	2	44	3	95	·	+	+	+	I.	Less infiltration and Discharge.
13	M	32	1	10	3	35	+3	+	+	·	I.	
14	M	47	1+10	20	3	84	·	+	+	·	M.I.	Face better. Cough less.
15	M	49	1	20	4	133	·	+	++	+	V.M.I.	
16	M	52	6	8	3	82	·	+	=	=	N.I.	Condition stationary.
17	F	30	1	25	8	355	+4	+	+	+	V.M.I.	Arrested?
18	F	21	6	5	8	394	=	+	+	+	I.	As regards general condition but Sinus I.S.Q. (N.I.).
19	F	23	6	9	8	244	·	+	+	=	I.	
20	F	10	2	9	7	187	·	=	+	=	A.	
21	F	16	1	8	7	182	+	+	+	=	M.I.	Appears inactive.
22	F	33	1	8	5	91	·	+	+	+	I.	Attends irregularly.
23	F	40	1	20	5	223	·	+	+	·	A.	
24	F	19	1	12	7	292	·	+	=	+	M.I.	Few Nodules in central area.
25	F	19	1	9	3	39	·	=	=	=	N.I.	Attends irregularly.
26	F	24	1	·	7	156	=	+	++	+	M.I.	Treatment interrupted by admission to Gen. Hospital.
27	F	10	2	3	3	73	·	++	+	+	I.	Ceased to attend.
28	F	11	4	1	6	127	·	++	+	+	I.	Ulcerated area smaller.
29	F	5	4	1½	5	81	+4	+	+	+	M.I.	Ulcer healed. Irreg.
30	F	48	6	15	4	47	+2	=	+	+	N.I.	Sinus I.S.Q. Irreg.
31	F	17	1	9	3	93	·	+	=	=	I.	Some Nodules healed.
32	F	13	2	·	3	83	·	++	+	+	I.	Ceased to attend. Irreg.

TABLE V.
PATIENTS TREATED BY 20 AMPERE LAMPS.

Case No.	Sex.	Age.	Site of Lesion. (See Table III).	Duration: Years.	Treatment (Weeks).	Treatment (Hours).	Result of Treatment.					Condition of Lesion.
							Weight: + or - lbs.	Pigment-ation.	"Well being."	Appetite and Sleep.		
33	F	19	1	5	6	30½	·	+	+	+	I.	Scar tissue softer.
34	F	32	4	3	6	24	·	+	+	+	I.	Swelling less. Sinus smaller.
35	F	43	1	1½	6	29	·	+	+	+	M.I.	Inflammation almost nil. Infiltration less.
36	F	30	9	1	6	25	·	+	+	+	M.I.	Psoriasis almost gone.
37	F	16	6	10	6	30	·	+	+	+	N.I.	Increased Disch. General condition improved.
38	F	28	6	27	6	22½	·	+	+	+	N.I.	Increased Disch. General condition improved.
39	F	25	10	10	4	10	·	+	+	+	V.M.I.	Bronchiectasis case. Remarkable clearing up of physical signs in chest.

TABLE VI.
IN-PATIENTS.

Case No.	Sex.	Age.	Site of Lesion. (See Table III).	Duration: Years.	Treatment (Weeks).	Treatment (Hours).	Result of Treatment.						Condition of Lesion.
							Weight: + or - lbs.	Pigmentation.	"Well being."	Appetite and Sleep.			
40	M	3	6	$\frac{1}{12}$	2	50	+ 2	+	+	+	+	M.I.	Swelling less; no pain.
41	M	8	1	7	8	50	+ 1	+	+	+	+	M.I.	Local Treatment by Q.M.V.
42	F	9	7	3	8	46	+ 1	=	+	+	+	I.	Abdomen distension less.
43	F	9	9	2	8	40	+ 1	+	+	+	+	A.	Kept owing to home conditions.
44	F	3	6	$\frac{2}{12}$	4	11	.	=	+	-	-	N.I.	Hip case, with Sinus. Admitted pending vacancy and transfer Robroyston.
45	F	8	7	3	8	48 $\frac{1}{2}$	+ 2	+	+	+	+	M.I.	Abdom. still full but no symptoms.
46	M	4	4	1	8	50	=	+	+	+	+	M.I.	Ulcers neck almost healed.
47	F	3	7	$\frac{4}{12}$	7	45	+ 2	+	+	+	+	V.M.I.	Looks well. Bad home conditions.
48	F	7	10	5	7	42 $\frac{1}{2}$	+ 1	+	+	+	+	M.I.	Basal Catarrh almost nil.
49	M	14	6	9	6	40	=	=	+	=	=	N.I.	Old spine case with psoas abscess and sinus back. Admitted pending vacancy Robroyston.
50	F	8	4	1	6	47	=	+	+	+	+	M.I.	Sinus healed.
51	F	9	7	5	5	41 $\frac{1}{2}$	+ 1	+	+	+	+	V.M.I.	No Abdom. symptoms. Home conditions bad.
52	F	5	7	2	5	42	- 7	+	+	+	+	I.	Abdom. distension less, fluid still, but less. No diarrh.
53	F	2	5	1	5	41 $\frac{1}{2}$	+ 2	+	?	+	+	I.	Swelling less.
54	M	5	2	4	4	20	.	+	+	+	+	N.I.	Lupus as on admission. Having local Q.M.V.
55	F	4	5	$\frac{6}{12}$	3	10	.	+	?	+	+	I.	No pain or swelling now.

Maximum daily exposure 90 minutes at 2 $\frac{1}{2}$ feet distance.

REPORT BY DR. E. D. CHALMERS SMITH ON ULTRA-VIOLET LIGHT CLINIC AT SANITARY CHAMBERS,
20 COCHRANE STREET.

22ND MAY-31ST DECEMBER, 1925.

Four 20-ampere carbon arc lamps have been used for treatment, and have been satisfactory.

Since the second week of October cored carbons (iron, tungsten) have been in use, instead of a plain carbon, and have also given satisfactory results with a shorter exposure time. This is an advantage, as a greater number of children can therefore be dealt with in a given period, and it also means a saving of time to each mother and child. As, however, erythema is more readily produced, and the danger of overstimulation by over-exposure somewhat increased, more careful observation of immediate effect and progress in each case is necessary.

The conditions are those of general irradiation of the body. Children are exposed, naked, at a distance of 3 feet. They are held by their mothers or fathers in a comfortable position, and rotated to the light at intervals indicated by the observer in charge.

The time of exposure now begins at four minutes instead of six. It is increased, gradually, to not more than a total exposure of 30 minutes. Reflection is aimed at by the use of a white screening behind the patients. Treatment is well tolerated, and after two or three exposures enjoyed by the children. Its popularity with the parents is very marked. Several fathers have attended with their children.

The clinical results indicated in a previous report are confirmed by further observation over a greater number of cases. Cases now total 194. Results are dramatic in some cases, as when a mother is surprised by a formerly sleepless and fretful infant settling down to sleep soundly at night, and becoming manageable and contented during the day.

RESPONSE TO ULTRA-VIOLET RADIATION.

Nervous and Mental.—Establishment of a greater nervous stability is the earliest response elicited.

Sleep and contentment improve; mental alertness increases; children develop delayed powers of speech, *e.g.*, new words; better articulation (old words) is observed.

Muscular activity is constantly increased:—

1. Muscular movement of limbs and trunk apart from progressive movements, *e.g.*, flexing, extending, rotating, &c.
2. Development of delayed powers of sitting, standing, and of movements of progression, *e.g.*, creeping, walking.
3. Increase in muscular firmness or tone.

Body weight is increased generally, in some cases markedly, especially in those cases where weight is much below normal.

In many cases weight was being lost before treatment.

Table showing average increase in weight in 72 children where a fairly good attendance has been made:—

Age Groups.		No. of children.	Average increase during treatment.		Average No. of exposures.
			lbs.	ozs.	
$\frac{7}{12}$ - 1 year,	...	8	1	9 $\frac{1}{2}$	15
1 - 2 years,	...	26	1	5	16
2 - 3 ,,	...	17	1	11 $\frac{1}{4}$	17
3 - 4 ,,	...	17	1	3 $\frac{3}{4}$	19
4 - 5 ,,	...	4	1	4	18
		—			
		72			
		—			

In several cases the presence of obstinate diarrhœa and bronchial catarrh prevented, for some time, an increase in weight. These conditions eventually improved.

The duration of treatment in these 72 cases varied from 5 to 8 weeks approximately.

Bony System.—Results of X-ray examination are not sufficiently numerous to warrant a definite statement. Improvement, however, in the bony structure is definite where treatment has been regularly continued. Some degree of straightening of the bowed legs and diminution in the size of the epiphyses (wrists and ankles) have been observed in a number of cases.

Alimentary.—Appetite improves. In 3 cases obstinate diarrhœa has cleared up during treatment.

Blood-count.—An investigation has been made of the condition of the blood in children before and after treatment. The rise in the hæmo-globin percentage after treatment is well marked in every case:—

Before treatment this ranged from ...	...	40-66 per cent.
After	do. do. ...	61-90 „

The improvement in the colour of the patient's skin, *i.e.*, from pallor to a healthy appearance, is a common observation during treatment. This is apart from pigmentation due to the local effect of the light.

Skin.—Pigmentation is light and moderate in the majority of cases. Where it definitely occurs improvement is generally more decided. Erythema occurs to a slight extent in practically all cases; it is frequently followed by a branny desquamation, and gives no trouble. The skin generally, becomes more healthy, in colour and texture, subcutaneous resilience increases, and impetiginous affections tend to improve.

Acute conditions, *e.g.*, bronchitis, otorrhœa, adenitis, are apt to be aggravated except with very cautious initial exposures. A possibility of improvement is then indicated.

Record of Attendances and Consultations from 22nd May
1925 to 31st December, 1925:—

Number of Consultations,				92
1st Visits. - 1 Year.	1st Visits. + 1 Year.	Subsequent Visits. - 1 Year.	Subsequent Visits. + 1 Year.	
29	165	102	1,571	
Total Visits,				1,867
Total Number of Cases,				194
Sex { Male,		...	...	105
{ Female,		...	...	89
				194
Present Ages of those attending—				
- 1 Year,		...	...	9
- 2 Years,		...	...	76
- 3 Years,		...	...	53
- 4 Years,		...	...	26
- 5 Years,		...	...	30
				194
Reasons for Treatment—				
Rickets { Early cases,		...	19	
{ Marked cases,		...	114	
{ Prophylaxis,		...	6	
				139
Debility—post-infectious disease,				29
Malnutrition,				23
Debility—post-poliomyelitis,				2
? T.B.,				1
				194

(Sgd.) E. D. CHALMERS SMITH.

Sanitary Chambers,
Glasgow, January, 1926.









