The value of radium in the treatment of malignant disease is still under investigation. Dr. Mackenzie Davidson has reported a case of carcinoma of the breast to which radium was applied to the extent of producing ulceration and sloughs with no resulting good of any kind, and from this he thinks radium is of no use in the treatment of this form of malignant disease. It is to be hoped further trial will give more encouraging results. Exner and Holzknecht, of Vienna, have reported cases of epithelioma and melanosarcoma treated with radium with results apparently satisfactory.

Dr. David Walsh has reported a case in which radium is being used in the treatment of a cancerous throat. The case was still under treatment but he is convinced that the progress of the case has been profoundly modified, if not arrested. The same may be said of a similar case under treatment at the London Hospital. A noteworthy fact is the great diminution in the amount and offensiveness of the discharge. Full details of this case will be reported in due course. So far as we have gone there seems reason to believe that radium has a more or less benign influence on malignant growths—whether this influence is sufficiently powerful to entitle radium to be regarded in any sense a cure is a matter for further research to determine.

METHOD OF APPLICATION.

No doubt the most efficient way would be to apply the radium near the area to be treated without any intervening diaphragm. This I have tried, but it is not satisfactory, owing to the impossibility of keeping the radium dry. Moisture reduces its radio-activity very seriously, so that any advantage there may be in direct application is very soon counteracted. The same objection applies to its use through mica, though to a lesser degree; mica obstructs the passage of the rays much less than glass.

The best plan is to have it in small glass tubes 1 in. or 2 in. long, containing 5 mg. in each, as suggested by Dr. Mackenzie Davidson. One, two, or more of these may be used according to the requirements of the case.

As to the length of time between the applications and the duration of each it is impossible to lay down any hard-and-fast rule as yet. So much depends on the amount and radio-activity of the radium used. Taking that of uranium as the unit of radio-activity, the specimens of radium obtainable range from 5,000 units to 1,000,000 units or more. The plan followed at the London Hospital is to apply it for half an hour every second or third day, and there has been no severe reaction in any case as yet. Once we can obtain an adequate supply of radium of a standard radio-activity, the question of application will be very much simplified.

The following notes refer to a case of rodent ulcer successfully treated with radium, which was shown at the meeting when the above paper was read.

It is not, of course, claimed that in this case a cure was brought about in record time. Probably the x rays would have cured the case within a month, instead of a little over fifteen weeks. It must be remembered, however, that at the time of commencing treatment very little was known of radium in the treatment of disease. It was the first case submitted to such treatment in the London Hospital, and it was considered advisable to proceed with caution, and for this reason there were two, if not three, intervals of a week during the first half of the time, that the treatment was suspended in view of the possibility of a severe reaction taking place. We now know such a precaution was unnecessary. A further reason for the long time taken in effecting a cure was the small amount of radium available. Placing the radium the same distance from the surface of an x -ray screen, it was seen that an area $\frac{1}{4}$ in. in diameter was all that came within the effective field of action, and I think I am safe in saying that had there been enough radium to subject the whole ulcer to its action a dozen applications would have been sufficient to effect a cure.

In support of this assertion I was shown a case of a small rodent ulcer, $\frac{1}{4}$ in. in diameter, under the care of my colleague Dr. Sequeira, which was quite healed over after nine applications with the same specimen of radium used in this case. From a cosmetic point of view the result has been exceedingly satisfactory.

J. B., age 57, sailor, came to the London Hospital in July last, suffering from rodent ulcer. He was under the care of Mr. Eve, who referred him to me for treatment with radium.

History.—The patient first noticed a "wart" two years ago on the left side of his nose, the top of which he rubbed off while drying his face with a towel, a scab formed which in turn was rubbed off, and this process had continued more or less ever since, with occasional bleeding and a progressive increase in size.

Condition at the Time of Admission (July 15th).—There was a furrowed ulcerating surface measuring $1\frac{1}{2}$ in. by $\frac{3}{4}$ in. on left side over the nasal bone, coming down slightly over the cartilage. The surface was raised above the level of the surrounding skin and of a pink colour. Up to the time of admission no treatment of any kind had been attempted.

Progress.—Ten milligrammes of radium bromide of good penetrating power were used held in a vulcanite capsule having a window of mica. It was supported about half an inch from the surface and applied for 30 minutes daily except Saturdays and Sundays. In the intervals of treatment a mixture of zinc ointment and lanoline was applied. As there was no perceptible change beyond a slight increase of redness ten days later, the radium capsule was applied almost in contact. August 3rd. Itching; the sore was discharging freely. August 24th. The itching had ceased, the sore was less swollen, and the surface had a more healthy appearance. September 16th. The surface was now almost level with the surrounding skin. There was very little discharge. The upper and inner parts were cicatrizing, and the appearance of the ulcerating surface was healthy, circular in shape, and $\frac{3}{4}$ in. in diameter. As there had never been anything approaching a decided reaction the length of exposure was increased to one hour. October 22nd. The raw surface was less than $\frac{1}{4}$ in diameter, quite level, and had all the appearances of a healthy granulating sore. This was quite healed on October 27th. There were 76 applications in all.

The patient was last seen on February 2nd, 1904, and except that it is more shiny, the scar very closely resembles the surrounding skin both in colour and texture.

A special feature of this case was that beyond the application of a little vaseline once or twice daily, no attempt had been made to effect a cure up to the time the case came under observation, and that radium was the only agent used in the treatment.

My thanks are due to Mr. F. S. Eve, surgeon to the hospital, for his kindness in allowing me to publish the details of this case.

SOME TYPICAL EXAMPLES OF ROENTGEN-RAY AND HIGH-FREQUENCY TREATMENT

WITH OBSERVATIONS THEREON.

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I SHOULD like to offer a few remarks on the following cases treated by the Roentgen rays and high-frequency electric current, and also on the general application of the Roentgen rays therapeutically. The few cases taken from my notebooks from some hundreds treated at the London Skin Hospital and in private, during the last four years, are fairly typical ones, as they are all absolutely cured cases, with no return during a long period after treatment. In the cases treated by the Roentgen rays, my *modus operandi* has been the use of a Mackenzie-Davidson break with a coil of 12-inch spark and a medium tube, rather hard than soft, made for me by Messrs. Harry W. Cox and Co., Limited, of Cursitor Street.

I use 24 volts for the break and coil, and generally give three amperes with the surface of the tube 4 in. from the part affected.

I generally, but not always, protect the surrounding parts by thick lead foil covered on both sides with silk, as the emanations from the tube consist of a large amount of static electricity from the surface of the glass, combined with the Roentgen rays from the interior, the lead foil thus cutting off the rays, and the silk, the static electricity. Proof of the amount of static electricity being given off, can be obtained by stroking the skin of the patient while under the rays, when a peculiar rasping will be felt by both patient and operator.

My experience had led me to trust in short applications 5 to 10 minutes—never more—ceasing treatment when any marked dermal congestion occurs, but keeping the patient under observation. By these means I have been enabled to give fairly continuous treatment until apparent cure, but the effect of the rays being cumulative I find that patients return, after a prescribed period of rest, in a better condition than after entire cessation of treatment.

The great point about the results of Roentgen-ray treatment is the very natural appearance of the scar which results—a soft and pliable one, with no keloid.

I should also like to draw attention to Cases v and viii, where the Roentgen rays, applied through a special nasal dilator made for me by Messrs. Allen and Hanburys, of vulcanite only, were enabled to affect the cartilaginous septum of the nose with the best results. In certain cases I have

used medicinal preparations while the patient has been under the rays.

In lupus and rodent ulcer I have used a saturated solution of permanganate of potash well painted over the part, the therapeutic value of which I attribute to the freeing of the oxygen by the electricity and rays. In psoriasis I have found the unguentum pyrogallolici co. (Unna) most useful in combination with the rays.

I have a case now under treatment of deep naevus stain, on the left cheek of a little girl, to which I applied solution of hydrogen peroxide 40 vols. in conjunction with the rays, with much diminution of the staining. Afterwards I decided to try adrenalin (Parke, Davis, and Co.), and the case is rapidly improving.

I believe that there is a great future for the use of different applications in conjunction with the rays, for possibly the penetrative powers of the Roentgen rays, combined with the static electricity, have some effect of increasing the therapeutic action of the applications. The same plan may be found to be useful even in internal medication, as in a case of carcinoma of the rectum, which I have under treatment (which had been operated on and recurred and pronounced inoperable). I am giving sulphate of quinine 2 grains four times a day and apply the high-frequency electric current internally four inches up the rectum, impinging on the mass; the patient has steadily improved in health and locally.

CASE I.

Mrs. F., aged 70, first came to consult me in October, 1901. She had a rodent ulcer on right cheek, which had commenced about seven years previously. She had had various ointments and lotions, but had refused to have it scraped or burnt. The ulcer was about the size of a two-shilling piece. Thirty-five applications of the Roentgen rays were given, five each week for a period of seven weeks. The ulcer commenced to heal from the commencement of treatment and at the end of treatment very little was noticeable, except a slight dermal congestion was to be seen.

I have had frequent opportunities of seeing the lady at various times since. At the present time it is (nearly 2½ years after treatment) absolutely healed with no apparent scar.

CASE II.

Mr. G., aged 50, was a case of chronic gouty eczema of the buttocks, anus, and testicular regions, accompanied by severe pruritis ani, which had extended over a period of fifteen years. He consulted me in January, 1902. The patient could not lie down at night, but had to sit up in an armchair. Various applications and treatments had been tried, some of which had partially relieved him for a time. He was given five weeks' continuous treatment with the Roentgen rays, consisting of twenty-five sittings, the patient lying in the prone position.

He steadily improved and since cessation of treatment has had no return, two years after treatment.

CASE III.

The Rev. F., aged 52, in November, 1901, was a case of psoriasis of about ten years' standing, extending from the shoulder blades to the heels in large scattered patches. The patient suffered great irritation and could not lie down in comfort or ride his bicycle. He had two periods of treatment by the Roentgen rays of three weeks at the time, five applications a week with an interval of one month, thirty applications in all. He left me with only a slight staining of the skin and has since had no return. The method of treatment in his case was the prone position on a castor couch, the Roentgen rays being stationary, and the couch was moved backwards and forwards during a period of fifteen minutes at each application.

This case has remained well for more than two years.

CASE IV.

Mr. P., aged 62, had an apoplectic seizure three years ago. The right hand and leg were paralysed, with speech impediment. He gradually partially recovered, but with difficulty in walking and inability to co-ordinate movements of the right hand, used to scribble some time at his office before he could write even fairly well, until December, 1903, when he came under me. I applied the high-frequency electric current with general massage—sparking of the spinal column and the right arm and leg for a period of six weeks continuously for five to ten minutes at the time, in all thirty-six applications. The patient has now no difficulty in walking, has good co-ordination of movements of the hand, and the general health very much improved.

My method in this case was monopolar, the patient holding the electrode in his right hand, during which time I gently spark-massaged the regions indicated.

CASE V.

Mrs. M., aged 35. This was a case of lupus vulgaris of nose with ulceration of the cartilaginous septum, which had commenced about three years previously. She came to me in September, 1902. Had been subjected to various treatments. There was not much destruction of nasal tissue externally but very deep ulceration of the cartilage. This was a very obstinate case and very similar to Case VIII. I had her under

treatment by the Roentgen rays during nearly a year at intervals varying from a month to six weeks for three weeks at the time. For the treatment of the cartilaginous septum I employed a special nasal dilator made solely of vulcanite, which Messrs. Allen and Hanburys carried out from my design. I heard from the patient about a month ago by letter in which she said she was quite well, and no trouble with the nose externally or internally. Before she ceased treatment there was no scarring and the cartilage was practically healed.

CASE VI.

Dr. O'S., aged 58. This gentleman had a very suspicious ulceration on the left side of lower lip at the junction of skin and mucous membrane about the size of a threepenny bit with slightly indurated edges and much constant scaling. He had the very best advice and saw several eminent surgeons who almost unanimously advised removal, it having very slowly but surely advanced for seven years, and was of a marked epitheliomatous character. He came to see me in December, 1903, when I persuaded him to let me apply the Roentgen rays, which I did for about five minutes at the time. I gave him eighteen applications during a period of three weeks, and then two periods of six applications with an interval of a week.

There is now nothing to be seen or felt, except the slightest indentation.

CASE VII.

Mr. B., a farmer, aged 55. In 1900 he was wearing pince-nez which caused a redness on the right side of nose where the glasses caught. A red spot formed and spread into an ulcer about the size of a sixpence. He was told by his medical man that it was a rodent ulcer, and various applications were tried. In September, 1901, he came under me and I decided to apply the Roentgen rays. He had twenty applications extending over four weeks, the ulceration healing very rapidly. The patient was seen in February, 1903, and there was then no visible sign of ulcer or cicatrization.

I have heard from the patient this year and his condition remains the same with no vestige of any recurrence, and it is now two and a-half years after treatment.

CASE VIII.

Miss D., aged 32, first came to see me in September, 1902. Disease commenced about five years previously with ulceration of the cartilaginous septum of the nose and lupoid infiltration of the lower third of the skin of the nose. She came from New Zealand, where she had been a hospital nurse, and had been subjected to many treatments, but the ulcer had steadily increased. She was treated in a similar manner to Case V., with satisfactory results. She has returned to New Zealand, after being in England about six months.

I have since heard from her—in November, 1903—more than a year after treatment, and she expresses herself as cured, and suffers no trouble with her nose internally or externally. She had forty applications of the Roentgen rays altogether.

CASE IX.

Mrs. B., aged 72. This was a case of rodent ulcer, extending over the left half of the chin, from the lip to the lower jaw, about the size of a five-shilling piece, which had lasted over a period of twenty-seven years, with deep ulceration and indurated edges and eversion of the left side of lower lip. She had had many applications and treatments. It was "burnt" in May, 1895, and again in July, 1901, and commenced with a single spot on the chin, and the progress in its increase in extent was slow, but steady. The patient came to me in the middle of November, 1901, and I had her under observation until April, 1902, and applied the Roentgen rays sixty times. She steadily improved, with the exception of one small place about the size of a split pea, but as there was a good deal of dermal congestion I advised a rest. She came again at the end of October, 1903, until December, during which period I gave her forty applications.

I saw her a few days ago, when the ulcer had remained healed, with a good dermal-looking scar and no disfigurement, the eversion of the lip having disappeared.

CASE X.

Mr. R. J., aged 40. This was a case of severe ulceration, partaking of both an epitheliomatous and rodent ulcer type. About eighteen years ago patient was cut, whilst being shaved, on the right lower jaw. A red spot formed where the cut had been made, which gradually increased in size, but with no destruction of tissue at first. Then a "sore" made its appearance at the end of three years and steadily increased until November, 1901. He was treated by his local medical man and subsequently advised to have it operated upon. When he came to me there was a very deep, ragged ulceration, extending above the angle of right lower jaw to the chin, along the ramus, extending above and below about two inches, with indurated edges and much suppuration and steady breakdown of tissue. I gave him the Roentgen rays for a period of six weeks—thirty applications—the resultant scar being very presentable.

In a letter just received from him he says: "Since December, 1901, there has been no return and not the slightest inconvenience."

The late Deputy Surgeon-General Henry Cayley, C.M.G., who died on March 19th, has left estate of the value of £60,354 17s. 3d.