well advanced, or serologically because the amount of reagin circulating in the blood was too small to estimate.

An important group of cases belonging to this latent stage are women who have no symptoms, in whom the Wassermann's reaction is negative, but who, in spite of all, beget syphilitic children, and *ipso facto*, are themselves syphilitic. Such cases will, in my experience, give a positive Wassermann's reaction after a provocative injection of salvarsan, thereby indicating how necessary treatment is.

In cases of cerebro-spinal meningitis, in which the cerebro-spinal fluid gives a positive Wassermann's reaction, repeated injections of salvarsan will convert the positive into a negative reaction and at the same time cause the lymphocytosis to disappear. As the cerebro-spinal fluid is both weak in its reagin content and complement-fixing capacity, it should invariably be tested in increasing strengths.

I have recently had two interesting cases in which before treatment the Wassermann's reaction was negative in the blood and positive in the cerebro-spinal fluid, becoming positive in the former only after treatment.

From the foregoing it can be seen that there is a fallacy in the fourteen-day limit which is advocated now. Cases of latent syphilis, especially after the first injection, may give a negative reaction then and not appear positive on the fourteenth day until after the second injection. Further, cases of primary syphilis and cases nearing their end of treatment not infrequently give a negative reaction on the fourteenth day, but a positive between the seventeenth hour and fifth day, and, in my opinion, so long as an injection has the power of producing a positive reaction, whenever that may be, the disease is not eradicated—until the reaction is negative on every occasion tested.

As an injection of salvarsan will not give rise to a positive reaction in a non-syphilitic, one must regard the occurrence of such as indicative of the presence of disease, and efforts should be made to bring about a cure.

In the primary and secondary stages of syphilis this is possible, but in a large number of tertiary cases it is not, even nine injections being insufficient to change a positive into a negative reaction. Therefore, in the early stages of syphilis salvarsan should be used with the idea of curing the disease, and in some of the late stages of abolishing the symptoms only. This alone will show how imperative it is to diagnose and treat a case of syphilis as early as possible.

One most important point I have noticed in making these various tests—that is, that two individuals in exactly the same stage, with the same lesions, in the one a permanent negative reaction may be obtained after four injections, while in the other six or more may be required.

Another point: A permanent negative reaction is most easily obtained when the treatment is continuous, that is, when the injections of salvarsan follow closely upon one another and when mercury is given simultaneously. For instance, early cases of syphilis which were given one or two injections of salvarsan several months back, have required nearly the number given continuously as presumably would have been required had those previous injections not been given. Therefore, it is of the greatest importance, if a course is going to be started, that it should be persevered with until the desired effect is obtained.

Neo-Salvarsan.

As to neo-salvarsan, the most important point to estimate is whether it is more, or less, powerful than salvarsan. The ease with which it dissolves and the little disturbance following its employment would not alone warrant its use in preference to salvarsan; it must be proved to be more potent in its action.

If films from a primary sore are made at frequent intervals after an injection, and in one case the spirochaetes are found to be absent after seventeen hours, and in another after twenty-four hours, no conclusions can be drawn if the former is found to be the case after neo-salvarsan and the latter after salvarsan, since the time required to kill the spirochaetes varies enormously, and the variation is no doubt caused by the fibrous tissue in the induration preventing a thorough permeation with the drug.

The only means by which one can compare neo-salvarsan with salvarsan is through the medium of the Wassermann's reaction.

I first of all employed weekly injections of neo-salvarsan and tested the blood twenty-four hours, forty-eight hours, and the seventh day after last injection, and found that a negative reaction was obtained after fewer injections, and that some of my tertiary cases which failed to give a negative Wassermann's reaction after seven injections of salvarsan, quickly became negative on using neo-salvarsan.

As my observations of the influence of treatment on Wassermann's reaction have shown me how necessary it is to give the injections following upon one another as soon as possible, much better results are likely to follow neo-salvarsan than salvarsan, because two maximum doses of the former can be given weekly without any ill effect, or three smaller doses. I have used neo-salvarsan—1 gram of which corresponds to 0.6 gram salvarsan—twice weekly, employing doses from 0.9 gram to 1.5 gram, and three times weekly with smaller doses, in all over 200 injections.

When two injections weekly are given the Wassermann's reaction should be tested in the blood withdrawn on the day of injection, and so many injections given till the last blood test is negative. Then the blood should be tested seven, fourteen, twenty-one, and twenty-eight days later. This should also be done when three injections weekly are given.

CONCLUSIONS.

Taking all stages of syphilis, I have found that three to seven injections are necessary to cure most cases of syphilis.

There is no doubt that many cases in the tertiary stage can be cured with neo-salvarsan which failed to be cured with salvarsan.

Liable to change as these conclusions may be, I cannot but admit that the alterations in the Wassermann's reaction as the result of treatment are most constant, and that when tested at short intervals give a much safer guide to regulate treatment than by saying that just so many injections will be required, or, as the old syphilologists used to teach, that a three years' pill treatment was sufficient for all cases alike.

As there is a possibility of fallacy, I advise my patients to have a provocative injection of neo-salvarsan six months or a year after they have been discharged, and the blood tested forty-eight hours, the seventh, fourteenth, twenty-first and twenty-eighth day after that injection. I might finally add that all my cases for some months past have had three to nine injections of salvarsan, given at seven to fourteen days' interval, or three to seven injections of neo-salvarsan, given at not more than seven days' interval, with not a single bad manifestation or a recurrence of symptoms.

THE X-RAY TREATMENT OF GRAVES'S DISEASE.

By WILLIAM H. HOOTON, M.R.C.S., L.R.C.P.,

LEEDS.

THE numerous remedies, ranging from fresh air and forced feeding to a severe surgical operation or the quasi-specific treatment by serum or milk of thyroidectomized animals, indicate by their very multitude the generally unsatisfactory nature of the treatment of exophthalmic goitre. But it is beginning to be seen that we have in the x rays, properly applied, a therapeutic agent of efficacy in the relief of this disease. The Roentgen rays affect the tissues as follows: After a dose has been administered there is a latent period of several days during which no change can be made out; then, if the dose has been a small one, there is increased secretion from glands and increased activity in other structures—for example, the amount of sweat increases and hair grows more rapidly for a time. A full dose, on the other hand, paralyses cell activity, the hair falls, and glandular secretions are diminished. A still larger dose causes inflammation of the superficial structures, which may go on to necrosis, leaving an ulcer often very slow to heal. It is obvious, therefore, that the quantity of rays given must be accurately measured.

It is generally agreed that the symptoms of Graves's disease are due, at least in the first instance, to an unduly great outpouring of the result of thyroid activity into the blood stream. If, then, by administering suitable doses of

x rays, we are able to depress and diminish to within normal limits the secreting power of the thyroid gland, we should expect to be able to relieve the patient's symptoms, so soon, at any rate, as the rate of elimination of thyroid product rose above the rate of its absorption.

Experience shows that this is what occurs, and, moreover, after a sufficient number of applications the effect becomes permanent, and some histological change, probably a fibrosis, takes place in the gland.

The treatment is applied as follows: The patient reclines on a couch, a cushion being placed behind the neck to render it more prominent; collars and neckbands are removed. A focus tube of medium resistance (that is, one having an alternative spark-gap of about 4 in.) is placed so that the distance from the anticathode to the skin is 16 cm. A current of half a milliampere is passed through the tube, which is arranged so as to allow the rays to pass in an antero-lateral direction on each side of the gland in turn. A cylinder of stout lead cuts off all rays other than those passing to the thyroid region, the skin over which is protected from the softer rays (which are liable to cause dermatitis) by a disc of "sole" leather about 6 mm. thick. At first a twenty minutes' irradiation on each side of the gland may be given once weekly, a careful watch being kept for signs of dermatitis. Then, provided the patient is making satisfactory progress (as shown by fall of pulse-rate, lessening tremor and palpitation, etc.), the interval between the applications is gradually lengthened to two, three, four weeks; the duration of the application being cut down to fifteen or ten minutes on each side of the neck. Any sign of erythema would indicate cessation of treatment for a few weeks; and thenceforward smaller doses would be indicated.

The total number of these patients who have come under our treatment and observation is 31—all females except one. Of the whole number, 14 were treated privately, and 17 came under the Light Department of the Leeds General Infirmary. I must discuss the two classes separately, because those patients treated in the hospital do not, on the whole, get on so well as the private cases, and this for various reasons: (1) They cannot, in many cases, secure the requisite rest and abundant food enjoined upon those in more favoured circumstances; (2) they do not attend so regularly; (3) the soreness of the neck induced by the treatment assumes an importance to the untutored mind quite sufficient to act as an excuse for ceasing to attend; (4) cases are probably more developed when first seen.

Of the 14 private cases 10 are apparently cured, 9 of them having been quite well for over a year, the other for some six months; two members of this group have had quite recently a normal pregnancy and given birth, after many years of previously childless married life, to a healthy full-time child. The remaining 4, not classified as "cured," show very marked relief of symptoms and have been enabled to return to practically all the activities of normal life, except, of course, vigorous games, running upstairs, and the like.

Of the 17 hospital cases 7 may be classified as cured, 4 are markedly relieved, 4 show very little improvement, 1 was operated on with a fatal result after only five doses of the rays, and 1 has only just come under treatment. So that of these 17 the result in 11 is satisfactory, and of the 4 who have made but little progress, 1 has phthisis, 1 attends very seldom, and 1 has left the district.

Altogether, therefore, the "cured" and "greatly relieved" number over 80 per cent.

The general progress of the cases while under treatment does not show sufficient variety to justify giving a lengthy series in detail, I will therefore mention two typical instances:

CASE I.

Miss D., aged 35. When treatment was commenced there was extreme nervousness and tremor; marked protrusion of the eyeballs; a moderate goitre, the neck measuring 14½ in.; great weakness, dyspnoea, a pulse-rate of 160; much palpitation.

These conditions gradually diminished, and at present she is free from nervousness and tremor; the exophthalmos is materially lessened; the neck only measures 12½ in.; she can do an ordinary day's housework and can walk three or four miles; is not now troubled with "heart attacks," nor was she distressed in any way by the heat of last summer; pulse-rate now 84.

The thyroid is still easily palpable and feels like a hard fibrous mass; it does not pulsate. Her own doctor says, "Practically all her Graves's symptoms have disappeared and I consider her cured."

CASE II.

Miss F., aged 19. When first seen, about eighteen months ago, there were marked nervousness, shortness of breath, and tremor; the eyes were very prominent and the thyroid much enlarged. Palpitation and amenorrhoea for the previous twelve months. Unable to walk far or to pursue her work as a pupil teacher. Pulse-rate 128. Very anaemic.

After ten irradiations, covering a period of some three months, one noticed a marked improvement. The tremor and palpitation had disappeared; she could walk without distress on the level; the neck was smaller, and the pulse-rate was 88. She has had since then occasional doses of the rays, and when I saw her a few weeks ago she was able to dance and cycle; there is, however, some shortness of breath on climbing hills, and the exophthalmos and goitre are still marked. She is continuing treatment, having a dose once in six weeks or so.

Summing the whole matter up one may say that the noteworthy features are the lessening, often rapid, of the nervousness, the dyspnoea, the tachycardia, and the tremor; the patient's weight increases, and there is a return, in a greater or less degree, to a normal enjoyment of life.

One defect undoubtedly did, and to a smaller extent still does, exist—namely, the soreness of the skin of the neck, a true radio-dermatitis, present as a rule only for a few weeks during the earlier part of the treatment, but unfortunately giving place to a permanent brown stain and patches of dilated capillaries, which to those who wish to wear low-necked dresses is necessarily a great disadvantage. These difficulties, however, are being overcome by filtering out the softer rays which are responsible for the mischief to the skin; and after all, I do not think it is a great price to pay for relief from a distressing disorder.

In conclusion, I should like to express my thanks to Dr. Rowden, honorary director of the electro-therapeutic department of the Leeds General Infirmary, for his kindness in allowing me to make use of his notes in many of the cases.

ON DERMOIDS OF THE TONGUE.

WITH A REPORT OF A LARGE SUBLINGUAL DERMOID CYST.

By ROBERT OLLERENSHAW, CH.B., F.R.C.S.ENG.,
HONORARY SURGEON TO SALFORD ROYAL HOSPITAL AND TO CHILDREN'S DEPARTMENT, MANCHESTER NORTHERN HOSPITAL.

ALTHOUGH congenital in origin, sublingual dermoids frequently do not attain sufficient size to attract even the patient's attention until many years have elapsed. Surgical interference, however, is usually sought long before the cyst attains a size at all approaching that of the one here recorded.

A few large sublingual cysts have been reported, one of the most interesting amongst them being a case noted by Flinn. In this patient a small rounded swelling, the size of a pea, was noticed lying below the tongue on the second day after birth, and it slowly enlarged to the size of a hazel-nut. It then remained quiescent until the patient had reached the age of 23 years, when it began quickly to enlarge until it filled the mouth and projected in the submaxillary region, its diameter being 5 or 6 inches; it produced rather severe dyspnoea.

In another case the cyst at 10 years of age was the size of a hazel-nut; at the age of 29 the man could not close his lips, and there was huskiness and dyspnoea.

These cysts have their origin in groups of epithelial cells which remain enclosed in the mesoblastic connective tissue; they are of the type called by Bland-Sutton "sequestration dermoids." They are found to originate precisely in the middle line, lying in the septum of the tongue at any point between the mandibular symphysis and the hyoid bone, to one of which bony points there usually runs a firm fibrous band of attachment.

Sublingual dermoids have to be distinguished in diagnosis chiefly from ranulae, which have a bluish, translucent appearance in contradistinction to the whitish-yellow colour of the dermoid; ranulae, again, are much softer, and present easy fluctuation as compared with the putty-like consistency of dermoids, which pit on pressure. As the cyst enlarges the first noticeable change is in the speech, which becomes gradually less clear, the "s" sounds being first affected; swallowing is next interfered with, saliva dribbles from the mouth, and if treatment