simultaneously. In the design for the permanent bomb four point sources are placed approximately at the corners of a square, the radiation from each being restricted to a cone of any desired shape by means of lead screens, each cone, of course, employing a separate area of skin at entry, but all covering the depth point; the distance from the source to the skin is normally 6 cm., but can be increased to any desired extent, and also, if found desirable, reduced to 4 cm. The normal "relative depth intensity" at a depth of 10 cm. being 25 per cent., no difficulty would be experienced in using four ports of entry for the "bomb," thus making the relative depth dose 100 per cent. The "relative needle intensity" would then be, at a 10 cm. depth, one-half the standard needle intensity. Radiation will be permitted on both sides of the square referred to, one patient being treated by each beam. The normal axis of the beams will be at about 45 degrees to the ground, and each beam separately adjustable in shape and size with separate screens. The patients will be parallel to one another on different levels, this arrangement permitting a greater latitude of adjustment between one patient and bomb without interfering materially with the adjustment of the other patient. It has been said that adjustment requires some considerable time, so that when two patients are treated the adjustment of one would interfere with the treatment of the other were adequate protection provided for the worker during this adjustment. It is proposed, therefore, to make the necessary adjustments with a dummy "bomb" symmetrically situated with respect to the one containing radium. It will then be possible to perform the adjustment at leisure without fear of harm from the radium, and yet to continue the treatment of the patient already in position. The adjustment effected, the patient will be transferred mechanically from the dummy to the real "bomb," and the necessity for the worker to approach it, except in cases of emergency, will be avoided.

Designs for the permanent "bomb" have been prepared, and will be published in due course.

EARLY GRAVES'S DISEASE.

BY

JOHN H. HANNAN, M.A., M.D., B.CHIR.CANTAB.,
REGISTRAR AND PATHOLOGIST, HOSPITAL FOR WOMEN, SOHO SQUARE.

THE cause of Graves's disease has yet to be found, but there can be small doubt that a connexion exists between the condition of the nervous system and the severity of the symptoms associated with this disease. In many instances a history of sudden shock or a period of prolonged emotional strain can be traced in the period before the onset of the disease.

In recording a case recently under my care I have two objects in view—namely, to lay stress upon the difficulties associated with the diagnosis of early cases, and, secondly, to show that by controlling the nervous symptoms of the syndrome a complete cure may occur, in some instances, without any other treatment. The following is an abstract from my notes of the case, which commence on February 1st, 1928.

A blonde woman, aged 21, consulted me complaining of loss of weight, which had been steadily increasing for some six months, associated with profuseness of menstruation, which had been hitherto regular in nature. In the past few weeks she had felt easily fatigued after the slightest exertion. Constant hunger was complained of, but attacks of diarrhoea and vomiting prevented her from indulging her craving for food. In the past fortnight she had had two attacks of fainting, in which she was unconscious for some hours.

On talking over the history with her father, I ascertained that two colleagues had diagnosed her condition as being due to early tuberculosis, and based their diagnosis on a history of night sweats and the progressive loss of weight. On examination I found that she was markedly emaciated; the skin was moist—in fact, she was perspiring freely, a phenomenon which, she said, occurred with distressing frequency. The pulse was feeble, and the rate varied

between 120 and 140 beats per minute at different periods during the examination.

A thorough general examination was made, particular attention being paid to the condition of the lungs and the pelvic organs, with, however, negative results. On careful cross-examination I ascertained that the hot sweats occurred during the day as well as during the night. It became obvious during the examination that the girl's nervous system was profoundly disturbed, and that she was extremely restless; a fine tremor of the hand was constantly present.

Bearing in mind the clear syndrome presented by the foregoing symptoms, I made a provisional diagnosis of Graves's disease, and proceeded to look for the classical signs of this disease. The thyroid gland was found to be but slightly enlarged, not more so than commonly occurs in young women. Exophthalmos was absent; von Graefe's sign was not present. Stellwag's sign (widening of the palpebral fissure caused by a spasmodic retraction of the upper eyelids) was, however, present. Goetsch's test (reaction of the pulse rate and blood pressure to subcutaneous injections of adrenaline) was applied, and found to be positive. The urine was normal. The patient's weight was 7 st. 10 oz.

Finally, the patient was closely questioned, and I ascertained that she was greatly worried over her occupation as a typist, and that the symptoms of which she complained had come on shortly after obtaining employment in this capacity. A basal metabolism estimation was suggested to the father, but consent for this was not given owing to the extreme state of nervous exhaustion which my examination had produced.

I have, for some time, been engaged in investigating the syndrome of the menopause, and I have shown elsewhere that the change of life is associated with many symptoms which are present also in Graves's disease. In particular, I have shown^{1 2 3} that women at the menopause have an increased sensitiveness to adrenaline injections similar to that exhibited by cases of Graves's disease in general and the case under consideration, this adrenaline sensitiveness forming the basis of Goetsch's test for early exophthalmic goitre. Furthermore, I have also published evidence⁴ that the disturbance of the nervous system in women at the menopause is readily controlled by small doses of sodium veronal. I therefore prescribed a simple mixture, in this case consisting of sweetened water (to disguise the bitter taste of the sodium veronal) and sodium veronal, in such a dosage that the patient would take 1 grain of sodium veronal three times daily in a tablespoonful of the mixture. She was then instructed to report weekly.

The progress of the case was dramatic. On August 28th, 1928 (some seven months after commencing treatment), her weight had risen to 10½ st., all her symptoms, including the menorrhagia, had disappeared, and her pulse rate was now 65 beats per minute and of good tension. At the present time she is entirely normal and back at work.

It is interesting to note that some four weeks after seeing me for the first time exophthalmos became obvious and von Graefe's sign was positive. After this time, the exophthalmos became quickly better and von Graefe's sign disappeared. Stellwag's sign, which was the first to appear, was the last to disappear—namely, at four months after commencing treatment.

Several points of interest arise on considering this case. In the first place, we have the confusion which arose between the diagnosis of early tuberculosis and early Graves's disease without exophthalmos and without marked enlargement of the thyroid. In particular, I would draw attention to the importance of Stellwag's sign in these cases, which others, besides myself, have found to be present before exophthalmos becomes a feature of the syndrome. Furthermore, I would suggest that Goetsch's test might be more frequently employed with advantage in cases of this nature.

With regard to treatment, I feel that more attention should be given to the control of the nervous symptoms associated with Graves's disease than is done at present, and suggest that all patients showing evidence of this syndrome should be given a course of sedative treatment with sodium veronal before more drastic measures are undertaken.

REFERENCES.

- ¹ *The Flushings of the Menopause*, Baillière, Tindall and Cox, London, 1927. ² *British Medical Journal*, July 2nd, 1927, p. 14. ³ *Endocrinology*, 12, 1, 1928, 59-64. ⁴ *Practitioner*, October, 1927.