

With the small dosage necessary in dysmenorrhœa cases, the brown layer begins to peel off in about one month after the cessation of treatment, leaving a perfectly healthy skin surface. The skin is fully fit to stand operation, should this be necessary, within two months.

Danger of Faulty Technique.

That great harm can be done by faulty technique must be admitted; but this can be said of most modern methods of treatment. The risk in skilled hands is practically nil. And it must be remembered that—if the conditions stated at the beginning of this article have been fulfilled—either there is no alternative, or the alternative is a major operation.

To the majority of such patients life is literally not worth living, and I personally have found no class of sufferers so pathetically grateful for relief as women thus afflicted. It is essentially a disorder of young women, and ruins the best years of their life, often preventing marriage; or, what is worse, making it a failure.

As to choice of cases, the more nearly one approaches to the type described in the early part of this paper, the more likely is it to benefit by X ray treatment. When pain is prominent rather than loss of blood, cure is less probable, but a trial should be made.

Recent Cases.

The present writer first referred to this subject in an article published some years ago, in which details of several cases were given.² Two more recent ones are quoted below.

L. B., school-teacher, 30. First seen January, 1918. All her life had been troubled by excessive loss at periods. Of late years the condition had become steadily worse. Periods lasted ten days, and the free interval was less than a fortnight. There was a good deal of pain and headache at the time, and 2-3 days had to be spent in bed. She was in danger of losing her position and was in a very depressed state, threatening suicide. She had had prolonged treatment from her medical attendant and was certified by a gynaecologist to be apparently free from organic disease. X ray treatment at first aggravated the condition, and the interval succeeding the commencement of treatment was so short that X ray dosage was continued through a part of the second period—a departure from the usual procedure. The free period following lasted three weeks, and the succeeding period—the third after the commencement of treatment—was almost normal. A complete cure seems to have resulted, as the patient wrote in December, 1918 (seven months after stopping all treatment), to say that she was quite well.

The above case is typical of those in which a large measure of success may reasonably be expected. In one such as the following less confidence can be expressed.

C. M., 28, spinster. Had suffered since the age of 14 from painful menstrual periods lasting 6-7 days. Flow somewhat greater than normal. Headache severe for 3-4 days at the time of periods. Year by year the condition had become worse. General health in intervals indifferent, and patient was unable to follow any regular occupation. The uterus and both ovaries were slightly enlarged and tender to palpation. The girl was very miserable, and a gynaecological surgeon suggested complete removal of the organs if no other means of relief could be found. As a final resort before operation it was decided to try X rays. The second period after the commencement of treatment was considerably better, in so much that the bleeding was less and that it lasted only five days. Pain also was not so violent. Two more "interval courses" of X rays were given, but no further improvement occurred, and, in view of the possible final necessity for operation, it was not considered desirable to push the treatment. Result: Periods reduced to five days instead of 6-7. Flow normal. Pain more bearable. General health improved. Patient writes three months after cessation of treatment to say that, on the whole, she remains much better than before she had X rays.

In the above instance X ray treatment succeeded only to a limited degree, but it enabled the patient to avoid a serious and mutilating operation, at least for the time. I am not to be taken as opposing the operation of pan-hysterectomy in intractable cases of dysmenorrhœa, provided every other possible means of relief have been tried without success, *but X rays should always be remembered as among the most powerful of these means.*

The radiologist, holding, as it were, a position midway between that of the physician and the surgeon, has no need to encroach upon the domain of either. The patient with

dysmenorrhœa should first receive medical treatment—the term "medical" being used in its more limited sense. If this fails, it should be ascertained whether there is any recognised surgical cause for the trouble, such as a contracted os, or whether any condition exists dangerous to life—e.g., septic endometritis, large fibroid, uterine cancer, &c. Failing the presence of any of the above, X rays should be tried before major surgery is resorted to.

The vexed question as to the treatment of uterine fibroids I do not purpose entering on here, except to say that *small* fibroids associated with excessive bleeding at the menstrual periods, but not in the intervals, can be successfully dealt with by X rays in women near the menopause.

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IODIDES AND THE THYROID.¹

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THE specific relationship between the thyroid gland and iodine was first pointed out by Baumann, who discovered that the normal thyroid contains a considerable amount of iodine in organic combination. Iodine is a frequent constituent of cells generally, but the thyroid contains relatively 8-10 times more than any other organ.

Baumann obtained from the thyroid by a somewhat drastic means a substance which he believed to be the active principle called iodothyron, and looking upon it as the cause of the remarkable effects upon metabolism. Oswald has, however, shown that iodothyron is an artificial product, and that its mother substance is an iodised protein, iodothyroglobulin, from which iodothyron can only be obtained by breaking up the protein molecule.

An extract of the gland made with physiological salt solution contains all the iodine-containing substance, and gives relief in hypothyroidism; but so do various organic and inorganic preparations of iodine, though to a less degree.

Considerations as to the Active Principle of the Gland.

Are we, then, entitled to consider that iodine is the active principle of the gland? This theory has been advocated by Swingle, who considers that the iodine plays the part of an hormone, but before accepting it certain points require consideration; the presence of iodine in the thyroid is no proof that the activity of the organ is dependent upon its iodine-content, for one function of the thyroid may be to absorb iodine, another to provide a specific internal secretion. Even the fact that iodine is specifically absorbed by the thyroid, and perhaps stimulates secretion, does not prove that iodothyroglobulin constitutes the internal secretion of the gland. Carlson and Woelfel failed to find iodine in the lymph flowing out of the thyroid. Moreover, the iodine-content of the thyroid is subject to much variation and is greatly influenced by the amount of iodine in the food. The thyroid of carnivora contains little or even no iodine; the amount of iodine is greatest in herbivora, omnivora take a middle place. The thyroid of dogs can be made iodine-free by feeding on an exclusively flesh diet, and still the functions of the gland remain unimpaired. The fetal thyroid and the thyroids of newly born infants contain no iodine, yet in sucking animals thyroidectomy, after removal from the mother, produces its characteristic effects.

The iodine-content of the human thyroid is very variable; Jolin, in extensive investigations in Sweden, found these variations so great that he regards the iodine as of quite secondary importance; he was also unable to detect any connexion between iodine-content and health. Abelin found that a thyroid extract containing much iodine did not differ in activity from one containing little. During the administration of an iodide the iodine-content of the gland may rise to 4-5 times the average normal, and yet in the treatment of cretinism or myxœdema iodides are not so successful as is the taking of the gland itself. In view of these facts it appears at least improbable that the iodine plays an important primary rôle in the activity of the internal secretion of the thyroid.

Is, then, the active principle likely to be a protein? There are several facts which tell against such a

² Practitioner, vol. xcii., p. 716.

¹ Abstract of a post-graduate lecture delivered at the London (R.F.H.) School of Medicine for Women.

hypothesis. Abderhalden and also Herzfeld and Klinger got characteristic effects with protein-free extracts of thyroid. Abelin found that thyreoglaidol, a protein and lipid-free preparation, has the same effect on metabolism as the gland itself; indeed, the efficacy of the per os treatment with the dried gland would seem to indicate that the active principle is not a protein. An iodised protein which v. Fuerth employed was split up in the cat's intestine so that iodine appeared in the cells of the gut wall and in the blood, not as iodised albumin or peptone, but in inorganic form. Abelin considers it likely that the active principle of the thyroid is formed from protein in the cell metabolism of the gland, much as adrenalin arises from the protein of the adrenals. The investigations of Kendall go a long way to confirm this opinion, for he has obtained from thyroid a crystalline body of definite chemical constitution to which he gives the name thyroxin. It is an indol derivative, trihydro-triiodo-a-oxyindol-propionic acid, and Janney, who has clinical experience in the use of Kendall's preparation, considers that it is an hormone possessing the functions ascribed to the thyroid secretion. Kendall does not think that the iodine is of primary importance, and hence the omission of any reference to it in the name which he has given to his preparation.

An Apparent Paradox.

There is, then, considerable probability that the active principle of the thyroid is a breakdown product of protein which may be, but is not, necessarily iodised. Iodine, if present, has apparently no direct effect upon the activity of the internal secretion, and yet there is no doubt that when that activity is diminished it can often be restored to a certain extent by administration of iodides. Is there any explanation of the apparent paradox?

Jobling and Petersen have shown that unsaturated fatty acids have a powerful effect in inhibiting autolysis, but that in presence of iodine these acids on becoming saturated lose their inhibitory effect, so that the ferments causing autolysis are free to act. We have seen that the active principle of the thyroid is probably produced by the breakdown of protein in the gland—i.e., by autolysis. This process would, according to Jobling and Petersen, be facilitated by the presence of iodine in the gland, because the inhibitory effect of unsaturated fatty acids in the blood would be diminished or done away with owing to their saturation with iodine.

An inefficiency of the thyroid secretion might conceivably depend upon an excess of unsaturated fatty acids in the blood checking the autolysis by which the thyroid secretion is formed and in such cases the administration of iodides would be effective by promoting the saturation of the acids. If the inefficiency of the thyroid were due to destruction or removal of part of the gland, the activity of the remainder might well be increased by iodides which are specifically taken up by the gland, and would there favour the characteristic autolysis by checking inhibition.

Possibly the curative action of iodides in tertiary syphilis may be explained by the thyroid effect of the drug in thus favouring an increase in the active secretion passed into the blood, and so facilitating the absorption of lowly organised tissues such as gummata, &c. The same would apply to the use of iodides in the treatment of enlarged lymphatic glands.

If the above premises are correct they suggest that tertiary syphilis might be at least as successfully treated with thyroid as with iodides; indeed, one might anticipate a quicker result, and, moreover, there would be no fear of iodism.

Summary.

The action of iodides in relieving a condition in which the thyroid secretion is deficient is due to two facts: (1) iodine is specifically absorbed by the gland; (2) the iodine in the gland in saturating the unsaturated fatty acids of the blood-supply favours the autolysis by which the active principle of the gland is produced.²

The efficacy of iodides in tertiary syphilis may be explained on these lines, and it is anticipated that tertiary syphilis may be successfully treated with thyroid.

² The usefulness of cod-liver oil in tuberculosis may be in part due to its high content of unsaturated fatty acids limiting to some extent the production of thyroid excretion, and so serving to prevent the absorption of the lowly organised tubercle tissue and the setting free of the bacillus.

Clinical Notes : MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF NERVE TRANSPLANTATION.

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NERVE transplantation now being on its trial for war injuries of nerves, the following case, though only partially successful, is deemed worthy of record.

The Case Described.

Pte. S. was wounded in the left arm on Jan. 6th, 1916. There was a fracture of the humerus with clinically complete musculo-spiral paralysis. Several operations were needed before healing occurred, and then a large scar resulted very adherent to the bone. On Oct. 1st, 1917, the musculo-spiral nerve was exposed and found to be completely divided, with bulbs adherent to the bone. After excision of the bulbs the nerve ends could not be stretched to within an inch of each other. The external cutaneous nerve of the thigh was then searched for, and found with some difficulty as it was abnormally small. A length of two inches was removed, divided at its middle, and the two one-inch lengths so formed were stitched into the gap in the musculo-spiral side by side. A branch to the triceps, which was also implicated, was at the same time stitched in to the upper junction. The muscle was then stitched over the bone, between it and the bridged nerve, and the wound closed.

The wound healed well and the man was shortly after discharged from the Army and went to reside nearer his home in the north, where he was treated by electricity and massage as an out-patient. It was thought that his chance of recovering the function of the injured nerve was very small.

He was next seen by me on May 31st, 1918 (about eight months after the operation). Epicritic sensation, which had been lost on the outer side of the forearm owing to the low branching of the nerve, had then recovered. The wasting of the extensors and supinators was obviously less. There was slight but definite action both of the supinators and of the extensors of the wrist. There was no action of the extensors of the fingers and thumb. The grasp was good and the man was starting work. He was supplied with a "long cock-up" splint and told to wear it at night only.

Result of Further Examination.

Another examination has been made recently (May, 1919). The patient has been working since last seen. There is fair power in the supinators and in the wrist extensors, and there is slight power in the long extensors of thumb and fingers, so that one may hope that the man will still continue to improve.

The scar in the arm is still somewhat adherent to the bone, and probably to the repaired nerve also. I consider that had more attention been given to the excision and "toilet" of this scar a more complete and earlier recovery would have resulted.

I am indebted to Colonel C. J. Bond and to Dr. Annie C. Greenep for advice and help in this case.

A CASE OF STOMACH AND BOWEL ATONY IN INFLUENZAL PNEUMONIA.

BY NORMAN BRADLY, M.D.

IN THE LANCET of March 15th Mr. R. Eccles Smith has drawn attention to this condition in his paper on "Influenzal Intra-abdominal Catastrophes." The following case is recorded to show the value of pituitrin in this condition.

Account of Case.

Miss —, aged 21, was taken ill on March 4th and developed signs of pneumonia on the 9th. Toxæmia was profound, hæmoptysis was a recurring symptom, and severe cyanosis was constant, the administration of oxygen being almost continuous. On the 15th occasional vomiting of altered blood commenced and the pulse became markedly intermittent; on the 18th the temperature dropped to sub-normal, resp. 40-48, pulse 96; vomiting persisted and became