surely to means for the relief of suffering in mankind ; and it might be well were we to accept this guidance more readily in regard to our women, and urge insistently that the mothers of our race be fed with knowledge and understanding.

Lymphadenoid Goitre and Graves's Disease

A lecture might, by itself, be devoted to this subject, so much is the health of the thyroid gland and its departures from health associated with perfect nutrition on the one hand, and with faulty nutrition on the other. Lymphadenoid goitre, originally described in man by Williamson and Pearse (1925), is "the hypertrophic reaction of a physiologically inefficient organ with which there occurs a preponderance of lymphocytic aggregates, fibrosis, and a peculiar atrophy of the parenchyma." I have produced it under experimental conditions in rats (McCarrison, 1927). In these animals the physiological inefficiency of the gland can be induced by faulty nutrition, but the exciting cause of the goitre is some positive factor which has so far escaped me. One cannot be sure when this type of goitre is going to occur ; all that one can be certain of is that it surely will occur, in its own good time, provided the food is of a certain character. It is unrelated in its origin to iodine deficiency. I understand that it is now possible to diagnose this condition clinically in the human subject, and that thyroidectomy has been performed for its relief in not a few cases within recent years in London. Mention of its association with the use of foods deficient in vitamin A recalls the observation of Rabinowitch (1929) that a combination of relatively minute quantities of organic iodine, with a concentrated preparation of fat-soluble vitamins,

causes as marked a lowering of the metabolic rate in Graves's disease as larger doses of iodine when not combined with these vitamins. Fraser and Cameron (1929) have made a similar observation, using small amounts of sodium iodide instead of organic iodine. More recently Abelin (1930) has demonstrated the great value of vitamin treatment in Graves's disease.

"The hyperthyroid condition," he writes in his recent book, "is one of the abnormal raising of the metabolic rate, together with a lowering of anabolic processes. This disorder of lowered activity of cells can be successfully combated through nutrition. Among other things, for this purpose, the co-operation of vitamins is necessary. The organ destruction in thyrotoxicosis is caused by a vitamin-poverty in the body. The need for vitamin supply is, therefore, increased in hyperthyroidism. Through plentiful use of vitamin-rich substances—cod-liver oil, egg-yolk, yeast, tomatoes, spinach, etc.—the great destruction of sugars has been reduced or almost completely overcome successfully in animal experiments."

Again, it has lately been shown, in my own laboratory, how important is the balance between fat-soluble vitamins and iodine in the diet. The administration of iodine to rats fed on diets deficient in these vitamins may actually cause goitre (McCarrison, 1930). We have found, also, that the maintenance of an adequate iodine content in the thyroid gland is largely influenced by the content of vitamin C in the food (Sankaran, 1931). Few organs of the body, indeed none with the exception of the suprarenals and thymus, are more profoundly affected by faulty nutrition than the thyroid gland, and few are more sensitive to this influence.

My second lecture will deal with the causation of urinary calculus.

THE TREATMENT OF DYSMENORRHOEA *

BY

B. VENN DUNN, M.D., F.R.C.S.ED.

Recent investigations have facilitated the treatment of dysmenorrhoea on a more rational basis than has been possible in the past. The old classification of dysmenorrhoea into spasmodic and congestive varieties may be discarded for several reasons. In the first place the terms are not relative ; "spasmodic" denotes a disorder of function, whereas "congestive" implies a morbid anatomy. Secondly, the two forms cannot be easily differentiated ; cases frequently occur each with a different morbid anatomy, all with similar symptoms—those of spasmodic dysmenorrhoea. Thirdly, there is a danger of cases being labelled "spasmodic," without sufficient examination having been made. The importance of a complete investigation of every case of dysmenorrhoea cannot be too greatly stressed.

CLASSIFICATION

The following classification has been found of practical value in the investigation of cases :

1. Psychological.
2. Endocrine.
3. Mechanical.
4. Gross pathological.

The treatment of the patient will vary according to the category to which the case belongs.

THE PSYCHOLOGICAL TYPE

This applies to those patients, often in their teens, but sometimes much older, who have had an unhealthy psychological upbringing. They may, from their earliest years, have had their simplest physiological acts asso-

ciated with feelings of shame and repugnance. Such an association is bound to make a child magnify any slight discomfort experienced at a time when she is undergoing rapid mental development and in a region she has been told is so important as to be unmentionable. Perhaps, also, too much may have been made of any slight disability the child may have felt in the early months of puberty. The overanxious parent insists on the child lying up when it is more than ever necessary that the circulation in the pelvic area should be encouraged. Gradually a habit of pain becomes formed, the nerve paths for pain become especially sensitive from much use, and, unless a new hygiene is quickly enforced, dysmenorrhoea may continue for the rest of the sexual life.

The treatment of this type of case varies with the age of the patient. The great hope is to catch her young, and before the habit of pain is too well formed. Then we must be ready to spend a good deal of time, first with the patient's parents (either or both) and then with the patient herself. The matter must be talked out. These are the cases which do well under the regime recommended by the Medical Women's Federation, whose leaflet, "Advice regarding menstruation," consists of an exhortation to "business as usual" during the menstrual period. It insists on the necessity of the daily warm bath throughout ; it advocates an adequate amount of exercise, while it deprecates "long expeditions and cycle rides or matches or competitions in which there is a strong incentive to exhaust the reserves of strength." The use of a system of physical exercises such as that published a few years ago by Dr. Harold Dearden, under the title of "Exercise and the will," is extremely valuable for these girls. The older patients with this type of dysmenorrhoea are a trouble to their medical advisers as well as a nuisance to themselves. The only people who profit by them are the vendors of patent medicines and the retailers of gin.

* Abstract of a paper read before the Torquay Medical Society on March 19th.

A woman, aged 40, recently presented herself. She had always suffered from violent pain at the periods. There was no apparent abnormality in the pelvis. She had commenced life with a father who idolized her, and a mother who thought she was a nuisance, because the child interfered with her hunting. The sequence of an expensive education, marriage into the Army, childbirth (the child did not survive), colonizing in Africa, and eventually divorce, had failed to subdue the periodic pain. Month by month she retired to bed and subsisted on gin and hot water. After many conversations and much encouragement she is at last beginning to pull herself together and live a more normal life.

ENDOCRINE FACTORS

When we come to discuss the endocrine causes of dysmenorrhoea, the possibilities are numerous, and it is only by keeping strictly to the facts that it is possible to correlate certain definite clinical types with glandular dysfunction. The modern theories of menstruation have recently been well ventilated by Cannon,¹ James Young,² Teacher,³ and others, and it is necessary here to make only a brief survey. The alpha hormone of the anterior pituitary gland stimulates the production of oestrin by the ovary, which in its turn causes congestion of the uterus. This congestion is probably the forerunner of that type of menstruation which occurs without ovulation; it also assists in the more normal type which follows ovulation. The beta hormone of the anterior pituitary stimulates the formation in the ovary of lutein tissue, which governs the preparation in the uterus for nidation and gestation of the fertilized ovum. If fertilization fails to occur the scaffolding is cast off. It is the rhythmic variation in the supply of these hormones which results in menstruation.

Overaction of the anterior pituitary, overproduction of the alpha hormone, and overproduction of oestrin by the ovary may be responsible for that type of dysmenorrhoea which occurs in early developed young women who started to menstruate early and copiously, and who have well-marked secondary sex characters. This class of patient benefits mostly by active elimination during the few days immediately preceding the period. In addition to the exercises and baths recommended in the last section, the administration of magnesium sulphate first thing in the morning for three days prior to the expected period is often productive of very favourable results.

The reverse type to this is the under-developed late-menstruating girl whose flow is scanty and whose interval is prolonged. She has a flat chest and narrow hips. She is good at games and something of a tomboy. There is, we may reasonably suppose, inadequacy of the alpha hormone and shortage of oestrin. We should expect benefit to accrue from the administration of anterior pituitary extract or from oestrin. Three years ago I gave sistomensin in a series of twelve cases of dysmenorrhoea. I was disappointed with the results. Only three out of the twelve showed any definite signs of improvement. I think that may have been because the cases were not definitely selected. Dr. James Young, in a personal communication a few weeks ago, said:

"With regard to dysmenorrhoea I have been employing sistomensin in the form of two tablets daily for the ten days preceding the onset of the period, and in addition one ampoule hypodermically twice weekly the week before the period. We now have a large number of successful cases so treated."

Interesting in this connexion is the work of Collip and Campbell⁴ of Montreal. They have separated the alcoholic extracts of human placenta into three fractions, each having distinctive physiological properties. The second fraction represents 85 per cent. alcohol-soluble material present in the original extract but from which oestrin had been extracted with ether. They call the substance

"emmenine," and with it they produced oestrus in immature rats. The action resembled that of the alpha hormone of the anterior pituitary. Applied to the treatment of dysmenorrhoea, twenty-six out of thirty-six cases are said to have been relieved. There has as yet been no opportunity of employing this substance, but the rationale of the treatment is good and its outlook distinctly hopeful in this type of case.

A third endocrine cause of dysmenorrhoea may rest in overaction of the beta hormone with increased lutein action in the ovary. This probably accounts for those cases of dysmenorrhoea described by Beckwith Whitehouse,⁵ which he suggested were due to difficulty in disintegration of the surface layers of the endometrium. He believes that the transient exacerbations of pain which are so characteristic are due to the passage of abnormally large flakes of endometrium, and that what is usually called membranous dysmenorrhoea is really just an extreme form of the process which causes pain in the more ordinary cases. The treatment of this type, as in all cases of hyperfunction of the endocrine system, must depend either on drugs or on surgical intervention, and will be dealt with along with mechanically caused cases.

MECHANICAL CONSIDERATIONS

In this group I place cases in which the neuro-muscular mechanism of the uterus is at fault. Now the neuro-muscular mechanism of the uterus displays an interesting property, which has been designated "polarity"—a simple indication that there is a co-ordination of fundal contraction and cervical dilatation. The normal rhythmical contractions are increased in intensity during menstruation; if, then, the cervix fails to follow the lead and dilate sufficiently, the uterus will be thrown into spasm. This is not the only instance in the body where young developing tissue suffers from antagonism in the co-ordination of the neuro-muscular function. An analogy is congenital hypertrophic stenosis, in which there is no actual stenosis of the pyloric canal, and yet the intense spasm of the pylorus refuses to allow the stomach contents to reach the duodenum. In many cases of dysmenorrhoea the uterus is abnormally small, and it has been found that the proportion of muscle to fibrous tissue is low. If, associated with this neuro-muscular deficiency, there is to the outflow from the canal a partial obstruction, due to extreme ante flexion, to contraction of the external os, or to abnormal contents such as blood clot or large shreds of decidua, it is not surprising that the uterus is thrown into painful spasm in its attempt to fulfil its physiological functions.

The difficulty of any cut-and-dried classification is that there is bound to be a certain amount of overlapping, and in this class there are many cases which will benefit from endocrine treatment. In particular, where the faulty mechanism can be associated with other symptoms of thyroid deficiency, I have found that the administration of thyroid in conjunction with other measures has brought about relief. In cases in which the cervix is conical in shape and the os unduly small, dilatation either alone or combined with a plastic operation is the method of choice. To be efficacious dilatation must be sufficient. The cervix should be dilated up to number 14. Further, the patient must be warned that the operation may have to be repeated in three months' time. When operation is refused or is inadvisable, or sometimes as a concomitant to operative treatment, atropine is of considerable value. Commencing two days before the expected onset of the period, 1/200 to 1/100 of a grain should be given three times a day. Symptoms of idiosyncrasy to belladonna must be watched for. The pharmacology of atropine is interesting. Applied to nerve-muscle preparations of the uterus, it increases muscle tone, decreases the amplitude of the contraction, but increases the rate.⁶

Atropine acts on the uterus in the same way that it acts on the intestine—namely, it arrests only certain abnormal violent forms of contraction without interrupting the path of nervous impulses from the spinal cord to the uterus.⁷ It therefore aids normal uterine polarity by making the contraction of the fundus more smooth, and at the same time relaxing the spasm of the sphincter muscle at the internal os. In severe cases it is often advisable to combine the antispasmodic with an analgesic and a sedative in the following cachet: luminal 1/2 grain, pyramidon 5 grains, ext. hyoscyamus 1 grain.

In cases where these measures prove unavailing to arrest the complaint there are several others at our disposal. Subtotal hysterectomy must be mentioned only to be condemned as an admission of failure. The recent French work on resection of the presacral nerve is interesting. Binet,⁸ in a report on thirty-two cases of pelvic pain, claims that relief is usually secured. He removes the whole of the tissue, including the sympathetic fibres lying between the common iliac arteries. He says it is "a simple operation, easy, and, above all, efficacious." In Germany, Bloss⁹ has treated dysmenorrhoea by the injection of alcohol. He believes that dysmenorrhoea is due to increased sensitivity of the ganglia governing the uterus. At each side of the cervix is injected 5 c.cm. of 70 per cent. alcohol, containing 5 per cent. novocain. He says that the treatment has given excellent results for ten years, with no harmful effects even on child-bearing.

GROSS PATHOLOGICAL CONDITIONS

Lastly, there are those cases of dysmenorrhoea which are due to some gross pathological condition. The lesion may be anything from a simple cervical erosion to generalized pelvic cellulitis or new growth. The age of the patient will give no indication whether the pain is due to some functional or endocrine derangement or to organic change. There is only one way in which a correct diagnosis can be made—by a thorough examination of the patient. If the patient is a young woman, often even if she is older, it is necessary to examine her under an anaesthetic. The lithotomy position, and a visual examination of the vaginal vault with speculum and terminal mirror, followed by a careful palpation of the uterus and adnexae, are the minimum necessities. The following case is of interest:

A young woman, aged 15, recently presented herself. She was remarkably developed for her age. The secondary sex characters were those of a well-developed woman. She complained of right iliac pain accompanying her periods; indeed, so definitely was the pain localized that her appendix had already been removed. She first menstruated at 11 years of age, her periods occurring every twenty-one days. The pain began the day before the period; it was spasmodic in character, lasted for two days, and then gradually subsided. On examination under an anaesthetic, the left ovary was found to be replaced by a cyst the size of a cricket ball, while the right ovary was enlarged and prolapsed into the pouch of Douglas. At the operation, the cyst was removed, and the right ovary (which was very congested and more than twice its normal size) was stitched into a pocket in the peritoneum. There has been no return of the disability. I quote this case to illustrate the absurdity of attempting to treat dysmenorrhoea from a symptomatic point of view. The patient had already been treated with an oestrin preparation, though it was quite obvious that she was sexually over-mature, and that endocrine treatment could do nothing but harm.

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MINOR SURGERY OF INFANCY*

BY

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As we treat children until the age of 5 years in this hospital the following remarks are only applicable up to that time of life. There are many minor surgical conditions with which one is faced during the period of infancy. I have chosen a few of these conditions, and will describe a simple method of dealing with each.

HERNIAE

Hernia is very common in infancy. Large numbers of children are born with inguinal and umbilical herniae. The treatment of umbilical herniae has, in the past, usually been carried out by physicians. These learned gentlemen took great pride in strapping halfpennies, suitably covered with lint, over the protuberant umbilici

FIG. 1.

FIG. 2.

FIG. 1.—Aneurysm needle being passed subcutaneously round the neck of the hernia.

FIG. 2.—The ligature in place before it has been tied.

of the stream of infants constantly passing before them in the out-patients' department. Given patience, persistence, and perseverance, this method eventually leads to the disappearance of most umbilical herniae. I have recently ligated the neck of the sac of these umbilical herniae subcutaneously, with the result that the hernia is cured in five minutes instead of the more usual five months. The procedure is simple in the extreme. A local or general anaesthetic is administered and a small stab is made through the skin at the base of the hernia. A blunt aneurysm needle is passed through the stab wound, and, subcutaneously, round the neck of the sac. It is brought out at a diametrically opposite point on the skin through another stab incision. The needle is threaded with a piece of No. 2 catgut and is withdrawn. The needle is inserted through the original stab incision and worked round the base of the sac in the opposite direction, brought out at the second incision, and threaded with the remaining end of the catgut. When the needle is withdrawn a catgut loop surrounds the base of the hernial sac, which is then grasped and squeezed to make certain that it is empty. The ligature is tied. The stab wounds are so small that it is not necessary to stitch them, and they are sealed off with a dressing of Whitehead's varnish. I am indebted to Mr. Boyd for suggesting this method of dealing with these herniae, and I have successfully treated a number of infants by the technique described above.

Inguinal herniae in infants are treated by operative means. The operation for inguinal hernia in an infant, provided that the testicles have descended, is no more than a subcutaneous ligation of the neck of the sac of

* A lecture delivered to post-graduates at the Infants Hospital, Vincent Square, London.