Other Pelvic Disorders.

There were 59 cases of retroversion considered to require operative treatment, and dealt with by means of Webster's sling. I find this to be the most satisfactory of the 87 operations which have been devised in recent years for the correction of retroversion. Many of the cases were complicated by the results of old pelvic infection, and in several dyspareunia due to prolapsed ovaries was the leading indication for treatment.

Uncontrollable bleeding at the menopause was treated by supravaginal hysterectomy in 10 cases, which, I am given to understand, could have been dealt with successfully by means of radium. There were also 13 cases of ectopic gestation requiring salpingectomy, and remarkable only because they included no example of rupture with haemorrhage demanding "urgency" operation.

Further, there were 23 unclassified abdominal sections whose consideration is outside our present purpose, interesting as many of them were. They included an inverted uterus, a double uterus, a sequestered ovarian adenoma implanted on the rectum, diverticulitis, a renal sarcoma adherent to an inflammatory mass in the pelvis, a cyst of the common bile duct, desmoid growths of the abdominal wall, various cases of hydroperitoneum of obscure origin, and various cases of tuberculous peritonitis involving the genital organs. There was no case of primary genital tuberculosis.

Review of Abdominal Operations.

Thus there were 545 abdominal sections in all, and the deaths were 18 in all—that is, 3.3 per cent. It is clear that the mortality could be kept lower than this by selecting the cases; but if operation is undertaken whenever it is thought that life may be prolonged or that suffering may be relieved, a number of post-operative deaths must occur. A careful study of the notes of the 18 patients who died brings out a striking fact which is not always kept in mind. Only three of the eighteen were in ordinary good health when they came for treatment. The other fifteen had been injured by prolonged bleeding, by infections and degenerations, or were the subjects of malignant disease. The three healthy persons died from shock, embolism, and pneumonia respectively. In the other fifteen, pathological factors had been at work before treatment was sought. The lesson is that the removal of lumps from the pelvis and abdomen is like making a will—it should be done in time of health. Three deaths in 545 is $5\frac{1}{2}$ in 1,000, and we know that four deaths occur in 1,000 cases of labour. Thus, when a woman is in good health, she can have a simple uterine or ovarian tumour removed with little more risk and with much less discomfort than that involved in having a baby. But with delay up go the risks. No pelvic lump can be guaranteed to remain in a healthy condition; and if the patient declines to part with one in time of health the responsibility should rest on her and not on her medical adviser.

Vaginal Operations.

Passing on to the cases in which vaginal operations were done, there were 406 cases of genital prolapse. These were treated by methods which I have sufficiently described elsewhere, and all left hospital soundly healed. F. H. Lacey's recent investigation³ of my 1914-15-16 cases of prolapse shows that permanent cure was obtained in 97 per cent. of them. There were also 112 cases of rupture of the perineum and recto-vaginal fistula, who were all discharged cured. The urinary fistulae numbered 16 and were cured with one exception, which requires further treatment. The whole vulva was excised seven times for cancer and once for leucoplakia, and these operations, with those previously mentioned, make up 560 classified vaginal operations.

There were also 249 smaller vaginal interventions, including cases of haematocolpos, septate vagina, unruptured hymen, senile endometritis, pyometra, cysts of the vulva, Bartholinitis, caruncles, polypi, sterility, spasmodic dysmenorrhoea, cervical lacerations, hypertrophied clitoris, retained products of conception, and various diagnostic explorations of the uterine cavity. There was no death after any of the 809 vaginal operations; which, added to the 545 abdominal sections, give the total of 1,354 consecutive operations in 1919, 1920, and 1921.

REFERENCES.

¹ Polak: *Amer. Journ. Obstet.*, 1918, pp. 199 and 349. ² Bride: *Journ. Obstet. and Gyn. British Empire*, 1922, vol. xxix, No. 1. ³ Lacey, *ibid.*, 1921, vol. xxviii, No. 2, p. 251.

SOME COMMON DEFECTS OF DIET AND THEIR PATHOLOGICAL SIGNIFICANCE.

ABSTRACT OF THE OLIVER-SHARPEY LECTURES DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS,

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LECTURE II.

IN his second Oliver-Sharpey lecture, delivered on May 4th, Professor E. Mellanby began by reminding his audience of the conclusions to which his first lecture had pointed. He had stated that foodstuffs could be divided into two groups. The larger group, which included the major part of the average diet, was practically devoid of sodium, calcium, chlorine, and two vitamins—namely, the fat-soluble A and the antiscorbutic factor. The reason why this was the general diet was, because modern urban communities lived at a distance from the areas where food was produced, and therefore preference had to be given to foods for popular consumption which were easily transportable and which had good keeping properties. The economic situation made it necessary also that foods should be cheap and abundantly produced. He had also pointed out that taste was an uncertain factor in deciding the relative value of foods, and did not prevent people from eating the wrong thing. Certain foods which seemed to be good, such as cereals, upon which children flourished and grew fat, might, under certain conditions of ill balance in other respects, give a deceptive impression of being more nutritious and satisfying than they really were. He had then proceeded to consider, what would be the main theme of this second lecture, the factors in diet which were responsible for the calcification of teeth and bones.

Professor Mellanby went on to say that in all his investigations upon deficiency diseases he had been impressed by the fact that as soon as there was any interference with a natural food product it became less suitable for food and lost some of its best properties. He took as an example the case of milk: if milk was allowed to go sour and acid caseinogen to be precipitated the calcium was lost, so that acid caseinogen used in a diet already deficient in fat-soluble vitamin made the resulting rickets much worse.

Calcium and Fats.

Even if butter were added to a diet a certain additional quantity of calcium must be added to obtain the maximum physiological value. Butter was less satisfactory from the point of view of rickets prevention than the milk from which the butter was made, probably because, in the course of separation, the substance lost some of its calcium. Butter therefore was not as good a food as one would expect, and the results could not be improved in the case of an ill-balanced diet by giving larger and larger quantities of butter. The more butter that was given the worse under these circumstances did the animal become, and the animal might be made very ill by being given much butter without a certain amount of calcium to balance the diet.

This fact had been worked out by McCollum, of Johns Hopkins University, who had tested on rats the value of a diet as affecting growth, fertility, and the power of the mother to rear her offspring. McCollum had shown that the conditions could not be made better merely by increasing the fat. He had added first of all a mere trace (0.1 per cent.) of calcium carbonate, and the rats did better in growth, though the second generation of young rats did not thrive at all. But on doubling the percentage of calcium carbonate, not only was the growth of the adult rats much improved, but the second generation also began to flourish. Cod-liver oil had the power of utilizing to the full every bit of calcium present in the diet, and with 2 per cent. of cod-liver oil added to a diet in which there was 0.1 per cent. of calcium carbonate the condition of the animal was much better than with 8, 10, or even 20 per cent. of butter, with the same minimum of calcium, and no cod-liver oil. If, however, the amount of calcium was raised to 0.5 per cent. butter under those conditions became as good as cod-liver oil. The cod-liver oil could use the minutest quantities of calcium, which the butter could not. McCollum's explanation of these facts was rather hesitating, but the simplest view to take was that cod-liver oil contained a large amount of the fat-soluble vitamin and butter only a small amount.

The lecturer then passed on to speak of the work of Zilva and Miura in the biochemical department of the Lister

Institute. Their growth experiments depended on a piece of technique which seemed to him to be extremely able. They fed young rats on a diet which was so devoid of fat-soluble vitamin that the animals ceased to grow, and their weight remained stationary. Then to this diet were added the substances whose action was to be tested. If the interpretation of these experiments was correct, it looked as if there was a great deal more of this vitamin in cod-liver oil than in butter. In any case, taking these facts together, it was evident that butter was inferior to milk, and one explanation at least was that in milk there was a larger quantity of calcium, which was lost on the separation into butter. One result of feeding animals on butter was to give a beautiful glossy skin; but, although there was no eye disease—keratomalacia or xerophthalmia—which occurred with other diets, there was still rickets with a butter diet if calcium was not ensured in sufficient quantity.

Iodine Deficiency.

There was one point to be made in connexion with the constitution of cod-liver oil. Cod-liver oil did contain, at any rate, one substance which was not possessed by the other fats. In the animals on which the experiments had been made it had always been possible to detect which animals had had cod-liver oil by examining their thyroids. The cod-liver oil always ensured thyroids normal in size, whereas the thyroids of animals on other fats in these deficiency experiments tended to enlarge. In twelve puppies in whose diet cod-liver oil was used as the fat the average weight of the thyroids was 0.58 gram, while in twelve puppies fed on butter instead of cod-liver oil the average weight was 2.77 grams. Not only was there this difference in the weight of the thyroid, but the epithelium became more of a columnar nature and there were irregularities and invaginations of the epithelium and general abnormality in the thyroids of the butter-fed puppies. The hyperplasia produced in the gland by these means was almost indistinguishable from that associated with exophthalmic goitre, although there were none of the symptoms of this condition. The simplest explanation of the difference between the glands in these two types of animals was that cod-liver oil contained a certain amount of iodine, and the other fats did not contain iodine. It was instantly appreciable from a study of these dietaries how many substances in the ordinary range of foodstuffs did not contain iodine, for these animals were fed on quite a variety of food.

It was probable that a deficiency of iodine in human diet caused abnormalities, though he did not think such iodine deficiency very common in this country. In any event the ordinary case of goitre could hardly be said to be due entirely to deficiency of iodine in the diet; it was no doubt partly due to this cause, but it was due to some other lack of balance as well, making the story altogether a complicated one. In America the prophylactic treatment of enlarged glands was pursued by giving school children small doses of iodine twice a year, and it was said that where this procedure was adopted there was no subsequent enlargement of the gland. In any case in these animal experiments cod-liver oil prevented any of this kind of hyperplasia. However the animals were fed, and whatever the other conditions, if they had got cod-liver oil in the diet they always retained a normal gland. The action of cod-liver oil could not be explained merely on the ground of the iodine content; there must be other things in addition. If small quantities of iodine were given to patients suffering from exophthalmic goitre—say one or two grains three times a day—the effect was quite dramatic. Usually this treatment for a time altered completely the metabolism of the patient. The patient put on weight, the tremor disappeared, sweating gave place to coolness, excitability to quietness, and with all this the tumour at the neck became larger. These were the first effects of the administration. If cod-liver oil were given to people with exophthalmic goitre the effect was to increase the symptoms; there was more tremor, more sweating, increased loss of weight, and the size of the gland usually went down. The whole effect was different from the iodine effect. He made it plain that he was discussing this matter from the experimental, not from the curative point of view.

A Seeming Contradiction.

Returning to the question of calcification, Professor Mellanby reminded his audience that in his first lecture he had pointed out that in the repair of structures affected by rickets the vitamin did the calcification, while growth depended largely on how much cereal was used. The more cereals eaten, everything else being constant, the greater the rickets produced in

the absence of the vitamin. When these results were first published he thought that the cause of this was the amount of carbohydrates which the animals had eaten, but lately he had taken up the subject again to see whether there was any difference between the cereals, independently of their carbohydrate content, and he found that there was such a difference. A dog was placed on a standard diet, with olive oil as a fat, and white flour. He had been inclined to predict that oatmeal and wholemeal flour would be the best cereals because these contained calcium, and that white flour, having lost its calcium, would be the worst. But the dog which had had white flour as its cereal appeared to be fairly normal, whereas the dog which had had oatmeal got rickets. Therefore from this point of view oatmeal was worse than white flour. The x-ray photographs showed that the animal fed on white flour had a certain slight amount of rickets, whereas an animal fed on wholemeal flour had more pronounced rickets, everything else in the diet being equal; with rice, again, there was less rickets, and with oatmeal more. These results were entirely opposed to all that one would imagine. A dog brought up on polished rice *plus* wheat germ showed worse rickets than a dog brought up on rice alone without the wheat germ. He could not see the explanation at present. It did not mean, of course, that oatmeal and wholemeal flour were worse than rice and white bread, but what could be said was that when a diet was deficient in fat-soluble vitamin, oatmeal and wholemeal flour seemed to be the worst cereals from the point of view of continuing rickets.

Diet in Human Rickets.

Turning to human rickets and the applications of these results to the treatment of children, the lecturer said that obviously the matter was most important from the point of view of infant health. If the process of calcification of teeth and bones were well started at an early age, it was difficult to upset the process later on. In Sheffield, where he had been working lately, there was a great deal of child rickets of a much worse type than anything seen in London, and there was much adult rickets also. In the treatment of these children the diet on which they were put did not differ greatly from normal. It contained milk, bread, and beef dripping. The children were given about one ounce of minced raw meat, with potatoes and greens, and milk pudding; and in addition to these ordinary things he gave them cod liver oil three times a day, and always included an orange in the diet. Cod-liver oil, however, had its dangers—for instance, it sometimes led to dyspepsia—and if there was any difficulty about giving it, the best plan was to cut down the other fats. On these diets the rickets was cured. He showed some striking comparative photographs of children who came in with bad deformity and gradually improved under this diet. Some of the children with rickets were quite unable to stand when they came in, and often appeared quite imbecile. The diet not only cured the rickets and strengthened the bones, but absolutely transformed the child's attitude towards life. He did not understand the talk about the necessity for exercise and massage and electricity in rickets; it was the deficient diet which prevented exercise, and until that was rectified the rickets would go on.

In conclusion Professor Mellanby said that he had used this question of rickets and the calcification of bones, not in order to show the etiology of the disease or even the treatment—he had used these facts to illustrate the differences that could be brought about in the anatomy and physiology of ordinary human tissue by changes in diet. It was possible now to take a point of view which would have been quite out of the question a few years ago. This work on foodstuffs was only at its beginning, and it would take many years before all the variables could be worked out. These diets did not only produce bone changes; paralytic effects and other nerve symptoms were produced, and often in these animals changes were brought about in the heart which made them extremely susceptible to anaesthetics. Under the influence of diet they became also very susceptible to catarrhal infections of the alimentary canal and the respiratory tract, and to skin affections; but these conditions had not been worked out because it was not known in detail what were the actual factors involved. Although it was impossible to demonstrate at present the basis of the susceptibility to these infections, he had no doubt in his own mind that deficiency of diet played a large part in them. In any case in this kind of work the laboratory justified itself in a manner in which perhaps it had never done previously.