A Discussion ON THERAPEUTIC MODIFICATION OF THE DIET IN INFANCY.*

BY

HECTOR C. CAMERON, M.D.CANTAB., F.R.C.P.LOND.,
Physician and Physician-in-charge of Department, Diseases of
Children, Guy's Hospital.

DEBATES upon the subject of infant feeding seldom arouse profitable discussion. As a rule they serve to make clear only the difficulty of reconciling the views of those who might be supposed to speak with authority. Therefore, in the first place, I would ask the question: Wherein lies the difficulty and complexity of the subject? Why is it that in this subject, on the importance of which all are agreed, opinion has remained so fluid, and so little that is solid and concrete has crystallized out from it? Why is it that, in practice, we still encounter, on the one hand, a frenzied search among a host of proprietary foods for one which may act up to the promises of all, or, on the other hand, a too rigid adhesion to some one system of feeding, despite the persistence of symptoms.

Difficulties Inherent in the Subject.

It is obvious that some of the difficulties with which we have to contend are inherent in the subject itself. In the practice of infant feeding the data are difficult to interpret, for two reasons. On the one hand it is mercifully the nature of the child to wax and grow strong, and this upon a very great diversity of dietetic prescriptions. Yet the prescriber of each diet is prone to claim this most usual happening as evidence of success, and as proof of the virtues of his prescription. On the other hand, the human infant is of so sensitive a nervous organization that a great variety of adverse circumstances are capable of producing ill effects upon its health—effects which almost always manifest themselves in gastro-intestinal and nutritional disturbance.

The infant has but one function highly developed, that of the digestion and absorption of food. So hypertrophied a function is necessarily unstable, and, in the absence of other functions capable of manifesting symptoms of derangement, disorders of very different natures are apt to show themselves in the guise of digestive and nutritional disturbance. Thus intercurrent infective diseases, great variations in the atmospheric temperature or humidity, extreme restlessness from timid or uncertain handling or from overstimulation, inco-ordinate and ineffective suction with aerophagy, individual inherited idiosyncrasies against certain constituents of the food, are each and all capable of so lowering the tolerance for a diet, in itself quite unobjectionable, that severe dyspepsia may result. Because of the action of one or other of these adverse influences many dietetic prescriptions, in themselves admirable, are apt to fall into disrepute, and to bear the blame of a disturbance of which they have not primarily been the cause. On the other hand, since these influences are more often than not transitory in their action, many dietetic recipes, tried at the moment of recovery, bear off the credit for that recovery which was in fact quite unconnected with their use.

These difficulties are inherent in the study of the infant and of its diet, but in this country at the present time there are other difficulties with which we have to contend, and which are responsible in part for the confusion which surrounds the subject. I will briefly refer to three only.

The Neglect of the Study of Pediatrics in Universities and Medical Schools.

In medical schools and universities too little attention is paid to the scientific study of the child. The subject is regarded as a specialty. It struggles painfully for recognition among the conflicting claims of oto-rhino-laryngology,

orthopaedics, and even proctology. We may be sure that only when it has been elevated to the rank of a subject of the first importance, and takes its place with medicine and midwifery as one of the trilogy of the final examination, can we hope to find the profession as a whole equipped as we would have it equipped to deal with so all-important a branch of general practice. Operative surgery, on the other hand, which occupies to-day so large a part of the student's time and attention, belongs rightly to the specialties. Its practice is a matter for post-graduate rather than undergraduate study, and its technique can only be usefully acquired by the special training of some of those who have already received a medical education. The dearth of professorial chairs in pediatrics in this country is both symptomatic of and productive of the widespread neglect of the subject.

Detrimental Effect of the Advertisements of Proprietary Foods.

To the lay mind the proof of the pudding is in the eating. Digestive derangement, however caused, is taken as indicating that the particular diet adopted is responsible for the disturbance, and a change is demanded. One food after another may be tried in an unmethodical search for something which "suits." The numerous advertisements of proprietary foods are cleverly designed to play upon the anxieties of the mother. Their effect in producing this constant demand for change and in increasing our difficulties is not lightly to be set aside. Nothing is more amazing to-day than the success of advertisement in a population trained to read but not to reason. The latest device is the advertisement in the form of a Socratic dialogue—hitherto confined to the vendors of cheap furniture—under a picture of the kindly doctor with his arm resting reassuringly on the shoulder of the distressed young mother, while he extols the virtues of the food, and she dutifully undertakes to follow such good advice.

These foods are to some extent the raw materials of the physician's art. Their virtue lies in the uses to which they are put, not in their composition. Many owe their origin to successful prescriptions in the past for particular types of disturbance. Commercially, however, there is little profit to be made by putting on the market a diet for sick infants only, hedged by restrictions and indications for and against its use. It is more profitable to make the claim of universal applicability, based on selected cases which have undoubtedly thrived by their use.

Ill Effects due to Misunderstanding of Propaganda for Infant Welfare.

The appreciation of the disastrous effect of these repeated and injudicious changes of diet in the dyspeptic disturbances of infancy has led some to go to the opposite extreme, and to maintain that, by a rigid adhesion to some particular formula or scheme of feeding, success can always be attained, at least in what is called a "well baby." This is the attitude which has been associated, to take one well known example, with the name of Sir Frederick Truby King. He says in effect: "Give me a healthy baby, and I will show you how to keep it healthy." If we were to ask him he would say: "With sick infants I have nothing to do. My work is preventive, not curative." He rightly regards the preparation and supervision of the diet of the healthy infant as falling within the province of the educated mother or children's nurse, supervised and instructed, if need be, by the trained nurse or infant welfare worker. No one can fail to admire the enthusiasm which he has thrown into his work and the energy with which he has conducted his extensive propaganda among mothers and nurses. But propaganda upon matters of health is by no means free from danger to the public. There is, indeed, at the present time an attempt on the part of certain medical men to enlist the services of the lay press in bringing medical knowledge to the notice of the public. Those who oppose the suggestion and are fearful of its effects may well point to certain unhappy results which have followed on the propaganda for infant welfare. No one branch of medicine has been so subjected to this process of popularization. For popular consumption propaganda must be so simplified that the truth is

* The opening paper of a discussion in the Section of Diseases of Children at the Annual Meeting of the British Medical Association in Edinburgh, 1927.

almost squeezed out of it in the process. An outline, a mere diagram, is all that can be depicted, without light or shade, without degrees of emphasis, and without consideration of exceptions or variation. Hence we find that the successful propagandist is seldom himself expert. Late in life a surgeon, supreme in his art, turns dietitian, or an asylum superintendent devotes his later years to the standardization of infant feeding.

All standardization is detrimental to the progress of medicine, although it immensely simplifies elementary teaching. The effect of standardization in this instance, although certainly not its aim, has been to tend to leave the doctor out as one no longer needed. The public has become confused. It hears the Truby King or some other "system" of feeding extolled as giving admirable results. Why should these great benefits be confined to healthy infants? The mother of some ailing child demands that it, too, should share in them. And so it comes about that ailing infants are admitted to institutions which were designed only for preventive work, and that mothers and nurses come to regard the standard diet—which I should look on much as a sighting shot, to be persisted in only if successful—as conferring health on all dyspeptic infants.

If it were possible to feed all infants, healthy or sick, in the same way, it would indeed be true that the subject could have no possible interest for medical men. The nurse, trained in the preparation of the particular diet, would then rightly take charge. The routine dietetic treatment, known beforehand, is then all that is required, beyond that skilled nursing and handling which every baby needs, and which is, in truth, the irreplaceable and all-important contribution of the trained nurse. Indeed, under a standardized system it is not necessary before giving advice to see the infant at all, or to make any examination of it. In one of the largest institutions for infant welfare it is considered possible to manage the whole business by letter. The matron conducts a consultation department known as "Better Babies by Post." From all over the country mothers write describing the symptoms from which their babies are suffering, and question and answer are published in the lay press. The child may be overfed or underfed, it may have pyelitis, or it may be suffering from injury to its medulla oblongata at birth—no one knows, but the advice by post, a little stereotyped perhaps, but simple and legible, is always to be obtained. Such happenings bring discredit upon a subject the welfare of which all of us have very much at heart.

We need, I think, above all the elevation of pediatrics, as the most truly educative of all subjects, as well as one of the most important in practice and for the service of the State, to a more important place in the curriculum. I would welcome, too, some restriction on the trade in proprietary infant foods, and in the character of their advertisements. The difficulties of the infant welfare movement will right themselves in time. In time the public will learn not to confound sensible advice on the care and diet of a healthy infant with the therapeutics of the sick.

Therapeutic Modification of the Diet.

In the last twenty years much progress has been made in the attempt, based upon the study of the etiology of particular symptoms, to devise modifications which may suffice to control and correct disturbances originating upon the standard diet. In other words, if the sighting shot is unsuccessful we must seek to determine the nature of the error, and how it can be corrected. No doubt these therapeutic diets are for the most part to be regarded only as temporary expedients. By their use freedom from symptoms and a gain in weight, in vigour, and in well-being can often be achieved. But the ultimate aim must be to restore the child as quickly as possible to the standard diet of health. Only when it has demonstrated its power to thrive on the standard diet can we claim to have achieved complete success.

It is on this subject of the therapeutic modification of the diet that I especially wish to invite discussion. In

order to open that discussion I choose three such modifications.

(A) High caloric feeding in post-infective dystrophy.

(B) Thickened feeding in the vomiting of aerophagy, nervous vomiting, and hypertrophic pyloric stenosis.

(C) Feeding with a high percentage of casein in fermentative diarrhoea.

[The opener discussed the results attained by these devices, illustrating his remarks by charts.]

DISCUSSION.

DR. DINGWALL FORDYCE (Liverpool) first referred briefly to breast-feeding. The quality of maternal milk was, in his experience, seldom at fault, and the most powerful factor in modifying it was nervous unrest and instability. Chemical tests were of little practical value, but occasionally bacteriological examination was of the utmost importance. The demonstration of *B. coli* in the milk of apparently healthy mothers had explained the unsatisfactory progress of three of his cases. The relation of diet to general health and constitution was a complicated problem. The late Dr. John W. Simpson had been among the first to use thyroid extract in the treatment of wasting babies, and his results were very good. In order to influence the thyroid function, and therefore the whole sequence of endocrine activity, it was not, however, necessary to administer the extracts of the endocrine glands; adjustment of the diet, particularly by modifying the nature of the carbohydrate and the amount of fat, could effect the desired result. Success in infant feeding could not be attained by rule of thumb. Each infant must be regarded as a patient with a constitution demanding study. Practical infant feeding could be learned only in the clinical atmosphere of the bedside and the home. The time must inevitably come when the subject of the feeding of infants as part of the larger subject of the medical care of children would receive adequate recognition in universities and medical schools. When it did, this in itself would largely counterbalance many detrimental effects associated with propaganda in favour of proprietary foods and misunderstandings in child welfare. With increasing knowledge therapeutics in childhood was joining hands with prophylaxis. When the subject was suitably recognized it was very desirable that development should take the form of a department for the medical care of children, and not be limited to the relatively narrow subject of therapeutics in sickness.

DR. G. B. FLEMING (Glasgow) thought that hardly enough attention had been paid to the quantitative modification of the diet in infancy. In his opinion underfeeding was an extremely common cause of malnutrition. He considered that the average infant less than 6 months old required about 55 calories per kilo of body weight for basal requirements, 5 calories for growth, 5 calories to make good loss in the excreta, and perhaps about 35 calories for muscular exertion—a total of 100 calories per kilo. It had to be borne in mind that marasmus, atrophy, or decomposition did not represent a disease but a state of malnutrition. He had been interested in the problem of whether this malnutrition was the result of a too rapid utilization of nourishment by the atrophic child. Rosenstern first suggested that infants should be fed according to their age rather than their weight. Investigations on metabolism had thrown considerable light on this problem. It had been shown that the basal metabolic rate of the overweight infant was no higher than that of the normal, and also that there was little difference in the milder degrees of malnutrition. When, however, the infant was about a third below the average weight for its age there was a fall in the metabolic rate, and this became progressive as malnutrition proceeded. His conclusion as a result of these investigations was that, when an infant's weight was 70 per cent. of what it should be for the age, the requirement was 90 calories per kilo of expected weight instead of 100 calories. Beyond that point the calorie intake had to be further reduced proportionately to the fall in the basal metabolism and the diminution in

muscular activity. Roughly, a reduction of one calorie per kilo of expected weight should be made for every 1 per cent. the child was below 65 per cent. of its expected weight. Thus at 55 per cent. of expected weight the allowance should be 80 calories, and at 45 per cent. 70 calories per kilo of expected weight. In atrophy, then, it appeared that there was no excessive utilization of food and that the condition was brought about by one or both of the other causes of malnutrition—starvation or mal-assimilation. These considerations were useful in helping to avoid gross errors of under- or over-feeding.

Dr. LEWIS THATCHER (Edinburgh) confined his remarks to the use of acidified milk. In many feeding cases the food that was being given was deficient not only in total caloric content, but also in protein value. The reason for this was often not that the diet had not been recognized as deficient, but that all attempts to give an adequate quantity had been attended by signs of intolerance. In many such cases he had found acidified milk most valuable. There was nothing new in the use of acidified milk to meet this difficulty. Buttermilk had long been used, and Finkelstein's albumin milk was a mixture of buttermilk and extra curd. In practice, he thought that acidification was best brought about by adding an organic acid. He used lactic acid, as the method was not difficult and the degree of acidity was easy to control; 1 drachm of lactic acid (B.P.) was added to a pint of milk which had been boiled for two minutes and allowed to cool. It was important that the milk should be nearly cold, and be constantly beaten with a spoon or shaken up in a large bottle while the acid was added slowly, drop by drop. It was convenient to prepare the ration for the twenty-four hours at one time. The milk might be skimmed or whole, and carbohydrate, preferably in the form of dextrimaltose, added as considered necessary. It was better to give no more than five feeds, if sufficient could be taken at each feed. This allowed of more complete emptying of the stomach, and also of the administration of orange juice and water between feeds, a plan which was preferable to diluting the mixture. When the change over was taking place it was, however, wise, as in all modifications, to build up the diet gradually. Mothers could prepare the milk quite efficiently after a demonstration from the ward sister. There had been two main explanations of the undoubted benefits obtained: the first was that the coagulated casein salt was in a finely divided flocculent form, which passed easily into the duodenum; and the second, that the essential process was one of debuffering. Marriott and others had shown that the buffer value of cow's milk was much higher than that of human milk, which meant that about three times as much acid had to be added to it to change the reaction to an equal degree. The result was that in the process of digestion of cow's milk the hydrochloric acid in the gastric juice was used up for this purpose, and little or none was left for keeping the stomach contents at the optimum acidity for peptic digestion, stimulating gastrointestinal motility, and killing off micro-organisms. The formation of a finely divided curd ought also to facilitate fat digestion.

Dr. L. G. PARSONS (Birmingham) agreed with the view that lactic acid milk was valuable in the treatment of certain types of case. He was in the habit of using milk modified by the growth of the *Streptococcus lacticus*; for his original culture he was indebted to Dr. Alan Browne of Toronto. He thought that this form had certain advantages, but the method of preparation was not so simple as that in which lactic acid was added; it was therefore less suited to out-patient and private practice. It was difficult to understand why sick and debilitated infants should thrive better on lactic acid than on other forms of acid milk. The fat and calcium absorption on lactic acid milk was not so good as on ordinary cow's milk, and the calcium absorption was considerably less than on hydrochloric acid milk. The probable explanation of its superiority was that it did not put so much strain on the acid-base balance as hydrochloric acid milk. Syörgy of Heidelberg had suggested that the value of lactic acid lay in the fact that it was synthesized to carbohydrate and stored as glycogen in the

liver. Lactic acid milk was useful in cases of pyloric stenosis when breast milk was not available. In that condition, as a result of the loss of hydrochloric acid from vomiting, a state of alkalosis was liable to develop and lead to convulsions and a fatal termination. The importance of giving an acid milk both before and after operation was therefore obvious. There was no objection to giving lactic acid milk to newly born or even premature babies. It could be given also over prolonged periods. One patient had taken it, owing to an oversight, for twelve months on end with excellent results.

Dr. C. W. VINING (Leeds) associated himself with those who regarded underfeeding as an important cause of marasmus, and pleaded for a more general use of caloric measurements of food. At the same time it was desirable to keep feeding methods as simple as possible. The chief merit of the caloric method was that it offered a means of regulating and controlling food requirements. There was room also for improvement in methods of measuring quantities of foodstuffs. The tablespoon was commonly believed to hold half an ounce of fluid, whereas its measure was nearer three-quarters of an ounce. Larger quantities than were intended were therefore administered when this domestic measure was used. He believed strongly in leaving young infants with their mothers, even when the latter were poor and ignorant, rather than in admitting them into a hospital ward where there was always the danger of stray infection. As a routine in out-patient hospital practice he employed mixtures of dried milk and dextrimaltose. These were made up in three strengths and were dispensed at cost price. He had been impressed with the usefulness of lactic acid milk and had also had success with banana pulp feeding in the stationary type of case. He hoped that pediatrics would soon appear among the subjects of the final examination for medical students.

Dr. CATHERINE CHISHOLM (Manchester) strongly supported the opener's contention that pediatrics did not occupy the place it should in the medical curriculum. She urged the use for teaching purposes of the abundant clinical material now to be found in special municipal wards for infants, infants' hospitals, and well equipped Poor Law institutions. Such teaching could not be given in out-patient departments. She was glad that Dr. Cameron had emphasized the real value of proprietary foods as a temporary diet for prescription in cases in which some special need of digestion had to be met. She had found lactic acid milk prepared by culturing the lactic acid bacillus of great value in infants over the age of 3 months. In younger babies she relied in bad cases on breast milk from foster mothers. A supply of such milk should be available in every institution dealing seriously with infantile dystrophies. Her experience of the use of banana pulp had been disappointing. In several cases the immediate effect was good, but after a week or two intolerance developed and the diet had to be changed.

Dr. MARGUERITE LOWENFELD (London) said that a fundamental difficulty in the therapeutics of infant feeding was the lack of agreement as to the criterion to be chosen in arriving at a standard diet, both in respect of composition and quantity. One school aimed at giving a food the composition of which approximated as closely as possible to that of breast milk; another took the actual energy needs of the body as a basis. In the obstetrical department of the hospital she had taken part in a study of the amounts taken by normal babies at each feed during the twenty-four hours, together with a biochemical analysis of the milk. One point of considerable significance in the matter of the fat percentage had emerged. It had long been known that in both human beings and animals the fat content of the milk tended to rise towards the end of a feed. Experimental workers had found, however, that this was not invariable. This investigation had shown that two factors had to be taken into account. The first was the amount of fluid present. The greater the amount of fluid the smaller the percentage of fat. The fluidity of milk was greatest at the beginning of feeding. The second factor was the degree of direct pressure exerted on the areola. This was tested by using

degrees of pressure varying from that obtained by the gentle use of a breast pump to that resulting from vigorous digital expression. The greater the pressure the higher the percentage of fat. With a maximal amount of fluid in the milk and a minimal pressure on the areola, the content of fat might be 8 per cent. below that obtained when the fluid was small in amount and the pressure vigorous. When, however, the pressure was maximal at the outset of a feed and minimal at the end, the percentages of fat could be equalized or even inverted. She was convinced, therefore, that no two infants would get the same percentage of fat from the same mother, even under identical conditions. It might be that the so-called overfed infant to which Dr. Cameron had referred was really the vigorously sucking infant, who obtained not necessarily an excessive quantity of milk, but a milk with a very high percentage of fat.

Dr. HELEN MACKAY, (London) emphasized the point that it was not only necessary to have some knowledge of calorie values, but also to be able to instruct the mother as to the conversion of weights of given foodstuffs into the domestic measures available. She instanced the great variations that existed in this respect in different foodstuffs in common use.

MESENTERIC LYMPHADENITIS AND ITS CLINICAL MANIFESTATIONS:

WITH SPECIAL REFERENCE TO ITS DIFFERENTIAL
DIAGNOSIS FROM APPENDICITIS.

BY

G. D. F. McFADDEN, M.B., M.Ch., F.R.C.S. Eng.,
ASSISTANT SURGEON TO THE ULSTER HOSPITAL FOR CHILDREN,
BELFAST.

MESENTERIC lymphadenitis was well known to physicians in the past under the name of the "strumous abdomen." During life it was guessed at on general symptoms, or from the *post-mortem* table an accurate scientific fact was recorded. It is only since abdominal section has become common that the protean aspects of the condition have been realized. Whether the glands are acutely or sub-acutely inflamed or have resisted their invaders, symptoms may arise at each step. An acutely inflamed appendix, a stone passing down the ureter, a carcinomatous obstruction, a duodenal or gastric ulcer, can be most accurately mimicked; in fact, there is hardly an abdominal condition for which laparotomy is commonly performed that may not be simulated by diseased mesenteric glands.

That these glands are frequently infected is common knowledge. The tubercle bacillus has been stated to be the causative organism. Still found enlarged mesenteric glands in 59 per cent. of all *post-mortem* examinations in children. Dingwall Fordyce in fifty autopsies could trace tubercle bacilli in 20 per cent. McFadyean and MacConkey found 25 per cent. of clinically non-tuberculous patients to harbour active tubercle bacilli in their mesenteric glands. No child is too young to be infected. De la Alberca reported three cases on which he performed *post-mortem* examinations and found no lesion excepting caseating mesenteric glands. One child was 5 years of age, one 4 weeks, and one had been born only 7 days before. At the Ulster Children's Hospital twenty-five cases of acute appendicitis were treated during 1925 and 1926. So that if one considers the numbers that do not reach hospital these cases must be almost as common as cases of acute appendicitis.

Accurate diagnosis in the case of a patient who is suffering from a pathological condition of the mesenteric glands rests to a great extent on a knowledge of their physiological properties and of their anatomical distributions. The lymph channels follow closely the blood vessels of the same region. The glands are situated in relation to these blood vessels. There are as a rule three sets. The glands affected in mesenteric lymphadenitis are the ileo-caecal, the mesenteric, the inferior mesenteric root gland, the middle glands in the transverse mesocolon, the

root glands at the origin of the superior mesenteric arteries, and the lateral sacral glands.

The flow of the lymph through these glands is as a rule direct from one to the proximal one. The lymph may jump from one set of glands to reach a more distant group. This occurs in intestinal infections where the juxta-intestinal group seems to be passed over and the middle mesenteric group infected. It occurs where the area drained has suffered a developmental change in position. The lymph may take a circuitous route to reach its termination if the glands in its direct route are destroyed by accident or disease. It is in this way that a diseased appendix may infect the subpyloric group of glands. Sometimes the lymph flows backwards; this occurs when its onward way is blocked. This has been cited as a frequent cause of phthisis, where the bacilli in the mediastinal glands have their efferent paths blocked and the backwash of lymph carries the bacilli into the lungs. Ravdin reports a case where a mesenteric lymph abscess was opened and drained. The surroundings appeared healthy. Four months later the caecum and ileum were the seat of hypertrophic tubercle. This was in all probability a case of infection of the intestine from a backwash of infected lymph.

Now pathological changes in these glands are a great worry to the surgeon when it comes to a question of diagnosis. In 6,000 to 7,000 cases admitted to various hospitals only 45 were correctly diagnosed. Even the time-honoured aphorism of appendicitis—pain starting at the umbilicus, followed by vomiting, followed by the pain settling down in the right iliac fossa—may attend the beginning of an attack of inflamed mesenteric glands.

At operation three main types of glandular conditions are found: (1) Discrete enlarged inflamed succulent glands. This type is found in children who have exhibited the symptoms of acute appendicitis. (2) A mass of glands grouped around a caseous gland or a small abscess. There is an acute inflammation of the whole mass, and often there is free fluid in the peritoneal cavity. These cases simulate acute appendicitis with abscess formation; occasionally they get intestinal obstruction. (3) The terminal or healed stage of lymphadenitis—a single gland or several calcified glands lying in the mesentery. It is this type that is usually found in adults. The symptoms simulate those of a duodenal ulcer, a renal calculus, or a chronic appendix.

It is noted that children suffering from mesenteric lymphadenitis have a long history of stomach trouble. This history may only be obtained after long and judicious questioning. The history of the complaint may date from babyhood, or from a distant severe illness, such as scarlet fever or measles. Other points to notice are the numbers of cases that suffer periodically from headaches, drowsiness, and loss of appetite for breakfast; these symptoms are probably the sequel of acidosis, a condition common among these patients. Unfortunately the urine of all children was not examined systematically in hospital, and it was after their acute attack—in some cases two years after—that my examination of the urine was made. In my series of cases acetone was present in 63 per cent. During an attack the percentage would certainly be higher. Nausea and vomiting are frequent in their history—some 71 per cent. of cases. I am inclined to think that the acute abdomen due solely to acidosis of the older clinicians does not exist, but that the real condition in these cases is an associated inflammation of mesenteric glands. Distaste for fats is a common symptom. Constipation is not more frequent amongst these cases than amongst the rest of hospital patients.

Pain.

The pain may be severe. A number of patients are awakened out of their sleep by the pain. Carson has drawn attention to the sudden onset and the sudden cessation of the pain. Although this is frequent, it is not so frequent as to be a good diagnostic point. The duration of the pain varies from five minutes to about two hours. It frequently starts at the umbilicus and settles in the right iliac region; it often starts in the right or left iliac region, sometimes in both; it may be epigastric, usually to the left side of the epigastrium; in certain cases,