movements of the stomach have started on their course. This would explain the interval between eating and the onset of pain in gastric ulcers.

In duodenal ulcer the percentage of acid in the gastric juice is nearly always high. The pyloric sphincter relaxes in the presence of acid on its proximal side, and contracts if acid remains unneutralized on its distal side. If the strength of the acid is excessive the contraction of the sphincter is overdone and prolonged. The results of gastro-jejunostomy are said to be the most satisfactory in cases of duodenal ulcer. Perhaps this is because the operation allows a more free regurgitation of alkaline juice into the stomach, and provides an exit that is not guarded by a sphincter.

So that in gastric and duodenal ulcers the explanation of pain and its time-table is the behaviour of the smooth muscle under the influence of acid. In one case the acid stimulates the base of the ulcer, and in the other a highly acid juice produces a cramp of the sphincter.

These symptoms are such as are described by the patient as being characteristic of his trouble in its early days. By the time he presents himself for examination the symptoms are usually more confused, and, during the worst periods, the pain is constant and is bad at all times, soon and late after food. It is necessary, then, to ask the patient to go back and describe the symptoms of the earlier days.

If the ulcer causes a deforming scar, thereby producing either hour-glass stomach or pyloric obstruction, pain will be produced by the stretching of the stomach wall and will only be relieved by vomiting, lavage, or emptying the stomach naturally. A change, therefore, in the character of the pain and other symptoms must be looked for and taken into account. When the history reveals a change of this kind in a case of long duration, the evidence is very strong indeed and a definite diagnosis can be made with great accuracy.

Alteration in the character of the pain will also occur when the base of an ulcer becomes adherent to neighbouring structures, such as pancreas, gall bladder, liver, and crus of the diaphragm. When an ulcer of the lesser curvature becomes adherent to the pancreas, constant pain through to the back will be felt. If the crus of the diaphragm is invaded the pain will be in the shoulder. The same pain will be felt in inflammation of the gall bladder as soon as the diaphragm is affected, though the more constant pain in gall-bladder trouble is through to the scapula.

But these pains are additional and are either referred or due to the implication of subperitoneal nerve endings. The vast majority of dyspeptics, however, have nothing so simple as an ulcer. A very large number complain of pain as soon as food enters the stomach. This may be a temporary affliction or more lasting. It is found in patients who have a tired-out or ill used stomach. At its worst the pain does not go until the patient has vomited. In character the pain is more often a dull aching, and not the violent cramp-like pain such as occurs with duodenal ulcer. It can be regarded as a stretching of atonic muscle fibres. In such patients there is atony of the circular and longitudinal fibres, due either to the general weakly condition of the patient or to some recent misuse of the stomach. The presence of food stretches the muscles and produces discomfort or pain. In the worst cases the strong oblique muscle fibres are also affected and then the symptoms are more lasting. In such cases there is a general dropping of the stomach.

In many of these cases there is a low acidity of the gastric juice. There may also be slow emptying of the stomach. These people may truly be said to have weak digestions. But in some, in which enteroptosis can be demonstrated, there is an increased acidity, and there may be rapid emptying. Here the symptoms may suggest duodenal ulcer, but the absence of the intervals of good digestive health, and the immediate improvement on putting the patient to bed, and other minor points will help to differentiate. It is not necessary for the enteroptotic patient to have indigestion. Many eupeptics have a low-placed stomach. But if some cause of indigestion occurs the presence of ptosis is against the patient's chances of satisfactory relief.

The majority of dyspeptics who seek relief belong to the class of atonics. Very often they are feeble in other ways, and their poor nutrition enhances their general as well as their gastric debility. The surgeons call the condition "medical dyspepsia." They are quite right to avoid operations on such subjects, for they are likely to do them more harm than good. But it is rather sad that the physicians should be left to deal with the most thankless and intractable kind of case. It is still more sad when the physician is called in to make the best of a patient who has had a series of operations, including gastro-jejunostomy, appendicectomy, freeing adhesions, etc. However, a good deal can be done for these atonic patients by putting them in bed with the foot of the bed raised, by giving small feeds frequently, by fitting an abdominal belt, and by massage.

Cancer of the stomach may be productive of pain of the visceral type, but pain must not be regarded as a necessary symptom of cancer. If the cancer cells infiltrate the wall of the stomach, making it stiff and rigid as in the leather-bottle stomach, the capacity of the stomach is incapable of adapting itself to the presence of food. The entry of food may put the wall of the stomach on the stretch and produce instant pain. Or a carcinomatous ulcer may be associated with pain in the same fashion as a non-malignant ulcer by infiltrating neighbouring tissues. But many cases of cancer are painless. Possibly the absence of acidity is responsible for the absence of pain. But the majority of patients who have pain immediately after food have a tired-out or ill used stomach which is in a condition of atony.

Substernal pain, or "pain in the chest"—a symptom of indigestion commonly found in constipated young women and in sufferers from flatulence—is concerned with the cardiac sphincter. Substernal pain may be due to dilatation of the oesophagus because the cardiac sphincter will not relax to allow food to pass into the stomach. In the flatulent, pain is produced by the pressure on the cardiac sphincter until it opens. When the cardiac sphincter opens and the gastric tension is lowered, relief of the pain follows at once. Here again the wrong behaviour of muscle can be blamed for the pain.

In all the cases described it would seem that the visceral pain of indigestion is to be attributed to the condition and the behaviour of the muscular wall of the stomach. If, then, we wish to explain to ourselves the meaning of digestive pain we must express our explanation in terms of muscle. In the disorders of digestion there is infinite variety. A few examples only have been taken to show the significance of the predominant symptom—pain.

In the opinion of the patient pain is of the greatest importance, and if we can understand how the pain is produced we are in a better position to treat it and to prevent a recurrence. We can arrive best at this understanding if we take into consideration the state and behaviour of the smooth muscle of the stomach.

NEPHRECTOMY IN INFANCY.

BY

A. CLIFFORD MORSON, O.B.E., F.R.C.S.,

SURGEON TO ST. PETER'S HOSPITAL FOR URINARY DISEASES; SURGEON TO OUT-PATIENTS, HAMPSHIRE GENERAL HOSPITAL.

ALTHOUGH the removal of a kidney during the first twelve months of life is seldom indicated, nephrectomy may be a life-saving measure. Renal sarcoma in the very young is well known and may produce a tumour of considerable size which is often bilateral. Urinary symptoms are generally absent and attention is first drawn to the lesion by the presence of an abdominal swelling. The general health remains good until pressure of the growth causes obstruction either to the ureter or the adjacent bowel.

Opinions differ as to the origin of these tumours, some holding the view that they are extrinsic to the kidney, while others claim that they are entirely renal. If the latter view is correct, it is strange that haematuria, the common manifestation of all other neoplasms of the kidney, should never be observed, more especially as carcinomatous

elements have been described. This so-called congenital sarcoma is best explained by Wilms's hypothesis, which maintains that it contains three parts—a carcinomatous, a sarcomatous, and a myomatous. All these elements can sometimes be found in the same growth if sections are taken from various portions.

Nephrectomy has been practised for many years with unsatisfactory results, the mortality rate being at least 50 per cent. In those that survive the shock of the operation recurrence is rapid, but from time to time an exception is met with in which clinical evidence is forthcoming that surgery has produced an apparent cure. So long, however, as diagnosis is delayed until pressure symptoms arise, there is more hope for the prolongation of life in the exposure of these tumours to irradiation than in submission to the surgeon's knife.

Experience has shown that if the kidney fails to develop normally during foetal life it is prone to become diseased. All kinds of operations have been devised to restore the kidney to its normal function. Their multiplicity proves that none produce the desired result, and when they are practised nephrectomy is merely delayed. Within the first decade of life hydronephrosis of congenital origin, uncomplicated by infection, causes vague abdominal symptoms which can only be diagnosed accurately by the aid of pyelography. On the other hand, if infection occurs there is little difficulty in determining the site of the lesion. Recently there has come under the care of my colleague, Dr. Adolphe Abrahams, an infant, aged 7 months, suffering from a structural defect of the right kidney.

A child, aged 7 months, healthy and robust-looking, was admitted to hospital on October 10th, 1925, with a history of an attack of diarrhoea and vomiting on October 5th. On October 9th straining and pain during micturition was noticed and the urine was observed to contain a white deposit.

On admission the temperature was 104.2°, pulse 160, respirations 60. The stools were normal. The urine gave an acid reaction, had a smoky appearance and unpleasant odour; specific gravity 1025; microscopically coliform organisms and some pus cells were reported.

Drawing to illustrate abnormal kidney in an infant of 7 months.

The tongue, mouth, and pharynx were clean, and apart from the abdomen being tender and phimosis being present there were no other physical signs.

The alkali treatment of pyelitis was adopted; the temperature and respirations fell steadily, and by October 16th the temperature was normal; urine 30 oz. per diem and alkaline.

On October 29th circumcision was performed. The temperature rose with the onset of bronchitis; a definite deposit of pus appeared in the urine, which had again become acid. The child went off his feeds, and on November 6th the respirations were slow and sighing; temperature 103°, pulse 168.

The urine contained a heavy deposit of pus; no acetone and no diacetic acid present. On November 7th a tender tumour the size of a hen's egg was palpated in the right loin, the bladder was distended, and incontinence with overflow was present. Ten ounces of urine were drawn off by catheter and the bladder washed out with boric acid lotion (half strength), much muco-purulent material being present. On November 8th the above procedure was again attempted, but failed owing to the blocking of the catheter with muco-pus.

Operation.

A small incision was made to the right and above the umbilicus. Intra-peritoneal palpation revealed a right kidney enlarged and cystic and a left kidney normal in consistence and size. This incision was then closed and suprapubic cystostomy performed, a malacot tube being left in the bladder.

The condition of the child improved, and on November 18th the right hydronephrotic kidney with 3 inches of distended and coiled double ureters was removed through a curved lumbar incision; the perirenal tissue was drained by a small tube and a fresh malacot catheter inserted into the bladder.

On November 24th this catheter was removed and the bladder washed out suprapubically. An attempt was then made to cysto-

scope the patient through the suprapubic fistula, but owing to the small size of the bladder and its inability to retain fluid the ureteric orifices could not be seen. The wounds healed rapidly, and though another attack of bronchitis supervened the child is now doing well and gaining weight. This patient has been kept under observation since discharge from hospital. His general state of health is excellent and the urine is normal.

The accompanying illustration demonstrates the chief features of the abnormal kidney. It will be noted that the lower ureter is dilated and opens into a large pelvis and that the calyces are almost entirely absent. The upper ureter is also dilated and opens into an accessory pelvis perched on top of the upper pole. There is no communication between the two pelves. At the operation the two ureters were discovered to unite just before entering the bladder.

In the *Transactions* of the Royal Society of Medicine (vol. xiv, No. iv) Jocelyn Swan records a case of double ureter in a man aged 33, where the accessory duct opened into a cyst at the lower pole of the kidney. I believe that this cyst was really a second pelvis.

It is interesting to inquire why, if the ureteric bud on one side divides to form two ureters and two pelves, the mesonephros on the same side, from which the renal cortex is developed, does not likewise split up into two portions. A case has yet to be recorded of a man with three fully developed kidneys.

I am indebted to Dr. G. L. S. Kohnstam for the compilation of the case notes.

Memoranda :

MEDICAL, SURGICAL, OBSTETRICAL.

BROMISM: THE SODIUM CHLORIDE TREATMENT.

Two types of eruptions due to the administration of bromides are described: (1) an acneform (bromacne), usually seen on the face, chest, or back; and (2) a granulomatous hyperplastic variety which occurs most often on the extremities.

An occasional peculiarity is the relatively long latent period between the last dose of the drug and the appearance of the symptoms, which once they are established may "persist for a considerable time after it has been discontinued."¹ These points were well illustrated by a case to which I was called by Dr. D. H. Fraser on January 7th.

The patient, a lady aged 65, was suffering from a left-sided incomplete hemiplegia with some aphasia—her fourth stroke since 1914. Both bromide and iodide of potassium had been administered, the latter continuously for some weeks, and up to the moment of our consultation. The last dose of bromide, in the form of bromoglydin (gr. 5), was given on December 22nd. Its administration had not been regular, but not more than 125 grains of bromoglydin had been given during the period of her illness—seven weeks. The eruption consisted of: (1) Reddish, raised, grouped acneform papules on the front of the chest. They were larger and much brighter in colour than acne vulgaris. There was no tendency to pustulation, and there were no subjective symptoms. The face was not affected. (2) The more typical raised granulomatous, discoid plaques, varying in size from that of a shilling to half a crown, were present on the backs of the hands, the dorsa of the feet, and sides of the little and big toes. The first of them had been noticed by Dr. Fraser on the forefinger of the left hand on December 23th—that is, a full week after cessation of the bromide. These lesions were of a dull red colour, and discharge was oozing freely from a number of points on the surface of each. Three such lesions were present on the right hand, two on the left, and a larger number of less typical patches on the feet. The temperature was not raised, there was no pain or irritation, and the associated glands were not notably enlarged. The case seemed to me, without any doubt, to be a classical example of bromide eruption as suspected by Dr. Fraser.

The duration of such cases may be prolonged. In one of my own cases—a chronic alcoholic who had taken bromide after an attack of delirium tremens for some months, and had in consequence developed severe granulomatous lesions on both legs—in spite of many different applications, and the internal administration of arsenic, healing did not take place for five weeks. I was therefore glad to have the opportunity of testing the efficacy of the salt treatment devised on an experimental basis by Wile, Wright, and

¹ MacLeod: *Diseases of the Skin*, 1920, p. 718.