atrophic, and beyond being utterly selfish in her attitudes towards her mother, she did not offend social conventions.

In the case next to be referred to, conduct is becoming more outrageous but not yet bringing the patient in conflict with the law.

Girl, aged 27. Her father was an alcoholic, and deserted the home when she was three years old, and she has two healthy sisters who are married. She has lived with her mother and her mother's sister "in a rather puritanical atmosphere." Her aunt writes: "She walked and talked at a normal age. As a child, very excitable and passionate, with no sense of fear. Later on, very difficult and unmanageable; sent home from four schools owing to defiance of rules. From time to time has been boarded with different families in the hope of finding congenial surroundings, but in no case would they keep her long. Aged 16, tried office work; after a month at the Bank of England, sent away as unsuitable; then to a large stores for a month, with the same result, as she would go out to lunch and not return till five o'clock. She then took up farming, and went to fourteen different farms, staying for two to six weeks at each; in most cases the report was that she did not like work and only wanted to ride the horses. She then tried to become a nurse, and went to a country hospital, but was sent home after three weeks as absolutely unsuitable. Aged 20, she applied to be trained as an army motor cyclist, but was refused. For the last six years she has been studying music and singing; she refused to take the ordinary course at a musical academy, but, notwithstanding, has had some fleeting successes. Very excitable, erratic, and moody, can be bright and entertaining when she likes; has no vicious tendencies, free from malice, of a generous disposition, and extremely lazy." Six months before I saw her she was found in her bed-room, shamming unconsciousness, with the gas turned on and her window wide open, and on medical advice was sent as a last resort to Australia, said to be suffering from neurasthenia and nervous exhaustion. She was met on arrival, and treated with quite extraordinary consideration and patience, to which she responded during the whole of her visit with studied rudeness. In spite of very inadequate musical qualifica-

tions, various employments were found for her, only to be quickly discarded; nothing below the position and dignity of a *prima donna* would satisfy her. She then went to a residential club in a humble capacity, and vanished after being there a few hours; she was found the next morning some distance away, having taken a toothbrush and some fruit with her up into the hills, where "she intended to die." Finally, after many other adventures, she was repatriated home at the expense of the steamship company, who were apparently responsible in law, in so far as they had introduced an immigrant who had failed to support herself. On her return, she told me as follows: "She had had a vague idea that Australia would be adventurous, but she loathed it, the environment was wrong, and the people irritated her. She was the most popular girl on the boat. Wants a life of adventure, would like to go to China, but being only a 'mouldy girl' cannot do these things. Would like to fence, sail, ride and dance, loves constant change. Has no friends, hates her home, likes Bohemian people and a spice of danger in everything. Has no desire to get married or to be made love to; babies make her sick. Has read the Greek philosophers and Oliver Lodge. Hates everybody and everybody hates her."

(To be continued).

X-RAYS AS AN AID IN THE DIAGNOSIS OF DISEASES OF THE ALIMENTARY TRACT.

By F. HERNAMAN-JOHNSON,

M.D.ABERD., D.M.R.E.CAMB.,

Radiologist to the French Hospital, London; Physician-in-Charge, X-Ray Department, Croydon General Hospital, &c.

A LECTURE (ILLUSTRATED BY LANTERN SLIDES) DELIVERED UNDER THE AUSPICES OF THE FELLOWSHIP OF MEDICINE AND POST-GRADUATE ASSOCIATION, ON MARCH 5, 1928, AT THE BRITISH INSTITUTE OF RADIOLOGY.

As this lecture-demonstration is, in common with others of the present series arranged by the Fellowship of Medicine, open to all medical men, it must necessarily be of a non-

technical nature. I shall therefore confine my remarks to conditions readily demonstrated on radiographs, avoiding cases where there is any special difficulty in interpretation, and saying little about the practical details of X-ray examination.

An account of the use of X-rays in alimentary disorders should logically begin with the teeth. This, however, would unduly overload my subject, and I must content myself by pointing out that it is of little value to the patient to diagnose a gastric ulcer, remove it by surgical incision, and leave the patient with a septic mouth. I have myself come across cases in which recurrence occurred very shortly, and X-ray examination of the teeth, which should have preceded, and not succeeded, operation, revealed definite foci of infection. Modern specializing is carried so far, that it may well be that the teeth and the alimentary tract are X-rayed by different men; I cannot but think that this is not always to the advantage of the patient.

The X-ray examination of the stomach and bowels is chiefly carried out by means of the opaque meal. The pharynx and œsophagus should always receive the first consideration, even though the patient makes no complaint of difficulty in swallowing. Cases of suspected gastric trouble evidenced by hæmatemesis, or by a feeling of discomfort in the epigastrium, may turn out to be the result of trouble in the gullet. In the slide which I now show you, there is very great narrowing of the œsophagus, caused by malignant stricture, yet the only complaint was of vomiting blood.

When actual complaint of dysphagia is made, the trouble may be functional or organic. It is easy to make a mistaken diagnosis in either direction. A nervous middle-aged woman, who complains that, ever since, some years ago, she swallowed accidentally a large unmasticated fragment of an apple, she has had difficulty in swallowing, is usually put down as suffering from a neurosis. Yet X-ray examination may reveal

a pharyngeal pouch. One presumes that this pouch gave no trouble until irritated in some way; it may be "silent" for years. Mechanical irritation is not essential; a period of mental stress may be sufficient to cause symptoms, and these symptoms may later disappear, although the X-ray appearance of the pouch remains unchanged.

Pouches, whether active or passive, are definite organic lesions, and cannot disappear unless surgically treated. Cardiospasm is in a different category; it often follows overstrain in nervous persons, and may cause an obstruction equal to that of organic disease. In the case which I show you, the lower end of the gullet is much dilated; obstruction had been complete for weeks, and the patient was being kept alive by feeding through a gastrostomy opening. The diagnosis, made in India, was carcinoma of the lower end of the gullet. This patient was made to drink no less than $1\frac{1}{2}$ pints of opaque fluid. It caused great pain, but the last few ounces proved too much for the cardiac sphincter, and the bulk of the mixture suddenly entered the stomach. This patient, who had been sent home to die, was assured that she had nothing serious the matter with her, and was advised to take a rest in the country. At the end of six weeks she was taking food in the normal manner.

The stomach lends itself well to exploration by the opaque meal method. Ulcers in their very early stages cannot as a rule be diagnosed, unless one is fortunate enough to see a small "fleck" of barium food adhering to the abraded surface after the main meal has passed over. But an ulcer which has "penetrated" beyond the gastric wall betrays its presence as a "niche" projecting from the normal outline. I show you several examples of this, all on the lesser curvature, which is the favourite site. Two of the slides illustrate the necessity for examination at various angles. In one the ulcer is invisible because obscured by the shadow of the spine. In the other, a slight

rotation of the patient brings it clearly into view. I also show you a slide of a penetrating ulcer so large that it was thought to be malignant, and another of the same case after three months rest and dieting, in which the ulcer has disappeared, so far as radiographic evidence is concerned.

Ulceration of the duodenum is shown by the same signs—the “fleck” and the “niche.” Although duodenal ulcer is statistically much more frequent than gastric ulcer, it is, in my experience, much less frequently demonstrated by X-rays.

As regards indirect X-ray evidence of ulcer, the only sign of real value is the incisura, which sometimes occurs on the greater curvature opposite to a small ulcer on the lesser curvature. Spasmodic hour-glass contraction of this kind is of no value in indicating an organic lesion unless it persists after the patient has been on belladonna for two days, and the exhibition of the drug has been carried to the point when the throat becomes dry and the pupils somewhat dilated.

Growths in the stomach, or growths adjacent to it which alter its lumen, manifest themselves to X-ray examination by what are called filling defects. I show you some slides in which the pars pylorica is absent from the radiograms. These were cases of pyloric cancer. I also show you a picture in which the opaque food pours out of the pylorus like fluid out of a spigot of a cask. This an example of “leather bottle” carcinoma, with rigid walls and a permanently open pylorus.

X-ray examination in itself cannot determine the exact cause of a gastric deformity. A few cases are due to non-malignant conditions, though, unfortunately, 90 per cent. are neoplastic.

The small intestine is not normally open to X-ray investigation, but stricture can of course be detected.

As regards the colon, filling defects can be demonstrated either by meal or enema in the same manner as in the stomach. If a

filling defect is persistent after castor oil and soap and oil enemas, it must be regarded as indicating a growth. If it shows before purging but not after, it is obviously due to a collection of fæces—but one must not hurriedly conclude there is no growth. A neoplasm in its early stages may cause a semiparesis of the gut in its neighbourhood, and be in fact, the *cause* of the accumulation. All such cases should therefore be carefully watched.

I now come to a very important part of my subject, viz., the X-ray examination of the cæcum and appendix. Cases in which a diagnosis of chronic appendix can be made on X-ray examination may be divided into two classes: (1) Those in which the diagnosis might have been made with a fair degree of certainty on clinical grounds alone. They are usually instances in which the appendix region is “silent,” the symptoms being confined to the epigastrium. The patient is sent with a query as to gastric or duodenal ulcer and, in the course of routine palpation of the cæcum and colon, is found to have a tender, possibly an adherent appendix situated more or less in the usual position.

More interesting, from the X-ray standpoint, is the case with a pelvic cæcum and retro-cæcal chronic appendix.

A pelvic cæcum must not be too readily diagnosed. To deserve the name it must be always in the pelvis, and refuse to come out even when a large enema is injected. It must also show residue for at least twenty-four hours after the rest of the meal has left the ascending colon. In such cases the appendix cannot as a rule be visualized until the cæcum is more or less empty, when the appendix will be seen behind it. Palpation on such a cæcum may or may not be resented; but absence of tenderness under such circumstances is no guarantee of an innocent appendix. In my experience, a cæcum conforming to the above type nearly always has an unhealthy appendix behind it; and where otherwise unexplained

gastric or duodenal symptoms were present, exploratory operation is fully justified.

It is sometimes said that every appendix which is seen filled with barium is diseased. This is most certainly not the case. Every normal appendix will be seen filled if sufficient observations are made, but this is not always practicable.

Points in the X-ray diagnosis of chronic appendix are: (1) tenderness on pressure. This is of especial value when sharply localized. If the patient was previously unaware of any painful sensation in the right iliac fossa, and if pressure there causes pain and discomfort which lasts for some hours afterwards, this may be taken as almost pathognomonic. (2) Fixation. (3) In women, a tender right ovary must be excluded. (4) An appendicular residue after forty-eight hours, the cæcum being empty, is not proof of chronic inflammation, but such an appendix should be looked on with some suspicion, especially if it is not freely movable. When there is a pelvic cæcum, with stasis, a chronic appendix may, as previously stated, be present without there being any tenderness demonstrable on palpation.

As regards negative X-ray evidence, this is of considerable value when there has been nothing suggesting an acute attack; but when such an attack has been reported by a competent observer the absence of any X-ray abnormality some weeks or months later must not be taken in any sense as a guarantee that the patient will have no further trouble.

From a consideration of the appendix—a natural cul-de-sac—one passes to the subject of diverticula. Diverticulosis must be sharply distinguished from diverticulitis. Diverticula of the colon are most common on the left side, especially in the sigmoid. They may exist indefinitely without causing symptoms, but, when they do inflame may give rise to acute attacks of what has aptly been called “left-sided appendicitis.”

In a case of suspected diverticulitis, the

quickest means of arriving at a diagnosis is by opaque enema. This while *in situ* will reveal any stenosis or filling defect, and, after evacuation, the characteristic residue of small circular masses outside the normal gut margins may reveal the nature of the trouble. The mouths of these diverticula are sometimes very small, and the enema may not be in long enough to fill them. In many cases I have seen pouches demonstrated by a meal, when a barium injection has failed to show them. Although demonstration of diverticula in a case which has been suspected of being malignant is always to be viewed with relief, it is not absolute proof of an innocent lesion, as malignancy and diverticulitis may co-exist.

Although the opaque meal and opaque enema are the principal means of demonstrating the alimentary tract, there are certain subsidiary methods which are occasionally of use. Inflating the gut with air is now seldom employed. Distension of the peritoneal cavity with carbon dioxide gas may be valuable. I show you a slide demonstrating adhesions between the coils of small bowel and the abdominal parietes; also an abdominal tumour in profile. Although the particular tumour I show you was large enough to be readily felt, it is obvious from the radiograph that it would have been equally well shown by the method of pneumo-peritoneum at one-tenth of the size, and therefore at a stage when it could not have been otherwise diagnosed. Carbon dioxide gas is absorbed within a few hours; nevertheless, unless precautions are taken, a patient may have abdominal pain for weeks after an examination. The essential thing is to keep him on his back for twelve hours, not permitting him to sit up even for a few seconds before this period has elapsed. If the work is carried out in a private consulting room, the patient must be carried out on a stretcher and taken away in an ambulance. If this is done, he will be in a perfectly normal condition twelve hours later.

No account of the X-ray examination of the alimentary tract, however brief, should omit referring to the gall-bladder. The symptomatology of gall-bladder affections cannot be separated from that of the stomach and the bowels. Till about three years ago X-ray investigation of the gall-bladder was confined to the demonstration of such gall-stones as had sufficient calcium content to show on an X-ray plate—about 10 per cent.—and of greatly enlarged and thickened gall-bladders, which alone cast shadows. The introduction of sodium-tetra-iodo-phenolphthalein by Graham in America, is perhaps the most remarkable forward step which has been made in X-ray diagnosis since the end of last century. I say this advisedly, for in a book by Williams of Boston, published in 1899, will be found the gist of all other proceedings, including opaque meal examination. Graham's method of cholecystography introduces, however, a new principle, in that the opaque material is not directly introduced into an organ, as in barium meal work, or in pyelography, but has to be taken up into the blood, pass to the liver, and be concentrated in the gall-bladder. If the walls of the latter viscus are diseased to any serious extent, the concentrating function is impaired or lost, and no image appears.

The dye may be given by intravenous injection or by mouth. The latter gives a high degree of positive results—somewhere between 60 and 70 per cent.—provided it is used in a fresh state. As its administration is simple and safe, it should, in my opinion, always be used first. If a good shadow is obtained, all that is necessary has been achieved. On the other hand, if no shadow appears, there is always the possibility that its absence is due to inefficient absorption of the dye from the bowel. In a few cases when no shadow has appeared after intravenous injection, the gall-bladder has been found at operation to be healthy; but negative evidence after the giving of the dye by the venous route is no doubt of much more

value than it is with the oral method. Nevertheless, the latter remains the method of choice for a first examination. It may be vitiated by vomiting or diarrhoea, but such disturbances, though often seen a year or so ago, are now seldom met with, owing to improvements in manufacture.

When an image is clearly seen, the diagnostic points are—size, shape, position, density and homogeneity or otherwise of shadows. Gall-stones, which are transparent to X-rays, may show as negative shadows—filling defects—owing to their displacing some of the dye.

A very important part of cholecystography examination is the test of function. If the gall-bladder shadow is seen at the usual time—twelve to fourteen hours—after the ingestion of the capsules of dye, the patient is given a "fatty meal." Buttered toast and cream does very well. Re-examination in about half an hour after this meal should show the gall-bladder reduced in size by something between one-third and one-half. A gall-bladder which is normal in size, shape and density, and which reacts in a proper manner to the fatty meal test, is unlikely to be seriously diseased. There cannot be more than at most a mild cholecystitis. The presence of one or two isolated calculi cannot be ruled out, but the familiar "bag of stones" can be excluded.

The combination of cholecystography with an opaque meal is often of value in showing the relation of the gall-bladder to the duodenum; but such a combination may sometimes interfere with the fatty meal test, the view of the reduced gall-bladder being obscured by superimposed barium shadows.

In conclusion, I show you slides of a few of the conditions which, while they have nothing to do anatomically with the alimentary tract, may give rise to symptoms which lead to patients being sent for barium meal examination. The most important are osteo-arthritis of the lumbar spine and Paget's disease of bone. For confirmation

of the latter, the skull should always be examined. Tubercular disease of the lungs may in some cases cause few symptoms referable to the chest, but only general lassitude and gastric disturbances. Lastly, disease of the spinal-cord—tumours and locomotor ataxia in particular—may be a cause of abdominal pain, and although they may not in themselves be the cause of any radiographic changes, the radiologist cannot afford to neglect the possibility of their existence.

A MUSEUM FOR POST-GRADUATE STUDY.

EVEN those most acquainted with the wonders of this great city constantly make discovery of some new feature which has escaped their notice. There are facilities and advantages at our very doors of which we live in total ignorance, until by some lucky chance they are revealed to us. How many medical men in London know of the existence of the Wellcome Museum of Medical Science? We have to confess we were numbered among the ignorami until we received a courteous letter from the Director (Dr. S. H. Daukes) offering the opportunities afforded by the Museum to Post-graduates of the Fellowship of Medicine. This Museum is quite unique both in its arrangement and in the wonderful facilities it affords for post-graduate study, not only pathological but clinical. The exhibits are arranged so as to show the causation, pathology, symptomatology, treatment and prevention of disease by means of specimens, models, paintings, photographs, photo-micrographs, &c., in such a way as to convey a graphic picture of the most important features of each disease. Associated with each exhibit is a short summary of the important points, and also a file containing abstracts of all recent research work on the subject of the exhibit.

We know of no other Museum so useful to a Post-graduate wishing to refresh his knowledge or to keep himself abreast of recent work.

It is proposed to arrange a series of weekly demonstrations in the Museum during the autumn, on subjects of interest.

The Museum is at 25/28, Endsleigh Gardens, close to Euston Square Station, and so is very convenient of access. Any member of the medical profession will be welcomed during the hours which the Museum is open (10 a.m. to 5 p.m.).

CONFERENCE ON RHEUMATIC DISEASES.

ON May 10 and 11, 1928, a conference was held at the Pump-rooms, Bath, under the presidency of Sir George Newman, Chief Medical Officer, Ministry of Health, to consider the problem of rheumatism in its social, economic and individual aspects.

Delegates from all parts of the United Kingdom and Europe enjoyed not only the presentation of masterly surveys of the subject by acknowledged experts, but the amenities and social entertainment for which the ancient city and its civic authorities are justly famous.

After an address of welcome had been given by the Deputy Mayor, in the regretted absence through ill-health of the Mayor, the conference proceeded to the actual business on the agenda.

At the opening session under the chairmanship of Lord Dawson, the scope of the conference was outlined in a presidential address by Sir GEORGE NEWMAN, who laid stress upon the extreme importance of clear conceptions of the causal factors and treatment of rheumatism and its great bearing upon the well-being of the individual and the State.

Lord DAWSON then gave a brief address pointing out the divergencies of opinion as