blackwater fever. The blood inoculated could not have carried a double infection of *P. vivax* and *P. falciparum*, for the strain had been passed through four persons before the case under review was inoculated. Since then sixty-eight inoculations have been performed with the same strain of parasite at Claybury Mental Hospital, and it has been used by other mental hospitals. Colonel S. P. James has also used the strain for mosquito inoculations. No malignant parasites have been found. The strain must therefore be a pure strain of *P. vivax*.

Yamakami³ has found that about 25 per cent. of tertiary and congenital syphilitics have the cold haemolysin in their blood. It is therefore probable that it might be present in a case of quaternary syphilis. Although the Eason-Donath-Landsteiner test was negative, it must be remembered that the test was performed a long time after the attack of haemoglobinuria.

The diagnosis of this case is therefore difficult, but on consideration of the detailed report of J. G. Thomson on blackwater fever it would appear that it is probably a case of paroxysmal haemoglobinuria.

In conclusion, I wish to thank Dr. J. S. Harris of West Park Mental Hospital for his assistance. For permission to publish records from Claybury Mental Hospital my thanks are due to Dr. G. F. Barham, medical superintendent.

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X RAYS IN THE DIAGNOSIS OF ORGANIC DISEASES OF THE COLON.*

BY

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In estimating the value of radiology in the diagnosis of organic diseases of the colon, it is necessary to compare it with the other available methods of confirming, or otherwise, suspicions aroused by a consideration of the patient's history. Apart from the ordinary physical examination of the abdomen and digital examination of the rectum, the only direct means of investigating intestinal diseases are the x rays, investigation of the stools, and sigmoidoscopy.

For the purpose of this communication my colleague, Dr. J. F. Venables, has analysed all the cases of the kind which have come under our observation at New Lodge Clinic during the last four years. In each an x-ray examination has been carried out by Dr. P. J. Briggs, the stools have been investigated by Dr. J. H. Ryffel and Dr. J. F. Venables, and I have inspected the rectum and pelvic colon with the aid of the sigmoidoscope. The relative value of these different methods can thus be estimated, but it is at once clear that all are valuable and should be systematically used, as it is generally impossible to tell beforehand which will give the most important information in a given case, whilst in many the final diagnosis is only reached by a consideration of the symptoms and the results of the physical examination in the light of the information obtained—whether of a positive or negative character—with the x rays, the investigation of the stools, and sigmoidoscopy.

The series of cases includes 13 of carcinoma of the colon, excluding growths of the rectum which could be felt on digital examination, 5 localized adhesions of the colon, 5 cases of diverticulitis, 3 strictures following ulcerative colitis, 1 case of tuberculosis of the caecum, and 1 of tuberculosis of the last three inches of the ileum.

1. The X Rays.

(a) An x-ray examination after an opaque meal never reveals an obstruction of the colon which cannot be recognized with an opaque enema, but it is useful in the diagnosis of obstruction of the small intestines, especially near the end

of the ileum. In only 2 out of 12 cases of cancer of the colon was anything abnormal seen after an opaque meal.

(b) As I first demonstrated in April, 1908, an opaque enema shows the presence of obstruction at a comparatively early stage, often long before localizing symptoms develop. But a negative result does not exclude a growth of the colon; in 1 of the 9 cases in which an opaque enema was given and in 3 earlier cases a growth was found, though an opaque enema had failed to show the slightest abnormality.

An opaque enema is the only certain clinical means of recognizing diverticula of the colon. This is of great importance, as it may be impossible, even during an exploratory operation, to distinguish between a growth and an inflammatory mass secondary to diverticulitis. In one case in which we had found that symptoms of obstruction were due to diverticulitis, a recurrence of symptoms two years after the mass had been removed was shown by an opaque enema to be due to carcinoma developing in connexion with a diverticulum of the iliac colon, which had apparently escaped notice at the original operation.

Until recently I believed that ulcerative colitis never led to stricture on healing. I have, however, now seen 4 cases out of a series of 17, in which delayed recovery was due to narrowing of the colon, which was discovered with the x rays; in two of these the whole pelvic colon was shortened and narrowed, but complete recovery ultimately occurred without surgery. In the third case a long stricture was found in the transverse colon and a short one in the descending colon, and in the fourth a long stricture of the transverse colon and a kink of the pelvic colon; in neither were any symptoms pointing to obstruction present, but the x rays showed the necessity of short-circuiting operations, without which recovery would have been impossible. Delayed recovery in cases of ulcerative colitis, whether an appendicostomy has been performed or not, is thus an additional indication for x-ray examination.

2. The Stools.

Microscopical examination may show the presence of blood corpuscles and pus in stools which look normal to the naked eye. Much more frequently blood can only be recognized by chemical means and by the discovery of haematoporphyrin or acid haematin with the spectroscope. In 4 out of 12 cases of growth of the colon the blood was obvious; in all of the others occult blood was found in every stool. For some unknown reason it appears to be present with equal constancy when obstruction is caused by adhesions; thus obvious blood was present in 1 and occult blood in the remaining 4 of our cases of this kind; occult blood was also found in the cases of ileal and caecal tuberculosis. In 3 cases suspicious symptoms and the presence of occult blood induced us to advise operation, though the x rays had shown nothing abnormal; in 2 of these the symptoms were referred to the stomach and achlorhydria was present, and we diagnosed carcinoma of the stomach, so that an opaque enema, which might have led to a correct diagnosis before operation, was not given.

3. The Sigmoidoscope.

The sigmoidoscope is so invaluable in diagnosis that every practitioner and physician should learn to use it himself in cases of supposed colitis or unexplained disturbance in the functions of the bowels. With its aid a growth of the upper part of the rectum or lower part of the pelvic colon can be recognized before it can be felt—often before a barium enema shows any definite abnormality. By means of the sigmoidoscope I have twice been able to diagnose early malignant degeneration of a polypus before the wall of the bowel itself had become involved.

I hope that one result of this discussion may be to induce surgeons to avail themselves more frequently of the assistance given by a thorough investigation before embarking on an exploratory laparotomy. I have had the disappointment of learning that a patient, in whom we had diagnosed a growth of the splenic flexure, had had his appendix removed by a distinguished surgeon, whom he consulted without telling his own doctor, to whom we had sent our report; eighteen months later he was operated upon a second time for acute obstruction caused by an inoperable growth of the splenic flexure.

* Contributed to a discussion in the Subsection of Proctology of the Royal Society of Medicine, May 13th, 1925.