Optic Neuritis.

This man received an injection of 0.6 gram of salvarsan for syphilitic rash. Two months later he complained of pain in the eyes and headache. Ophthalmoscopic examination showed marked optic neuritis. The Wassermann reaction was positive. I at once administered a second injection of salvarsan. The result was wonderful; all symptoms rapidly disappeared, and the man was discharged to duty with normal vision, and has remained perfectly well for over eighteen months.

Cerebral Lesions.

Fleet Surgeon Bassett-Smith has kindly permitted me to add some notes made from his report on the pathological condition found on examination of the brain of a man who died after the second injection of neo-salvarsan.

The meningeal vessels were markedly congested. Oedema was present in the cortex of the frontal area.

On the right side the Sylvian vein was full of hard clot extending half-way up the frontal lobe.

The centrum ovale on section showed punctate haemorrhagic spots. The internal capsule of both sides showed haemorrhagic areas with acute capillary congestion. The pons and medulla showed the same condition. Arsenic was found to be present.

Microscopically.—The infiltrated areas showed congestion of all the small vessels, with collections of blood cells round about the capillaries.

In portions impregnated with silver by Levaditi's method no spirochaetes were detected.

Sections of the larger arteries in the Sylvian fissure showed periarteritis and endarteritis.

Sections of the thrombosed Sylvian vein did not indicate an infective origin.

I wish to express my indebtedness to Fleet Surgeon Bassett-Smith, C.B., and also to Surgeons Campbell Ross, W. G. Custance, and V. J. Richardson, all of whom have largely participated in the work done at Chatham.

"STANDARD" OPAQUE MEAL FOR RADIOGRAPHIC EXAMINATIONS.

By ALFRED C. JORDAN, M.D. CANTAB., M.R.C.P.

For radiographic examinations opaque meals are administered with several different objects in view. The purpose may be to elucidate physiological principles, as in the examination of the healthy stomach, and various kinds of meal must be used to ascertain the effect of different foods on gastric peristalsis, and on the rate at which the stomach empties itself. In all such investigations the presence of the opaque substance (usually a salt of bismuth or the sulphate of barium) modifies the character of the food so greatly (making it unpleasantly dry and earthy) that the conclusions cannot be assumed to be directly applicable to the case of ordinary meals. We are driven to determine the behaviour of the healthy stomach with our opaque meals, and to endeavour to discover which deviations from the usual behaviour are due to organic disease.

In my own case the opaque meal is almost always given to ascertain the presence of disease, or abnormality of structure or of function, and in the vast majority of cases I examine not merely the stomach but the entire length of the alimentary tract from the mouth to the rectum. My method of procedure has been evolved, little by little, as my experience has grown, the main object being to obtain the greatest amount of trustworthy information. To attain this object I have made a practice of following my patients to the operating room whenever an opportunity has arisen. In this way I have been able to compare the appearances shown in my radiograms with the condition of the parts as actually revealed at the operation.

The "Standard Meal" I am about to describe is that used by me in the majority of cases in which I make a complete investigation of the digestive tract, and this includes examinations for intestinal stasis.

METHOD OF EXAMINATION FOR INTESTINAL STASIS.

The patient takes his usual breakfast. About one or two hours later he comes for his first examination.

An emulsion is prepared consisting of bismuth carbonate, 4 oz.; sugar of milk, $1\frac{1}{2}$ oz.; water in amount sufficient to make an emulsion which is not thick.

The whole drink makes less than a tumblerful. In the case of big subjects, 5 oz., or even 6 oz., of bismuth carbonate are given, with a correspondingly greater amount

of sugar of milk and water; even this makes no more than a tumblerful. The water should not be quite cold, especially in winter. I have not had a single case in which this dose has produced the slightest untoward result.

The sugar of milk in this "standard meal" has a three-fold function: (1) To make a satisfactory emulsion, (2) to increase the bulk of the meal, and (3) to make the meal pleasant. In some cases it has a mild laxative effect.

The patient is first examined upright on my revolving saddle seat with canvas back.¹ The chest is examined, first in the anterior view, and then in the right anterior oblique view. While in this position (R.A.O.) the patient begins to drink the bismuth emulsion, and its course down the oesophagus is well shown; if this appears normal, and the bismuth begins to enter the stomach at once, the patient is swung round to the anterior position, and the level of the great curvature of the stomach is noted as the first portions of bismuth reach it. The final level of the great curvature is lower, the difference being due to the weight of the bismuth.

After the vertical examination the patient is examined on the couch—supine, supine after lying on the right side, prone. All details regarding the size, shape, and position of the stomach and duodenum may be determined at this examination, and accurate observations may be made of the motor activities of these organs. Subsequently the bismuth passes through the small and large intestines, and enables them to be studied to great advantage. My results have been published from time to time.²

OBJECTIONS TO THE METHOD EXAMINED.

Several objections have been raised to my method. I propose to consider them individually.

1. "The bismuth carbonate neutralizes the free acid in the stomach." I use it for this very reason; it overcomes (partially at any rate) the pyloric contraction, whether physiological or pathological, and allows the bismuth to enter the duodenum in sufficient amount to give a good view of it (the duodenum), and to permit of an accurate study of its form and functions.

1A. "But if you neutralize the free acid in the stomach you diminish the peristaltic activity of the stomach." A few inconclusive experiments have been described in support of this contention, but an extended experience with bismuth carbonate has shown me that active peristalsis may be observed when this salt is used, while the excessively powerful peristalsis and the reversed peristalsis that occur in some cases of pyloric stenosis may be demonstrated to perfection with an emulsion of bismuth carbonate given in the way I have described.

2. "If you give the bismuth when there is food in the stomach, and allow more food to be taken before all the bismuth has left the stomach, you cannot form correct estimates of the rate at which the stomach empties itself." True, but the rate of emptying of the stomach is not a point of paramount importance; certainly it is of far less importance than a proper view of the duodenum, and the duodenum cannot, in my experience, be properly examined if the bismuth (or barium) be given on an empty stomach, for in the latter case the bismuth has to encounter persistent spasm at the pylorus—a physiological effect which I have recently described and explained.³ Further, even with barium given on an empty stomach, the rate at which this organ rids itself of the barium varies greatly on different occasions in the same subject. One day the barium may be all out in two or three hours, while another day it may take six or eight hours, or even longer. Patients do not appreciate being kept without food so long! There is a further grave objection to withholding food beyond the usual time: one of the most powerful factors in causing the contents of the large bowel to advance is the taking of food. It follows that the results obtained for the rate of passage through the intestines are seriously invalidated in cases in which food is withheld.

3. "If you place a large dose of bismuth in the stomach, and then cause your patient to lie on the right side, the duodenum will become unnaturally distended and will give a picture which does not correspond with the actual state of affairs." The answer to this is conclusive. All my patients are examined in this way. My reports show that in a dozen patients I get evidence of marked duodenal distension in one or two only (40 in the last 334 patients);

and in these I always find associated changes in the lower ileum, and usually in the large intestine. In the normal cases the duodenum is small and short, and the bismuth is seen to pass through it by active peristalsis, without delay or regurgitation, into the jejunum as soon as the patient is placed in the supine posture from the right lateral position. Moreover, my results, both normal and abnormal, are repeatedly checked at operations, and the actual state of the duodenum is found to agree closely with my previous account of it. In a thin subject I have seen the duodenum dilated and showing strong "writhing" peristalsis though it contained no bismuth—in fact nothing but Benger's food.

4. "The larger the dose of bismuth the greater will be the delay in its passage through the intestines; consequently the intestinal stasis, if present, will seem to be greater than would be the case with ordinary food, and stasis may appear to be present when there is no stasis to ordinary food." The former part of this assertion is true to a slight extent (though the laxative action of the sugar of milk prevents delay in most cases), but as all my patients are given the same dose of bismuth (never less than 4 oz. in an adult), the normal time of passage is well known to me, and all my results are comparable. With a smaller dose it is impossible to obtain satisfactory pictures of the duodenum, the terminal portions of the ileum, the appendix, or even the large intestine.

5. "An emulsion does not fill the stomach sufficiently to give a good picture of its outline." "An emulsion does not mix uniformly with the gastric contents, but falls to dependent parts." The former assertion would be true if the emulsion were given on an empty stomach; this is not my practice. The latter statement is partially true; but it is true of almost all opaque meals, and no fallacy is introduced provided the observer checks his vertical and supine examinations with a view in the prone posture. The various changes of position—vertical, supine, right lateral, prone—ensure the proper mixing of the gastric contents with the bismuth.

By allowing the patient to take his usual meals throughout the investigation a true picture is obtained of the usual progress of the ingesta through the alimentary canal.

ADVANTAGES OF AN EMULSION.

The advantages of an emulsion over a solid meal are numerous.

(a) *From the Patient's Point of View.*—A smooth emulsion, slightly sweetened by the presence of lactose, is incomparably pleasanter, easier, and speedier to take than a bowl of porridge, or gruel, or bread and milk containing bismuth or barium. Many of my patients have been given one or other of these solid meals by other observers previously, and their verdict is absolutely unanimous. As a rule they volunteer the statement unasked. This refers to a porridge containing only 2 oz. of bismuth or barium; if 4 oz. were to be given in this way, the bulk of the meal would have to be so great that no patient could take it. In the case of barium sulphate, I find it necessary to give no less than 10 oz. of this substance in order to get the same pictures of the intestines as with 4 oz. of bismuth carbonate. Many patients (for example, cases of gastric ulcer) cannot or will not take a solid meal, or their doctor (very properly) will not permit it. A large dose of bismuth carbonate is decidedly soothing to the stomach and intestines. This is a property of great value, many of the patients being subject to nausea, vomiting, flatulence, colic, etc. It would be impossible to follow a test meal through the alimentary tract in some of these subjects but for the beneficent action of the dose of bismuth carbonate. It is a daily occurrence for a patient to volunteer the statement that he (or she) had a better appetite for lunch after the bismuth than had been the case for many months. There is certainly less flatulent distension during the presence of the bismuth in the large intestine, and even if there be no evacuation of the bowels for four days or more, the patients are able to tolerate it without discomfort, although they could not go so long under ordinary conditions without suffering from nausea, pain, distension, headache, etc.

(b) *From the Observer's Point of View.*—The time taken to eat a bowlful of porridge or bread and milk might well be spent more profitably, and doctors bringing patients have often complained to me of the loss of time inflicted on them in this way by some radiologists. The oesophagus

is not observed, and as a rule no examination of the chest is made, the observer concentrating his attention on the stomach at once. No view of the duodenum is obtained—a most important omission; this is due, as I have often explained, to the spasmodic contraction set up at the pylorus by a solid meal. The difference is most striking, for with an emulsion of bismuth carbonate given after a meal the duodenum is shown well filled with bismuth, and its behaviour may be studied with certainty and precision as the peristaltic waves pass along it, forwarding its contents into the jejunum in normal cases. The cheapness of barium sulphate does not compensate for the loss of these advantages.

CONCLUSION.

Those observers who are content to examine the stomach only, and do not seek information regarding the duodenum or the ileum, can give any opaque test meal they think best; in my own case, having come to the conclusion that the whole alimentary tract should be investigated in each case, I hold that an emulsion of carbonate of bismuth should be given—composed as stated in the early part of this paper—and administered in the manner there described, and the examinations should be carried out as I have described in my papers on intestinal stasis and gastric ulcer.^{2,3}

For the purposes of an opaque enema I am now in the habit of using 12 oz. of barium sulphate mixed with kaolin (*Bolus alba*, *German Pharmacopoeia*) and warm water.

"Butter-milk" is largely used in America in the composition of opaque meals; I have never tried it, but I imagine it would increase the acidity of the gastric contents, and so prevent the proper filling of the duodenum.

I am indebted to Dr. F. M. McPhedran, jun., of Toronto, for many valuable suggestions after reading the rough notes for this paper.

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SOME ACUTE ABDOMINAL CASES.

BY

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THESE cases have been seen recently, and I have considered them worth recording as acute abdominal conditions.

Cases Nos. I and II presented the usual symptoms of an acute abdomen, the remaining four had abdominal symptoms, which were acute and permitted no delay. The distinction I draw between the acute abdomen and those cases presenting acute abdominal symptoms is, with the former there is general peritonitis, due to some cause such as rupture of stomach or intestine either by disease or trauma, rupture of abscess, etc.; and the latter, where there is no general peritonitis, and the acute symptoms are caused by some form of internal strangulation of gut, cyst with twisted pedicle, ectopic gestation, intussusception, etc.; but in either group of cases the word "acute" means no delay. The difficulty of diagnosis is usually great, and is often made more difficult by delay and by the administration of some form of opiate.

CASE I.—General Peritonitis: Cause Doubtful.

E. H., aged 70, male, was seen, in consultation with Dr. Thomas, during the afternoon, with a history of an inguinal hernia, which had been reduced the same morning, but vomiting had continued with marked abdominal tenderness; the knees were drawn up and the pulse was 140. I considered that, although the hernia had been reduced, strangulation had not been relieved.

The patient was conveyed in a motor ambulance to a nursing home, and I operated at 8 p.m. the same day, assisted by Dr. Thomas.

Incision was first made to explore the site of the inguinal hernia on the right side. On opening the sac, thin, purulent, non-smelling fluid escaped. The wound was left open and a