molecules or ions the phenomenon due to surface development becomes suppressed, and the fluid will manifest properties characteristic of true solution. Hence it is the size of the dispersoid in a dispersion medium and the degree of dispersion which in fact determine the nature of a fluid—whether a suspension, a colloidal solution, or a crystalloidal solution. As already stated, precipitation is of a physico-chemical nature, and the efficiency of an antigen is determined by the extent of its colloidal capacity. While there are no broad distinctions to be drawn between the members of the series, colloids differ from the rest in that they are more readily precipitated by other colloids and by electrolytes. It has been demonstrated that a substance may be either colloid or crystalloid, the form it assumes depending upon treatment. Thus, the production of a colloidal solution in saline from an alcoholic extract solution of lipoids will depend greatly on the manner in which the extract and saline are mixed—whether slowly or rapidly by shaking. In the former case a suspension or a colloidal solution is formed, in the latter almost a true solution. This is shown by an experiment (the result of which is given in Table IV.), in which an alcoholic extract of the human heart prepared in the way described above is mixed with saline: (a) by first floating the extract on saline overnight, followed by shaking (here the resulting fluid is practically a suspension, evidenced by the fact that the suspended particles are large, visible to the naked eye, and readily separate out); (b) by mixing gradually in the way indicated under description of technique (this yields a mixture showing the characteristics of a colloid; and (c) by immediate shaking (the mixture thus formed is almost a true solution, being practically clear, and showing in this instance that the dispersoids are of minute molecular size).

TABLE IV.—Preparation of Antigen.

(a) Slow mixing, a suspension; (b) gradual mixing, a colloid; (c) immediate mixing, a solution.

Serial No.	W.R.	(a)	(b)	(c)
127	Positive serum.	++	++	—
128	„	++	++	?
129	Negative „	++	—	—
130	Positive „	++	++	—
131	„	++	++	—
132	Negative „	++	—	—

Reading was taken after interaction for 18 hours at 37°C. between serums and antigens. +, +, ?, —, indicate, respectively, much precipitation, doubtful, and no precipitation.

The experiment shows that if, on one hand, the mixing of the extract and saline is effected immediately, the antigenic property of the fluid is practically nil; and if, on the other hand, it is done too slowly spontaneous precipitation will take place. For the preparation of a satisfactory antigen in this respect the manner in which the two ingredients are mixed is therefore of great importance. Sachs and Georgi have prepared an antigen for detecting syphilitic infection by a precipitation test. With their antigen they have examined 2770 serums, and obtained a parallel result with the W.R. in 94.9 per cent. of the cases. The antigen used by them is prepared as follows: An extract with 96 per cent. alcohol of the bullock's heart is made, and put up at the strength of 1 g. of the muscle to 15 c.cm. of the alcohol. To this extract a 1 per cent. alcoholic cholesterol is added, in the proportion of 300 c.cm. of the former to 13 c.cm. of the latter. For use, one volume of this cholesterolised extract is at first rapidly mixed with one volume of physiological saline, and then more slowly with four volumes of the saline. The resulting mixture may, in my experience, be either turbid or opalescent, the degree of opacity depending on the speed at which the cholesterolised extract and saline are mixed.

Using this sedimentation method of Sachs and Georgi Nathan and Weichbrodt¹⁰ have tested 1280 serums and found an agreement with the W.R. in 93 per cent. of the cases. Logan,¹¹ amongst others, however, considers, and with him I agree, that with

Sachs-Georgi cholesterolised heart antigen the precipitation is so fine that a sharp end-result is often not obtained; consequently a personal element is liable to be introduced in recording a reading. It will be seen that no great emphasis is laid by Sachs and Georgi on the care with which the ingredients are mixed, and the maximum turbidity aimed at in their antigen is brought about, not by a slow interaction between the heart extract and saline, but by the addition of cholesterol.

Conclusions.

1. The test has been practised on 200 serums, and was controlled throughout by the W.R. In 192 cases (96 per cent.) a parallel result was obtained with the two tests. Discrepant results were found in eight instances, which consisted of three treated cases, three cases with a definite sign or history of syphilis, and two unknown.

2. All the positive W.R. serums, numbering 73, were found to yield also a positive reaction with the precipitation test.

3. Of the 124 negative W.R. serums, 119 were negative, 4 were positive, and 1 was doubtful to the sedimentation test. The four serums which reacted positively to the sedimentation test but negatively to the W.R. were obtained in two instances from treated cases, in one instance from a case showing active manifestation of syphilis, and from one unknown.

4. The three doubtful W.R. serums gave in two instances a positive, in the third a negative precipitation test. The former belonged to a treated and a latent case.

For courtesy in supplying me with the bloods I wish to record my indebtedness to Dr. H. H. Scott of the Government Bacteriological Institute, Dr. G. H. Thomas of the Tung Wah Hospital, and Dr. T. C. Wong of the Ho Miu Ling Hospital.

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A CASE OF
PERFORATED GASTRIC ULCER
WITH UNUSUAL SYMPTOMS AND SEQUELÆ.

By E. G. D. MILSOM, M.R.C.S.;
AND
LIONEL E. C. NORBURY, O.B.E., 'M.B. LOND.,
F.R.C.S. ENG.,
SENIOR ASSISTANT SURGEON, ROYAL FREE HOSPITAL,
ST. MARK'S HOSPITAL, ETC.

THE following case presents unusual features and may deserve record.

Past History.—The patient, C., male, aged 58, had had pneumonia on four occasions, periodic attacks of vomiting for last 20 years, no hæmatemesis, intervals of complete freedom from gastric symptoms of one or two months' duration, and attacks at more frequent intervals of recent years.

Present Illness.—On the evening of June 1st, 1921, after a very long walk, he had a sharp attack of epigastric pain and severe vomiting set in and continued for 36 hours. On June 3rd he was examined by one of us (E. G. D. M.) at the surgery. There was no abdominal rigidity and no obliteration of liver dullness, but slight epigastric tenderness. Temperature 97.8° F., pulse 72, urine normal. He was sent back to bed and given albumin water only. At 5.30 p.m. he took a dose of a mixture containing bismuth-pepsin and morphia, and at 6 p.m. he had a violent attack of abdominal pain which was referred from the epigastrium to the tip of the penis. There was no erection of the penis; he desired to micturate but could not do so. At 7 p.m. another severe attack of epigastric pain following

administration of 2 oz. of albumin water was also referred to the penis. He was shouting with pain, and holding on to the penis. Marked opisthotonos was present.

The abdomen was "board-like" with no distension and no dullness in flanks and no obliteration of liver dullness. Heart normal; signs of chronic bronchitis and emphysema in lungs. Inject. morph. hyp., gr. 1/8th, quickly relieved the pain. Vomiting continued. Urine was passed naturally, no hæmaturia. Temp. 97.8°, pulse 80. At 10 p.m., condition unaltered, temp. 97.8°, pulse 90; diagnosis, ? perforated gastric ulcer.

Operation.—Under closed ether the abdomen was opened by a right paramedian supra-umbilical incision. A little free fluid was found but no gas, and there was some local peritonitis below the liver and around the pyloric region. On the anterior wall of the pylorus was a large chronic ulcer, one and a half inches in diameter, with a pinhole perforation in its centre. The ulcer was overlapped by an enlarged liver and the perforation was evidently due to the giving way of adhesions between the liver and stomach. Considerable induration was present for some distance around the ulcer. The ulcer was invaginated by a row of Lembert's sutures reinforced by an omental graft, and the abdominal wall was closed.

Subsequent History.—June 4th: Condition satisfactory; no vomiting; temp. 100°, pulse 110; saline and glucose given per rectum, four-hourly, and sips of iced water by mouth. June 5th: Condition still good. "Coffee-ground" vomiting once after a feed of Berenger's food. Food by mouth stopped. The next morning copious and persistent coffee-ground vomiting. Good result from enema. Saline, per rectum, continued. Temp. 98.8°, pulse 112 per minute. On the 7th stomach much dilated with visible peristalsis. Lower border of stomach midway between umbilicus and

symphysis pubis. Signs of broncho-pneumonia, much rusty sputum, septic ulcers on pharyngeal walls. Large quantity of coffee-ground material withdrawn by stomach-tube.

Diagnosis of Post-operative Condition: (1) Pyloric obstruction, the result of invagination; or (2) acute atonic dilatation of the stomach.

Treatment.—Gastric lavage, twice daily. Inject. pituitrin hyp., 1 c.cm. bis; saline and glucose per rectum. From time of commencing lavage, vomiting ceased. With each gastric lavage, less and less distension of the stomach was evident. Signs of broncho-pneumonia, much sputum, and symptoms of cardiac failure present from June 7th to 13th, after which date recovery was uninterrupted. Stomach washed out for last time on the 10th.

Present Condition (November, 1921).—Patient's general health excellent. Still some signs of chronic bronchitis. Digestion said to be better than for years. Only symptom now complained of apparently due to cardio-spasm. At beginning of certain meals food seems to lodge in œsophagus. On swallowing some fluid, this first portion of food returns; then, as a rule, the meal is taken normally and without any subsequent discomfort or vomiting.

The following are the unusual features of this case:

1. The gradual onset of acute symptoms due apparently to a minute leak from the stomach.
2. The severe attacks of pain, apparently of sympathetic origin, referred to the penis, with inability to pass water, and accompanied by opisthotonos.
3. The marked post-operative acute dilatation of the stomach, with persistent vomiting, which was instantly relieved by gastric lavage.
4. The occasional attacks of cardio-spasm at the present time.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF MEDICINE.

THE TREATMENT OF GASTRIC ULCER.

A MEETING of this section of the Royal Society of Medicine was held on Feb. 2nd, when Dr. G. NEWTON PITT, the President, presided.¹

Two Great Difficulties.

Sir WILLIAM HALE-WHITE said that the treatment of gastric ulcer laboured under two great preliminary difficulties. The first was diagnosis: for disease of the teeth and gums, gastrostaxis, appendicitis, cholecystitis, stone in the kidney, duodenal ulcer, carcinoma of the stomach, and various functional dyspepsias had been not infrequently mistaken for gastric ulcer. Statistics as to the results of medical treatment could therefore not be considered reliable. Absolute proof of the presence of an ulcer could be obtained by means of the X rays; and a further X ray examination of a series of these proved cases six months after treatment would be valuable as evidence of cure.

The second difficulty arose from our ignorance of the causation of gastric ulcer. There was strong evidence in favour of the belief that infection from elsewhere was the common cause—e.g., disease of the mouth, appendix, gall-bladder, &c. But the only ulcers whose cause was definitely known were the rare forms due to tubercle or syphilis. Nevertheless treatment should be directed in the first instance against any discoverable toxic focus. The physician was encouraged to treat gastric ulcer himself by the fact that ulcers tend naturally to heal. The acute ulcer common in young women occasionally perforated, but generally healed completely. The chronic ulcer, commoner in men between 30 to 40 years, did not heal so readily.

Medical Treatment of Acute and Chronic Types.

Acute Type.—This rarely revealed itself on X ray examination, yet many patients should be treated on

the assumption of its presence. Rest in bed upon a diet of milk and eggs (seven and a half fluid ounces of milk with two eggs to the pint every two waking hours) combined with a little olive oil and the exhibition of full doses of sodium bicarbonate and moderate doses of tincture of belladonna, together with some bismuth, was generally curative. The diet he prescribed provided ample nourishment; this was important, since starvation (or rectal feeding) meant delayed healing of the ulcer. The return to normal diet after four to five weeks of this treatment should be gradual.

Chronic Type.—Treatment of the second type was not so invariably successful and a number of cases eventually had to undergo surgical intervention. Medical treatment upon the lines already described should be prolonged for many weeks, but surgery was indicated if this failed, if the case relapsed, in the presence of pyloric stenosis, hour-glass stomach, or repeated and severe hæmorrhage. It was noteworthy that a larger proportion of hospital than of private patients underwent operation. This was largely due to the difficulty of dieting and prolonged rest amongst the former.

Hæmorrhage.—As regards hæmorrhage from acute ulcer, surgery was contra-indicated since it could nearly always be dealt with by medical means amongst which morphia and two grains of calcium chloride as an intramuscular injection were the most valuable.

Where syphilis was present anti-syphilitic treatment should be combined with the ordinary dietetic treatment.

Sir BERKELEY MOYNIHAN's contribution to the discussion will be found on p. 267 of the present issue of THE LANCET.

Details of Medical Treatment.

In the absence of Sir WILLIAM WILLCOX, his paper was read by Dr. H. L. TIDY. He said that no exact rules could be laid down for treatment since each case would present individual peculiarities, but, in general, medical treatment should be given except in cases of perforation or of almost complete pyloric obstruction, for which immediate surgical measures were imperative. The treatment advocated by Sir William Willcox for early cases consisted in complete rest in bed and regular feeding every two hours with 6 oz. of citrated milk with 20 gr. of bicarbonate of soda. Search should be made in every case for a septic focus. Oral sepsis

¹ We regret that the name of Sir William Hale-White was erroneously given in our report last week as presiding over the discussion on the Diagnosis of Gastric Ulcer, to which this is a sequel. Dr. Pitt was in the chair at both meetings.—ED. L.