when it rises to 84. The tongue is clean and the appetite good. The patient is putting on weight and mentally he is bright and alert. He has been able to attend at my consulting rooms for blood counts. The following counts will demonstrate the progress made. On November 30th, 1929, a few days after commencement of treatment with ventriculin, the blood count was as follows:

Red blood cells (per c.mm.)	...	...	830,000
White blood cells (per c.mm.)	...	...	2,000
Haemoglobin	...	...	20 per cent.
Colour index	...	...	1.2
Differential count:			
Polymorphonuclears	...	...	53 per cent.
Small mononuclears	...	...	42 "
Large mononuclears	...	...	3 "
Eosinophils	...	...	1 "
Megaloblasts	...	...	1 "

Poikilocytes and anisocytes were present. Eve's halometer reading = 3.7.

On January 6th, 1930, the patient's condition showed great improvement. A blood count was as follows:

Red blood cells (per c.mm.)	...	...	2,100,000
White blood cells (per c.mm.)	...	...	5,500
Haemoglobin	...	...	38 per cent.
Colour index	...	...	0.83 "
Differential count:			
Polymorphonuclears	...	...	61.5 per cent.
Small mononuclears	...	...	32.5 "
Large mononuclears	...	...	3.5 "
Mast cells	...	...	0.5 "
Eosinophils	...	...	2.0 "

The red blood cells show variation in size and shape. No nucleated red cells were seen, and no reticulocytes. Halometer reading = 3.8. The blood count on January 20th was as follows:

Red blood cells (per c.mm.)	...	...	2,670,000
White blood cells (per c.mm.)	...	...	6,200
Haemoglobin	...	...	64 per cent.
Colour index	...	...	1.19 "
Differential count:			
Polymorphonuclears	...	...	71.6 per cent.
Small mononuclears	...	...	24.4 "
Large mononuclears	...	...	2.4 "
Transitional mononuclears	...	...	0.4 "
Eosinophils	...	...	0.4 "
Mast cells	...	...	0.8 "

The red blood cells show variation in size and shape. No nucleated red cells were seen, and no reticulocytes. The following was the result of a count taken on January 27th:

Red blood cells (per c.mm.)	...	...	3,600,000
White blood cells (per c.mm.)	...	...	5,500
Haemoglobin	...	...	74 per cent.
Colour index	...	...	1.03 "
Differential count:			
Polymorphonuclears	...	...	65.5 per cent.
Small mononuclears	...	...	28.0 "
Large mononuclears	...	...	0.5 "
Transitional mononuclears	...	...	5.5 "
Eosinophils	...	...	0.5 "

REFERENCE.

1 Sharp, A. Elwood: An Anti-anemic Factor in Desiccated Stomach, *Journ. Amer. Med. Assoc.*, 1929, 93, 749.

PROBABLE SEPTICAEMIA TREATED WITH SCARLET FEVER SERUM.

BY

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THE following case, clinically of septicaemia, is interesting in view of the fact that injection of antiscarlatinal serum seems to have been the deciding factor in bringing about a recovery.

The patient, a boy aged 14½, was seen on the morning of May 5th, 1929, complaining of pain in the region of his heart, much worse on even slight exertion, such as turning over in bed. The cardiac dullness was increased to 1 inch to the left of the nipple line, and the heart rate was 108, the first sound being impure at the apex. The temperature was normal. The throat was slightly reddened; the tonsils had been efficiently removed some years before. There had been a shiver on the previous night.

There was a history of a feverish attack during the holidays, with sore throat, rapid heart, and a temperature of 101°, for which he had been kept in bed for several days, until he appeared quite well. During this attack there was no suspicion of carditis, though it was looked for repeatedly.

By the next day the patient had a slight rise of temperature, more precordial pain, a blowing systolic murmur limited to the apex, and some pain in his thighs and calves. There was tender swelling of the glands at the angles of his jaws. No rheumatic nodules were felt. Sodium salicylate was given in increasing doses up to 90 grains in twenty-four hours, with sodium bicarbonate.

Between then and May 18th he gradually became worse. His temperature varied between 99° and 101°. He became toxic in appearance; his heart became more dilated and a pericardial rub appeared, as well as broncho-pneumonia in his right lung. No enlargement of liver or spleen and no petechiae or rheumatic nodules were found.

On that day he was seen by Dr. Holmes, and later by Dr. Grace of Chester, who took blood specimens. As the case appeared to be one of septicaemia, probably streptococcal in nature, 10 c.cm. of antiscarlatinal serum were injected intramuscularly.

The pathological report on the blood by Dr. Grace was, briefly, as follows: Widal reactions completely negative to typhoid and to paratyphoid A and B; white cells 12,000 per c.mm. (polymorphs 73 per cent., lymphocytes 18 per cent., mononuclears 5 per cent., mast cells 2 per cent., myelocytes 1 per cent., eosinophils 1 per cent.). After thirty hours' incubation at 37° C. the blood cultures remained sterile.

On May 19th the patient was seen by Dr. Capon of Liverpool in conjunction with Dr. Littler of Southport, who also agreed in the diagnosis of streptococcal septicaemia, and advised a continu-

ance of the serum. The doses of serum from May 18th to May 25th are given below.

Date.	Morning.	Evening.	Remarks.
May 18	—	10 c.cm.	—
" 19	—	5 c.cm.	—
" 20	—	20 c.cm.	Temp. 105°; respirations 50.
" 21	No serum given	—	Some improvement.
" 22	20 c.cm. + 1 c.cm. sod. nucleinate	10 c.cm.	Suddenly became very ill in early morning; almost moribund.
" 23	20 c.cm. + 1 c.cm. sod. nucleinate	10 c.cm.	Much better in morning and improvement continued.
" 24	10 c.cm.	10 c.cm.	—
" 25	10 c.cm. + 1 c.cm. sod. nucleinate	10 c.cm.	—

By this time the boy was definitely much better, his temperature and also his pulse and respiration rates falling, and the physical signs of broncho-pneumonia and pericarditis gradually clearing up. Between May 18th and May 31st he received 175 c.cm. of antiscarlatinal serum, and 25 c.cm. between then and June 10th; his temperature finally settled by June 12th. The only treatment given beyond injection of serum and sodium nucleinate was symptomatic.

The patient was taken home by car, lying down, on July 7th; he then had an appearance of good health, and had surprisingly few physical signs left of the ordeal he had been through. From July 10th to the 18th, however, he had a relapse of a serious nature; he was not as desperately ill as before, and no serum was given.

A blood culture again gave negative results, and a count was as follows: red cells 4,125,000 per c.mm., white cells 9,200 (polymorphs 65.5 per cent., eosinophils 1 per cent., small lymphocytes 22.5 per cent., large lymphocytes 9.5 per cent., large mononuclears 1.5 per cent., basophils 2 per cent.). The temperature returned to normal on July 18th and has remained so, except for a rise to 99°–100° on August 3rd, 4th, and 5th.

On September 11th the physical signs were as follows: temperature 98°, pulse rate 100, respiration rate 18. The boy had a good colour; he had no cyanosis, orthopnoea, clubbing of fingers, or rheumatic nodules. There was visible pulsation in the third and fourth interspaces in the nipple line. The apex beat in the fourth space was half an inch outside the nipple line, and there was no thrill or precordial tenderness. Cardiac dullness extended above to the third rib, on the right to the border of the sternum, and on the left to half an inch to the left of the nipple line at the level of the fourth space. There was a systolic murmur at the apex conducted to the axilla; the pulmonary second sound was accentuated, and a diastolic murmur was heard to the left of the sternum in the third and fourth spaces. The blood pressure on July 9th was 110/80, and on September 11th 138/90. The apex beat moved 1 inch to the left and right when the boy was lying on the corresponding side.

The negative cultures of the blood taken on May 18th, and on a later occasion after his return home, may seem to negative a definite diagnosis of septicaemia, though clinically that diagnosis seemed obvious; and this is made still more likely by the very dramatic improvement on May 23rd, following the injection of 30 c.cm. of serum during the preceding twenty-four hours, which improvement was maintained later until July 10th.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

A CASE OF CEREBRAL MALARIA.

CEREBRAL malaria is so rarely seen in England that the following case seems worth reporting.

A gentleman, aged 35, who had recently returned from West Africa, had a rigor, for which he took 10 grains of quinine. Instead of being better the next day he had a very severe headache, and his temperature was still up. He called in a doctor, who prescribed more quinine, without effect. The headache became worse and worse, and vomiting set in. That night he was very delirious, with intense headache and frequent vomiting; morphine gave him no relief. In the morning I was asked to see him as a case of meningitis.

He was then semiconscious, with a temperature of 103.6° F., pulse 112. His head was retracted and could not be moved forward. There was double Kernig's sign, and the toe reflexes were extensor. The abdomen was retracted, the spleen could just be felt below the ribs, and the liver was slightly enlarged. Some of the vomit during the night had been of coffee-ground character.

I came to the conclusion that the case was probably one of cerebral malaria, and asked the doctor to inject 10 grains of quinine hydrobromate into the buttock as soon as possible, and another 10 grains into the other buttock in two hours. In six hours the patient was perfectly conscious and free from headache and vomiting. He was given an intramuscular injection of 10 grains twice a day for the next three days, and had then quite recovered.

This case illustrates the fact that quinine by the mouth is no good in cerebral malaria.

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TOXIC EFFECTS OF METHYL CHLORIDE GAS.

IN view of the fact that methyl chloride gas is now used to a large extent in the smaller refrigerating plants, and that medical literature contains no reference to its effects on man, publication of the following two cases would appear to be justified. It must be common for refrigeration engineers to inhale small doses of the gas in the course of their work, and the incapacity that may possibly ensue will give rise to a claim under the Workmen's Compensation Act.

Some experimental work has been carried out in Germany by G. A. Maloff¹ upon the toxicity of some of the chlorine derivatives of methane, as judged by the increase of the fat content of the livers of dogs after exposure to them. Their results show that, while tetrachlor-methane and trichloro-methane (chloroform) show a toxic effect, dichloro-methane, which has fewer chlorine atoms, has no such effect. Unfortunately methyl chloride (monochloro-methane) was not investigated; but it is reasonable to suppose that there is no toxic effect on the liver by this gas, in view of the still fewer chlorine atoms combined with the methyl group.

CASE I.

A man, aged 33, while at work stopping a leak of methyl chloride gas, inhaled a large quantity of it, or assumed that he did, the gas being odourless. He felt faint at the time and vomited, and subsequently suffered from nausea and vomiting of all solid food, and had diarrhoea. Some of the material vomited was dark in colour, but there is no record as to whether this was altered blood or not. His symptoms abated after twelve days, and he returned to light work. His nausea and vomiting were aggravated by a rough crossing to Ireland three weeks after his exposure to the gas, and again on his return to England six weeks after the exposure.

On examination soon after his return he did not look ill. He was somewhat tremulous, and his pulse rate was 112. The thoracic viscera were normal. There was rigidity and tenderness over the

epigastrium, and to a less extent over the right iliac fossa. The stomach itself seemed to be tonically contracted, and pressure over the epigastrium made him feel sick. At the time I was not satisfied that his symptoms were due to exposure to methyl chloride, and thought that in any event there was a functional element in the case.

On re-examination six weeks later he felt quite well and had done so for the previous four weeks—that is to say, his symptoms had disappeared two weeks after my first examination, and two months after the exposure. The abdomen was quite normal, and free from tenderness or rigidity. However, he still had a frequent pulse (104), and a slight fine tremor of the fingers and tongue, with brisk knee-jerks, which favoured my previous opinion that he was of a nervous temperament. I was still not satisfied that his incapacity had been due to methyl chloride, but the occurrence of another similar case was regarded as conclusive.

CASE II.

A man, aged 36, on January 18th, 1930, had to disconnect a pipe which he knew to contain methyl chloride, and was exposed to this gas for five hours. At the end of that time he began to feel giddy, vomited, and had diarrhoea. The diarrhoea lasted for one day, but the giddiness and vomiting persisted. His symptoms finally left him after nine days, and at my examination, eleven days after the exposure to the gas, he felt quite well. Neither did my examination reveal any abnormality, either functional or organic. According to his history, this man had had a similar, but slighter, attack resulting from exposure to methyl chloride six months before.

Conclusion.

Methyl chloride gas, after a certain, but unknown, amount has been inhaled, causes giddiness, nausea, vomiting, and diarrhoea of abrupt onset. Recovery takes place after a lapse of time, which varied in the above cases from ten days to two months, and no permanent ill effects have so far been encountered. I am of opinion that the period required for recovery in Case I was prolonged by other factors—namely, sea-sickness and a nervous disposition on the part of the patient. Probably the gastro-intestinal disturbance is of central origin.

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CLINICAL AND SCIENTIFIC PROCEEDINGS.

NORTHAMPTONSHIRE DIVISION.

Acute Intestinal Obstruction.

At a meeting of the Northamptonshire Division, held at the General Hospital, Northampton, on February 12th, Professor D. P. D. WILKIE of Edinburgh gave an address on acute intestinal obstruction.

In the course of his remarks Professor Wilkie said that acute intestinal obstruction was one of the few conditions regarding which there could be no room for differences of opinion as to treatment. Immediate surgical intervention was the only hope, and the high death rate, still of over 30 per cent., was due almost entirely to operation being carried out too late. After referring to the difficulties of the experimental investigation of this subject, owing to the varied and complicated factors involved, he emphasized the important results obtained by experiment in identifying the types of obstruction and the changes in blood chemistry associated with them. It was necessary to distinguish four fundamental types: (1) simple obstruction of the intestinal lumen; (2) closed loop obstruction; (3) interference with the blood supply of the intestine; (4) strangulation. A fifth type—namely, paralytic or adynamic ileus—must also be considered.

In regard to *simple obstruction* the well-known observation that high obstruction was much more rapidly fatal than low was explained by the fact that if a block was established between the upper secretory and the lower absorptive reaches of the intestine a profound disturbance of physiology and blood chemistry occurred, and this was absent in low obstruction until its final stages. The importance of dehydration and loss of chlorides was referred to, and the necessity for generous subcutaneous infusions of normal saline and the intravenous injection of 20 c.cm. of 15 per cent. saline as an integral part of the surgical treatment, was insisted on. Hypertonic saline given intravenously promoted active peristalsis in, and diminished

¹ Arch. f. Exp. Path. u. Pharmacol., No. 134, 1928, pp. 168-172.