highly concentrated urine during the height of the fever; (8) the inconclusive Widal reactions of the serum; (9) the negative blood culture; (10) the failure to isolate organisms of the enteric or dysentery group from the stools; (11) the negative report upon the sputum.

CASE IV.

(Report by Dr. E. L. Elliott.)

On January 17th the patient, a gardener, aged 55, sought my advice for general malaise. He had been out of sorts for three or four days, but had been able to carry on his work. I found him with a temperature of 101° F., and ordered him to bed. For the first four days the temperature was raised, varying from 99° to 101°, and the pulse was slightly intermittent. During this time there was sleeplessness and low delirium, and the patient had some rigors followed by profuse sweating. He was seriously ill, and I considered a fatal termination a possibility. He developed a left-sided pneumonia of the lobar type, but without the violent respiratory symptoms of the pneumococcal form of that disease; the cough was never severe, and there was no sputum till January 27th, when yellow frothy muco-purulent sputum was brought up. The respiration rate was not markedly raised, nor was breathing difficult. The pulse rate was on the low side, usually below 100°, and during the first week the cardiac action gave some cause for anxiety. The pulse was weak and the heart sounds were feeble. For the heart condition he was given digitalis.

On January 26th he was not markedly ill, the temperature was normal, and the pulse 96. He looked as if he had passed through an illness; the tongue was furred but beginning to clean at the edges; there was no sore throat and no rash. The heart was not enlarged, and its action was not abnormal. The left lower lobe gave a dull note, and coarse crepitations were to be heard over its whole extent. There was no evidence of pleurisy or of effusion, and there was no distress on taking a deep breath. The abdominal organs were normal; neither spleen nor liver could be felt, and though the bowels had been freely open they had not been abnormal. The blood gave no reaction to any of the typhoid or dysentery group, including *B. aertrycke* (Hutton) and *B. abortus* (Bang).

On January 30th the condition was much improved; there was still an impaired note at the left base, and fairly copious sputum. The improvement was very marked.

CASE V.

Miss F. was likewise very ill, but as she was seen in consultation by Dr. Robert Hutchison he will no doubt publish a report of the case later in his own series.

The outstanding features of the attack seem to be (a) the high infectivity of the disease from the bird, five out of eight contacts developing it; (b) the absence of a single case of infection from a human being; and (c) the extreme severity of the illness.

Two of the patients had symptoms suggestive of typhoid fever; three had lung symptoms, but none showed the solid condition of the lung described by Dr. Thomson at Birmingham.

I am most grateful to all the other doctors concerned for their kindness in providing me with details of the cases reported in this paper.

TREATMENT OF PERNICIOUS ANAEMIA WITH DESICCATED HOG'S STOMACH.

BY

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It is believed that the following record will be of interest in view of the severe relapse which occurred while the patient was on liver treatment and the subsequent recovery resulting from the administration of desiccated hog's stomach.

The patient, a man aged 52, was first seen by me on June 30th, 1924, for the examination of his blood condition, a diagnosis of pernicious anaemia having been made some time previously. On this occasion the blood count was as follows:

Red blood cells (per c.mm.)	...	...	...	1,700,000
White blood cells (per c.mm.)	...	...	...	6,200
Haemoglobin	...	...	...	40 per cent.
Colour index	...	...	...	1.17
Differential count:				
Polymorphonuclears	...	...	...	68 per cent.
Small mononuclears	...	...	...	24 "
Large mononuclears	...	...	...	3 "
Transitional mononuclears	...	...	...	4 "
Eosinophils	...	...	...	1 "

The film showed marked poikilocytosis and anisocytosis, also granular basophilic degeneration; one nucleated red cell was seen; no parasites.

I saw him on several subsequent occasions during the following years, and he was also treated medically in Germany. The diagnosis was frequently confirmed by ample blood counts and by clinical examination. His red blood cells were rarely more than 3,500,000, and his colour index was usually above 1.

In June, 1927, he became seriously ill and received medical treatment in Germany. This treatment took the form of several blood transfusions and the application of a diet chiefly composed of the yolk of eggs and orange juice, and was successful for a time. His blood count before treatment was: red blood cells 1,000,000 per c.mm., white blood cells 1,300, haemoglobin 30 per cent. Six months later, in December, 1927, he came to see me, and the count was: red blood cells 3,300,000, white blood cells 6,500, haemoglobin 84 per cent., and colour index 1.23.

Treatment by means of liver and liver extracts was duly tried in this case, but did not appear to bring the improvement met with so frequently in other cases of pernicious anaemia. At the commencement of his last relapse he had tried liver extract as made by several different reputable firms, but he was steadily getting worse. During this period he was out of my immediate observation, but he again came to see me on October 3rd, 1929. He was then in an extremely exhausted condition, and his blood count was:

Red blood cells (per c.mm.)	...	...	...	1,240,000
White blood cells (per c.mm.)	...	...	...	3,000
Haemoglobin	...	...	...	30 per cent.
Colour index	...	...	...	1.25
Differential count:				
Polymorphonuclears	...	...	...	46 per cent.
Small mononuclears	...	...	...	38 "
Large mononuclears	...	...	...	8 "
Transitional mononuclears	...	...	...	4 "
Mast cells	...	...	...	4 "

A few macrocytes, microcytes, and poikilocytes were present.

I wrote to his medical attendant that I regarded him as extremely ill, and that unless some drastic change could be effected he would die. I suggested that a transfusion be done, and also pointed out the recent work of Dr. Sharp, director of the Department of Experimental Medicine of Parke, Davis and Co., in regard to the administration of desiccated hog's stomach.

His medical attendant agreed with me as to the desperate nature of the patient's condition. The patient was very loath to have any further blood transfusions in view of the number he had had in Germany, and a very unpleasant experience he had had from receiving a few cubic centimetres of blood not of his own group. Consequently the blood transfusion was postponed temporarily. Treatment with another liver extract was continued, and the administration of glycerinated raw pig's stomach was tried. The condition, however, became worse, and a blood transfusion (140 c.cm.) was given on November 9th. This helped the patient a little, but the pulse was still rapid (120) and oedema in the legs was present forty-eight hours afterwards.

On November 16th the blood count was:

Red blood cells (per c.mm.)	...	...	...	985,000
White blood cells (per c.mm.)	...	...	...	3,600
Haemoglobin	...	...	...	22 per cent.
Colour index	...	...	...	1.22
Differential count:				
Polymorphonuclears	...	...	...	42.0 per cent.
Small mononuclears	...	...	...	41.5 "
Large mononuclears	...	...	...	13.0 "
Transitional mononuclears	...	...	...	0.5 "
Mast cells	...	...	...	1.0 "
Eosinophils	...	...	...	2.0 "

The red blood cells showed variation in size and shape; there were no nucleated cells.

I got into touch with Parke, Davis and Co., who promptly sent me experimental supplies of desiccated hog's stomach (ventriculin), so that this method of treatment might be tried.

At the commencement of treatment with hog's stomach the patient was in an exhausted condition; he was extremely anaemic, the lips were blanched, and the conjunctivae very pale. The spleen was enlarged two fingerbreadths below the costal margin, and the liver was also firm and enlarged. The pulse was 120 per minute with the patient in bed, and there was a fair amount of oedema in the feet. The tongue was very furred. Albuminuria also was present.

The first administration of hog's stomach consisted of 7.5 grams daily, and after a day or two the dose was increased to 15 grams. On January 13th, 1930, the dose was further increased to 20 grams. This treatment has been continued with only an intermission of a day or so up to the present time. After a few days the patient's condition improved considerably, but the blood count did not show the same improvement. Since then the improvement has been rapid and the patient is up and able to go out of doors. The spleen is not palpable and the liver is much improved. Albuminuria is still present, but there is no oedema. The pulse is now normal (72) except after exertion such as going upstairs,

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.