I have been told by many that a blood transfusion should not be given to a patient with pernicious anaemia who is running a high temperature, but I have repeatedly given 500 c.cm. of blood to patients with a temperature of 102° F., and so far I have not had a severe reaction either in cases where both donor and recipient were of the same group, or where the donor belonged to Group IV and the patient was of another group.

In most cases of pernicious anaemia, and in all cases where patients have a temperature, I give liquor arsenicalis by the mouth. In three non-febrile cases which were being treated with liver extract, one showed no improvement and the other two only very slow improvement until arsenic was given, when a prompt and rapid increase in the red blood cells took place. In each case a different firm's liver extract was used.

The case of a patient who was kept for thirty-six days on liver extract alone without showing improvement, and who made rapid progress on arsenic, will suffice to emphasize this.

CASE IV.

A man, aged 37, was admitted on November 23rd, 1928. Red blood cells were 1,600,000 per c.mm.; haemoglobin 36 per cent. He was put on liver extract in amounts equivalent to half a pound of whole liver daily without other treatment. The succeeding counts were as follows:

December 4th: Red blood cells 1,620,000 per c.mm.; haemoglobin 37 per cent.

December 15th: Red blood cells 1,650,000 per c.mm.

December 21st: Red blood cells 1,520,000 per c.mm.

December 29th: Red blood cells 1,340,000 per c.mm.

On December 29th liquor arsenicalis was prescribed in increasing doses, and on January 14th the red blood cell count was 3,370,000 per c.mm.

In the concluding paragraph, referring to liver extract, the report⁸ of the Committee on Pernicious Anaemia of the Harvard Medical School states:

"Because one lot of a product has been effective it does not prove that subsequent lots will be satisfactory, as the experience of the committee under the best conditions at one time demonstrated."

Since treating the case just mentioned I have advised patients that, although they may alternate whole liver with liver extracts, on no account must the whole liver be stopped. I always double the dose of extract; if the patient is receiving whole liver in quarter-pound portions, when substituting an extract I prescribe the equivalent to half a pound. This is not a needless precaution, as I have had relapses in patients who said that they had tired of whole liver and had relied entirely on the equivalent amount of liver as extract. It is possible, of course, that these relapses might have occurred even if they had been taking whole liver, but this is doubtful.

The following case will indicate the undoubted superiority of whole liver over liver extract, at any rate in this particular patient.

CASE V.

A man, aged 29, was treated in hospital for pernicious anaemia, and discharged on September 25th, 1929, with a red blood cell count of 3,000,000 per c.mm. He took one and a half pounds of lightly cooked whole liver per week until the beginning of May, 1930, when he tired of liver and began taking liver extract in amounts equivalent to two and a quarter pounds of whole liver per week. During the time he was on whole liver he felt as well as he ever did; in addition to returning to work he was able to play games. From the middle of May, 1930, two weeks after he had substituted liver extract for whole liver, his appetite began to fail, and increasing weakness and anaemia was noticed. At the beginning of June, 1930, he stopped the extract and tried to take whole liver again, but his lack of appetite prevented him from eating much of it during the ensuing week. He was admitted to hospital on June 10th with a temperature of 100.2° F. and a red cell count of 1,040,000 per c.mm.

He was put on whole liver, half a pound a day, and arsenic, without, it must be admitted, very rapid improvement, and two transfusions were given in the course of the next two weeks before the temperature came down and real improvement set in.

Conclusions.

1. Severe cases of pernicious anaemia with a high temperature either do not respond to liver treatment or they respond very slowly.

2. Severe cases with a temperature often respond well to a blood transfusion, and in some cases it is probably a life-saving measure.

3. Improvement takes place quicker if arsenic is prescribed for cases of pernicious anaemia which are under liver treatment.

4. It is safer not to rely entirely on liver extracts. Whole liver should always be included in the diet in every case of pernicious anaemia.

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ACUTE LYMPHOCYTIC LEUKAEMIA.

RECOVERY AFTER INTRAMUSCULAR INJECTIONS OF HOG SPLEEN.

BY

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LYMPHOCYTIC leukaemia is such a rapidly fatal disease that the following account of a recovery may be of interest. In publishing it I wish to point out that I do so merely in the hope of stimulating the interest of others to try the treatment. The suggestion of using spleen extract was put forward on the grounds of the connexion in the etiology and the pathology of the disease and the imperfectly understood functions of the spleen. Workers with more material at their disposal might experiment with further cases and draw their own conclusions from their results.

A girl, aged 8, was brought to the surgery on February 1st, 1930. Her mother complained that she looked pale and tired. On examination no physical signs could be discovered to account for the child's loss of interest and energy, but there appeared to be slight anaemia. She was put on a simple iron mixture, and was seen at intervals of four or five days.

On February 19th her condition appeared to have become suddenly much worse; she was therefore ordered to bed. On the following day the degree of anaemia was found to be much more severe, and a loud systolic murmur was heard over the whole cardiac area, being loudest in the recumbent position. There was visible pulsation of the carotid arteries. The spleen could not be felt, but the liver was enlarged to one inch below the costal margin. The child had had three attacks of epistaxis, and had vomited that morning.

A blood count made on the following day was: haemoglobin 24 per cent.; red cells 1,940,000 per c.mm.; leucocytes 6,100; and colour index 0.63. The differential count was: polymorphonuclear neutrophils 40 per cent.; polymorphonuclear eosinophils 0.5 per cent.; lymphocytes 57.5 per cent.; large mononuclears 1 per cent.; and neutrophil myelocytes 1 per cent. There was great variation in the size and shape of the red cells. Punctate basophilia was prominent, and nucleated red cells were present.

The child continued to get rapidly worse. She was removed to hospital for further investigation, and a blood count made on March 3rd—that is, only twelve days after the first count—showed the following alarming progress of the disease: haemoglobin 12 per cent.; red cells 856,000 per c.mm.; leucocytes 9,600; and colour index 0.7. The differential count now was: polymorphonuclear neutrophils 7.2 per cent.; lymphocytes 87.2 per cent.; and large mononuclears 1.6 per cent. The red cells showed a great deal of change in the form of anisocytosis and poikilocytosis, polychromasia, and punctate basophilia. Normoblasts and megakaryoblasts were now present in percentages of 6.4 and 0.8 respectively. Blood platelets were scanty.

On examination the spleen was found to be still not enlarged, and there was no discoverable enlargement of the lymphatic glands. She was obviously extremely ill, of a pale, yellowish waxy colour, with oedema of ankles and legs; a moderate pyrexia was present. Repeated attempts were made to administer liver extract by the mouth, and a small amount was taken, but it was vomited.

On March 7th the child was too ill to take any notice of anything, and entirely refused food. The next day it was decided to try the intramuscular injection of hog spleen and liver extract alternately. The injections were made into the gluteus medius muscle, and 5 c.cm. of a 40 per cent. albumin-free solution of hog spleen was given. Two days later 1 c.cm. of a 20 per cent. solution

of liver extract was given. These injections were repeated two and four days later respectively.

On March 15th the condition of the child showed definite but slight improvement. Teaspoonful doses of liver extract were tried by the mouth, and were retained. Two more injections of spleen and liver were given at two-day intervals, and then the injection of liver extract was stopped, but the injections of spleen were continued at four-day intervals until ten had been given. The dose of the liver extract given by the mouth was gradually increased, until two teaspoonfuls of the liquid extract were being taken three times a day. The child continued to make rapid and uninterrupted progress.

On April 30th she was looking very well, and was up and running about; all physical signs, including all trace of the cardiac murmur, had disappeared. The liver extract by the mouth had been reduced ten days previously to two teaspoonfuls twice a day. A blood count performed on April 30th showed: haemoglobin 88 per cent.; red cells 6,330,000 per c.mm.; leucocytes 16,200; and colour index 0.7. The differential count was: polymorphonuclear neutrophils 56 per cent.; polymorphonuclear eosinophils 1 per cent.; lymphocytes 41 per cent.; and large mononuclears 2 per cent. The films showed nothing else of note, the condition of all the red cells seen being normal.

The child was seen again on June 26th, when she appeared perfectly well; she had returned to school, and played games with a normal amount of energy, no sign of anaemia being present. The dose of liver extract had been reduced to one teaspoonful twice daily, which she is continuing to take.

In conclusion, I wish to express my thanks to Dr. C. P. Lapage of Manchester for his interest and advice, to Dr. Muir of Halifax, and to the pathologists of Halifax Infirmary and St. Mary's Hospital, Manchester.

HAEMORRHAGIC NON-PUSTULAR SMALL-POX.

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The case here reported is one of several which clinically and pathologically portray a picture of haemorrhagic non-pustular small-pox occurring in the colony of Hong-Kong. It is interesting to note that most of these cases occurred in pregnant women during the eighth month of pregnancy, and hence gave us serious thought as regards revision of the diagnosis. After very careful consideration of all the facts we feel, however, that we should still stand by our provisional diagnosis.

History.

The Chinese are very reluctant to give facts relating to their indisposition, and hence we are not able to supply fuller details, although we consider the history very incomplete. The patient stated that she was 22 years old, and that on November 23rd, 1929, she complained of pain in the sacrum of a very severe character; she resorted to the Chinese method of thumping the affected part in an endeavour to get relief, but was not successful. Three days later there was fever, and the movements of an eight months foetus were felt; uterine pain was felt resembling that of commencing labour. The lips rapidly became cracked, and sordes developed on the mucous membrane. An aphthous condition appeared on the gums, and ulcerations here and there on the tongue. Soon afterwards there were rigors and cold sweats, with nausea and vomiting; all these signs and symptoms occurred for the first time within a very short period of each other.

The patient said that her condition was due to "kup sik" (fever after sexual intercourse), which had taken place ten days previously. The Chinese have a superstition that a woman in advanced pregnancy may die if she has sexual intercourse with her husband, and state that the condition is allied to a "severe type of pneumonia." There was no cough in spite of the rapid respiration, and there were no convincing signs of pneumonia.

Condition on Admission.

On November 28th, 1929, she sought admission to the Tung Wah Hospital, stating that her eyes had become very sore on the previous day. She had suffused conjunctivae

and marked lacrymation. The face was flushed, and the body showed a nodular rash, which was not itchy. It was ascertained that the patient was a primipara, and had only been married in the previous July. She had never had swelling of either the face or the feet. She was vaccinated against small-pox in her native village some time ago; how long ago, and whether the vaccination was carried out correctly or not, could not be ascertained, but there was no clinical evidence of vaccination ever having been performed.

Complaint was made of severe aching of the bones, with great discomfort. Not once during her period of pregnancy had she ever left her bedroom. There was no evident history of syphilis. The faeces were yellow and soft in appearance, and since admission the bowels had been open three or four times daily. No blood or mucus was seen. The urine was a little concentrated, and when passed was said to produce a burning sensation. No albumin was found in a catheter specimen, and the specific gravity was normal. For some time there had been weakness of the legs, but no further history or physical signs of note were obtained.

The patient died in the Tung Wah Hospital on November 30th, and was sent to the Victoria public mortuary, where a post-mortem examination was made by one of us on the following morning.

Post-mortem Findings.

The liver was markedly amyloid, and much increased in size. The left kidney pelvis was full of organized blood clot. The bladder contained no urine; there was slight injection of the mucous membrane. The mesentery showed marked numerous petechial haemorrhages. The spleen was congested, but otherwise normal in appearance. In the intestines, including the colon, there were many circular and irregular oval dark-red or blackish haemorrhages of average size (0.5 cm.) remote from the mesenteric margin.

The uterus contained an apparently normal eight months foetus. The stomach showed large oval dark-red haemorrhages, on the greater curvature chiefly. There were also marked petechial haemorrhages on both the pericardium and epicardium, most marked within two inches of the apex. The lungs were only congested, and the larynx and pharynx were injected, without any evidence of diphtheria or other infection. On the gums there were petechial haemorrhages, no blue line, and no dental caries. The brain and meninges were injected, but there was no evidence of cerebro-spinal meningitis or of any other brain or cord condition.

The breasts were well developed, and contained lacteal fluid; in the fatty areolar tissue there were petechial haemorrhages. The joints showed no evidence of haemorrhages, nor of any abnormality. The pupils were dilated, slightly reddened, and beginning to "sink." The blood vessels were thickened. There was a diffuse purplish rash over the whole of the face, neck, trunk, and part of the upper extremities, but it only extended for two inches below the groin, where it could be distinctly seen to end in a fraying-out of petechial haemorrhages, which penetrated into the subcutaneous tissues. At first sight the distribution on the thighs was like that in scarlet fever. In the pancreas was found an abscess 1 inch in diameter, oval in shape, and well encapsulated; no other abnormality was noted.

DIFFERENTIAL DIAGNOSIS.

The following alternative diagnoses were considered: haemorrhagic small-pox (the purpuric non-pustular type of Tidy); purpura haemorrhagica; and purpura fulminans; severe typhoid fever (no typhoid spleen nor Peyer's patches were evident); Henoch's purpura (age usually 5 to 20 years only); lead poisoning (the macroscopic signs were not present, but there was an appearance resembling bilateral foot-drop; mechanical purpura (possibly caused by venous stasis due to pressure of the foetus); acute leukaemia (no glands were enlarged as would be expected); chloroma (skull examined, but no evidence of green marrow); cerebro-spinal meningitis (the pathology was negative); infective endocarditis with secondary septicaemia; certain forms of toxic nephritis of pregnancy (there was a marked conjunctivitis which required other diagnosis for explanation, since the local condition was considered of general origin); and typhus fever. After a very careful consideration of all the signs and symptoms and post-mortem findings, the differential diagnosis was gradually reduced to one of three conditions—namely, haemorrhagic small-pox of the non-pustular variety, typhus fever, and mechanical purpura. Lead poisoning had been eliminated by examination of all the organs by the Government analytical