blood was transfused. Following this he showed improvement, and for the next week his progress was fair, but he seemed to have lost heart, and it was thought that a second transfusion would give him the desired stimulus. On December 28th (red blood cells 2,320,000, haemoglobin 60 per cent.) 450 c.cm. of whole blood was transfused with the two-way stopcock from a second donor. More than this quantity was not used, as towards the end of the procedure the patient complained of general discomfort, and within ten minutes after the operation the pulse became weak and rapid, respirations shallow and hurried, and he was only partly conscious. Stimulants were administered, and four hours later he was sitting up in bed smoking a cigarette. The following day intense jaundice was present, and he had passed a small quantity of very dark red urine. The pulse was weaker and there had been considerable bloody oozing from the stump. Twenty-four hours after this (the second) transfusion he became unconscious and died. At autopsy only a few petechiae were found beneath the serous coat of the small intestine, the liver was fatty, the kidneys and spleen dark red. No sign of pulmonary embolus or infarct could be found. Death was due, apparently, to acute haemolysis.

CASE IV.—Rfm. M., under the care of Major T. R. Elliott, R.A.M.C., who was kind enough to furnish me with progress notes, sustained multiple shrapnel wounds on December 14th, 1915. Three days later he was admitted to base hospital in very bad condition, with septic wounds of the left knee, right ankle, and left lung. On the twelfth day after the injury trismus appeared simultaneously with the expectoration of gangrenous pus from the lungs. Tetanus developed rapidly on the next day, causing rigid trismus and board-like abdomen, but no spasms nor difficulty of respiration. The condition of the patient was very pitiable, since he could not void from his mouth the fetid material that continued to come up from the lung abscess on the left side. Antitetanus serum was given until January 6th (a total of about 60,000 units). On the twenty-seventh day after the injury secondary haemorrhage occurred twice from the septic wound of the left knee. The vessel was ligatured. The blood lost was estimated as being rather less than a quart; the patient was much blanched. For the next week the general condition became worse, and there were signs of consolidation at the base of the left chest. No pus was found on exploration. On January 17th, before transfusion, the red blood cells were 2,832,000, and haemoglobin 45 per cent. By syringe-cannula method 860 c.cm. of blood was transfused; a rigor followed at once, and lasted fifteen minutes. On January 18th the red blood cells were 4,600,000, and haemoglobin 60 per cent. Following this the condition improved, and on February 1st a small localized empyema was opened, and the right ankle thoroughly cleaned and drained. By February 16th the patient was rapidly convalescing; the sputum ceased to be fetid soon after the abscess was drained. He was evacuated to England on this date.

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A SIMPLE TECHNIQUE FOR INTRAVENOUS INJECTIONS IN INFANTS.

By ANN MARTIN, M.D. CORNELL UNIVERSITY.
(From the Sick Children's Hospital, Edinburgh.)

ON account of the small size and inaccessibility of the superficial veins in young infants, it is usually difficult, and often impossible, to give intravenous injections or even to obtain sufficient blood for the Wassermann reaction by the methods ordinarily employed. The difficulty is satisfactorily overcome by puncturing the superior longitudinal sinus through the anterior fontanelle, according to the procedure recently introduced by Helmholtz of Chicago.¹

I have made extensive use of Helmholtz's method in Dr. Fowler's ward in the Edinburgh Sick Children's Hospital during the past winter, and have found it simple and free from risk. The results of saline injections given in this way have been altogether better than those of the subcutaneous method hitherto employed. The following description of the technique of the Helmholtz method, based on a series of 50 cases, is offered as a guide.

The scalp over the anterior fontanelle is shaved and disinfected with iodine. No anaesthetic is required. The child lies in bed with its head raised to a convenient angle on two pillows. A nurse holds the head securely with a hand on either side; the operator stands in front and on the right side of the child. The needle (held at an angle of about 50 to 60 degrees with the plane of the fontanelle)

is inserted in the middle line, half way between the anterior angle and centre of the fontanelle. Some little force is required to push the needle through the firm pericranium, and, when the resistance is overcome, one can feel that the point of the needle is in a cavity. The point should not penetrate more than one-eighth of an inch below the surface of the skin since the sinus lies immediately under the pericranium. If the needle is in the sinus blood flows at once into the syringe; should this not happen the needle has gone too deep, and has passed completely through the sinus. This is the mistake usually made by a beginner; it does not, however, cause any damage. It is rectified by gently withdrawing the needle until the point re-enters the sinus, as is shown by a flow of blood into the syringe.

A specially ground needle is essential. The sinus is in many cases so shallow that an ordinary long-pointed needle pierces the inner wall before the entire opening in the end of the needle is through the pericranium. A needle of size No. 20 or thereabouts, with a bevel measuring 2 mm., should be chosen in place of one with an ordinary bevel, which measures about 4.5 mm.

When introducing fluid, such as eusol or saline solution, we have found a two-way stopcock and 10 or 20 c.cm. syringe, as described by Graham,² the most satisfactory instrument. The needle is inserted with the syringe only a quarter full of fluid, as it is easier to manipulate thus. Very little pressure is needed to inject the fluid, which, indeed, flows in almost of itself on account of the slightly negative pressure in the sinus. If pressure is needed one may be sure that the needle has escaped from the sinus; usually it has accidentally been pushed in too far. Each time the syringe is refilled it is well, immediately before injecting the fluid, to make sure that the needle is still in position by slightly withdrawing the plunger so as to ascertain whether there is a reflux of blood.

Autopsies on patients in whom, for diagnostic or therapeutic purposes, the sinus had been punctured at intervals of from a few hours to several weeks before death showed that in no case had any injury been done, nor in any case in which this method has been used have any untoward symptoms followed. The advantage of using the superior longitudinal sinus is evident. I have never found it necessary to give an anaesthetic. The puncture causes little disturbance, and infants even fall asleep while the fluid is running in. There is also the very material advantage that repeated injections, if such are necessary, are as easily performed as the first.

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ACUTE GENERAL HAEMORRHAGIC PERITONITIS.*

By ARTHUR J. NYULASY, M.R.C.S.ENG.,
GYNAECOLOGIST TO THE PERTH HOSPITAL, AUSTRALIA.

ACUTE general haemorrhagic peritonitis is an uncommon condition, but three cases have come within my experience in the Perth Hospital. Two of them resulted from criminal abortion and came to the *post-mortem* table; one of them presented a striking lividity of the skin, which persisted after death; it involved the whole body, and was so pronounced in the face as to be almost startling. The third case will be described in detail.

A multipara, aged 30 years, transferred from a medical ward, had been admitted with severe diarrhoea and some pain and tenderness in the lower abdomen, the pulse being 120, respirations 32, and temperature 101.9° F. The diagnosis suggested by the physician who sent her to hospital was "ruptured ectopic gestation." In a few days the diarrhoea ceased, and the temperature, after a fluctuating course, dropped to normal, the pulse to 108, and respirations to 28. On then examining the patient I found the tongue clean and moist, the colour of the face normal, and nothing in her appearance to suggest serious illness. The abdomen conveyed the idea of general "fullness," although there was no marked intestinal distension, while the pelvic area, especially in the left iliac fossa, was very tender on pressure. Bimanually a pelvic mass was made out, and later found to be the somewhat enlarged uterus and an enlarged left Fallopian tube and adherent intestines. The mass was extremely tender on pressure, so that a satisfactory examination

* Paper read before the Western Australian Branch of the British Medical Association.