details of the patient's family history and his condition before arrival in hospital and with specimens of water for analysis. He told us that the water came from a well, from which it was carried to the sink by a lead pipe. We wish to express our thanks to the special departments of the hospital for help in the investigations.

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A PLEA FOR THE FREER USE OF BLOOD TRANSFUSION IN OBSTETRICS

BY

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One woman dies every day in England and Wales from haemorrhage in childbirth. This statement is based on figures supplied by the Registrar-General, and takes no account of those deaths from sepsis in which anaemia is a contributing factor. When the frequent morbidity due to post-abort and puerperal anaemia is remembered, the importance of haemorrhage in pregnancy is still more striking. The annual death roll from this cause in America has been assessed at 1,500 and in Germany at 400. There is a tendency to believe that deaths from haemorrhage occur in those parts of the country in which obstetrical and surgical facilities are not so readily available as in most of the large centres, but an evening spent in reading the annual reports of obstetrical hospitals will convince any reader that this is not correct. He will be surprised by the number of deaths occurring directly from haemorrhage, and still more will he be surprised to find how seldom an attempt was made in these cases to restore the blood loss even in circumstances which might be considered ideal from the point of view of treatment and facilities.

Although so many articles have been published in recent years on the subject of blood transfusion its importance is still not fully realized. Public opinion would be shocked if 100 passengers on a liner were drowned simply because lifeboats available were not used; but when, in England and Wales alone, over three times this number of women die annually from obstetrical haemorrhage there is a tendency to regard the loss as inevitable, and insufficient vigour is displayed in organizing the facilities available that these deaths may be prevented.

It is not within the scope of this paper to discuss the great importance of prophylaxis in obstetrical haemorrhage. It is fitting, however, to draw attention to the fact that many of the most severe haemorrhages are preceded by some significant warning. Thus, preliminary small losses often announce the presence of a placenta praevia, and it is courting disaster in such cases to wait for a severe haemorrhage before grouping the patient and arranging for compatible donors. The case in which there is doubt as to the advisability of a transfusion is not under discussion. The value of saline, glucose saline, or gum infusion has been stressed on many occasions, but when blood loss has been extreme it is well to remember that the

effect of these remedies is fleeting and that lasting benefit comes only from replacement of blood. The exsanguinated patient may revive after saline infusion, but, as already indicated, the annual death roll is increased by the many who do not. These are the cases I now wish to discuss.

Solomons (1938) in an article on tubal pregnancy made the following arresting statement:

"Blood transfusion was not employed for any patient. . . . Patients have been killed by venous transfusion in this condition and in others, and at this stage I should like to utter a warning against indiscriminate blood transfusions and to emphasize the value of submammary and rectal saline, glucose, and coffee. The ambulatory intravenous services suggested in England and in other places have done and will do harm, even though they will be occasionally useful."

In spite of the excellent results Solomons reported in his series of 214 cases without a death, his words cannot be allowed to pass unchallenged. To discuss fairly the dangers of blood transfusion it would be necessary to consider the pathology of those conditions for which it has been advocated and used. Such a discussion would also embrace the question of age, blood volume, and other factors which are not relevant to this paper. It is sufficient to state that transfusion in cases of severe blood loss due to acute haemorrhage during the age period with which this paper is necessarily concerned is justified by theory and its value established by practice. In an extensive experience of such transfusions I have seen no disasters.

Fatal Cases following Blood Loss

Those who subscribe to the views stated by Solomons must find it difficult to explain the many cases recorded annually in hospital reports in such words as the following:

"She was admitted to hospital at 12.10 a.m. on May 17 with a retained placenta. She was in an extremely shocked condition and had had a very severe intra-partum haemorrhage before admission. On admission she was still bleeding profusely. A light anaesthetic was given and the placenta manually removed. An intravenous gum saline was then given, but the patient never rallied, and she died soon afterwards."

"Immediately following the delivery of the placenta brisk post-partum haemorrhage occurred, which responded well to ergometrine intramuscularly and hot intra-uterine douching. Following this the patient's general condition was poor, her blood pressure was 80/56, and her pulse almost imperceptible at the wrist. However, after the administration of 100 c.cm. of 50 per cent. glucose solution intravenously and morphia grain $\frac{1}{4}$, raising the bed, and bandaging the limbs, her condition improved remarkably and remained satisfactory for three hours, when she suddenly collapsed and died."

"The patient was delivered spontaneously of a living child which had presented by the breech, and satisfactory analgesia was obtained with the Minnitt apparatus. A severe post-partum haemorrhage followed, and manual removal of the placenta was performed under general anaesthesia. In spite of treatment she died from haemorrhage two hours later."

These examples from three recent separate reports might be multiplied many times.

All who have had experience of the effects of transfusion on patients who are exsanguinated will testify to the dramatic improvement it produces in most cases. One may ask why, if this is true, transfusion is not used more often in emergency cases. The answer is that in hospitals resident medical officers are frequently not "transfusion minded" and regard the giving of blood as a difficult and laborious procedure. For this attitude of mind the respon-

sibility must ultimately be accepted by the honorary staff. In private practice the belief is widespread that transfusion demands resources beyond the scope of the traditional black bag. Even if this belief could be justified in the past it certainly cannot be now, since the introduction of such simple and excellent apparatus as the "vacoliter" and similar transfusion sets.

Emergency Transfusion

If a reduction is to be made in the number of deaths from haemorrhage it is essential that in all institutions in which obstetrical and gynaecological cases are treated emergency transfusion apparatus should be available at a moment's notice. It is of equal importance that the nursing staff and medical officer in charge should be familiar with the apparatus and able to assemble and use it without delay. For this to be done effectively in institutions in which the resident staff is constantly changing there must be some co-ordinating control by a permanent member of the staff. To return to the analogy of the liner and the lifeboats, the latter can be effective in an emergency only if passengers and crew alike have been previously instructed as to their individual stations and duties. Transfusion drill in an institution is not essential, but, if irritating and perhaps costly delays are to be avoided, it is necessary that the equipment should be inspected periodically and maintained in first-class condition.

Technique

In the type of case under discussion a drip transfusion set is undoubtedly the best. With it a glucose saline can be given while suitable blood is being obtained, and then without further manipulation the latter can be supplied at any desired rate of flow. To facilitate the adjusting

of blood levels in the dripping chamber, and to provide an easy means of emptying the main container of saline before adding blood, a dripping chamber with a side arm (Fig. 1) is of great advantage. The argument as to whether to insert a needle or to tie in a cannula does not arise, because in the emergency cases under discussion the latter method is usually necessary and therefore always advisable. The vein will be found collapsed and often in apparent spasm. In such a case it is sometimes best to cut straight across the vessel, after which the contracted lumen is easily seen. While the cannula is

FIG. 1.—Dripping chamber with side arm and bulbous ends.

inserted the wall of the vein can be steadied with fine mosquito forceps, two pairs of which are invaluable in any transfusion set. On occasions venous spasm or collapse is so pronounced that it is necessary, at the start of the transfusion, to supply the blood under pressure. With improvement in the general condition of the patient the blood flows more easily. The choice of a vein is one of individual preference. The internal saphenous vein as it crosses the anterior aspect of the internal malleolus has much to recommend it for emergency transfusion. It can be exposed in a few seconds in the fattest of patients or in the newborn babe. There is no need to search for it by palpation or to apply a tourniquet to display it. It is always present, and practically constant in position. Even

at birth it is of a reasonable size. With only the ankle exposed it is easy to keep the patient warm; and, moreover, to her the psychological value of operating on a site removed from her field of view is considerable. A further advantage is that no splinting is required even if the transfusion is maintained for many hours. If the cannula and tubing are connected as sketched in Fig. 2 freedom of movement within reasonable limits is given to the limb.

It may be asked why it should be necessary to use the drip apparatus in transfusing emergency cases when immediate replacement of blood loss is the first essential in treatment. One advantage has already been mentioned

FIG. 2.—Sketch illustrating tubing supported by toes. No splinting necessary.

—that without assistance it permits of a glucose or gum saline being given while compatible blood is being obtained. It is also easily controlled and provides a means of avoiding repeated transfusion. The patient who is exsanguinated may have her life saved by a pint or less of blood, but will be left with a severe secondary anaemia requiring many weeks of adequate iron therapy before the blood picture is restored to normal limits. If, however, once the stage of immediate anxiety is over, the transfusion is maintained at a slower rate, the response of the patient is dramatic, and weeks or even months of ill-health may be avoided. This is well illustrated by the following case:

The patient, aged 24, a 2-para, was admitted in a collapsed and exsanguinated condition following haemorrhage during the abortion of a six-weeks foetus. She was scarcely able to speak, and could not remember her name or how many children she had. She was still bleeding on admission, but the haemorrhage ceased as she arrived in the ward. Her haemoglobin was 30 per cent. A drip saline was begun while a donor was obtained. Twenty-two ounces of blood were then given, followed by a pint of glucose saline; this was followed by a further twenty ounces of blood and a second pint of glucose saline. The administration of these lasted twenty-four hours. The uterus was then evacuated. Iron therapy was started, and six days after operation the patient had a haemoglobin of 55 per cent. She then felt so well that she was anxious to go home.

With the best of equipment and the best of intentions, a scheme for emergency transfusion must always break down unless the doctor in charge has confidence in his own ability to type and cross-type blood. In spite of the simplicity of the procedure it is amazing how many medical men find difficulty in quickly and satisfactorily performing it. The technique is so clearly described in numerous textbooks that no purpose would be served by repeating it here. It may be opportune to suggest, however, that the typing and cross-typing of blood should be a routine practical exercise for every medical student.

The problem of obtaining a compatible donor can usually be solved without difficulty. Most patients when admitted as emergency cases are accompanied to hospital by one or more friends or relations. To type them requires but a few minutes, and if none is compatible

further relatives or friends are usually available without much delay. It is a great deal more satisfactory from every point of view to secure a donor from the family circle than from a transfusion service. Unfortunately, however, it is not always possible to do this, and an emergency list of donors should therefore be at hand. As a final resort, in case of extreme emergency the doctor himself may be a suitable donor; but how many medical men are aware of their own blood group?

Conclusion

It is perhaps advisable again to make it clear that blood transfusion is not being advocated as necessarily the method of choice in the treatment of pregnancy and gynaecological anaemia. It is advocated, however, for the severe haemorrhages which occur from time to time in every clinic and many private practices. Severe antepartum and post-partum haemorrhage, the extreme collapse due to extensive internal bleeding in certain ectopic gestations, the exsanguination that is at times associated with abortion or hydatidiform mole, and the collapse in severe haemorrhage of the newborn are all examples of those accidents which at the present time account for over 300 lives each year in England and Wales alone. It is for this type of haemorrhage that the wide adoption of emergency transfusion is urged as the most effective method of saving life.

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THE NATURE OF GROWING PAINS AND THEIR RELATION TO RHEUMATISM IN CHILDREN AND ADOLESCENTS

BY

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While the phrase "growing pains" is apt to provoke the comment that there is no evidence that the process of growth is painful, it is still widely used as a diagnosis for cases of pain in the limbs of growing children and adolescents. Its use and abuse have often provoked controversy because of vagueness, particularly as regards the aetiology of the pains. A definition of what is meant clinically by growing pains must vary with the observer's own individual taste, but in most cases it would probably be found to indicate pain, sometimes recurrent, felt in the limbs or back by a growing person in whom there was no evidence of acute or subacute rheumatism, trauma, or local infection. The condition thus defined is common throughout school age, and may be seen for several further years beyond this: growth may be directly responsible for skeletal pain in a number of cases by causing an increased strain through weight-bearing on some postural deformity such as flat-foot, knock-knee, or scoliosis.

For many years it has been felt that growing pains were perhaps to be regarded as direct manifestations of rheumatism, and therefore of a disease capable of provoking carditis; but again there has been no uniformity of medical opinion. There are those who consider the two conditions to be quite unrelated, and also those who regard cases thus diagnosed as potential cases of rheumatic carditis, to be treated with periods of rest, absence from school, and curtailment of physical exercise. This state of affairs is very unsatisfactory, since it is clear that

if there is in fact a danger of carditis insufficient care is often being exercised, while if there is not, a large number of young people are having their activities curtailed and scholastic careers impaired by prolonged periods of treatment by rest, and are being educated as partial invalids to no purpose.

A series of approximately 1,000 children and adolescents has been investigated in London and Birmingham over the last ten years (Hawksley, 1938), the object being to ascertain whether or not rheumatism and growing pains are related. The conclusions reached were that growing pains are not symptoms of rheumatism and are not associated with or followed by carditis; that growing pains are associated with a number of clinical abnormalities which can be adequately diagnosed on clinical grounds; and that treatment directed towards the underlying cause is usually successful in stopping the pain. The supposed association between growing pains and carditis is largely dependent on the layman's tendency to talk loosely of limb pains in children as growing pains from ignorance of the symptoms of true rheumatism, and also on the tendency of physicians to accept a history of skeletal pain in a child as possible evidence of rheumatism without adequately ascertaining the site and type of the pain and its association with other features in the patient's history and clinical investigation.

Sheldon (1936) collected a series of 189 cases of growing pains at the Hospital for Sick Children, Great Ormond Street. After a lapse of four years he found that only two had developed rheumatism with carditis, and none chorea. He stresses the absence of relationship between growing pains and sore throats, and also mentions the fact that there is no evidence of the histological change of acute rheumatism to be found in patients with growing pains. A number of debilitating diseases are associated with pain of the typical growing-pain type. Bray (1931) quotes a series occurring in cases of asthma in childhood.

Frequency of Occurrence of Growing Pains

During the year 1928 a series of 505 children between the ages of 4 and 14 was examined at University College Hospital and an inquiry was made into the number who had growing pains: it was found that 33.6 per cent. had suffered from them. A series of 206 children seen in 1930-1 at the Children's Hospital, Birmingham, revealed a somewhat higher percentage. Accepting the lower figure as more appropriate for London children, one child in three is at one time or another afflicted with growing pains, and therefore in all probability one child in three that develops rheumatism will also have had growing pains. Many mothers will have regarded the pain complained of as something that the child has had before and will have failed to appreciate that a new type of pain has arisen. An inquiry by the doctor at this stage would reveal differences, and a clinical examination would show that the pain was now definitely articular, that the child was ill and possibly anaemic, that there was fever and also tachycardia. The further investigation of the case in hospital would probably demonstrate changes in the blood and the electrocardiogram, indicative of active disease, that are not seen in association with growing pains. It must also be remembered that primary cardiac rheumatism is a clinical entity: Findlay (1931) found that, of 489 children in Glasgow with cardiac disease other than of congenital origin or septic nature, 8.6 per cent. had nothing in their previous history to account for it. For every three cases of primary cardiac rheumatism one will probably have had growing pains. Another feature to which the frequency of occurrence of growing pains