seem occasionally to be of benefit but more often they are not. While it is difficult to say if the serum would have any effect in these cases it should certainly be tried, both by subcutaneous injection and by direct application of the serum to the bleeding-point in the kidney pelvis.

2. *Hemolytic Test.*—Human blood-serum is injected in small quantities at first, 10 c.c. to 20 c.c., and, because it is injected subcutaneously, takes some time to become diffused throughout the body. If there be any reaction, any "serum-sickness," another blood-serum may be used and hemolytic tests be made. If the blood be obtained from any relative there is no fear of serum-sickness and one may give as large a dose as wished.

Welch makes the general statement: "Human serum never gives serum-sickness or causes anaphylaxis in the human subject." Certainly serum other than human is given every day without hemolytic tests as, for example, diphtheria antitoxin. While serum-sickness occurs in 20 per cent. of patients receiving antitoxin, fatal results are rare.

3. *Method of Collecting Blood for Serum.*—Welch gives a picture of an apparatus for collecting blood, which consists of a glass jar having a cork stopper with two holes to admit two glass tubes. One of these tubes goes to the needle which punctures the vein, and the other is for suction when drawing the blood. In emergency, the blood could be collected in a sterile test-tube and the serum taken from that.

4. *Method of Giving Serum.*—If the renal hematuria be part of a diathesis, if the patient be a bleeder, then unquestionably the serum should be injected subcutaneously. If the bleeding should be due to a nephritis, unilateral or bilateral, to a papillitis, to varicose veins of the kidney pelvis, small amounts of serum might be injected through a ureteral catheter.

The efficiency of direct application of blood or blood-serum to a bleeding-point was first discovered by Bienwald,¹ who applied the grandmother's blood to a bleeding cut on a child's head. The child was rapidly becoming exsanguinated and the bleeding stopped immediately after the application. If the serum be injected through a ureteral catheter, 5 or 10 c.c. would be sufficient and diphtheria antitoxin or any other handy serum might be used.

5. *Quantity of Serum.*—The initial dose depends on the urgency of the case. In an emergency, I should not hesitate to inject 40 or 50 c.c. of any relative's serum as the first dose, and, if no reaction ensues, to follow this up in five or six hours with three or four times this amount. The amount of serum that can be injected without injurious reaction is given by Welch. In one case he gave to a dying new-born child 10 c.c. of serum three times in the first day. In another case he injected 209 c.c. in five days.

6. *Duration of Cure.*—As yet no one seems to know how long the one-time bleeder will remain a non-bleeder after the injection of serum. It is possible that the quantity of serum administered has an effect on this. My patient was given 20 c.c. of rabbit's serum six days after the operation for intestinal bleeding with the object of controlling any subsequent hemorrhage. Six weeks after this injection bleeding from the kidney began.

7. *Other Effects and Uses of Serum.*—In addition to its effect on the coagulability of the blood, it is an accepted fact that human blood-serum has a distinct bactericidal action.

If the kidney bleeding is caused or accompanied by infection the serum will help overcome this infection. A third virtue is its nutritive value; the patient has had just so much good food. This, of course, is of much more importance in cases of hemophilia neonatorum.

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SPONTANEOUS HEMORRHAGE OF THE NEW-BORN WITH RECOVERY

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Spontaneous hemorrhage of the new-born is so obscure and so fatal a disease that any experience pointing the way out is worth recording. All treatment detailed in the literature of the subject is so difficult a technique as to require either special skill or special apparatus or both. In view of these facts the following case is worthy of report:

Mrs. R., aged 42, white, was delivered rapidly and easily of her ninth child at 4 p. m., Aug. 26, 1912. She was not in labor more than thirty minutes and the baby was born fully half an hour before the attendant's arrival. The child, a girl, weighed 9½ pounds and appeared perfectly well and normal. Of the eight children previously born, two had died, one, the first born, of some bowel complication at four months; and one, the fourth, of hemorrhage on the fourth day. The ninth child was well for thirty-six hours when the nurse found her listless and flaccid. On examination it was discovered that a large quantity of blood had been passed by the bowel. Some of the blood was red but much the larger part was dark and tarry-looking. I saw her at 9 a. m., August 28. The child was then of a deep lemon color and in profound shock. She had vomited some blood. During the day she had half a dozen bloody stools and at 9 p. m. the pulse was rapid and weak. She had been very languid and relaxed all the day, though she had taken the breast at three-hour intervals. At 9 p. m. she was given about 15 c.c. of normal horse-serum subcutaneously.¹

August 29 and 30 small amounts of blood were passed, but each time the amount was less, running possibly from half an ounce down to a teaspoonful. At 7 p. m. on the 30th the child was given 20 c.c. normal horse-serum and from that time on there has been no blood. Both injections were made into the buttocks, one on each side. September 1 the stools were the usual yellow color of a nursing infant and have continued so ever since. September 16, when last seen, she was a splendid specimen of baby, skin clear and healthy and nursing well, bowels regular, stools natural and every evidence of perfect health.

Twenty c.c. is a fairly large subcutaneous dose for an infant and in this case put the skin on the stretch decidedly. This tension subsided rapidly and in an hour's time the tumor had disappeared.

DIPHTHERITIC SERUM USED TO CONTROL BLEEDING IN A HEMOPHILIAC

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I report this case because diphtheritic serum was used, no other horse-serum being obtainable, and because I believe that great benefit was received, both from the serum and from the calcium lactate used.

The patient, L. R., aged 16, was admitted to my service at the Spearville Hospital, Thursday, July 18, 1912, at noon. He had been bleeding for ninety hours from a cut just above the right upper central incisor, received by being struck with a bracelet on a young woman's arm when falling out of a hammock. Two of the mother's brothers suffered from hemophilia. The patient was bleeding profusely and much weakened from loss of blood when admitted. He was given,

1. EDITOR'S NOTE: The use of horse-serum has been noted in New and Nonofficial Remedies for a number of years. In the 1912 edition it will be found on page 222. While human serum or blood is to be preferred, horse-serum will do in an emergency.

1. Bienwald: Deutsch. med. Wchnschr., 1897, xxiii, 28.