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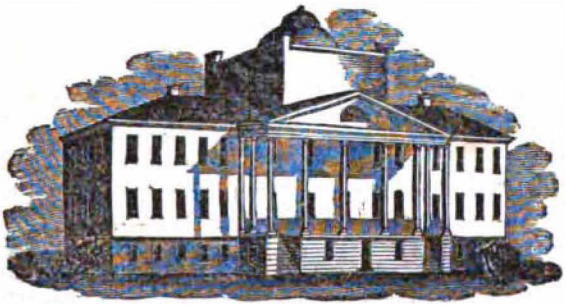

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I.

ON THE TRANSFUSION OF BLOOD.

By W. CHANNING, M.D.

DURING the prevalence of the doctrine that disease was the consequence of a change in the blood from a healthy or natural, to a diseased or unnatural condition, it occurred to some medical philosophers that the surest and readiest mode of cure was to remove the diseased blood from the body, and to substitute for it the blood of an animal in health. Much speculation arose on the question what sort of blood, or the blood of what animal would answer the purpose of the doctrine best, and it would seem that the blood of a lamb obtained the most reputation. The doctrine was put to the sure test of experiment. But whatever blood was employed, the result was so disastrous that the practice fell into great discredit. And its proving fatal in the instance of a young man of rank in England, was among the causes of its final abandonment.

Within a few years the practice of Transfusion has been revived in England, with different views, under different circumstances, and with very different results. We are indebted to Dr. Blundell, Lecturer on Physiology at Guy's Hospital, for some very interesting facts on this subject. He acknowledges that he is wholly indebted to some experiments instituted by Dr. Leacock of Barbadoes, for his earliest notions on the subject. The paper in which Dr. B.'s first experiments are contained was published in 1818. In his more recent work on Physiology, he has still further treated on transfusion. A brief abstract will be given of the first publication, and of some cases in which transfusion has been practised.

Dr. Blundell's attention was particularly directed to the possible remedial effects of transfusion, by witnessing an instance of death from uterine hemorrhage, in which many circumstances concurred to give the case peculiar

interest. Experiments were instituted to ascertain how far this opinion was well founded. The femoral artery of a dog was laid bare, a pipe large enough to fill it was introduced with its end towards the heart. On being opened, eight ounces of blood were discharged in two minutes, and the discharge soon after ceased. *Symptoms.*—Distress and gasping; struggling and convulsions, and at length profound fainting, marked by stoppage of the circulation, by insensibility, and by a complete relaxation of the abdominal muscles. After lying thus for a few seconds, six ounces of blood taken from the artery of another dog were injected into the femoral vein. He soon revived; the abdominal muscles became firm, and the respiration regular; the sensibility was restored. "So sudden and complete was the resuscitation, that the animal seemed rather to awake from sleep, than arise from apparent death." Now the combination of the above symptoms is mortal; and the animal invariably dies when left to itself, if the blood is suffered to flow from the femoral tube till the discharge spontaneously ceases. Transfusion, says Dr. B., alone can save it.

The next object was to settle that the transfusion of blood by the syringe does not unfit it for healthful circulation. A syringe with a double pipe was used, and a pipe was introduced into the artery and vein. Then the blood which passed from the artery into a cup was directly returned into the vein, and this was continued for twenty-four minutes. The dog sustained but little injury. Dr. B. next shows the effect of delaying the transfusion after drawing the blood. In one experiment the blood was in the cup between 50 and 60 seconds. Human blood was used. The animal revived a little, but died in a few minutes. In another, 30 seconds elapsed. The animal revived, but died in twelve hours. Experiments were next made with human blood, on dogs, and the transfusion done without delay. One died in a few minutes; another in a few hours, and a third several days afterwards. This last was found to have dropsy of the pericardium. Mr. Goodridge of Barbadoes tried a similar experiment on a very vigorous dog. He recovered and lived. "This experiment, therefore," says Dr. B. "is in reality in unison with my own; for it is not contended that the exchange of blood *necessarily destroys* life, but merely that it *may sometimes endanger* it." Dr. Leacock made experiments with the blood of sheep. Death in general took place in a few days afterwards. The inference is a fair one from all the preceding experiments, that "transfusion by the syringe powerfully recommends itself, as it enables the operator to inject human blood into human veins." It is remarked in another place that from experiments it was shown that the venous blood seems to revive an animal, as well as arterial.

In injections with the syringe, there is some risk that air may be introduced along with the blood. Experiments were next made to ascertain how far this occurrence would be dangerous. Five drams of atmospheric air were thrown into the femoral vein of a dog about as large as a full sized cat, a dram at a time. Very little in-

jury was suffered. In three days the dog was well, and at no time did any symptom of immediate danger occur. In the same dog three drams were blown into the femoral vein, without producing even *temporary inconvenience*.

We have in the next place a drawing and description of the syringe employed by Dr. B. in these experiments. Without a drawing here, a description would not be intelligible, and it is of less consequence as the common syringe has been again and again employed in the human subject with perfect success. Dr. Blundell's instrument may be obtained of Laundy, St. Thomas's Street, Southwark, London. Let the operation be done as it may, the injection is not to be delayed after drawing the blood; the syringe is to be warmed in tepid water, and the ordinary care used of raising the point of the syringe and depressing the piston to expel any air that may be between the blood and the extreme point. The quantity of blood necessary to preserve life is last spoken of. It might be supposed that this should be as great as the patient may have lost. This opinion is stated by Dr. B. to be an erroneous one. His remarks on this subject deserve to be quoted at length. "It must be confessed, however, that it is not necessary in cases of hemorrhagy to throw into the vessels as much blood as they have lost; a very small supply, although it will not restore the energies of the animal, will preserve its life. This truth, which is in some measure established by the result of the first experiment, is so generally admitted, that it is unnecessary to enlarge upon it; yet I cannot forbear adding, that it seems to deserve a more minute investigation than it has hitherto received." The cases now to be briefly narrated confirm these original views of Dr. Blundell.

Cases of Transfusion of Blood.

Case 1.—August, 1825. This was a case of uterine hemorrhage, and is communicated by Mr. Waller in one of the London Journals. The ordinary means for suppressing the hemorrhage, and of restoring the patient had been unsuccessfully used, and the following *Symptoms* were present:—face deadly pale,—extremities cold,—no power of deglutition,—no apparent respiration,—pulse hardly perceptible,—intermittent. These symptoms had existed for some time without change, and the danger of death being imminent, Mr. W. determined on transfusion to save life. A common injecting syringe holding two ounces was used. A vein was opened in the bend of the arm, and secured below the orifice to prevent further escape of blood. The blood was drawn into a tumbler from an attendant, and two ounces injected without delay. No effect followed. Two more ounces were then thrown in. A nearer approach to syncope was the consequence,—the pulse fell still lower than at first,—there was sighing, and one effort to vomit. These symptoms ceased in a minute or two. Patient now revived, felt easy, and the transfusion was stopped. In six hours after was much better, and recovered entirely.

The only objection which has been brought to this case is the smallness of the quantity of the blood injected. In answer to

this, it is only necessary to refer to the state of the patient at the time when the transfusion was made; the length of time that state had continued, and the unchecked progress of fatal exhaustion. Will any one doubt that this patient would have died if nothing had been done to restore her? Is now the smallness of the quantity of blood transfused a valid objection to the opinion of the surgeon that the operation saved the life of the patient? Mr. W.'s inferences are,—that the operation is easy and simple,—that no bad effect followed it, and that it is highly probable that it saved the patient.

Case 2.—September, 1825. *Uterine Hemorrhage.*—Mr. Doubleday reports this case. *Symptoms.*—No pulse; bloodless face; nostrils pinched; sight indistinct; excessive restlessness; breathing hurried; sighing; cold clammy sweats. It was agreed to employ transfusion. The median cephalic vein was chosen; patient resisted, and the operation was omitted. Six hours after, patient again seen; hemorrhage had stopped for six hours. Cordials had been tried faithfully. Twenty ounces of brandy, 160 drops of laudanum, ammonia, &c. had been given in the interval of the visit, but without reviving the patient. Her state seemed utterly hopeless. Transfusion was at once practised; the pipe was inserted in the median cephalic vein, a ligature being applied below the orifice to prevent loss of blood on return of circulation. A two ounce syringe was used. Good effects were obvious. After six ounces, great improvement. She said, "I am as strong as a bull." Fourteen ounces in all were injected. Pain now occurred over the left eye, and the transfusion was stopped. On the following day, there was much excitement in the system, with milk fever, and the vein was found inflamed. Twelve leeches to the vein. 7th day from the transfusion the patient was well.

Case 3.—August, 1826. Communicated by Mr. Jewel. This was a case of uterine hemorrhage. *Symptoms* less promising than in the preceding case. As no vein could be found in the arm, the right external jugular was opened. A syringe of only three drams measure was employed. This was filled sixteen times and the blood poured into the vein, in about twenty minutes. Sickness now occurred, and efforts to vomit; in turning the neck the tube was displaced, and the patient died.

Case 4.—Uterine hemorrhage, with hour-glass contraction of the uterus. Mr. Fox's case. *Symptoms* like those already repeated. Six ounces of blood were injected in divided portions. This patient recovered.

Case 5.—Hemorrhage from bursting of a varicose vein. By Mr. Philpot to Dr. Blundell. This case is from the December number of the London Med. and Phys. Journal, and is extracted entire.

"July 21, 1827.—A poor woman, named Ashdown, aged twenty-nine, now in the sixth month of pregnancy, who during three former pregnancies had suffered from varicose veins of the legs, had this day, after standing for some hours at the ironing-board of a laundress, a sudden effusion of blood

from the bursting of the vena saphena, about six inches above the right ankle.

"About a quarter of an hour elapsed before I reached the house where she was, when she had lost, as it seemed, between eight and ten pints of blood. Assisted by my friend Mr. Phillipson, I, by compress and bandage, immediately stopped the hemorrhage. The patient was in a state of complete syncope, without pulse at the wrist, and but a very indistinct pulsation at the region of the heart; she was cold, with lips and face completely blanched; a profuse sweat broke out, and she passed both fæcés and urine involuntarily, so that she appeared moribund. Stimulants applied to the nostrils produced no excitement, and she had totally lost the power of deglutition. Though with little hope or probability of her recovery, we determined on the operation of transfusion.

"A person being quickly obtained from whom blood was drawn, a ligature was applied on the right arm of the patient, the median vein laid bare, and carefully dissected, so that a probe was passed under it; the vein was opened, and the end of a common bone syringe (the only one at hand), with its extremity filed off, was with some difficulty introduced. Several syringes full were thus injected. When about four ounces had been thrown in, she became extremely restless, throwing her head from side to side, and making an effort to vomit. We then desisted, and had the satisfaction of distinguishing the pulse at the wrist, though extremely small and rapid: warmth was applied, and wine and brandy and water administered frequently.

"In the evening, six hours after the operation, the pulse was then distinct, and at 120. She was so much better as to answer several questions. Heat was gradually developed, and the next day she was removed in a chaise to her own house. She recovered."

In these cases except the last, Dr. Blundell was present, and assisted in the transfusion. In concluding this paper, I cannot but remark that I consider this whole subject as extremely interesting. There seems full evidence enough to recommend it to the attention of the profession. Should the experiment be tried in this country, it will give the Editors of this Journal much pleasure to communicate the results in its pages.

Note.—Since the above was written, another case has been met with in the February number of the London Med. and Phys. Journal, communicated by Mr. Waller, from Mr. Bird. This case is important since it shows "that cases may and do occur, wherein the patient sinks from exhaustion, although the flooding has been permanently stopped by the tonic contraction of the uterus." This was a case of placental presentation. Hemorrhage had taken place at intervals for several days, and had gradually become more profuse. Symptoms of extreme exhaustion were present when Mr. B. first saw the patient. There were no labor pains. She was delivered by turning. Very little blood was lost during the operation or after the birth of the child. It was

sufficient, however, still further to reduce the patient. Transfusion was decided on, but much time was lost before this could be done. The blood flowed slowly from the person who was bled to supply it, and before the second injection was completed, it was believed the patient was dead. Not more than two ounces were injected.
