

laxation, and in very many of them stimulants are, from the great debility induced by the bleeding, afterwards necessarily resorted to. If, however, the administration of tartar emetic may be generally relied on, as I expect, the ill effects of taking much blood will frequently be obviated.

Cold Water as a Means of restoring suspended animation.—I will take this opportunity of adverting briefly to another subject. I have for some years, in my lectures at this hospital, taught the propriety of cold sprinkling the chests of children, when born in a state of suspended animation, or in cases where the respiratory function was not sufficiently active, conceiving it to be decidedly one of the best means we have for the purpose referred to. But it should not be applied at all on the face, as I have seen it, so directed, produce injurious and often destructive effects. Its application on the face suddenly suspends the respiration.

BLEEDING IN THE COLD STAGE OF INTERMITTENT FEVER.

To the Editor of THE LANCET.

SIR,—I beg to forward you the following cases of intermittent fever, in which bleeding was employed in the cold stage as recommended by Dr. Mackintosh of Edinburgh, with the most successful results. May I beg the favour of their insertion in your valuable periodical. I am, Sir, yours respectfully,

SAMUEL LA MERT, Surgeon, &c.

14, Bury-street, St. Mary-Axe,
May 14th, 1834.

CASE 1.—M. Teulon, a printer, aged 45, of bilious temperament and spare habit, had been the subject of tertian intermittent fever for several years, which, from its continuance, had produced general derangement of his health. He had taken quantities of bark without producing any permanent effect, although it had relieved him from time to time, but immediately he caught cold he was certain of an attack. On the morning of Tuesday, November the 27th, 1832, I was called to see him, and found him in the following state. Yawning and stretching, with feelings of lassitude and debility, complaining of tightness across his chest, which rendered his breathing difficult and laborious. In a few minutes a complete rigor set in; teeth chattered; countenance lived; pulse 100, and much oppressed; extremities deadl-

cold; conjunctiva turgid; heat of trunk not below the natural standard. The sensations of cold now became almost insupportable, and he shivered to such a degree as actually to shake the bed he was lying on. I immediately determined to bleed him, although the man was frightened at my doing so, as, to use his own expression, he thought he required blood instead of abstracting any. However, I succeeded in persuading him, and with great difficulty (owing to the tremors) made a large orifice in the basilic vein. The blood at first oozed out by drops only; I then applied hot bottles to his hands and feet, and used friction to the arm, and had the satisfaction of getting a full stream in a very little time; and when about ten ounces had been abstracted, a gradual warmth was felt pervading the body, and the shivering had ceased. I tied up the arm, and in a few minutes the extremities became quite warm, the breathing free, the pulse 85 and soft. He here expressed great surprise at the relief which he had so suddenly experienced. I then had him lightly covered, and gave him the following:—

℞ *Magnes. Sulph.* ʒiiss; *Liq. Antim. Tart.* ʒj; *Sp. Æther. Nitrosi* ʒiiss; *Mist. Camphoræ* ʒiiss. M. Fiat haustus ter die sumendus.

In an hour afterwards he fell asleep, slept for four hours, and awoke quite refreshed. The first thing he noticed was that no hot stage had supervened, but that he was in a gentle perspiration. This continued in a very light degree for about four hours; he passed a very excellent night, and the next day he was working in his office. He continued taking the draughts for one week. It is now nearly eighteen months past, and he has not had another attack, but is in the enjoyment of excellent health.

CASE 2.—January 20th, 1833. Mrs. N—, aged 58, living in the City-Road, had been in a bad state of health for some time. When she applied to me, she was complaining that every other day she was attacked with an acute pain in the head, accompanied with shivering and intense cold, which in a few hours gave way to excessive heat and thirst, and terminated in a profuse perspiration, when all pain and uneasy feelings subsided until the next attack. Bowels were costive, tongue foul, pulse 110, and on her telling me that she expected the paroxysm in the afternoon, I went to see her, and found her in exactly the state she had described. After the rigor had well set in, I opened a vein in the arm, and abstracted about-

ten ounces of blood, with immediate effect, for the coldness and shivering ceased, and a gentle perspiration ensued. I then gave her the same draughts as in Teulon's case, and ordered her to be kept quiet, and have low diet.

22. Had felt better during the interval than hitherto. Tongue cleaner; bowels freely opened; the paroxysm came on in the evening, but not so violent as before. I again abstracted blood. The pulse previous to this was 60. After eight ounces had been drawn, it mounted up to 80. Heat again returned, and the pain in the head had completely ceased; no hot stage followed.

24. Had scarcely perspired at all after the bleeding, and during the interval had felt no weakness. Tongue clean; appetite improved; bowels open; about eight in the evening felt a sense of coldness, but not amounting to a rigor; pulse 70; pain in the head not half so acute as before. I again bled her, and took about twelve ounces, as I imagined I had not taken sufficient before. The result was here highly satisfactory; no hot or sweating stage followed. The next period of the attack passed over without any unpleasant symptom; she gradually recovered her strength, and has been in excellent health ever since.

CASE 3.—Dec. 4, 1832. Mrs. Goodson, wife of a stable-keeper, aged 48, mother of seven children, complains that every other morning she has a violent pain in the head, accompanied by a severe rigor, which lasts about an hour, and is succeeded by a hot and sweating stage. The continuance of the disorder has produced general bad health, and œdema of the extremities; tongue is furred; pulse 100; no appetite. I gave her the following:—

R *Extract. Colocynth. c.* gr. xii; *Hydrarg. Submur.* gr. iij. Fiant pilulæ tres statim sumendæ.

Dec. 6. This morning had a rigor, accompanied by all the symptoms of ague; after it had well set in, I opened a vein on the back of the hand, and applied a hot bottle to the palm. In a few minutes I obtained a good stream, and when six ounces only had been abstracted, the shivering ceased, the coldness gave way to a gentle warmth, the pain in the head vanished, and the breathing became free, and unaccompanied with tightness of the chest. In fact the change was so sudden, that the by-standers were amazed. The skin was moist, and bedewed with a gentle perspiration; no hot stage had followed.

R *Potassæ Nitratis* gr. x; *Liq. Ammon. Acet.* ʒij; *Sp. Ætheris Nitrosi* ʒj; *Mist. Camph.* ʒix. M. Fiat haustus ter die sumendus.

7. Had perspired freely; pulse 80, and soft; œdema of the legs rather diminished; had passed a great quantity of water; tongue cleaner; bowels open; felt better during the interval. Continue the draughts.

8. About noon had another rigor, which was very severe; was bled to 10 ounces with a decidedly good effect, no hot stage following. The blood in this instance was taken from the saphena vein. The bowels being costive, I gave her one ounce of castor oil, and ordered the draught to be continued.

10. In the morning pulse was 75; tongue quite clean; bowels had been freely opened, and had made a great quantity of water. Legs were diminished to one half the size they were previous to the first bleeding. In the evening had no attack, and from this period she convalesced; the legs became of a natural size, and she has since enjoyed excellent health.

Remarks.—The preceding cases must, on reflection, afford convincing proofs that bleeding is a safe, efficient, and certain remedy in intermittent fever in the cold stage. In Teulon's case it effectually prevented any hot stage following; and instead of an immense discharge taking place from the excretory vessels of the skin in the sweating stage, a slight perspiration merely ensued, and the next day he was in perfect health, engaged at his usual avocations. In the last case also, although œdema of the extremities had taken place, the effect of the bleeding was as decided as in the former. There are many who say that bleeding must do considerable mischief where the patient, having been long affected by the disorder, has become weak and debilitated. But they do not consider that the quantity of fluid which exudes from the skin in the sweating stage, is very considerable, and comes direct from the blood itself. In fact, nature herself effects the same process, by removing a load from the system, though at the expense of inducing far greater debility than the bleeding would in the first stage; added to this, by depletion in the first instance we prevent mischief occurring from irregular determination of blood to different vital organs, which frequently occurs in the hot stage, and lays foundation for future disease. It is as notorious as it is remarkable, that all those who have expressed their opinion

in opposition to this practice, have done so from imagination only; for had they founded their opinions on the proofs elicited by the trial of the remedy, they would doubtless have published them to the medical world long since.

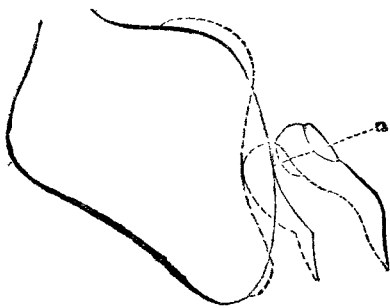
ON THE CAUSE OF THE HEART'S IMPULSE.

By E. L. BRYAN, Esq., *Stowmarket.*

THE investigation of the heart's impulse requires a careful consideration of the mechanical states of the parts which are active, and of the parts which are passive, in its production.

The ventricles, the active parts, have two states; one in which their muscular fibres are relaxed, and do not compress the blood; the other, in which they are contracting, and powerfully compress that fluid. When in a state of rest, the ventricles have no determinate form, but may be moulded into any shape which the pressure of the parts in contact with them may happen to give them; they are soft and yielding, and a slight pressure upon any portion of their surface would cause a depression of that surface. For the sake of elucidation, let *Fig. 1* represent the outline of the ventricles in a relaxed state.

Fig. 1



Suppose the end of the finger were pressed upon them at *a*, it would occasion a depression as represented by the dotted line.

In their state of action, however, the case is quite different, whatever might have been the form of the ventricles during their relaxation, on the instant their valves are closed, their powerfully compressed fluid causes them to take on the most rounded or spherical form which the arrangement of their muscular fibres will permit, and as this arrangement is per-

manent, the form of the ventricles is always the same during their active state. If it were possible to take a mould of the ventricles at the commencement of one beat, they would exactly fit that mould at the commencement of each following beat. Let *Fig. 1* represent the ventricles when in action; pressure at *a* would now occasion no depression, because the heart, when contracting, is hard and resisting; but if the pressure had been applied when the ventricles were in a relaxed state, depression, as previously observed, would have occurred, and immediately on their action the ventricles, reassuming their own peculiar and rounded form, would either strike back the finger to *a*, or themselves recede in the opposite direction.

The parts which are passive in the phenomenon in question are those portions of the parietes of the thorax, which form the outward walls of the cavity containing the heart; and their mechanical state is of necessity connected with that of the cavity whose walls they assist to form. In this cavity (which I shall here call the heart's space) is contained the substance of the heart and the blood in its four cavities. Now the quantity of the heart's space occupied by the substance of the heart is the same, whether the muscular fibres be in action or at rest; but the blood in this (i. e. the blood in the heart's cavities) is constantly varying in quantity, or, at least, has a tendency so to do; because from this space blood departs with arterial force and velocity, while it enters it with venous force and velocity; the necessary consequence is, a tendency to vacuum in the heart's space, equal to the difference of the two forces. The inevitable effect of this tendency to vacuum in the heart's space is, that on the instant the ventricles have discharged their contents and become relaxed (the exact period at which the tendency to vacuum is greatest), those portions of the external parietes of the heart's space, which are sufficiently elastic to yield to a slight force, close in upon that space.

Let *Fig. 2* represent the outline of a heart and a section of the parts in contact with it; let the line *a* represent the form of the ventricles when in action; when, powerfully compressing the blood, they are of their most rounded or spherical form. On the instant they have ejected their contents and become relaxed, the most elastic portions (*a*) of the external walls of the heart's space, close in slightly upon that space, as represented by the dotted lines, and depress the contiguous surface of the ventricles, the relaxation of the ventricles permitting the