increased heat is wasted nerve-force, so to speak; or what ought and would be nerve-force, if the nerves possessed their healthy conducting quality. Hence the absence of vaso-motor power, and an expanded state of capillaries. The effusion which ensues in a superficial inflammation is analogous to that in all organs: the phenomena which are presented in all depend upon their peculiar functions, and their disturbance. The capillaries most pressed upon by the tumefaction pour out their contents, or exosmosis takes place; others of these, nearer the surface, will be more expanded than natural; hence absorption by the greater current of circulation through these capillaries, or endosmosis. These changes, progressing, lead to the absorption of tissues and the discharge of abscesses.

In passing, it may not be amiss to allude to alcohol. How does it act? It is apparent that saccharine, fatty, and probably alcoholic matters, produce nerve-force as well as heat; whilst albuminous matters supply the structures by which the body is moved—viz., the muscles and connective tissues. Alcohol may act in the *healthy body* upon the inner surface of the heart and capillaries and the nerves of sense as an excitant only, and the chief amount taken into the system be carried away without undergoing combustion; and thus, after serving this end only, will leave the system enfeebled to the extent to which it has called forth its powers. But what concerns the profession to know is, what are its effects in the enfeebled states of the body, or in low states of disease, as in typhoid fevers, etc. It will act here also as an excitant; but I am persuaded that it does more than this; that it is oxidised, since it does not intoxicate even when given in large quantities, but rouses up the energies of life. The mind resumes its wonted calmness and power, when properly administered, to a much greater extent than can be accounted for by its excitant effect; yet the excitant effect in these cases will be greatly diminished here, since the sensibility and power of the system are greatly reduced; hence the marked effect in these cases is from oxidation. And no smell of alcohol is perceived in the breath and urine of such. It would be desirable to examine the tissues of the body and brain where it has been largely given in these low states of body, to settle this vexed question.

M. Cl. Bernard has shown that, after section of the sympathetic nerve, the blood contains a larger amount of fibrine than usual, and is more easily coagulated, as in ordinary inflammation. This teaches us that, after the relief of congestion of a part or organ by local or general depletion, we may in many cases prevent the too great effusion of fibrine by the cautious use of alcohol; for it is evident that the oxidation of alcohol will, so far as it becomes oxidised, prevent the oxidation of albumen into fibrine; for that which will unite with alcohol would otherwise unite with albuminous matters. Again, alcohol will, according to Dr. L. Beale, produce an excitant or contracting effect upon the capillaries, and thus reduce effusions by keeping down tension. The good effects of alcohol, however, are seen in low cases of fever, and inflammations attending these, in which no fibrine is effused, and also where little of fibrine exists in the blood of these cases. Here we perceive the mind rouses up from lethargy; or, if rambling, it becomes calm and conscious; the pulse becomes full and steady; and a marked improvement takes place, from the heat and nerve-force which it is capable of giving to the system by oxidation. By its excitant action upon the heart, the blood will flow through the capillaries of the lungs with more vigour, and thus produce (by endosmotic current) a greater amount of

oxygen. It may not be amiss to point out the heat capable of being produced by the heart's action.

The amount of mechanical work performed by the heart has been computed by the Rev. Samuel Haughton, M.D., etc., to be equal to 124 foot-tons per day. A near approximation of this may be arrived at by considering the height to which the column of blood is sent from the aorta, and its weight. From the above, we may consider the left ventricle expends force equal to 100 foot-tons per day, at least. This, reduced to pounds, is 224,000 foot-pounds, which, divided by 772, the mechanical equivalent for heat (for 772 foot-pounds equal the amount of heat necessary to raise one pound of water 1° Fahr.), there will be produced about 289° as the quotient—an amount of heat which, divided by 145, the average weight in pounds of a man's body, will give the actual amount of heat which is capable of being produced by the arrest of mechanical force of 100 foot-tons per day; viz., 2° Fahr. for each pound of matter which constitutes the body. When we come to consider this amount divided over the space of twenty-four hours, we shall see how inappreciable this would be at any one of the twenty-four hours; for the heat generated by this means would be inapplicable to us. But we are not certain that all this force is converted into heat. Part is, no doubt, converted into frictional electricity, if we may use the term; owing to the heterogeneous nature of the blood and the coats of the vessels. Friction of homogeneous bodies produces heat alone; of heterogeneous bodies, heat and electricity.

The application of the facts here contained, and their relations in diseased actions, are almost universal. One symptom observable in mechanical injury of the spinal cord is great elevation of temperature in one or both of the lower extremities, owing to injury of the sympathetic, and the arrest of nerve-force to the centres; and hence the same effects as when this nerve is divided in experiments. As Dr. Brown-Séquard has lately said in a lecture, "the circulation in these cases is not more rapid, but fuller and (more energetic)?"), than in the corresponding limb. Hence the heated condition of the blood and limb could not be greater than in the other or healthy limb; for, although the arteries may be more expanded on the injured side, from the deficient power of vaso-motor nerves which cause contraction of these vessels, there cannot be more—probably less—of the heart's force arrested and converted into heat.

It will be evident that "determination of blood" to a locality or organ cannot exist, but that it depends upon lesion, disease, or malnutrition of the vaso-motor nerves, which allows the capillaries to become congested and inflammation to result. The importance of this question and of allied conditions known to exist in the phthisical constitution, will enable us to understand the deposition of tubercle in the lungs, etc., and heat in the axillary region.

NOTES ON HERNIA.

By JOHN THOMPSON, M.D., F.R.C.S., Bideford.

[Concluded from page 371.]

THE necessity for care in the after-treatment of cases of herniotomy is amply shown by clinical observation. After bringing the edges of the wound together, and retaining them in apposition by sutures and plaster, a difficulty may arise in keeping the intestine quietly reduced. Where a hernia has had for its immediate cause some violent but temporary muscular effort, the call for which passed at the time, there will be no further unnatural compression of the

viscera after the operation; but, in case the hernia has been produced by severe muscular efforts concerned in coughing or micturition, arising from disease in the system, the circumstances of the case are materially altered, and it will require corresponding increase of attention.

A compress of lint is usually laid over the course of the hernia, and supported by a bandage made to describe the figure of eight in its gyrations over the thigh and pelvis. To such, it is presumed, no exception can be taken. The suggestion is, however, offered, that this simple process should be performed with just the same studied discretion that marks the execution of the cutting operation. Protrusion of the intestine is no imaginary danger; it occurs frequently under favouring circumstances, sometimes merely disturbing the process of healing; but it may be far more serious, and peril the life of the patient.

I was many years ago called to an old woman with strangulated femoral hernia, produced by the coughing of bronchitis, from which she was suffering. Her usual medical attendant met me in consultation; and, reduction being found impracticable, he performed herniotomy in a very neat manner, and to the complete relief of the patient. After this operation, he brought the edges of the wound together with sutures and a few strips of plaster, and supported the whole by a compress of lint and a bandage. On parting, he requested me, as my residence was nearer to the patient than his own, to pay her a visit in case of any urgent necessity; and to this I cordially assented. Two days after, I was sent for in haste; and, on my arrival, they informed me that the patient's bowels were coming out on her thigh; and, indeed, this was about the truth. There was, in fact, a protrusion of intestine which in mass represented the size of a man's fist; it had been forced out between the ligatures, and found its way under the lint and bandage to the surface. Every coughing increased the protrusion, which projected readily through the conical wound, but met with insurmountable obstruction to its return. I was obliged at once to remove the dressings and sutures, and then had no difficulty in replacing the bowels; but the poor patient, who had before been apparently doing well, experienced such a shock that life was as it were snuffed out, and she died in a few hours.

This accident, it may be said, might have been prevented by inserting more sutures, and keeping the parts more firmly supported by the lint and bandage; and probably this is true; but there is a consideration concerned also in the matter of a tight compress.

Some time after this untoward case, I was called to a man with strangulated femoral hernia, produced, as in the former case, by coughing. Here I was the operator. After dividing the stricture and returning the intestine, I inserted a goodly number of sutures, and placed strips of plaster between them as supports; and finished the appliance with two compresses of lint, crossed over the wound, and kept in position by a bandage. This answered very well in preventing protrusion; but, instead of the wound healing nicely, sloughing of the hernial sac took place; and, though the man made a good recovery, it was protracted.

Mr. Erichsen mentions that he has twice witnessed sloughing of the sac, in both instances the patients doing well. He does not suggest the cause of the sloughing, nor will I take the liberty of doing so with his patients; but I have always strongly suspected that, in the instance of my patient, the rather firm compress bore some causative relation to the sloughing sac. Since then, instead of using lint as compress, I have taken a round wad of raw cotton

and placed it along the course of the wound, and bandaged it over. The cotton guards the canal even better than the lint; and, being far more soft and elastic, exercises efficient pressure, with less risk to the infirm tissues surrounding the hernial passage.

Mr. James of Exeter has suggested that the patient should lie on the side opposite to that which has been cut; and the advice appears to be very sensible. This position of the patient would certainly cause the bowels to fall somewhat to the sound side, and moderate tension on the side of the wound.

It has seemed to me correct practice to close the wound completely for the first few days, the period of union by adhesion; and not to allow a communication between the abdominal cavity and the atmosphere. The discharge coming from the wound during the first four days is probably fluid draining from the abdominal cavity, and which there is no necessity for evacuating by the wound, as peritoneal absorption would be quite sufficient for its removal.

Herniotomy sometimes serves as a tapping to the abdomen; and the quantity of fluid gushing out when stricture and sac are both divided may be, as I have known, very considerable. In such cases, effusion has arisen in the abdominal cavity as the result of congestion, or most probably peritoneal inflammation; but that a drain should be left between the abdominal cavity and the surface seems to me even then contrary to modern views of practice, where tapping is resorted to for idiopathic dropsy.

It is most important that the bandage should not be made to compress the abdomen, because it would thus favour protrusion, or might occasion pain, and increase the tendency to peritonitis. But if its course, after passing round the thigh, is along the truss line of the pelvis, it will be just in place, and the patient will feel no inconvenience.

I had occasion, some time since, to operate for femoral hernia on a woman who had passed the middle period of life, and where strangulation had existed six days. After the operation, a friend of mine who was present undertook, at my request, to apply the bandage; and I left it to him. Two hours after the operation, we returned to see our patient, and found her in great distress. She had vomiting of feculent matter, like as before the operation; and said she was in an agony of pain. I was led at once to examine the bandage, and found that it was around the abdomen, above the crest of the ilium, and made unnecessary pressure. We altered the position, and placed it around the pelvis: vomiting ceased, the pain left, and the patient passed a good night. Had we not kept watch, the consequences would, in all probability, have been fatal to recovery. The same case gave evidence of the propriety of using great care in the dieting. The patient was visited by her medical attendant every two or three hours, day and night, for the first sixty-eight hours; and both the quantity and quality of the food were regulated by him. She took opium in full doses at first; after forty-eight hours, had an enema of warm water; next took a dose of castor-oil; and all with excellent effect. She was free from pain or tenderness; had no vomiting; could relish arrowroot, beef-tea, and such sorts of nourishment; and her bowels had acted nicely by the oil and the enema. However, on the fourth day, the female friends thought fit to supplement the patient's allowance with some sherry; and the result was, that vomiting, stercoraceous in character, came on, and the woman's safety seemed perilled. A strict adherence to the former plan of diet set matters right, and there was no other relapse. She is now quite restored, and enjoys vigorous health; but, I believe, mainly owes her recovery to the great care

taken in the management of her case after the operation.

When, notwithstanding every care, death takes place, its most common cause seems to be peritonitis. I have only had the opportunity of getting a *post mortem* examination in two cases, and in each this was the cause of death; which accords with the experience of other observers. It is very curious how much greater evidence of this affection is given in some cases than in others, the part of the membrane involved seeming to influence the amount and the character of the pain. In a few cases of very old people, life has seemed to ebb from the time of the performance of the operation, as if the constitutional shock were overpowering to the system.

As to results, so much depends on the time that has elapsed from the time of the strangulation to the performance of the operation, and also on the age of the patient, that it seems necessary, in order to make statistics reliable, that records of cases should always detail the age of the patient, and the period during which strangulation has existed. A run of good cases will make the experience of an individual operator look very favourable for a time, till an equally unaccountable succession of bad ones depresses his average to perhaps even a low figure. I have operated on five cases in succession, four femoral and one inguinal, recovery taking place in each; and, again, have been concerned in two or three unsuccessful ones in quick succession. Then, in very old people, vitality being very feeble, recovery is hardly to be expected; though in one case an old woman considerably over seventy, to whom I was called, lived for years after the operation.

As it is necessary that a truss should be worn after recovery from the operation for strangulated hernia, it may not be out of place to remark that some considerable difficulty is occasionally found in managing this for old people, who are commonly the subjects of hernia. They very often complain that the spring of the instrument is too powerful in the first instance; and, after a time, find it hardly powerful enough to support the hernia. This feebleness of action is usually caused more by the chemical action of fluids and air on the metal of the instrument, than by loss of elasticity from use. If the springs of all these instruments were japanned, or covered with some material to prevent erosion, it would be an improvement.

Transactions of Branches.

BATH AND BRISTOL BRANCH.

FUNGUS HEMATODES OF THE EYEBALL.

By FREDERICK MASON, Esq., Bath.

[Read January 25th, 1865.]

H. B., aged 14 months, the child of a farm labourer, a fine well developed infant, was brought to the Eye Infirmary on December 27th, 1864. The child is the youngest of eight, all the others of which are healthy. The parents are healthy; but the child's maternal grandmother is said to have been scrofulous; or, in the mother's words, to have suffered from "evil". The exact character of this disease is doubtful, as some operation was performed for its removal from the face when she was young.

The mother gave the following history. When the child was born, a white spot was observed behind the pupil of the left eye; and five weeks later, the child was discovered to be blind in that eye, vision being perfect in the right. The iris at this time was

of proper colour, and perfect. The disease advanced, and at the end of six months the pupil must have been dilated to an extreme extent (from pressure from behind), for the eye is described as having then been entirely white. The brilliant reflection of light from the bottom of the eye, when it was exposed to the direct rays of the sun, candle, etc., was especially noticed. It now slowly turned red, and abscess appeared to form, the eye appearing larger and more prominent than the other. In three months—that is, when the child was nine months old—the eye burst, and a portion (probably the diseased and opaque lens) fell on the floor. The diseased mass now grew rapidly, frequently bleeding profusely, but continued partially (about half) covered by the lids, until Thursday, December 21st.

Dec. 27th. There was now a large fungus-looking mass protruding from the orbit and tightly encircled by the lids, which had become oedematous. The growth appeared to be sloughing in the centre, and apparently growing and extending at the circumference, and bleeding freely on the slightest touch. The child was restless, sleeping very little, and evidently suffering much pain.

Dec. 29th. The child was placed under the influence of chloroform, and the contents of the orbit were removed. The growth had no attachment, excepting at its entrance into the orbit. The bleeding during the operation was slight, and there was no hæmorrhage afterwards. After the operation, the child slept well, and there was no bad symptom. The eyelids continued much swollen for four or five days; this then subsided, and the child appeared free from pain.

On the 7th, the child was so much improved that, the mother being anxious to return to her family, it was discharged, promising to attend with it as an out-patient.

The disease appears to have commenced during intruterine life in the optic nerve, probably within the cranium. Where this nerve emerged from the optic foramen, it was greatly enlarged. The disease must then have passed through the eye, implicating the internal structures; and, after escaping by the ulcerated opening of the cornea, involved to a great extent the anterior portion of the sclerotic, a small portion only of which membrane still appears white and shining.

January 17th. The child was brought to the Infirmary, improved in appearance, and free from pain; and the orbit appeared healthy.

[The child did not return to the Infirmary; but six weeks after the operation, the mother wrote, saying, the disease had returned, and was extending rapidly over the face. The child died on April 19th, 1865. A *post mortem* examination could not be obtained.]

CASE OF RHEUMATIC FEVER, FOLLOWED BY PERICARDITIS AND MORTIFICATION OF THE EXTREMITIES.

By W. G. DAVIS, Esq., Heytesbury.

[Read May 13, 1865.]

HENRY FRANCIS, aged 17, a fine young man, an agricultural labourer, of rather spare habit, the youngest of ten living children, capable of carrying (according to his own report) a sack of beans, was attacked with rheumatic fever in the autumn of 1864. Being sent home to his own parish for change and recovery of strength, he came under my care.

I found him fearfully weak, with great difficulty of breathing, etc. I could not define the *bruits* or murmurs about the region of the heart on account of