

action, for there are organisms which flourish at or below the freezing-point of water. In short, the various forms of bioplasm have their individual peculiarities and characteristics, which they inherit and may transmit, and which are not to be accounted for by physics, and which seem in truth to belong to their constitution. Conditions which are life to some forms of bioplasm are death to others. We may speculate as to the origin of these individual peculiarities which characterise the different forms of living beings, but we cannot at present expect to determine how they have arisen or whence they have been derived in the first instance.

Some are content to be assured and have faith enough to believe that peculiarities from time to time originate, and that their fortunate possessors gain thereby great advantage, so that they are enabled to overcome their less fortunate brethren, and even to utterly exterminate them. A never-ending scramble for mastery seems to be regarded by philosophical naturalists as an essential factor in the origin of species. Success in the perpetual life-struggle falls to the lot of the strongest, or the most cunning, or to those blessed with some other fighting or out-lasting quality, the origin of which is to be traced, it is said, to some slight deviation from the ordinary upon the part of one of a vast number of organisms of the same kind, which gives to that one the advantage of an offspring certain to survive the offspring of the less fortunate multitude. Being the fittest to live, the few soon predominate. Bioplasm, with the newly-acquired properties, transmits the peculiarities to that which descends, until bioplasm, capable of producing an organism still more fit, somehow results. The organisms derived from this then prevail, and enjoy the advantage of living and continuing the race. So the experiment is supposed to proceed. Whether or not new constructive power is thus acquired by bioplasm, the existence of wonderful powers in relation with the bioplasm is proved by the fact of the formation of tissues in the new organism having the individual characteristics of those of its progenitor, at a time long after the bioplasm mass was produced and detached from the organism that formed it.

TRAUMATIC POPLITEAL ARTERIO-VENOUS ANEURISM TREATED SUCCESSFULLY BY LIGATURE OF THE POPLITEAL ARTERY AND VEIN.

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PETER R—, aged ten, was admitted into my wards in the Edinburgh Royal Infirmary on the 28th of October, 1874. Three months before admission he received a wound in the popliteal space from the point of a pair of scissors. Blood poured from the wound in a large stream, but a jacket bound round the knee and wound partially checked the bleeding, and a woman supposed to possess some medical knowledge being sent for, a bandage was applied by her and the hæmorrhage completely stayed. Three days after the accident the bandage was removed, and no bleeding followed, but a small swelling was observed in the region of the wound. The advice of a schoolmaster being taken at this stage of the case, poultices were applied on his recommendation, and were continued for some days, until a small piece of "dead flesh" had come away. After this tincture of myrrh was applied to the wound, which soon healed soundly. The swelling was observed to beat quite distinctly, and caused him much pain during both the day and night. His leg was often cold, and he was glad to get up at night and warm it at the fire, as heat always relieved him. After the first few days following the accident the patient was allowed to go about, and one month after the injury he went to visit a relative at some distance, and was walking for nearly a whole day. The swelling had been very slowly increasing; but one month ago, after re-

ceiving a kick over the same region from a donkey, a more rapid increase in its size took place, and, for the first time, he was seen by a medical man, who advised him to come into the infirmary.

When admitted, a swelling the size of an infant's head, and of an irregular shape, occupied the popliteal space, and passed upwards for a short distance along the posterior aspect of the thigh. The swelling was seen to pulsate, but not very forcibly; and when the hand was placed over it, the characteristic aneurismal expansion could be felt on all its aspects. No peculiar thrill could be felt in the swelling. Pulsation was absent in the anterior and posterior tibial arteries at the ankle. At one point the swelling was very prominent, and the skin over this point was thinned and discoloured.

The case being diagnosed as one of traumatic aneurism of the popliteal artery, it was decided to treat it by laying open the sac and tying the artery above and below the wound.

On the next day—the 29th of October—I proceeded to operate in the following manner. A tourniquet being applied to the femoral artery in the upper part of the thigh, I made a small incision into the centre of the sac, sufficiently large to admit my forefinger. My reason for making this limited opening in the first instance was, that I could, if necessary, restrain any hæmorrhage until the finger had made an examination of the sac and separated any adherent clots. I learned the value of this practice in assisting the late Mr. Syme in most of his serious operations on large aneurisms. Having searched the sac with my finger, I gradually withdrew it so as to lay the whole cavity open, but on doing so free bleeding took place, and, as it seemed probable that this hæmorrhage was coming from the distal end of the wounded artery, an elastic ligature was applied round the upper part of the leg, the finger being kept in the wound as a plug in the meantime. The sac was then opened freely by a wound about five inches in length, and all the blood and clot in it sponged out. There was not very much clot, the contents consisting principally of fluid arterial blood. By this proceeding two openings were clearly exposed at the bottom of the sac. These openings were parallel to one another at a distance of about an eighth of an inch in the longitudinal direction of the limb. They were both about a quarter of an inch in length, and had the appearance of slits with little gaping of the edges. A probe passed into each opening determined the fact that one communicated with the canal of the popliteal artery, and the other with that of the popliteal vein. The canals of both vessels were pervious as far as the probe would pass above and below the wounds. The sac of the aneurism was well formed, circumscribed, and white and smooth on its inner surface. The popliteal artery, being carefully cleared by dissection for a short distance, was ligatured above and below the wound with prepared catgut; and the popliteal vein, being cleared in the same way, was also ligatured above and below the wound with the same material. The tourniquet and elastic ligature were now removed, and a small artery and vein which bled, in the region of the wounded vessel, were tied also with catgut. A drainage-tube was then introduced into the cavity, and antiseptic muslin was applied in the usual way, after the edges of the wound had been stitched together. The whole operation was performed under the antiseptic spray.

On Oct. 30th the report is that the patient had passed a good night. There was slight œdema of the foot, but the temperature of the limb was good.

On Nov. 1st a small piece of discoloured clot with a few drops of purulent fluid escaped from the wound. The temperature of the limb was good, and the cavity of the wound was contracting. No pulsation had as yet been felt in the tibial arteries at the ankle. The œdema of the foot was less.

On Nov. 8th the superficial portion of the wound was healed except where the drainage-tube was inserted. The cavity was contracting rapidly, and there had been no more purulent discharge. All the sutures were removed.

On Nov. 17th the drainage-tube was removed, the cavity having contracted. There was only a small superficial sore where the tube had been introduced.

On Nov. 26th the antiseptic dressing was removed, and solution of boracic acid applied to the small sore which remained. There was still a slight œdema on the side of

the foot on which the limb rested. Pulsation in the tibial arteries remained absent.

On Dec. 1st the wound was quite healed, and the patient was allowed to leave his bed, and go about the ward on crutches. There was a little weakness of the foot, but the knee-joint and limb were perfectly movable and strong.

On Dec. 26th the patient walked freely without support on the affected limb, the foot of which still remained somewhat weak.

Remarks.—The case just reported is one of great importance in connexion with the surgery of the bloodvessels. The absence of the peculiar thrill which has always been considered diagnostic of arterio-venous aneurism is a point of interest. Had the operation not so distinctly disclosed the presence of a wound in both artery and vein, I and those who saw the case would have looked upon it as one of *traumatic aneurism of the popliteal artery*. The reported cases of traumatic arterio-venous aneurism of the large arteries are not numerous, but in most of these, as far as I can ascertain, this symptom was observed, and directed attention to the true nature of the case. An examination of the wounded popliteal vein, made at the time of the operation, did not discover any appreciable dilatation of its canal, such as has usually been noticed in arterio-venous aneurism, and therefore I am inclined to think that, although a wound in both artery and vein communicating with the aneurismal sac existed, there was little or no communication through these wounds between the arterial and venous circulation. This conjecture may be explained by the longitudinal direction of the wound in the vein, and its position in regard to the corresponding wound in the artery. Be the explanation what it may, the fact of the absence of the peculiar thrill in this instance must be considered as quite exceptional in connexion with arterio-venous aneurism.

The most instructive part of this case is a consideration of the treatment which was successfully adopted. Mr. Holmes,* in his very valuable lectures on this subject, directs attention to the methods of treatment which have been employed in cases of arterio-venous aneurism of the femoral vessels. These methods may be enumerated as (1) ligature of the artery after the Hunterian plan, (2) compression, (3) ligature of the artery above and below the sac without opening the latter, (4) laying open the sac and tying the artery above and below the wound, the vein not being interfered with.

A consideration of the treatment of the reported cases of arterio-venous aneurism shows that the *first* of these operations has proved most unsatisfactory; that the *second*, when it can be applied accurately, so as to cause obliteration of the venous communication, has proved and is likely to be useful; that the *third*, although it has proved successful,† is only applicable in certain cases, and necessitates a difficult dissection; that the *fourth*, although it has proved successful,‡ is attended with great risks—(1) from venous hæmorrhage, (2) from purulent absorption.

The method employed in the case related has, as far as I am aware, never before been practised, but it is only just to state that Mr. Holmes,§ in his remarks, suggests the advisability of this proceeding, and refers to instances where both arteries and veins have been obstructed or ligatured without bad consequences following.

The result of the operation in my case tends to prove that surgeons have taken a too serious view of the risks likely to follow the ligature or obstruction of the principal artery and vein of a limb. One principle in all former operations for the relief of arterio-venous aneurism has been to avoid any interference with the vein, but this case has now practically demonstrated that both artery and vein may be successfully ligatured.

Should carefully-applied compression fail to relieve an arterio-venous aneurism, my recent experience inclines me to advocate the operation performed in the present instance, provided the case be one otherwise suitable for an operation.

The advantages of this plan are, in my opinion, (1) certain closure of the openings of communication in both artery and vein; (2) absence of any risk from venous hæmorrhage or absorption in connexion with the wounded vein; (3) its

practicability in the large majority of cases; (4) its easy performance without much dissection.

By the employment of the antiseptic treatment in the present case, all local irritation in connexion with the sac and wound was prevented, and suppuration was limited to the single discharge of a few drops of innocent pus.

In consequence of these facts, I consider myself justified in attributing to this treatment much of the success of the case, and I would therefore recommend its adoption with great confidence in this class of operation.

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CASE OF PHTHISIS TREATED BY PHOSPHORATED COD-LIVER OIL.

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MR. F—, aged twenty, had in his boyhood suffered from disease in the bones of the leg; fragments of bone had from time to time become detached, and the apertures had, after many months, cicatrised, and remained so to the date given below.

In March, 1869, I saw this gentleman in consequence of a troublesome cough, attended with copious yellow expectoration every morning, often mixed with florid blood. His pulse was 100; his tongue white; and he looked pale and emaciated. Left chest resonant; respiration full and strong. Right apex: impaired resonance, strong bronchial breathing and bronchial voice; behind, crepitant râle is heard at supra-spinous fossa. Ordered to take two drachms of Savory and Moore's phosphorated cod-liver oil* three times a day, and a tonic mixture of quinine with dilute phosphoric acid.

He was not seen again till January, 1870. At that date he said he had scarcely any cough, and had gained in flesh and weight. Pulse 104. Left chest normal. Right apex dull, with bronchial respiration at infraclavicular region, and slight crepitant râle behind. He had taken a few bottles of the quinine tonic, and had continued the phosphorated oil, with occasional intervals.

He went on well till June, 1871, when I was called to him at his home in the country in consequence of severe hæmoptysis; being away from town I did not, however, see him till September, 1871, when he came to me. The hæmoptysis continued for some time, and he was attended by Mr. R. Perrey, of Marden. When I examined him I found the physical signs not much changed. Crepitation was distinct and limited to right apex. He was ordered some tincture of iron, but this made him feverish, and caused a return of the bleeding; it was therefore stopped.

In December, 1872, I again saw him, and from this time up to March, 1873, he was feverish, pulse often 120, temperature in mouth 101°, much shortness of breath, loss of appetite, expectoration, and occasional hæmoptysis.

On examining the chest (March, 1873), there were cavernous breathing, loose crepitation after cough, pectoriloquy, and "crack pot" note, all as well-marked signs, in right upper third of chest. He was now taking the phosphorated oil, and no other medicine. The physical signs being so strictly limited to the right upper third, I considered that a deposit had softened here, and that this process had caused the rise of temperature, and other symptoms. There seemed no sign of mischief in the left lung, and I advised the continuance of the oil, and perfect rest at home. The quinine and phosphoric acid were again administered.

June 1st, 1873.—Pulse 100; cough much less; appetite good; much less crepitation in right chest; left normal. Finds the phosphorated oil agree well, and he desires to continue it. Recommended to go to Harrogate, and take a tonic of nitric acid and cascarrilla.

Sept. 19th, 1873.—Returned from Harrogate, where he gained 8 lb. in weight during seven weeks. Cough much less; pulse 92. Says he does not get nearly so hot as he

* THE LANCET, October 17th, 1874.

† Mr. Spence's case (Lectures on Surgery, p. 625).

‡ See Mr. Holthouse's case (British Medical Journal, May 7th, 1859).

§ Loc. cit.

* Containing one-fifth of a grain of phosphorus in the ounce.