1861

Pathology Jordan

Treatment:

1. Hot fomentation favours comparison
2. Too much in 7 of direct incision
On the Pathology and Treatment of Aneurism.

An Aneurism is a cyst containing blood which has escaped out of the course of the circulation, & communicating with the cavity of an artery. Most authors in treating of these formations have classified them into two great divisions, True & False; understanding by the former, those in which the sac of the aneurism is formed by one or more of the dilated coats of the vessel, and by the latter, those in which all the coats are ruptured, the wall of the sac containing the escaped blood, being formed by the surrounding cellular tissue taking a membranous form. There does not now exist any difference of opinion in regard to the mode of formations, constitution of the sac, & surgical treatment in the case of the True Aneurism, but on all these points, in regard to the False Aneurism, important differences of opinion still exist. And, as it seems to me, a knowledge of the pathological condition, here as elsewhere, will help us to form a con-
rect judgement on the disputed questions, I shall endeavour to give a short description of what is known of the most important branch of the subject.

But, before entering on this there is the question as to what is the deviation from the normal condition predisposing to the formation of Aneurism. Hunter, in treating of the causes producing it, considers that the dilatation is an accident, as it may arise either from disease or weakness, producing weakness which is the remote, while the force of the circulation is the immediate cause. He considers, however, that whatever may have been the remote or the immediate cause, the dilatation must arise from a disproportion between the force of the blood and the strength of the artery. The force of the blood's motion as impelled by the heart's motion is also thought by him to operate as the remote cause of some aneurism near the central organ, but in vessels at a distance this can have very little effect. The force of the circulation then is the true cause of the dilatation. The artery weakened at one point by disease is pressing on the column of blood and propelling it onward with a wave-like motion. The blood reacts on the arterial walls and the pressure of fluids being equal at every point, the weakened or diseased part gives way and suffers dilatation; so that the blood becomes the means of effecting the enlargement, not as an active agent, but only passively, the con-
traction of the arterial tunic by the active means by which its own wall defects, disease having previously produced a weakened condition.

That the production of Spontaneous Aneurism depends
on a morbid degeneration in the walls of the vessel and that mere weakness, apart from disease, is not sufficient to allow of dilatation to any great extent, was proved by the experiments of John Hunter performed upon the Dog.

The Carotid Artery, which he chose as being near the heart and receiving the full force of the blood's motion, was laid bare for the space of an inch in length and layer after layer of its walls was dissected off until the blood could be easily seen beneath the thin transparent membrane, which was the only part of the arterial tunic left at the part operated on.

The dog was now kept alive for two or three weeks, and,
on dissection at the end of that period, whether the wound had been allowed to close in upon and supplant the injured vessel, or union had been prevented by the intervention of a foreign substance, (the wound in this case being allowed to heal from below,) the artery was found neither enlarged nor diminished in size, its parts having returned their normal thickness and appearance.

For the formation of a true aneurism then, we usually have disease as the predisposing cause and,
as a general rule, the coats of the vessel begin to de-
late only upon the application of an exciting cause,
such as a blow, or the overstretching of the part by vo-
cent muscular action, the result of which is the rupture 
of the internal or middle coats. The artery is now very 
much in the same condition as that of a fractured 
bone which has not been treated in such a way that 
motion has been entirely prevented; the current of 
blood keeping the artery in a state of constant move-
ment does not give it a chance to heal. If any pla-
tic matter is thrust out, it will be immediately swept 
away before time has been allowed for it to become 
modelled into formless.

A Morbid process being at the foundation of 
Aneurismal formations, to it we will now direct our 
attention. The Pathological Condition of the arterial 
coats, which most frequently precedes the formation of a 
true aneurism, is that which is associated with the pres-
ence of what has been named Atheromatous matter.

With reference to this diseased formation its origin and dis-
seet, authors disagree; and we propose to give a short 
account of some of the principal opinions which are 
held in regard to it.

The term "Atheroma" was originally applied to 
the follicles of the skin; signifies an enclosed sac
containing pulpy matter. This word is now used to designate a change in the internal coat of an artery, in which we find the deposit of a putrescent, cheesy-like substance. On examining the inner surface of a vessel in which this change has taken place, we see that it is marked with a grayish white or translucent or a milky white or opaque matter, which is either spread over the interior at various points or in occurs in considerable patches, the thickness of the deposit varying at different parts, thereby roughening the normally smooth and serous lining membrane of the vessel to assume an uneven appearance.

Most writers on this subject although they differ as to the cause of which this diseased formation is the result, and also as to the question whether we have here to do with an entirely new deposit or simply a transformation of pre-existing texture, agree in considering the process of formation to consist of several stages: and first, we have the "simple putty Metamorphosis" of Virchow in many cases not preceded by any preliminary phaenomena, sometimes, however, following on a "Stage of Irritation," resembling the condition of cloudings and enlargement which we find in inflamed parts. Accordingly, he considers this change to depend specifically on an inflammation affecting the inner artery.
- torial coat. According to Boikitaevsky it consists in the "ex-
- creptive formation & deposition of the lining membrane of
- the artery, derived from the mass of the blood, at the same
time constituting hypertrophy of this membrane" and is
quite independent of any inflammatory change. He
also termed the stage of oil formation by other action.
The second stage is marked by the development of the
true atheromatous matter as a result of the metamer-
phoric or desintegration of the deposit formed during
the first stage. The third & last change is one in which
we have the deposit ulcerating & softening.
In further considering space in detail, the atheromatous
process, we shall content ourselves with giving the opinion
of Virchow & Boikitaevsky in regard to it.
According then, to Virchow, this deposit is effected
by a transformation of fire-exciting texture. The part
primarily affected is the inner coat of the artery, the
tissue of which is destroyed its place being taken by cell
of granules of fat. The fatty change takes place first
on that portion of the inner coat which lies nearest the
circular middle coat. Fat cells & granules are formed
in the place of the proper texture of the coat which
at the part affected had been considerably swollen
so as to cause a bump-like projection into the in-
terior of the vessel. These cells are interspersed between
the strata of the internal coat, the external fibres running over the deposit being continuous with the fibres of the hor-
monal internal coat, while the deeper fibres run directly into it.
the deposit, their continuity being broken by their own
degeneration which has produced the deposit.

Virchow's second stage is associated with a Chronic
Inflammatory affection of the inner coat, resulting in
the metamorphosis of the above described deposit of fat
into the true atheromatous matter. The part of the fat-
deposit in which this degeneration is first observed
coincides with the deepest layers of the internal coat, which
were also the first to undergo the previous change, and
we often find the two conditions co-existing, the athero-
mae also going on in the deep layers, while the more super-
ficial layers have not proceeded further than the
simple fatty change. The result is the formation of
a pustular mass, lying apparently in a closed cavity
between the internal and middle coats, and giving rise
to the descriptions by Haver & the older anatomists,
of the possibility of the inner to be stripped off from the
middle coat. On a microscope examination of this
pus-like substance, numerous crystals of cholesterol
tartrate in the form of large rhombic tablets present-
ing a glittering appearance are seen, associated with
black-like fatty granules & molecules & mixed up with
the debris of the softened tissue of the internal coat. The further changes which take place in this diseased formation, are those of softening, ulceration, & breaking down of the deposit. Now, the inner coat in its whole thickness becomes involved in the disintegrating process, and finally it ulcerates at its most projecting point, the latter
-matter is washed out into the general current of the circulation & there is left an excavation which is termed an atheromatous ulcer. Into the question of the still more advanced metamorphoses which the deposit undergoes, e.g. those of ossification & calcifi-
cation, we do not require to enter as they are for the most part concomitants of old age, and have not any special bearing on our subject.

At representing those who hold that this matter, foreign to the normal arterial wall, is a deposit from the snap of the blood, we shall now inquire into the ex-
-planation of the atheromatous process, given by Richter & Kaposi. He considers it to be an excessive deposition of the lining membrane of the vessel derived from the blood. It is not necessary again to go over the appear-
-ances presented by the deposit, the subsequent changes which take place in it, as his description of these cor-
-responds very much with that of Rixenoe; the source of the deposit is the main point on which there is any,
difference of opinion.

Some have taken a still different view of its origin; they consider it an exudation from the nutrient arteries of the walls of the vessel affected, and afterwards undergoing the atheromatous change.

The explanation which appears to me as the most probably correct one, is that given by Bichat, being in his opinion a transformation into fatty matter of pre-existing tissue. We frequently find that, those in whom this disease of the vessel exists, are of the Adipose Dia-

therein, there being associated along with the atheroma, the production of fat elsewhere, such as fatty degener-

ation of the walls of the heart. I am at a loss to un-
derstand how it can be a deposit from the vessels of the blood, as if this were the case, we ought to find it first showing itself on the surface of the vessel nearest the blood, but it is not so; it makes its first appearance where the internal comes in contact with the middle coat, the athero-

masia proceeds from without inwards, the athero-

masia attacks first the oldest stratum of the fatty mat-

ter and follows the same course as the fatty change until at last an opening is produced for discharge to take place into the interior of the vessel. The fact that the nu-

trient vessels of the affected artery do not penetrate fur-

ther than one third of its thickness into the substance of
the middle coat, taken along with our knowledge of the fact where the revascular formation first manifests itself, precludes the idea that it is an erudition from these vessels.

The deposit of Atheromatous Matter very rarely affects the Pulmonary vessels; it is almost exclusively confined to the course of the Systemic Cirulation where it is limited to the arteries. It is found either confined to one or more points of the vessel, those parts of the arterial wall intervening between the spots remaining unaffected and in their normal condition, or it is diffused more or less over the entire circumference arterial system. This fact as will be afterwards seen has an important bearing on one of the methods lately proposed and successfully applied in practice for the cure of true aneurysm.

The trunk of the aorta is usually the primary seat of the disease, and the frequency, with which it affects the other vessels, is in direct ratio with the frequency of the production of aneurysms in these.

The period of life, too, at which we find this disease most frequent, viz. between the ages of thirty and sixty years, corresponds to the time when aneurism is most apt to be developed.

In those instances where the disease is extensively diffused, we very often find that it affects the arterial system
symmetrically. It has been recorded that, in several cases where an aneurism existing in one limb has been cured by ligature, the cure of the first has been followed by the formation of an aneurism in the opposite limb, occupying a corresponding position to the first.

Atheroma, then, being the basis of True Aneurism, it comes to be a question, what causes to compose the wall of the aneurism, are one or more of the arterial coats always ruptured or does aneurismal enlargement ever result of a simple dilatation of all the coats of the vessel? In answering the last of these questions would seem to favour the belief that this does occur, but rarely and is more especially limited in the arteries & arteries of the brain. Why this mode of formation should be thus limited may be explained in reference to the former of these localities, by supposing that the great strength of the external & middle coats gives time even for the diseased & non-elastic internal coat to become gradually detached by the pressure from within, and that those parts of the arterial system, where aneurysms by dilatation of all the coats is found, are not exposed to any of the suddenly acting exciting causes which would, if applied here, as elsewhere, cause rupture of the inner coat & lead to the formation of aneurism in the ordinary way. In the case of the arteries of the brain, if the
Since coats are weakened by disease, the external sheath is so thin that it ruptures and extravasation occurs instead of aeurism.

With regard to what are called external aeurisms, their formation by dilatation alone is extremely rare. We have already seen that the parts of the arterial wall involved in the morbid process are those which lie nearest the current of blood. Thus therefore on the application of an exciting cause will be the first to give way, and thereby allow of the dilatation of the external sheath.

Under such circumstances, the aeurismal tumour will form rapidly, but if the disease is limited to the inner coat, if the aeurismous ulcer does not extend deeper than this, we can readily understand the dilatation of the in this case, healthy middle coat to a certain extent, its giving way after a time of the slow formation of the tumour, consequently. In most instances, however, we find that the internal and middle coats have ruptured, that this has happened on the application of an exciting cause, that the pressure of the blood dilates the external coat which alone forms the wall of the aeurism, becoming thickened and strengthened by deposit of fibrin externally and externally, by the condensation of the cellular and other neighbouring tissue.

The presence of an exciting cause seems to be of great
importance in determining the formation of Anemia. The fact that these formations are by far the most frequent opposite the articulation, appears to indicate that the cause of their occurrence in these situations, is not that the disease has here extended its ravages most widely, but that the violent extremes of tension and relaxation to which the arterial walls are subjected is the principal agent in their production. The comparative frequency of Anemias in the two sexes also shows us how much the presence of an exciting cause influences their occurrence, for, out of 83 cases of Anemia in various parts of the circulatory system undeterminately, only 9 were found in women who are much less exposed to those accidents which in men tend to the production of Anemia. We have additional reason for regarding great importance to the exciting cause, in the fact that, of the above mentioned 83 cases which did occur in the females, 5 were anemias of the aorta and one only was external or in the extremities.

Treatment
In considering the question of the means to be adopted for the cure of Anemia, our remarks will be considered as applying to those which come within reach of the surgeon. Anemias of the aorta are
considered more as subjects of medical practice, not to be interfered with by the surgeon. The dangers attendant on any operation on the central arterial trunk are so great as to cause all to refrain from the use of the method. The difficulty of the operation itself is not so great, as the technique can be readily enough applied, but it is only inapplicable as a means whereby life may be prolonged for a few hours, without affording the remotest chance of ultimate recovery.

Before entering into any detail of the methods practiced by art for obtaining a cure, let us see what nature can and does sometimes effect in our treatment must be guided by the direction her efforts take. In establishing a spontaneous cure, nature seems to act according to one or other of the three following plans: first, by coagulation and absorption of the luminal contents.

This is the most common means by which a radical cure is accomplished. Layer after layer of the fibrin of the blood becomes deposited on the interior of the lumen until it becomes entirely blocked up, the plugging process usually extending far beyond the cardiac and arterial aspects of the aneurism as far as the giving off of an important branch. The extent to which this has been rendered impossible by coagulation, becomes a fibrous cord and the enlargement gradually takes the form of a small fibrous tumour.
It may happen, however, that a cure is established without
the obliteration of the artery itself, and several cases are re-
lated by Hodgson where on deflation, the deposition of ca-
gugula had proceeded to such an extent as to preclude
the possibility of rupture of the sac, in this way prevent-
ing a fatal result by haemorrhage, and where the
blood had still flowed in its natural channel. In
the second place, the vessel may become obstructed on the
eradicde side of the aneurism, and a cure may follow
after the above described process, or by ulceration and
sloughing of the sac and its contents. The obstruction
may be produced by the extension upwards of the
aneurism itself, tending to erect prose on the trunk
of the vessel; or a tumour entirely unconnected with
the muscular system may be situated so as to con-
press the artery and causes are even given where the
formation of a second aneurism arising by compre-
ssion also. Because the means of obliterating the one
first formed; this last can not be called a cure but
it, along with the other means which Potter adopts, shew
us the great principle on which we are proceed in re-
gard to operative interference. After obliteration of the
artery cure may be obtained in the manner first described
or such distension may occur as to set up an inflamma-
tion involving the sheen and the tumour itself in dele-
-ation and sloughing; after the separation of the sloughs, the wound may granulate and heal.

The above described favourable results are by no means to be relied on, experience having taught us that in by far the greatest proportion of cases, we are to look for ulceration and sloughing of the seck without obliteration of the seck above the tumour, and haemorrhage in consequence. Therefore it becomes our duty to see if we cannot interfere before the securrion has reached such a size as to put the patient's life in danger from the unfortunate termination last mentioned.

Many plans have been tried to promote a cure, many difficulties had to be removed before a correct opinion could be arrived at as to the manner in which surgery was to interfere to promote a solitary result and even now authorities are not at one in regard to this subject. The perfection to which surgery has attained in the application of operative interference for the cure of securrions is very great but before determining the best at present employed, it will not be uninteresting to inquire what was the operative procedure followed by the older surgeons in dealing with it. And first then to the securrions with which they considered themselves warranted in interfering: those situated in the neck, armpits, groin or in any locality where the artery was
of large dimensions, they refrained from operating on, and until the year 1646 the only aneurism which they felt justified in attempting to cure by operation, was the false aneurism at the bend of the arm. The Ligatura was used to effect obliteration of the vessel and in some cases one only was employed above the tumour, while in others the vessel was tied both above and below the aneurism; the tumour was then incised, the corpora were peeled out, and various dressings such as powdered gypsum were applied with the intention of favouring the formation of pus. In some instances two ligatures were applied above the size and the artery was cut across between these, the one being then opened and its contents removed. In the case of those aneurism which they refused to operate on, palliative measures were used. Arthus mentions the application of plasters made of egg-yolk or decoctions to the tumour. Compresses of the tumour itself was also used, by means of thin plates of lead supported by bandage. Paré recommended the use of cooling and antiseptic lotions, the avoidance of violent exertion, and the employment of a space regimen.

Severinus was one of the first who made bold to operate on aneurism other than those at the bend of the arm. He relates a case of aneurism situated in
the groin, the skin over which was found to be livid, and threatening to become gangrenous; the lividity extended downwards to the foot which had already lost its sensibility. The patient becoming febrile, medicine were administered with the view of causing this to abate. This result was secured and by and by the gangrenous part began to slough off. On perceiving that they were about to separate, levure was applied hot with the view of procuring rapid removal of the dead portions. Their application was repeated on several occasions and blood to the amount of not a few pints was at different times removed from the wound. A very large loa was now left in which astringent powders were placed. Sloughing to a great extent took place but the sloughs gradually diminished in quantity, the discharge of putrid blood grew less and the leg wound by and by assumed a granulating aspect. In this con

strictrion the immense size of the wound, the con
test to which the fever was affected by disease and, the, to our ideas, highly deleterious nature of the deep

ing, which were applied, recovery was effected. The wound was healed up in two months after the first use of the

esterizing virus and before six months had elapsed
the patient was able to move about even without support.

I have narrated the above case at length, to show the
sudden and poverty of the practice in those times. As might be expected the results of that practice in general, were by no means favourable. Most of the patients were lost by the superelevation of sudden haemorrhage which the repeated styptic applications could not always restrain.

This same Severinus, however, along with Paulinus, in the year 446 cured an aeurism in the thigh by cutting into the far and tying above and below the en-largement. But before entering on the consideration of the ligature as employed for the cure of aeurism, we must consider another means made use of for the same purpose. This agent was compression which in various forms was at one time greatly advocated but it has now to a great extent gone into disuse. It ob-ject, like that of the other curative means was to take off the force of the circulation and allow opportunity for the coagulation of the contained blood and after wards for its absorption along with the aeurismatic sac.

The compressing agent was applied in three different ways: first, the whole limb was enveloped in a bandage, special compression being exerted on the tumour and on the artery immediately above where it entered into the sac; second, compression was employed on a portion of the navel, on the cardiac side of, and at a distance
from the sac and the third method was a raised plane where the aneurysm, after having been opened and its contents removed, was compressed at its mouth where it communicated with the artery. In the case where the whole limb was compressed, astringent lotions were applied and at each application of the bandage the amount of pressure was increased. The merits of this practice were strongly urged by Guattani and Milebrea and they mention instances where obliteration of the tumour followed on its employment. It was supposed by Lezina, when the pressure was made on the artery close to the mouth of the aneurysm, that, the two sides of the siphon being placed accurately in contact with each other, inflammation was set up, that adhesion of the walls took place and that thus the artery was rendered in- pervious; but it is difficult to understand how this is effected and the only way in which we can reasonably suppose pressure to be beneficial, is by lessening the force of the circulation through diminution of the vessel's calibre. The tediousness of the process and the uncertainty to results are the great objections to its use. Very few patients can be got to able to support the pressure for the length of time sufficient to bring about a fa- vorable result, and unless we have the compression uniformly maintained, it can be productive of no
good effects, while even then the objections previously mentioned still hold good. As an example of how little dependence we can place on this agent, we shall inquire into fourteen cases which were treated by compression under the care of QuatREF...the most powerful advocate of this method. Most of them were small aneurisms situated in the femoral and inguinal region.

The result of his treatment gives four cured, while the remainder were left much in the same condition as that in which he found them. Along with the compression, and, as many think, contributing more to the cure than that means itself, was maintained a regimen highly dietetic. Absolute rest was enjoined, the patient lived on the most sparing of diet, and, still more to deplore, the force of the circulation, repeated bleedings, were had recourse to. From a consideration of all the circumstan-c	ances under which treatment by compression was prac-tised and the comparatively few cases in which it has proved apparently successful, surgeons have as a rule concluded that, in the instances in which a cure resulted, it was due not to the compression but to the depletive mea-sures with which it was associated, and that probably spontaneous lacs would have taken place without the use.

The treatment of aneurism, according to the me-thod, which we have already considered, having proved...
As unsatisfactory, we must now inquire what better means are at our disposal. About the year 1646 the ligature began to come into more general use. There were, however, many difficulties in the way of its proper application and one of the greatest of these was the fear which perplexed the mind of every surgeon that, on cutting off the supply of the nutrient fluid by the ligature of the principal artery of a limb, gangrene should supervene and so the cure prove worse than the disease.

It is to Waller that we are indebted for the removal of this great difficulty; by his investigations surgeons were first made aware of the existence of collateral vessels sufficient to carry on the circulation after ligature of the chief arterial trunks of a limb, and he showed so clearly the great extent of these anastomoses and their multiplicity, that all fear of danger from gangrene, has entirely disappeared. After this great discovery, about the middle of the last century, and ligature of the femoral or popliteal arteries was performed by Saltzmann and other Italian surgeons and it has been recorded that the femoral artery was tied in the year 1757 at Manchester, for the first time in this country; and about the year 1780 this became one of the recognised surgical operations both in this country and on the continent.

Our descriptions of this operation refer to it, for the most part as performed on the Popliteal Artery and
as I cannot give a better description of it than that given by Reckanges, I will take the liberty of quoting from his "Observations." The operation for aneurisms by the incision of the sac requires a wound six or seven inches in length. The cellular membrane situated between the muscles is then to be cut through sometimes to the depth of three inches, care being taken to avoid the crucial nerve. The small arteries that are distributed to the muscles are liable to be divided in this stage of the operation and it is necessary to secure them. The sac being opened, the coagulum and blood that it contains is to be removed. It is frequently necessary to wash, cleanse, and in a manner to rub off the coagulum from the whole surface of the enormous cavity either with lint or a sponge. The assistant is compelled to pull around the sides of the wound that the operator may be enabled to see the bottom of the cyst. The cavity being cleansed, the opening in the artery is to be discovered; but this is not so troublesome a part of the operation as the ligature at so great a depth. If any collateral branches open into the artery between the two ligatures, since it is uncertain from what point the blood proceeds, it is necessary to compress the opening in the vessel or to apply astringents or lacunities. This account corresponds very much with that given by other surgeons and all agree as to the great danger from
and the frequent failure of the operation. The great majority of the patients operated on were carried off by secondary haemorrhage. There are some points in regard to the operation itself of great importance to be noticed, as bearing on the results. The great extent to which the artery was separated from its cellular connections, is one, and it was by no means an uncommon practice, in fact it was the general rule, although this is not allowed by the Editor of Hunter's Works, for the vein serve as surrounding parts to be included in the ligature along with the artery itself. Two, three or even four ligatures were sometimes applied and very frequently pieces of tape or some thread were used for this purpose.

Thus we have a general idea of the operation and its unsatisfactory performance in the hands of eminent operators. It is considered that it better to resort to amputation as a sure means of getting rid of the diseased and as not involving so much danger to the life of the patient as the incision of the Aneurism and the ligature of the artery.

In the year 1748 John Hunter performed what has been termed the "Modern operation" for aneurism. This consisted in the cutting down upon and ligaturing the artery at some distance from the tumour on the convex aspect. The considerations which led him to the employment of this practice were somewhat of
the following notice. He came to the conclusion, from a great many observations, that the artery, at the point where it was unusably tied, was affected by the same diseased condition which had produced the aneurismal tumour; that, such being the case, the part where ligatured was not capable of forming healthy plastic inelastic and that it was better to tie the vessel at a distance from what he thought the principal seat of the disease, it being sufficient in his opinion to take off the force of the circulation and thus to place the tumour and its contents into such a quiescent state that they would be readily removed by absorption.

The practice above indicated was confused during Hunter's lifetime to the operation on the femoral for the case of popliteal aneurism. The cases so treated were very successful, compared with the results of the former practice. It is not to understand the fact that the correct principles on which the ligature should be applied were not then known, nor indeed until sometime afterwards. By and by, aneurisms elsewhere were treated on the same principle and, from that period till now, it has been considered almost impossible to arrive at a higher degree of perfection in the treatment of aneur-
-termic operation, except as applied to that for which it was first recommended namely the Polytelit aneurism.

In a paper read before the Royal Medical & Chirurgical Society of London, Mr. Ewing brought forward a case of

Blue Spotted Varicose Aneurysm of the axillary artery in which he had performed the old operation of cutting

into the sac, removing its contents, and applying a ligature above and below the opening into the tumour, with

the very best results following. The results of this and other similar cases in which it might be supposed that

the artery was in a most unsuitable condition for the appli-

cation of a Ligature, but where the ligature was suc-

cessfully applied, have led Mr. Ewing to question the

soundness of the Hunterian operation at least as ap-

plied to Axillary Aneurysm. If we inquire into the

grounds on which this practice is founded, we shall find

I think, that it is in no way contra-indicated, in fact

the very reverse will be found to be the case. For the ease

of the aneurysm of the Polytelit artery, the advantages

of Hunter's operation are very great and no exception

is taken to ligation of the femoral artery for aneurism

in this locality. The close situation of the artery in

the limb its intimate and intricate relations with

neighbouring most important structures, the adhesion

of the sac to surrounding tissues, all combine to make
as consider it most unfavourably situated for the performance of the old operation. The Hunterian operation, here, then, must be considered a great triumph of modern surgery. What were the considerations which led Hunter to propose ligation at a distance from the aneurysm? We have already stated that he came to the conclusion, from very extensive observations, that not only was there the fancied of the aneurysm, but also that this disease extended for a considerable distance along the interior of the artery, both on its paricle and distal aspects, and that therefore it was by no means in a suitable condition for the use of the ligature. As a result of this belief he thought, that by taking off the force of the circulation at a point where the artery was not so likely to be diseased, a successful cure would follow. Thus it was held that to the extent to which the aneurysmal tumour overlapped the artery, with which it was connected, the neoplasm was in a suitable condition. It hence appears that on two grounds, first, that the artery still maintains a normal relation to the sheath in which it is contained, becomes firm and its supply of nourishment is in no way diminished and secondly, that it is "inconsistent with reason to consider the sheath sound so long as it can be felt beyond the tumour and diseased so soon as it becomes overlapped or enclosed by the expanding sac." And why should
The disease is greatest just at the point where the aneurism forms. Because, if this part had not been most affected, the aneurism would not have occurred here. But we have seen that it is stated by Pathologists that the disease exists either diffused over the whole extent of a vessel or is limited to one or two points with the arterial tissue interposed being very normal condition, and therefore we are just as likely to find the vessel sound just above the aneurism as at a considerable distance from its seat. The fact of the occurrence of an aneurism at any one point would appear to lead to the view that the subintimal lining walls must have been in a sound state previous to the dilatation process. For it is by the agency of the walls of the vessel that the dilatation has been effected, which would not have occurred, if through other causes deposit they have become rigid and lost their contractile power. But again, it is said, why was this operation so unsuccessful in its results in the hand of the most eminent surgeons; this must have been from disease preventing the excision of plastic matter. But disease could not prevent plastic matter being thrown out, for we find it agreed on all hands, that the nutrient vessels do not penetrate further into the substance of the arterial walls than one third of the thickness of the middle coat, consequently, not interfered with
at all by the closure and quite capable of forming healthy circulation when the internal and middle coat have been
reapplied by the ligature. Moreover the obliteration of
a pestle after the application of a ligature is not due
to the laceration of plastic matter above but due to
the formation of a clot of blood from the ligature up
to the giving off of one or more small branches of some con-
considerations.

We have no reasonable explanation of the want
of success attendant on the old operation, in these con-
considerations, and therefore we must look elsewhere for
and for the explanation of the success of the Hunter-
ian operation. In reading the accounts of the operations
as they were performed before the correct principles were
known by which we ought to be guided in operating
for the cure of aneurism, we find that it was set about in
such a way as, to our notions, almost to preclude the possi-
ability of a successful result; it was a common practice to
use four ligatures made of tape of a considerable breadth;
to get these applied, it was necessary to separate the vessel
to a very considerable extent from its neighbouring conne-
tions, on which it depended for its supply of nourishment.

This again, it was by no means uncommon for an accou-
stanting nerve and then to be included in the ligature along
with the artery itself. When we consider these facts and the
great depth at which the supphled artery is situated, the
consequent pulling and somewhat rough usage it had to
undergo before it could be enclosed in the ligature, we
cannot wonder that failure followed as an almost in-
variable result of this operation. Indeed, thus performed,
it would have been extraordinary, if the operation had
been successful in any degree sufficient to account for
continued performance. Moreover, it was not until Hunter
had proposed the new plan which bears his name, and
which soon became so firmly established that no one
thought of operating as formerly, that surgeons came
to apply the ligature in the correct principle of using
for the purpose a small a thread as was convenient
with firmness of hold and of separation, the artery from
its cellular sheath to put such an extent as well pur-
suit, without tearing, the passage of the aneurism would.
From ignorance of these important rules we had failure in
the one case, just as in the other, a hundred of
them were followed by success.

Seeing there were no disadvantages to this mode of treating
aneurism, which are not inseparable from the liga-
tive process, we must now inquire what bene-
fits it confers compared with that last mentioned
and whether the practice of it has been followed by
success. With regard to the first of these, the advocacy
to be gained are very palpable and decided. We have
induced the complete removal of the tumour, a re-
result which does not always follow the application
of the ligature at a distance from the aneurism.
In cases, such as that adduced by Mr. Synne, in which
it would be a very difficult matter or perhaps, almost
an impossibility, to apply a ligature at some dis-
tance from the sac on its external aspect, the direct
operation will be performed with much greater facility
and safety, and with a better prospect of ultimate cure.
Thus, if the aneurism had been treated on the Hae-
terian principle. The further, too, from the trunk, an
operation is performed, by so much, is the danger to
life defaced, and this will be well exemplified in the
case of aneurism of the groin. Thus, according to the
plan which has so long been established in this country,
require ligature of the external iliac for their cure,
and as it is agreed on all hands, that any operation
involving interference with the peritoneal sac, is one of
great danger, if we can accomplish a cure by the direct
operation, our patients will be placed in a position
much more devoid of danger than if the Hae
terian method had been followed. With these advantages
pertaining to the direct operation, complete success
has been found to result from its practice. In two
series of true aneurysm of the axillary artery in the hands of its inventor, the old operation was performed and was quite successful; but as sound ideas require many long years for their dissemination and as sound pre-judices have to be got over before the medical world in general can be brought to accept any improve-ment which runs tête-à-tête against its preconceived ideas, it is not improbable that a long period may elapse before all the advantages which the direct operation for the cure of aneurysm is calculated to confer, will be fully appreciated.

David Jones.