Theory of Ulceration.

William Willis, M.R.C.S.E.

M.R.C.S.E.
Ulceration.

I take for the subject of this paper the theory of ulceration; a knowledge of which I conceive is of great importance, both in a practical and scientific point of view. I would remark in the first place, that the phenomena of it have been very differently interpreted by different authors. Some look upon it as a process of absorption, and hence we meet so frequent ly in surgical works, with the expression "ulcerative absorption." Some again, on the other hand, look upon it as a process of ejection, whilst a third party look upon it as a process of absorption, and ejection combined. In other words to render ourselves more intelligible about these views. When Nature (by which I mean the forces of the economy) owing a part to the destructive process of ulceration, does the effect by a process, whereby the spoiled tissue is carried into the system by absorption; or does she effect it by a process in which the spoiled tissue is not
absorbed, but at once thrown off from the body in the shape of drainage, or does she combine these removing processes?

It may be said that the essence of ulceration does not lie in the removal of the ulcerating part, but that this removal is only one of the phenomena of a complex process: the essence lying in the condition, vital and physical, which render tissue subject to these removing processes. This condition of tissue in ulceration seems to have suggested itself to John Hunter for he says: "When it becomes necessary that some whole living part should be removed, it is evident that nature, in order to effect this, must not only confer a new activity on the absorbed, but must throw the part to be absorbed into such a state as to yield to this operation."

In a paper on this subject by Mr. Astley Cooper, he remarks that it is a process of degeneration or softening of tissue. And again it is a degeneration of tissue a change in the affinities, existing betw...
The component parts, by which it becomes changed from a solid texture, to a fluid inorganic mass.

Now I conceive it is of great moment to a right understanding of ulceration, to keep in view, first, the process whereby tissue is so altered as to be capable of removal; and secondly, the process whereby the altered tissue is removed. When we speak of a band as ulcerating, we are apt to combine in our mind, these two processes into one process, whether we lay hold of the doctrine of absorption or non-absorption, and consider as one what is essentially two connected operations; the one being an operation of decay and destruction of tissue the other of removal of this. Hence I think we can usefully divide our subject into two heads and consider first ulcerative destruction of tissue; secondly ulcerative removal of tissue.

It may be said that these expressions, ulcerative destruction, and ulcerative etc.
several are quite synonymous with ulceration, and that a synonyme cannot be made a subdivision. Should limit however as before indicated the meanings of these words as leaving our Jupons in the loccian time.

First, that the ulcer must be attended before unison, is manifest; both vitally and physically. Let us now enquire into the nature and process by which it is effected this alteration. I will quote from Dr. Williams’ Principles of Medicine at paragraph 463. The obstruction to the passage of blood through the capillary vessels of an inflamed part, and the increase of this obstruction, by the pressure of material by these vessels, which are the seat of determination reduce the vitality of the tissues to so low a degree that they are unable to withstand the chemical power of the effused fluids, acting as solvents and expelled as it is by high temperature. The tumours are therefore, gradually disintegrated, and dissolved
away. He in a note at the bottom of the page he gives his reasons for attaching a chemical solvent power to the effused fluids. Now this is what I conceive to be the place in ulcerative destruction of tissue.

Dr. Williams describes it under the head of process of suppuration. That the process of suppuration and ulceration have a good deal in common, we may learn from the fact that John Hunter considered ulceration as suppuration attended with absorption. It may be asked why do I substitute the expression ulcerative destruction for that of suppuration. The answer is that suppuration involves the idea of formation of pus and overlooks the more important feature of destruction of tissue. And is therefore too limited an expression to be synonymous with ulcerative destruction which has the tissue as the primary object of destruction, so that suppuration is as it were but one stage of the process...
and how far an essential one remains afterwards to be seen. Well now let us ask ourselves what is the essential characteristic of this process; I think the answer to this is contained in Dr. Williams' expression that the tissues are disintegrated and dissolving or in other words brought into the state of a fluid holding more or less of solid material unaltered. Now what I conceive takes place, and the foregoing bears me out, is that about undergoing this ulcerative destruction, or now that we have learned something about it, we may call ulcerative softening altered both vitally and physically and at the result of these alterations it is brought more or less directly into the state of fluidity, mainly through the action of effused fluids, acting chemically, assisted as we may surprisingly consider vitally of the tissue itself, by which I mean a lowering of those forces which tend to keep living matter in a state of infection.
Let us now say a word about gas- 
gene or mortification. First how does it 
differ from ulceration? They are both 
processes of destruction? I will quote from 
John Hunter. He says, "A creeping ulceration 
becomes a substitute for many cases for 
mortification, which is another mode of 
the loss of substance, and in such 
cases it seems to come its taking place 
of mortification to a degree of strength 
or vigour superior to that where mortifi- 
cation takes place; for although it is 
under from weakness yet it is in an 
action, while mortification is the loss 
of all action." Dr. Williams says in his 
Principles of Medicine. In suppuration, 
the dying textures are softened and dis- 
placed by pus as fast as they die, as 
gangrene the textures die more especially 
than pus is formed and they were into 
decomposition without being removed. 

Thus it may be concluded that these 
two processes differ not in kind but 
only in degree, in ulceration the textures
During their death are brought more or less perfectly into the state of a fluid, whilst in gangrene they die whole as it were. In ulceration we might suppose the vitally inherent in the tissue and the difficulty of solution causes it was a protracted struggle for life whilst in gangrene we might suppose owing to the great diminution of vitally the tissue gives way at once and at once.

In a word death in the state of a more or less imperfect fluid is the character of the one whilst death in the shape of a more or less perfect solid is the character of the other. In the last according as the solids prevail over the fluid, we have moist or dry gangrene.

It must be lived into that these two ulceration and gangrene must irresistibly glide into each other, and there are cases in which it might be difficult to say whether they are altogether or by a series of gangrene, or ulceration or by which they were originally formed.
Though we have said and believe that ulceration and gangrene are so far analogous operations, yet the details of the two are different and as a point of difference in this respect we would mention the disposal made of the dead tissue by nature, so far as we are aware of it. Now if we admit and I see no reason to the contrary, that prior to the disappearance of a hurt by ulceration it must be altered, and that this alteration consists in reduction to a state like ordure perfectly fluid and as proof of this fluidity I will mention first, granting the correctness in the main trend of the absorption theory of ulceration it is manifest that tissue must be rendered fluid in order that it may be absorbed, at least I cannot conceive with our present knowledge of the present of absorption and the absorbents how solid tissue could pass through their unbroken walls. If on the other hand we admit of the theory of osmotic absorption...
in ulceration, the proof of the tissue being more or less perfectly reduced to the fluid condition lies in the nature of the discharge. Will now having established as I think I have done the fluidity of tissue as one step in ulceration, the next question which presents itself is: how is this fluid removed? Is it absorbed into the system? Or is it at once thrown out of the system without absorption? Are the processes combined? First for the consideration of absorption. This was the agent in John Hunter's opinion and it was the prevalent doctrine for a long time. Astley Cooper was among the first I believe in this Country to challenge the correctness of this doctrine. It does not appear that John Hunter recognized a fluid condition as necessary for absorption though his opinion that "Nature must throw the hurt the absorbed into such a state as to yield to this operation" seems to show this idea of the necessity of some leucora
Agreement. If his data be granted, his idea of absorption being the great agent of dissolution is perfectly consistent, and to a great extent independent of what I have considered as an essential step of dissolution namely softening and solution. He says, "And the whole operation of absorption is performed by the open mouths of the absorbents." Resting upon the supposition of these open mouths, he goes on to say, "They are capable of absorbing substances in two different states that of solidity and fluidity. But mouths have never been shown to exist in absorbents, and the supposition of them is opposed to what is best known. Concerning them and without such mouths, I do not see how solid matter is to be absorbed as such. Hence if we abandon this theory of absorption as a dissolution, fluidity is the essential condition of matter undergoing this so-called disintegrative absorption, an oppression which when all we know is opposed to the mouths of absorbents must..."
assume a different meaning to that Hunter applied to it. Now as we cannot admit that absorption occurs after the manner described by Hunter, the first question is have any reason to suppose, or proof to show, that there takes place any absorption whatever during ulceration? Dr. Williams says, in speaking of suppuration and softening of tissue or what we would feel inclined to call an actual destruction of tissue, this assumes that absorption is still active in an inflamed part and the assumption is warranted by the fact that the absorbent vessels remain intact and certainly remain perfectly free. Now if this be true it is only fair to conclude with Dr. Williams that absorption is going on and so far theory is in support that dissolved tissue is absorbed. And how let us see if their view derives any confirmation from observation. I will quote from Mr. Paget. He observes, “In certain cases of sloughing of ulceration,
tissue, as Caruncules not yet open or
in Plegmonic cysticercus, or in the case
of external ulcers, in which with
out any external discharge, pieces of
dead tissue are completely detached
from the living tissue around them.
I cannot see how such déflection and
decay should occur unless we admit the view of
ulcerative destruction and absorption,
of the surrounding tissue. Now when
theory and observation are alike in sup-
port—though it may and does take place
it is evidence too strong to be resisted.
and I think the supposition that no
absorption take place in ulceration
is not in harmony with all that is
known regarding this process. Nor I
believe that we are liable to fall into
the error, of supposing that absorption
does not take place, because we have
periodical discharges from ulcers and
that abscesses are so unfrequently
absorbed. But I conceive this is no proofs
where it is true finds its way into the
Circulation through the tear vessels, but this is not absorption. We have no proof that pus, as pus can be absorbed. I will quote from Dr. Williams. He says "That these globules should remain unabsorbed will not appear extraordinary, when their size is taken into account, and also the fact that their cysts are not absorbed by their proper fluid, having acquired a remarkable degree of toughness." Now I think this fully accounts for the difficulty in curing and comparative infrequency of absorption of pus, but that pus is sometimes absorbed but it is true as pus with its well formed cells, but just broken down and dissolved, cannot admit of doubt, and indeed may be seen in disappearance of what is called Hydrops in or collection of pus in the aqueous chamber of the eye and also in the removal of catarrhal and purulent abscesses, without any external opening.
Some urge against this doctrine of absorption the statement, that absorption is at a standstill or inflammation and that alteration is attended with inflammation, and consequently that there is no absorption; but this is disproved not only by the observation of Dr. Williams, but also by the direct observation of Walter Huxley, who watched the gradual disappearance during inflammation of the pigment spots in a frog's skin, which proves that instead of its being diminished it is increased at all events in some cases. It does not appear to me satisfactory the evidence and reasoning adduced by some and thought sufficient to overturn the doctrine of absorption. Staford Kelly says "that Nature carries into the system motions material and poisonous tissues, which can be more safely and effectually got rid of by other means, is carrying analogy beyond the bounds of probability." The facility which Nature
goes to the entrance into the system of matter, often the most noxious and deadly is a sufficient answer I think to the kind of arguments Nature so to speak has great dependence in its successors, and the variety and richness of materials which have made their escape through the various wicket of the system during many morbid processes might be adduced in support of increased absorption. Another argument and a more plausible one is that in certain cases of annual inoculations if the resulting core be destroyed in the elevating stage the system is free and hence is established. System of destroying several times if met with at certain stages. The explanation given of the matter is this: the annual virus applied to a part causes inflammation and elimination of that limit during which there is no absorption, and hence to free the system is free, but elimination over the person gets into the system, and
contaminates it. Such an explanation, however, involves its difficulty, for if the poison is capable of exciting those morbid phenomena and that during these there is no absorption, how does the poison ever get into the system and why is it not carried away in the excretory discharge? Besides, how does it come that its presence at one time shall determine such actions that there shall be no absorption whilst soon, time after its presence is not opposed to absorption. Moreover, if the poison of a cattle snake be applied to a wound it is at once carries into the system whilst the poison of syphilis is reprobated to be now, it cannot be thought that on the score of local irritation and consequently, interruption to its inward march by absorption into the system the poison of syphilis is superior to that of the cattle snake. At all events the subject of animal poisons has so many difficulties, curare etc. with it, that we must
not drawn thirty Conclusions, from them
and more especially if there be referred
to observations, on which more reliance
is to be had, and of a different kind.
The fact however remains explain it
as we may that syphilitic cases destroy
as at certain stages save the system from
Contamination, but that this depends
on this that as absorption of syphilitic
brows into the system as yet I am not per-
pared to accept as proven. It may
be said the glands in the groin prove
it, but a great many difficulties again
present themselves. Buboes may be present
in any Kind of one of the penis urethra
and non urethra, and wherein lies the
proof that the one is in possession of
something essentially different from the
other? If the gland really contains any
syphilitic poison which is causing the
themselves how comes it that it is usually
only one to which often suffers since all
the absorvent vessels, and ganglia so
freely Communicate with each other.
Whatever explanations we may give of this matter I do not think that one in concern that supposes there is no absorption during ulceration. It is opposed by too strong evidence on the other side evidence which we are compelled to admit and indeed absorption seems the only agent in many cases as those instances by Mr. Paget show. In which he says, “No matter was seen to be observed here either from the dura mater the unconnected edges of the bone of the skull nor from that part of the scalp which had given way, and further the reason was the tumour being a living part and not an continueous one. The second effect was, however, similar to the others of an abscess unconnected that it was in that side nearest to the external surface of the body that the irritation for absorption took place.” Now I think this case not only shows that absorption can and does take place at all levels in bone.
Cases, but it is suggestive of the manner in which material lying over an abscess is removed and so far it would tend to show that breaking down of the superficial tissue and falling into the cavity of the abscess is not the means which Nature resorts to. To say the least it shows that in certain cases absorption appears to be the agent in removing the debris, which arises from the decomposition of putrescent matter from the system; and the only agent. From this and many other observations and reasoning it seems but fair to conclude that it is consistent with many things well ascertained, and observed, that absorption can and does take place in ulceration, but what is the exact phase it does take place in it is an inquiry full of difficulty and one which is not satisfactorily determined. It does appear to me however that it is reasonable to suppose that which is most perfectly fluid is absorbed during ulceration.
whilst that which is not so changed, flux is not, and cannot be absorbed, but is thrown off in the shape of discharge. This brings us to the second theory or an absorption theory in which during aeration every thing is supposed to be thrown off as discharge. If what we have stated in the foregoing be correct we cannot accept this as true and the reputation we enthrall in the foregoing. It is too exclusive and does not save the burden of a theory which would be in accordance with all that is known concerning aeration and I apprehend it is like the opposite of chlorine doctrine of all absorption in this respect; both have leave to expect though perhaps not equally so. Well but what establishes that there is ejection, and that the whole affair is not one of absorption in every instance as it appears to be in some? I think the answer is best reason and observation. Reasoning about the matter it is difficult to conceive how these particles of
tissue, which are not completely dissolved could get absorbed and as before remarked this difficulty of solution explains the reason why fluid is so little amenable to absorption. What does direct observation say in this matter? Mr. Page says the materials of the ulcerating tissue may be sometimes found in the discharge from an ulcer. Mr. Brev-ney Cooper has observed that while lard from soft parts only contains a trace of phosphate of lime, pus from diseased bone contained 2% per cent of that substance. Minute portions of bone have been found in the dis. charge from ulcerating bone. In the so-called ulceration of cartilage, the process of ejection of disintegrating tissue is clearly stated according to Mr. Page. This latter I do not however attach weight to as an argument, for that it is a process analogous to ulceration of other tissues may be fairly denied. But even in that case absorption can
and does occasionally take place and it is not always a process of ejection in which the disintegrated tissue is never carried into the system. We will quote from Sir B. Brodie's work on Diseases of joints. It is the case of David Clinton Page 174. Having detailed the case and after description of the right leg he goes on to say of the left knee. On dissection, the ligaments and synovial membrane were found to be in a perfectly healthy state, but about one third of the cartilaginous surface of the tibia and femur had been destroyed by ulceration, the ulceration having taken place near especially, but not entirely near the circumference. The cartilage of the tibia and the subdural cartilages were entire; but the latter in some parts were softer than natural. The bones were free from disease. There was no pus, cedem or other fluid in the joints. This shows that ulceration is not always
a process of disintegration, and yet it
It would be an interesting question,
how this absorption occurred, for we
have no right to attribute absence
of cartilage and as regards blood vessels
cartilage is quoted as an example
of a non-vascular tissue. Every thing
seems to show that this absorption was
performed by the neighboring tissues.
But it may be asked why is this now
more frequent? How comes it that we
have so frequently collection of fluids
in the joint in alleviation of cartilage
if the absorptions can do so much? I
think the explanation lies in this. This
will great difficulty that such liquids
are rendered so perfectly liquid as to be
capable of absorption and up through
a large portion of what we do meet.
Consists of pus, the cause of the con-
absorption we before known out of
this fluid. As all could have Paget's
view goes to the contrary as far as he
traces molecular disintegration and erection,
It is still a question how far the collections of fluid in joints consist of broken down decalcified cartilage, as absorbed or whether they are not mainly the resorbed fluid which is often formed during the breaking down of the cartilage. At all events, the absorption of the ulcerated cartilage when no fracture was found would suggest some idea like this, and tend to show that the difficulty lies not in the removal of the cartilage but of the pus. But to return. I think we have abundant proof to show in the nature of the discharge of certain ulcers that ejection takes place, of certain materials of the ulcerating tissue and that the suppurative theory of it being a process in all cases of absorption is inconsistent with what we know just as the suppurative doctrine in which ulceration is made
altogether a process of action is
at variance with other things we
know.

We lastly come to the theory which
combines these removing processes to
which we beg to subscribe ourselves,
and of the proof of this theory being
ture we must refer to what has been
said of the mean. It alone embraces
all that is known regarding elevation,
and I think we are bound to accept
it in the mean time until some of the
difficulties which at present surround
the subject be cleared away.

Considering this as the correct theory
it becomes an interesting question to inquire

to which of the foregoing removing
processes should we refer the
larger share of the operation of elevation
removal. I think this will de-
pend upon the nature of the texture
undergoing elevation, and the rapidity with
which it is inferred, and that the
ions are more rapidly than they can
be dissolved by the effused fluids in
some cases whilst in other their solu-
tion is more complete. In the former
I would suppose absorption to be lar-
gely concerned in their removal which
in the latter ejection. These however
are mere suppositions. I can conceive
a heat however with enough vitality
to resist its effects except in the unim-
portant proportion, whilst in another
case it yields more readily and dies
in some what larger proportion while
in a third it yields still more readily
and dies at once. In the first I
can suppose absorption in the second
ejection and in the last gangrene.
Hence however it is possible and was
sure to trust to if we may be led
into the general errors, it is only use-
ful when supported by observed facts.
We would now say a word about the term ulceration. We cannot help thinking that it is a word used loosely and vaguely and made to include things which have no essential connection. We speak of ulceration of the skin and ulceration of cartilage. Yet these two words must mean very different things. Dr. Axpe may say, in reference to ulceration of cartilage, "that these changes are referable only to an abnormal nutrition as their immediate cause, and in no case to mechanical or chemical actions, such as attrition or digestion, or a diseased secretion." Surely that account would not hold good of ulceration of skin! Yet Mr. Paget reasons from the one concerning the other. He says, "In the ulceration of cartilage, however, in which inflammatory reaction has no place, the
Process of ejection of the disintegrated tissue is clearly traced; and we might observe this almost a group of the same processes being observed in other tissues, if it were not that in the Cartilage, a necessary condition of absorption, the presence of a current, is wanting. Well I think that these two processes are so different that nothing derived from the one can be held as proof that the same takes place in the other, or even anything inferred from the one concerns any the other they differ so essentially. All the phenomena show that this so called solution of Cartilage consists in the softening up of the hyaline substance into gelatin with increased endogenous cell-formation, a thing totally distinct from solution of stroma. We might cite other instances but the foregoing shows how vaguely the expression has
been employed. Mr. Pagen remarks, that ever since the time of Hunter confusion has existed in the use of the terms employed for various kinds or methods of absorption and ulceration. If all that Hunter wrote nothing, I think, is so intricate so difficult to understand as his chapter on ulcerative inflammation, and uncle of the abscess, in which he left the subject remaining. Mr. Pagen proposes to limit the use of the word to the removal of the superficial or exposed particles of inflamed parts. This supposes that the bad is removed in the state of particles, and not in the state of solution a theory which all ought not to agree to; especially as in most cases he says, you another fault, it is impossible to find the ulcerating tissue in the discharge from the ulcer.

If we take into the absorption theory
"it may be termed "Alleluric Absorption" if the ejection theory then it may also be called "Alleluration"; but if we had the two as distinct we have reason to do so then we are left in the dark by Mr. Page.

It would suggest that we might use the word alleluration to signify minute death, dividing it into vascular and non-vascular, the former the result of altered nutrition with Arranged vascularly the latter of altered nutrition alone. Of course in many objections brought by fatal ones could be raised against this last such as it is vague in all degrees as Mr. Page remarks the terms that have been employed are confusing. It is needless to say that the word blood like alleluration is very vague and has been applied to conditions as things the key diseases to healing and
and unair to death and loss of
substance. Think however the general
substitution of bone for ulcer which
is being gradually adopted, and the
decision of this into healing and
accelerating is a great improvement.
for example for bone such an
expression as an accelerating ulcer
and prevented such a suggestive division.

In conclusion what have attempted
to show in the foregoing is the fore-
ground case is that ulceration as
it usually occurs in a vascular tract
is a process whereby tissue is de-
tegrated and dissolved and that
it is reasonable to conclude that
‘tis lead of this may find its way into
the system by the absorbents while
another portion may be thrown off
the Throat of Discharge that the
liquid is that which is absorbed whilst both
liquids and solids may be yielded and that
the means times observation compels us to accept.

These lute.
There was an attempt to show that both absorption and evacuation may be the means of clearing off ulcerated tissue and that either held unequivocally is consistent with all that is known. I have tried to show that the suppression ulcerative absorption with the frictional meaning is incorrect namely the absorption of tissue by the open mouth of the absorbent. Indeed we have no proof of any evolved increase or expectation of the absorbent during the process of ulceration; they simply carry away whatever is present to them in a fluid form and when this does not occur, matter is not absorbed by them. It must first undergo a species of liquefaction prior to removal by absorption, but Williams' observations would go to show that the little time may to do and hence the rapid compactly speaking of absorption of this fluid. The infectious focus which is sometimes present at the remaining
a long time without getting warm supports
this view as we may suppose that
the toughness of the cell wall prevents
solution whilst the lecithin gets
absorbed and that such things as
ionos globules should get through the
intercellular walls of absorbents (by which
Jacman means bacterial and absorbents)
is not conceivable.

There are many interesting questions
which more or less relate to our sub-
ject but we find we cannot enter
into them. The general doctrine of abso-
rbion in the animal body is a sub-
ject which relates to nutrition. It might
be a question how far the process
which we call mere adsorption
is not a process of true absorption.
The absorbent being concerned in removing
effete whilst its place is not taken by
new material so far simulating a
process of increased absorption whilst
in fact it is only normal absorption.
We have to acknowledge many imperfections in the foregoing and long labor in some cases we have got into error which has completely misled. It is however very difficult to keep on the right track in the dark obscurity of a difficult subject.

William Willis, M.R.C.S. E.