Inflammation.

Inflammation in its expression consists of :

1st Irritation - Exalted sensibility - Pain

2 ond. Redness ~~— influx of more~~ than the usual quantity of blood to the part Congestion

3 rd. Increased heat of the part

4 th. Swelling - effusion of a liquid or semi-liquid substance into the interstices of the tissue of the parts.

We may sum up the symptoms of Inflammation in four words in the order of the occurrence of its phenomena

thus; Pain, Heat, Redness, Swelling.

Cases may occur in which any one of the above symptoms may be present without true inflammation. Probably any two may be present without ~~true inflammation~~ but this must depend upon the acceptance or non-acceptance of definitions. The literature of the subject is exceedingly vague - especially in the use of the terms employed. There is also as yet not much known as to the real entity of the processes enumerated as belonging to the affection. We will take the principal

points and endeavor to consider them as we severally arrive at them in the order they are enumerated, but before proceeding we will say that we will not consider inflammation as established without the presence of effusion, or swelling - and one other of the symptoms named - any accelerated action below this will be regarded as a step toward the development of Inflammation; but not inflammation. This we regard as an arbitrary definition but some rule must be established for the sake of understanding

The only reason we can see or offer for the non-use of the term inflammation before the occurrence of this sign is that it is in a majority of cases perhaps the last in the list to arise and mark the completion of the inauguration of the affection, while the other symptoms may be regarded as steps looking toward this result.

Irritation is in its expression the cry of wronged vitality. It consists in its expression of exalted ~~irritability~~ sensibility - tenderness - excitability - a touch which in health would give rise to no inconvenience or

disagreeable sensations, is disagreeable - inconvenient - painful - The nerves of the part are found to be especially on the alert and resent the least interference from foreign bodies. The signs of irritation are given entirely through the medium of the nervous system and if the connection of the sensory organs nerves be cut off no sign of this step toward inflammation can be discovered.

This however is not irritation but only its cry - its expression - the symptom through which its presence is known - of its real entity we

are really known little definitely.

We have said that it is the cry of wronged vitality and it therefore has its material seat in the morphous or amorphous entities of tissue in which the living principle resides and consists of an interference with the proper and orderly performance of nutrition and the resentment of this interference on the part of the tissues which is made known through the excitation of the sensory nerves of the part.

This interference with the nutrition of the part and its resentment by vitality begets increased

action - a hyper activity of the part increased activity begets increased heat which results in an increased flow of blood to the part and assures in the second stage, or step, congestion which in its strict est sense means simply an unusual filling of the part with blood. How congestion is brought about is not very easily explained in a satisfactory manner.

We believe however that the increased quantity of blood is called to the part. Not sent - and is ~~not~~ inseperably connected with the increase of the heat of the part

so that we think it necessary to consider these two expressions together in order to gain an understanding of the manner of their reaction upon each other.

It is now pretty well demonstrated that animal heat is a result of vital activity. the actions and reactions of nutrition and denutrition. Integration and disintegration - the vital process of waste and repair, the performance of the functions of life in their ultimate entities of morphous and amorphous elements of life.

Again it is also a well demonstrated fact that heat dilates the smaller arteries and capillaries while cold contracts them. As to the reasons why these results should ensue from thermal change we know nothing, it is simply an observed fact.

Now placing these two facts side by side, we may obtain a tangible cause for the influx of blood to the part. We have inirritation a disturbance of the function of nutrition which at once begets an increased tissue activity, as heat is a result of tissue

activity - as heat the activities of life expansion of the capillaries results and an increased supply of blood follows - is called in to fill the expanded vessels - Congestion ensues as seen by the increased redness.

Locally considered heat of a part and redness are co-eval - coexistent arise together have their origin from one and the same cause - disturbed nutrition - resentment - increased activity venous blood results from functional activity of the tissues with which it is placed in contact. Therefore the blood in the expanded capillaries quickly

becomes venous - more quickly on account of the increased tissue activity and becomes itself a source of irritation while at the same time it flows more sluggishly on account of becoming more entirely venous proportionately blocking its egress from the part - thus bringing about a tendency toward a labored circulation, a tendency toward stagnation. Notwithstanding this, it seems to be a fact that the blood returning from a part in a state of active irritation is less venous than the blood from normal structures, which would at

first sight seem to deny that there there exists increased tissue activity and especially that the blood of the part becomes more intensely venous. The first proposition is made clear when we come to consider the greater amount of blood passing. If the amount of blood passing be four times the normal amount and its venous contents be one half that contained in blood from normal tissue, the venous element returned is just doubled, which represents a two fold tissue activity. The venous irritation may be under-

when we come to consider that the tendency to stagnation only exists in a small proportion of the tissue excited. The boundaries of intense excitement are never sharply defined.

We may here see a rational employment of either cold or heat in the treatment of incipient inflammation for cold will contract the arteries and lessen the amount of blood delivered to the part, and contract the capillaries on their contents and force it forward, this contraction usually giving use to more or less pain at the moment of its application. In the appli-

cation of warmth the capillaries and venules are more dilated giving the blood easy egress into the venous system thus lessening the engagement and preventing the retardation of the flow by which the intensly venous condition of the blood in the part is obviated and this source of irritation and further interference with nutrition obviated and the flow of blood made easy. This is based upon the same phenomena seen in the physiological periodical excitation of certain glands as those of the mucous membrane of the stom-

ach, the salivary glands &c.

Perhaps we should not pass this phase of the subject without mentioning another explanation of the phenomena we have just described which is more in accord with the received notions of to-day and certainly gives a thinkable solution of the subject, this based upon the influence of the nervous system as an instrument.

When an irritation, disturbance of functions of a part occurs the vasso-motor nerves which are supported to control the calibre of the arteries relax through reflex action

from the nervous centres and thus increase the calibre of vessels and a larger quantity of blood is invited to the part. This action is probably intensified by pain which causes an intensified reflex action and increased dilation. In this view of the case we may find a reason for the curative influence of opiates in inflammation for by lessening the pain the intensity of the reflex action is lessened hence a diminution of the quantity of blood sent to the inflamed part. The increased activity of a part is not a result of

increased quantity of blood - but the increased quantity of blood is the result of the increased activity is not itself the active agent but a demand made by increased activity the material demanded for the use of the active agents - the tissues - or vitality working through the tissues - its agents.

Increased heat cannot be a result of influx of blood unless indeed the part be below the mean standard of the internal parts - on the other hand the influx of blood would have a direct influence to prevent the rise of tem-

perature above the mean since its legitimate effect would be to carry away the accumulation of heat and distribute it; prevent such an occurrence, destroy it if it occurred, the influx of blood then, if the efflux be not hindered is palliative as an effort to restrain the rise of temperature and abate its evil tendencies. The next step is that which completes the conguration of the affection, namely exudation or infiltration.

Before this symptom appears the affection is called irritation, it may abate in this stage that is

just when exudation seems imminent and disappear - suddenly by Deliquescence or slowly by resolution. without effusion or any of its phenomena. But before effusion it can Terminate in no other way and the result is always health of the parts in their completeness, without Tissue change.

With the missing in of Effusion comes a marked change in symptoms, there is increased pain and a liquid substance is ponded into the interstices of the tissue first causing the part to swell, & finally if the part be a wound

poured out upon the cut surfaces if it be a serous membrane, upon the surface of the membrane. This effusion is not constant in its properties differing more or less in different situations and with the character of the disease with which it is associated. In simple inflammations there may be differences with the localities thus in inflammation of the serus membrane, it is supposed to be more watery in its character and less organizable than in in the muscular tissues in traumatic inflammations but in all

situations we believe it to contain an organizable lymph and the difference is simply one of proportion of this material. In specific inflammations however we must meet with effusions containing specific principles peculiar to the disease of which it is an accompaniment- as seen in the small pox - croup - diptheria, Erysipelas &c. We will confine ourselves for the present however with the consideration of the effusions of simple inflammations. Much discussion has been indulged in, in regard to the source

and character of this effusion.

The most general hypothesis being that it is composed of the liquid contents of the blood which has made its escape through the walls of the capillaries of the inflamed part. We think that there is much ground for believing that the formation of this product is of much more complex character especially since it is known that the liquid portions of the blood are not in any case very closely or perfectly confined within the walls of the capillaries, but on

the other hand are constantly escaping and forming what is now known as the Lacunar or insterstical circulation, a circulation of the fluid constituents of the blood, wanderingly seeming-ly at will through interstices of the tissues but really controlled by some physiological law and nor yet under-stood and forming what is known as the juices of the tissues. The cir-culation of some of the tissues is wholly of this character as the cor-nea of the eye of cartilage or which have no blood vessels or at least none into which the red blood cor-puscles can enter.

This would seem to preclude the idea stated above that this exudation is as its name implies or the term used would seem to imply, a simple transudation from the blood since it is seen to differ in its nature and functions.

It differs in that it contains an increased amount of fibrousine which seems to possess an independent power so to speak, of organization and constitutes the plastic material with which the laps of the wound are first sealed together which is afterward organized into Tissue of repair. This Tissue of repair always simulating the form

of that in which it is situated with a few notable exceptions among which muscular tissue stands prominent. If it be in bone tissue bone results - if in tendon - tendon results - if it be in fibrous tissue, fibrous tissue results - but if it be in muscular tissue it is healed with fibrous tissue.

It is also capable of forming new tissue substance in the interstices of tissues into which it infiltrates if the action be sufficiently prolonged.

This effusion or infiltrating there is a substance manufactured - elaborated - formulated by the tissue in -

planned intended for its own repair by addition as far as they may be able of lost parts.

In this elaboration the action of the tissues to some small extent resembles the action of the glands which formulate or elaborate a peculiar fluid containing specific properties for the fulfillment of a specific purpose.

Certain bodies are also observed in these effusions which have of late been the subject of close scrutiny and elaborate discussion. They have probably received more names than the most elaborately named child of any sovereign ruler. Such as Leucosites

Exudation cells. - amboid cells - wandering cells - Repair cells - and very many others. These cells have when in a state of rest a close resemblance to the white blood ~~of~~ Corpuscles, if not identical with them. And the most prevalent idea to day seems to be that they are either white blood corpuscles escaped from the blood vessels or ~~are~~ on the offspring of such escaped cells.

This hypothesis seems to be proven by the observed fact of the escape of these cells through the walls of the vessels of in-

flamed parts by movement similar to that of the ameba and hence the name ameboid cells - wandering cells &c. This process of escape from the vessels has now been confirmed confirmed by so many different observers that it may now be considered a settled fact and the discussion of the subject is now as to the office they are destined to perform.

In the outset it may be well to state that the discovery of ameboid cells is not confissned to inflamed Tissues but they are found also in non inflamed parts

and are confined to no particular part of the body. They are not then peculiar to inflamed Tissues but it is here that they are seen in greatest numbers and in inflammations of any great extent they are also increased in the blood generally - the white blood corpuscles - which gives force to the idea that they are formulated or have their origin in the blood itself - possibly in some organ especially devoted to that work as the spleen but as yet their origin can not be said to be known. I may be allowed to suggest that their origin

is in the tissues themselves and that in their wanderings they pass in & out of the bloodvessels and are continually being carried from part to part by the blood current and consequently are always present in the blood and for the very reason that their propagation is largely increased in the tissue activity of inflammation accounts for the increase of their numbers in the blood in inflammatory diseases.

The Tissues then is the birth place and normal home of these wandering cells, which are connected doubtless - in some as yet

unrecognized manner with the activities of waste and repair and are greatly multiplied during the increased activities of inflammation and wandering out from here they enter the circulation and return with it- and wander out with it - for that these cells do enter the circulation is about as well established as that they leave it.

As to the modes of termination of inflammation I do not propose now to speak, as the time will not allow.