

AN
INAUGURAL DISSERTATION

ON

Inflammation.

SUBMITTED TO THE

PRESIDENT, BOARD OF TRUSTEES,
AND MEDICAL FACULTY

OF THE

UNIVERSITY OF NASHVILLE,

FOR THE DEGREE OF

Doctor of Medicine.

BY

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OF

Kentucky

1858

W. T. BERRY AND CO.

BOOKSELLERS AND STATIONERS, NASHVILLE.

This term inflammation is derived from inflam-
-mo to burn. predicated probably upon an errone-
-us idea of the nature of the phenomenon which
it denotes. And it has been employed from the
earliest age of medicine until the present, as a
short but significant expression for a combinatio-
-n and succession of phenomena, regarded as the
most frequent and important, of any with
which the Surgeon or Physician is conversant,
-nt, & phenomenon with which he will meet
in the treatment of almost every disease, either
-er acting the primary part or as a seco-
-ndary consequent of that disease.

Inflammation is supposed to commence
where irritation ceases, and ends with
the death of the part, or its complete res-
-toration to health. It is characterized by
Increased redness heat pain and swelling,

Secondly, its nature. Thirdly cause. Fourthly its treatment. I shall speak first of its Phenomena Progress and Results.

The first prescriptive phenomenon to the patient is usually pain. This is generally felt very soon after the reception of the injury. It varies in degree and character according to the part affected, the stage degree and character of the inflammation. It is sometimes dull, heavy, tension, at others lancinating, throbbing, pricking, and burning. It is sometimes excruciating at others it amounts only to slight soreness. And in some instances it is felt only under strong pressure. Pressure always aggravates the pain. This is an important fact in the diagnosis of inflammation. The pain may intermit remit, or be continued, but is usually

purple. It may be in spots, or streaks or quite uniforme. It may have an abrupt boundary, or gradually recede until lost in the healthy color. But it is usually most intense in one spot and radiating from that point, as from a center in all directions until it can no longer be distinguished from the natural hue of the neighborhooding structure. The brighter colors, are attendant upon ordinary active inflammation, the darker that dependant upon the imbibition of some specific poison, or that which has a tendency to mortification. The cause of the increased redness in an inflamed part, is that an increased quantity of red corpuscles are, allowed to enter it. Owing not only to the increased quantity of red-

corpuscles in the blood, but also upon the adhesion of the white corpuscles to the sides of the vessels. There by forcing the red corpuscles to take the center, and they become crowded together, as the blood continues to flow in to the part in increased quantities, until at length the vessels become dilated and relaxed, thereby admitting a much larger amount of blood than they natural would, and as a consequence of this dilated, and relaxed, condition of the capillaries, the liquor sanguinis is effused, along with some of the coloring matter of the blood, and also by disintegration, the red corpuscles may pass out unchanged.

Heat. This sensation is usually perverted or exalted. For apparently there is greater heat to the patient, than the therm-

-ometer will indicate. But the local heat is certainly increased. Sometimes greatly so. Usually however it is increased from 100 deg. to 105°, or it may approach as high as 110°.

But it never exceeds the temperature of the blood in the heart. The cause of the increased heat is the increased combustion going on in the part. We know that animal heat is produced, by a union of oxygen and carbon. This union takes place in the lungs, and to some extent through the systemic circulation. Now as inflammation is a destructive process, and as there is an increased quantity of blood in the part, it is clear that there must be an increased union of carbon and oxygen in that part. And by this union there is increased local heat.

Swelling. This phenomenon is at fir-

-st dependant upon the increase in amount of blood in the inflamed part. The blood vessels become dilatated, under the continued pressure which they are subjected to, and after a short time they become relaxed, and as soon as they do become relaxed, there is an effusion of the more watery portions of the blood. Soon after the solid portions are found effused, probably by disintegration. These particles coalesce forming layers or fakes, which gradually become solid. The Swelling of an inflamed part may be flat rounded or conical, hard or soft, according to circumstances.

The changes produced by inflammation. These changes are first - 1. A change in the function ^{of the} part affected, for there is seldom ever inflammation without obstruction of some

of the tissues of the part. Secondly, a change in the constituents of the blood. This change consists in the increase of fibrin and red corpuscles. The most marked change is in the fibrin. It is increased sometimes as much as twice or three times its usual quantity. It exists ordinarily in the proportion of 2^{grs} in 1000 parts, but during inflammation it rises as high as seven or even ten, in a thousand parts. Upon this increased plasticity of the blood depends, the size or cupped shaped appearance given by the blood when abstracted during inflammation. I shall in the next place proceed to a consideration of the results of inflammation. One of the first and most important of its results is, the formation of pus. There is such a term used in the older works,

upon Surgery as healthy pus. But it should not. There can not be such a process as healthy Suppuration, for it is dependant upon a morbid action. But inflammation is sometimes called a healthy process, but can the name healthy be applied to a morbid process? It is not the natural function of any organ or part to become inflamed. It is true in some instances inflammation is set up to repair an injury, but the inflammation it self, is not a healthy process. The production of pus appears to be the result of a secretory process, as for instance, in the common abscess. The Lymph is thrown out, and by failure of a portion of it to become organized, pus is formed. It may be that only a few globules, are at first formed, but around

this is reflected a membrane and this little membrane not only prevents burrowing of the pus, but it also acts as a medium of secretion. The formation of pus is a vital process. it is continually being taken up, and deposited, that secreted to day will be absorbed tomorrow. Pus has the following properties. It is of the color and consistancy of cream, and has a sweetish taste, and rancidish odor. It is coagulated by muriate of ammonia. But it is neither alkaline nor acid. It yields by analysis albumen, fatty matter, soda, phosphate of lime, and some other salts. The fatty matter is very abundant, comprising from nine to twenty four percent.

Pus differs essentially in its properties.

The pus of Syphilis can not be distinguished

from that of a common abscess, though we know that they do differ materially.

The former is capable of producing the disease from which it originated, while the latter is perfectly harmless.

When pus collects in a cavity, the first object of nature is to get rid of it; as for instance in a abscess the pus has a tendency to gravitate towards a free surface, and by this tendency to gravitation, the tissues immediately between it and the surface are continually being pressed upon, until they lose their vitality. They then are either absorbed or broken down. This process is called, Ulceration. I will next consider the terminations of inflammation. Only two well defined terminations are now recognized. These are, Mortification.

tion or death of the part, and by Resolution. By the last mentioned term we mean a complete restoration of an inflamed part to its healthy state, without any alteration of the normal structure of that part. The blood ceases to flow to the part in such large quantities, and the exuded particles of the blood are absorbed, in this way the part is restored to its natural function, Mortification.

There are two varieties of mortification, one by the name of Gangrene, and the other Sphaelus. The first variety consists in a great reduction of the vitality of the part, with^{out} its being completely destroyed. The symptoms of gangrene are The redness of inflammation becomes a dark purple. The pain is increased if it is

a dull heavy or gnawing pain. The heat and swelling is diminished. The epidermis becomes detached, and the surface is studded over with blisters or bulla. These bulla are filled with a serous watery like fluid of a fetid odor. The odor of mortification is very peculiar, so much so that some Surgeons have been enabled to detect it merely from this one symptom. Sphaelus. We mean by this term the absolute death of the part. In the other variety, there is some little circulation, and sensation remaining, but in the sphaelus form, the vitality of the part is completely destroyed. It has passed from under physiological to chemical laws, and by decomposition, it is converted into a soft pulpy mass, filled with fluids

and gas. It is usually of a ash, gray or black color. When this state of things exist, nature soon sets up a process of repair, and this is accomplished by a line of demarcation being drawn around the part, completely isolating the living from the dead. This line of demarcation is nothing but a line of inflammation, which is a consequence of the contact of the dead structure with the living tissues, and this inflammation goes on to ulceration, and sloughing of the diseased part. In this way nature may do the work of the surgeon, dividing not only the soft tissues but the largest bones, all hemorrhage being prevented by adhesion of the coats of the blood vessels.

At the bottom of an ulcer little grain like bodies or granules, may be seen spring-

ing up, and these continue to project until they reach the level of the surrounding parts, and as soon as they get to this point, a little thin whitish blue film or pellicle, is thrown over them, which rapidly becomes organized. This process is called fibrination, and it is probable that it might be admitted as one of the terminations of inflammation.

Theory of Inflammation

This subject has given rise to much discussion among pathologists. Thus we find that some of the earlier pathologists, thought that inflammation depended upon a change in the fluids, and others taught, that it was increased tonicity of the capillaries. But the two theories, which, the profession has

been so long divided are. The one which was introduced by Helmont and adopted by Hunter, Cullen and Riccati. And the one maintained by Wilson Philip. The first of these pathologists maintained that inflammation consisted, essentially in an increased vascular action of the part. Whilst Wilson Philip thought that it was a congestive action. Both of these theories have had respectively many able and zealous advocates, and it is easily explained why two such opposite opinions should exist at the same time, for it is quite probable that these observers made their examinations during different stages of the disease, or that their attention was directed to only one action. Because it has been shown, and satisfactorily demonstrated, that there is both increased

and congestive action, at the same time.
As for instance if we take the wing of a
Bat, and place it under the microscope, the
blood will be seen moving on regular
and smoothly, in the same quantity and
at the same rate, in the most perfect harmo-
ny. Now suppose we draw a pin across
that part in the field of the microscope, and
notice what changes take place. There is
in the first place a great commotion of the
blood in the capillaries, it moves to and
fro or oscillating, as if it was indetermin-
ed which direction to take, But it soon
discovers as it nears the point of injury, and
rushes towards it, doubtless with the obje-
ct of repairing the breach. But it does
not stop here, for the capillaries surrounding
the part, and the arteries leading to it are
called upon for an increased quantity of

blood. By this means an increased volume of blood, is caused to circulate through the inflamed structure, and this quantity continues to increase until at length two or three times as much blood, will pass through it in a given time, as would in a healthy state. By this redundancy of blood the capillaries become dilated and relaxed, as a consequence of this state of the capillaries, the red corpuscles are admitted in greater numbers, and by adhesion to the walls of the vessels, and coalescing with each other, they block up the blood, not only is this the cause of the congestion, but it has been demonstrated that the blood flows much slower, and with greater difficulty, through a relaxed vessel, than it will through one that possesses its natural tone. But all though, there is a stasis or congestion of blood

immediately in the inflamed part, there is alse
dilatation and increased action of those vessel
s leading too, and surrounding that part

The facts which led to these conclusions
are first, - The observations made by the
microscope, and they are not unimportant
And secondly, If a patient has an inflam-
ed hand, and we open a vein in each of his
arms, it will be found that two or three
times as much blood, will flow from the
vein leading from the affected hand, as
will from the one upon the opposite side.
And if the pulse should be examined, it
will be found much fuller, and to
convey more blood than it will upon
the healthy side.

Treatment

The treatment of inflammation
may be divided, in to Constitutional,

and Local. The Constitutional Treatment.
5. Our first object should be in the treatment of this affection, to have the patient placed in a cool room, upon a hard mattress with the part elevated. Then if he is plethoric or has a full hard pulse, and if the inflammation is violent, we should practice general bloodletting. The patient should be placed, in a Semierect posture, and the blood allowed to flow, until some impression is made upon the pulse or until the pain ceases. But we should not bleed until syncope comes on, for if we did the subsequent reaction would be injurious. After sufficient depletion with lancet, we should give some pretty active cathartic, such as the sulphate of magnesia, or some of the preparations of mercury. Probably it would be best to give,

the Salt at first, and after a thorough evacuation of the alimentary canal, give the mercury. The effect of mercury in the treatment of inflammation is peculiar. It is known that the fibrin of the blood is increased during its progress, and it has been found that mercury will counteract this tendency to the formation of fibrin. We usually give it in connection with opium, in the proportion of six grains of Calomel, with a half grain of opium, every six or four hours.

Tartar Emetic. This remedy has long been used in the treatment of inflammation. It diminishes the action of heart, and excites an action upon the skin. It also reduces the fibrin, and red corpuscles of the blood. The dose is from one half grain, to a grain and half, or just

Sufficient to induce slight nausea.

These are the heroic constitutional remedies in the treatment of this affection. But there are others probably equally as valuable, but those just mentioned, combined with the local treatment will usually be sufficient.

Local Treatment.

The first remedy of this class claiming our attention is Leeching and cupping. They are very efficient in the treatment of inflammation. Their good effect depends upon the extraction of blood, immediately from the affected part, thereby unloading the distended vessels, and allowing them to contract, and regain their lost irritability. After the application of leeches, cloths wrung out of hot water, should be applied, in this way large

quantities of blood may be extracted,
Probably the most effectual of all
the local remedies, is the application
of cold. It may be applied in the
form of ice or cold water, Ice is
preferable than ^{best} the abortive treatment. For
if intense cold is applied to a part when
about to take on inflammatory action, it
will entirely suspend it. It should always
be our object to prevent diseases rather
than cure them, for it is impossible for us
to cure a disease, but we can often preven
-nt them. Our motto then should be, *Ab-*
-ta Principiis. One great principle
should guide us in the application
of cold, that is, it should be contin-
-ued. For if it is applied at intervals or
in such a manner as to allow the part
to react from under its influence, it

will do more harm, than good.

The principal upon which the application of cold acts, is, that of a refrigerant, absorbing the heat, and causing the blood vessels to contract, thereby repelling the blood, or limiting it in the part. Counter irritation. This is one of the most valuable local remedial agents that we possess, for the treatment of inflammation. We may produce counter irritation, by the means of blistering substances, or with a Seton or issue. We usually prefer a blister, in the treatment of ordinary active inflammation, and the Seton for the more chronic form. These substances act favorably by diverting the blood from an important organ, or part, to one comparatively unimportant. Thus in

inflammation of the lungs, if we apply
a large blister upon the surface of the
thorax, we will invite the blood from
the lung to the skin by setting
up a counter inflammation

I would go beyond my limits should I attempt to treat of all the varieties and forms of inflammation. For this reason it has only been my intention to give a general idea of the most common forms.

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1858

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