

A probationary essay on inflammation : submitted, by authority of the President and his council, to the examination of the Royal College of Surgeons of Edinburgh, when a candidate for admission into their body, in conformity to their regulations respecting the admission of ordinary Fellows / by William Hamilton Thomson.

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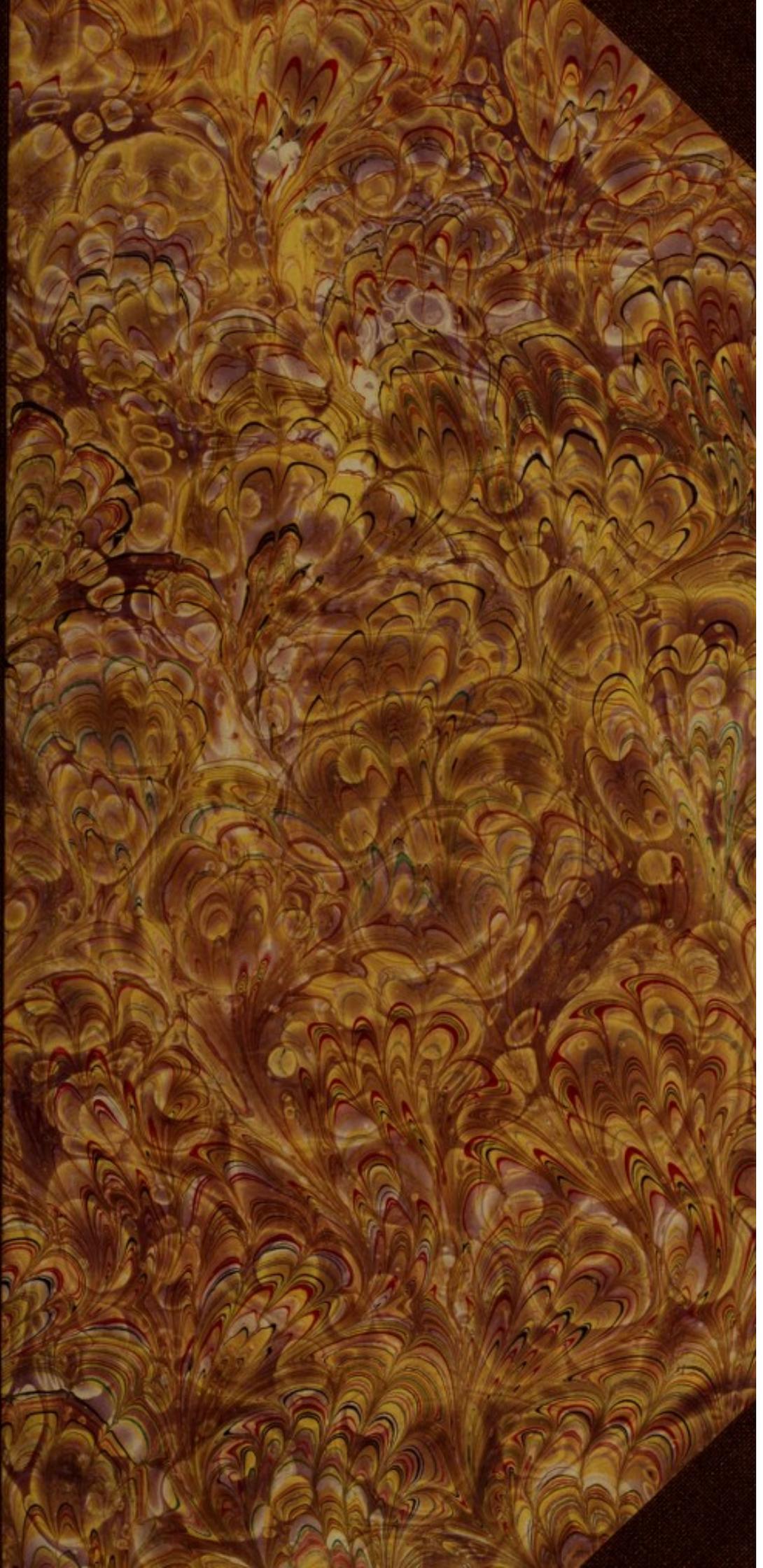
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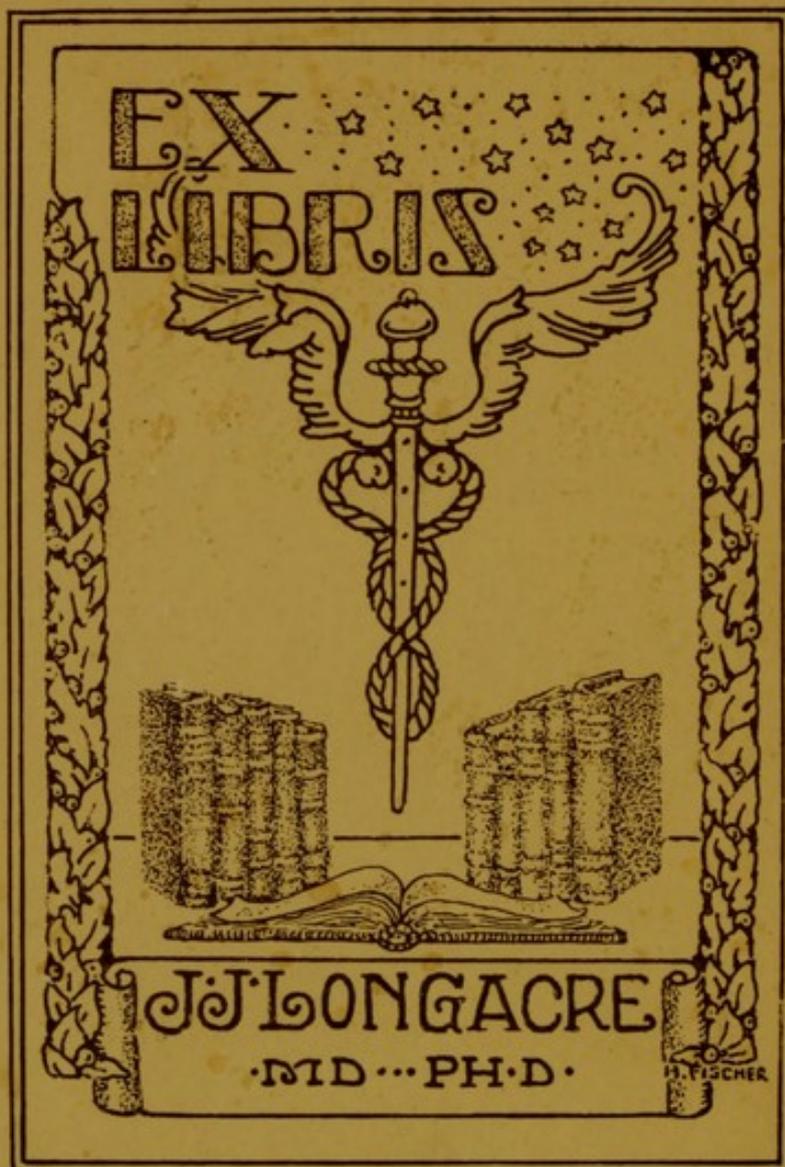
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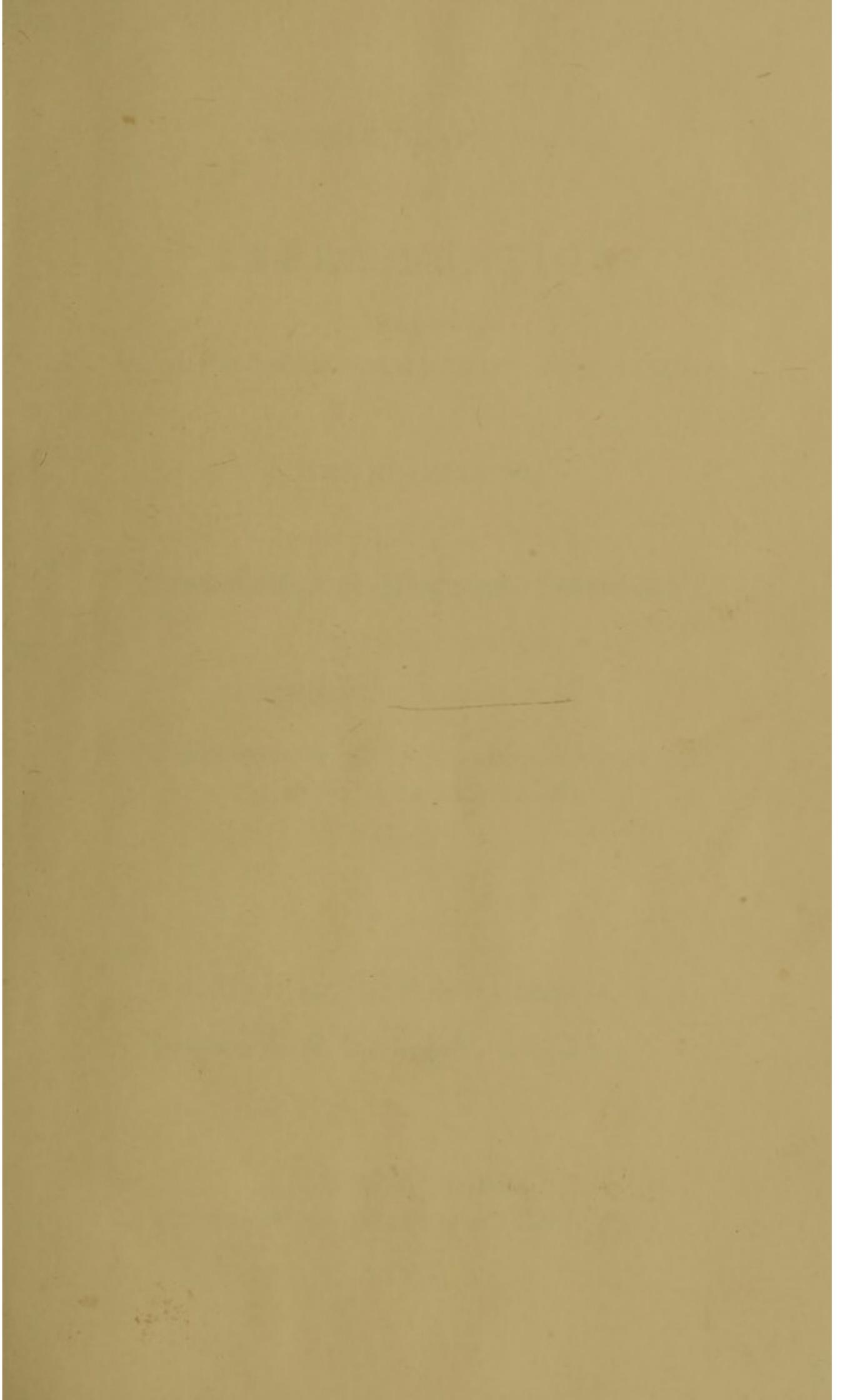
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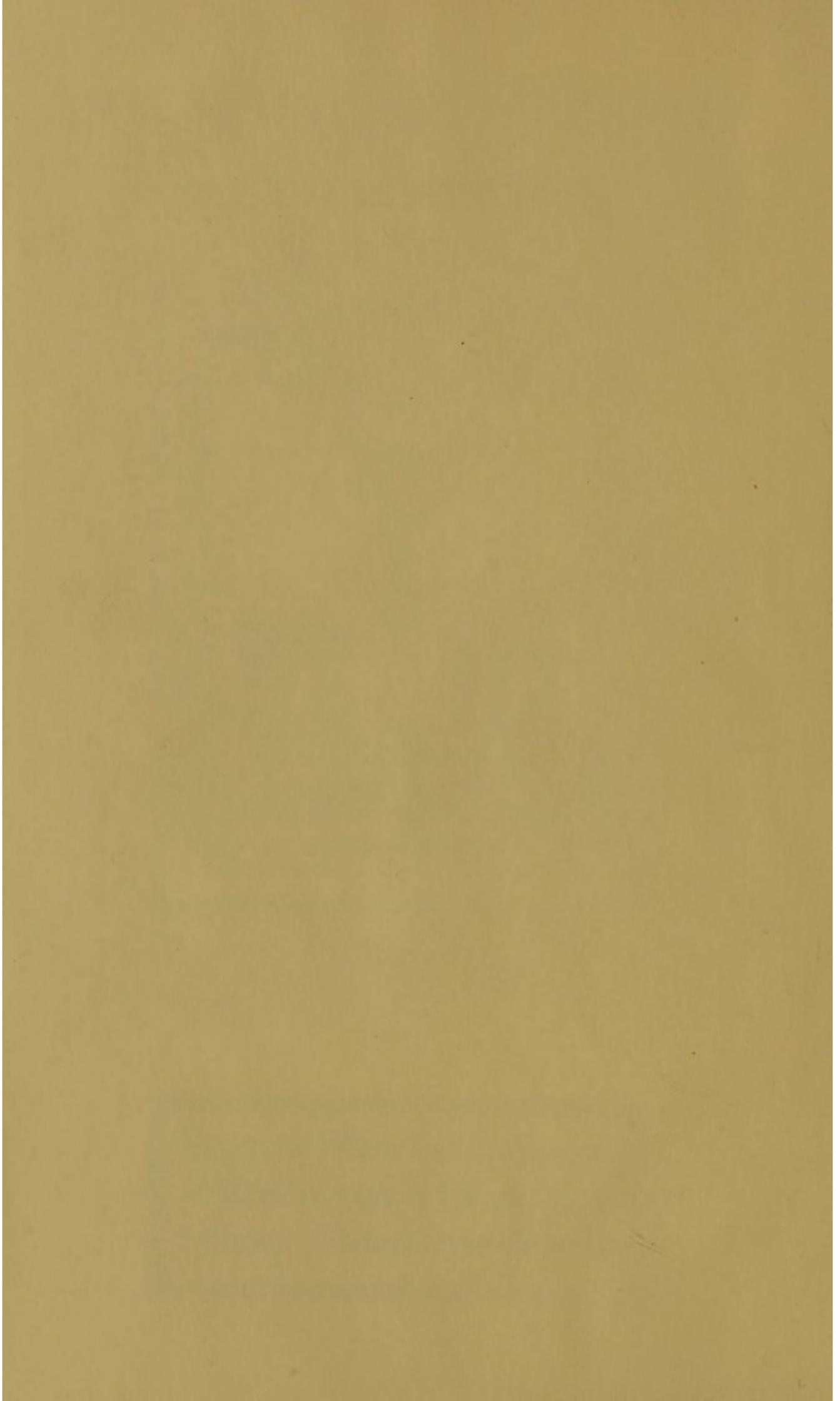
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A
PROBATIONARY ESSAY
ON

INFLAMMATION;

SUBMITTED,
BY AUTHORITY OF THE PRESIDENT AND HIS COUNCIL,
TO
THE EXAMINATION
OF THE

Royal College of Surgeons of Edinburgh,

WHEN CANDIDATE

FOR ADMISSION INTO THEIR BODY,

IN CONFORMITY TO THEIR REGULATIONS RESPECTING THE
ADMISSION OF ORDINARY FELLOWS.

BY
WILLIAM HAMILTON THOMSON, M.D.

admitted 20 Sept. 1836.

EDINBURGH:
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1836.



PROBATIONARY ESSAY

INFLAMMATION;

SELECTED BY AUTHORITY OF THE FACULTY AND BY COUNCIL

THE EXAMINATION

OF THE

ROYAL COLLEGE OF SURGEONS OF EDINBURGH,

WHEN CANDIDATES

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IN COMPLIANCE TO THEIR REGULATIONS RESPECTING THE

APPOINTMENT OF ORDERS BY EXAMINERS.

BY WILLIAM HAMILTON THOMSON, M.D.

submitted 25th July 1856.

EDINBURGH

PRINTED BY T. CONSTABLE, 1, THURLOUGH STREET

1856

TO
JAMES BEGBIE, M.D.

THIS ESSAY

IS INSCRIBED

AS A TESTIMONY OF THE GRATITUDE AND ESTEEM

OF

THE AUTHOR.

TO

JAMES BEGHIE, M.D.

THIS ESSAY

IS DEDICATED

AS A TESTIMONY OF THE GRATITUDE AND ADMIRATION

OF

THE AUTHOR.

INFLAMMATION.

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5. THE MODIFICATION OF INFLAMMATION.
6. THE ESSENTIAL NATURE OF INFLAMMATION.

OF
INFLAMMATION.

THE term Inflammation is one which has been applied, from a very early age of medical science, to one of the most common, but least understood morbid conditions to which animal bodies are liable. It has been rejected by some of the modern continental pathologists as a word, the limits of whose signification are ill-defined, and which is applied to a combination of circumstances not always found to take place together, and with whose mutual relation we are imperfectly acquainted. The latter objection, however, applies equally to all diseases which are in any degree of a complex nature, and, if of any weight, would have the very inconvenient effect of banishing all fixed nomenclature from the science, except, perhaps, such names as are given to those ultimate morbid actions to which, by a

process of analysis, the better known and more compound diseased states of body are reducible. With regard to the limits of what is called Inflammation being ill-defined, it is a consideration as unimportant as the other, for it would be unreasonable to expect that derangements of so complicated a machine as an animal body should ever be separated from each other by very distinct boundaries.

In the present state of our knowledge, it is sufficient for us, in order to apply names to combinations of diseased action, to know that such combinations occur more frequently than their elements do in a separate state; and the term Inflammation, though we do not perfectly understand the nature of what it denotes, is as definite and intelligible as the subject admits of.

Of the great importance of Inflammation, it would be commonplace to speak, as there is not an organ of the body which is not liable to it, and scarcely a disease of whose course it does not form an element.

I. THE PHENOMENA OF INFLAMMATION.

Upon the application of a stimulant, or any other agent capable of producing inflammation, the fol-

lowing are the more obvious phenomena which result :—

1. Increased sensibility of the part, amounting at last to pain, which varies in nature and intensity, according to the violence of the disease and the tissue in which it is situated.

2. At first the capillary vessels, if examined microscopically, are seen to contract, and the circulation to become more rapid than usual. In the next stage, however, the vessels begin to dilate, and the motion of the blood is retarded, and finally, at least in the portion most severely inflamed, completely arrested, while to this spot there appears to be an attraction of the blood from all the surrounding capillaries, even in a direction contrary to its natural motion.

3. There is an increase of temperature to the extent of a few degrees, seldom exceeding that of the internal parts of the body, though to the individual, from the increased sensibility of the nerves, it appears much greater than it really is.

4. Very soon after the commencement of the diseased process, more or less of the serum of the blood is separated from it, and effused into the surrounding tissue. During the retardation of the motion of the blood, this serum begins to be mixed with matters of a more solid nature, and differing

more from the natural constituents of the blood, consisting at first of lymph, a substance nearly resembling fibrin, and afterwards of the yellowish fluid called pus.

5. Sometimes, instead of returning to the healthy condition, the most severely affected portion of an inflamed part loses its vitality, and is separated from the body by a process of ulceration. In most cases, however, the disease terminates by the gradual absorption of the effused fluids, or their evacuation from the cavity in which they have been lodged, while the vessels and blood re-assume their natural calibre and motion. Hence, we speak of the two terminations of inflammation, that by *resolution*, and that by *mortification*.

The progress of inflammation, as now described, has been divided by some late writers into three stages. First, That of *incubation*, from the application of the exciting cause to the widening of the capillary vessels. Second, That of *congestion*, from the dilatation of the vessels, to the complete stoppage of the motion of the blood. Third, Of true inflammation, during which the blood is arrested in its course, and the principal effusions take place.

This arrangement seems to be a sufficiently natural one; and perhaps a fourth stage might be added, under the name of that of *resolution*, during

which there is an absorption of the effused fluids themselves, or of some part of the surrounding solids, to afford them an outlet.

The diseased process resulting from irritation may cease before it has gone through all these stages; but unless it reaches the third, it does not receive the name of inflammation. If it extends no farther than the first, it probably escapes notice; and if the fourth succeed immediately to the second, the part is said to have been in the state of congestion.

THE INFLAMMATORY EFFUSIONS.

In inflammation of almost every organ, we may trace more or less distinctly the successive changes of the effusion from serum to lymph, and from the latter to pus. In those cases where it is disguised, this is probably the effect of its being mixed with the natural secretion of the part, or infiltrated minutely into the substance of some organ.

The *formation* of serum appears to take place, as well before as after the beginning of the third stage, or that in which the circulation is arrested. It is most distinctly seen in those parts where it either constitutes merely an increase of the natural secretion, as in the serous sacs, or where it is infiltrated,

without admixture of other fluids, into a loose cellular tissue, as in some kinds of erysipelas. In vesications of the skin also, which may be considered as a species of false serous sac, to defend the subjacent parts from accidental friction or pressure, it is well exemplified. In certain stages of the inflammation of mucous membranes, the extreme thinness of the discharge is produced by the mixture of serum; and in pneumonia it is the cause of the crepitous rale. To its infiltration into the parenchyma of some of the internal organs, are doubtless to be attributed many kinds of ramollissement, especially those attended by increase of bulk.

As the inflammation advances, the effusion becomes more viscid and alkaline, its albumen is increased, and it deposits a thick coagulable matter, resembling the fibrin of the blood. By means of this are formed the false membranes, granulations, and adhesions, found in pleurisy and other serous inflammations. From this change also the sputa in pneumonia become gelatinous; and hepatisation (which is lymph retaining some of the colouring matter of the blood) succeeds to the mere effusion of serous fluid.

Most of the alterations of structure, termed

thickening and induration, are produced by the interstitial deposition of lymph variously modified in colour and consistence. Hence we hear of the white, grey, red, yellow, and black (melanosis) indurations.

It has been disputed, whether lymph is separated more immediately from the serum or from the colouring matter of the blood; but the doubt does not appear to affect any practical conclusion of importance.

Lymph possesses the singular property of forming in itself new vessels; thus becoming organised and constituting a part of the living body. The process by which this is effected is not perfectly understood; probably there are laws of attraction or "vital affinities," drawing the blood in particular directions, which will one day be elucidated. It is usually stated, that "in the recently effused lymph, canals are seen gradually forming themselves, having generally a coating of red matter; that these are at first larger than they are destined to be afterwards; but soon contract, and have blood poured into them from the neighbouring capillaries."

It is thought, however, that portions of lymph sometimes become organised, without vascular connection with the neighbouring solids. Pieces of organised coagula were found loose in the pleura by

Beclard ; and Andral has noticed numerous floating cysts discovered by him in a similar situation. The latter, however, appear to have nearly approached the nature of hydatids ; and until more light is thrown on the production of these bodies, no argument can be drawn from them ; and the other coagula mentioned may have been detached from the sides of the cavity in which they were lodged. If this process of organization, independently of the rest of the body, really takes place, and lymph has the faculty of secreting red blood, it probably bears a strong analogy to the first organization of the fœtus, and the first production of blood in the *punctum saliens* of the egg.

The effusion and organisation of lymph is the process by which nature effects the union of wounds ; when this takes place immediately by adhesion, without much irritation or the production of pus, it constitutes *healing* by the *first intention* ; when the surfaces to be united are distant from each other, and the space is filled by the little eminences called granulations, a process generally attended with a considerable degree of inflammation and suppuration, the lesion is said to have been united by the *second intention*. It is probable that these two operations differ more in degree and less in kind than is generally supposed.

Organised lymph, existing as a morbid production, is well exemplified in the false membranes so common in the serous cavities, and which also occur, though more rarely, in the mucous canals. In the latter, except in some of the very small branches, as the lachrymal duct, they seldom produce adhesion of the opposite sides of the tube, but rather form a kind of model of the cavity in which they are produced.

During the next stage of inflammation, or rather of inflammatory effusion, microscopical examination discovers the particles of lymph changing themselves into the larger and less cohering particles of pus,—and the part is now said to be in the state of suppuration. It appears that this process can take place equally within and without the capillaries, and occasionally even in the interior of the large vessels in the neighbourhood of a suppurating surface. M. Gendrin concludes, that the change of the particles of blood or lymph into those of pus takes place by a “purely chemical process, independently of any vital action of the vessels.” These, however, are vague terms, and suppuration, by whatever means it takes place, unquestionably bears a strong analogy to the process of secretion, the pro-

ducts of which resemble pus also in this, that (as in the case of urea) they are frequently found to exist mixed with the blood in the larger vessels, when prevented from having free egress by their appropriate glandular organs.

The transition from lymph to pus may be well seen in the healing of a common wound by the second intention, in the progress of a furunculus or boil, in the change from hepatisation to purulent infiltration in pneumonia, and in the change from gelatinous to puriform sputa in bronchitis or catarh.

Pus may be effused externally from a granulating surface or the surface of a secreting membrane; it may be collected in a cavity in the skin or cellular tissue, with walls of lymph, as in abscesses and pustules, or it may be loosely diffused through the parenchyma of an organ, as in the last stage of pneumonia.

It appears that pus is frequently absorbed into the system without producing any effect, as we see every day in the case of abscesses and pustules, which disappear without external evacuation of their contents; sometimes, however, and according to many of the French pathologists, this is the case particularly when the pus has been slightly altered by exposure to the air, very serious irritation seems

to be created by its re-absorption, and secondary depositions of it take place in some of the more important organs of the body, especially the lungs and liver; some imagine also that there is danger of this, more particularly when a large wound, as that of an amputation, has been treated with a view to union by the first intention, which is a reason frequently given by the French surgeons for their partiality to healing by the second.

The liability of the lungs and liver to be the depositaries of pus in these circumstances is curiously illustrated by the fact of mercury which has been injected into the veins, ultimately finding its way to these organs.

Pus, in what is considered its least morbid condition, is of a whitish colour, and equal, creamy consistence, without smell, and of a sweetish taste; sometimes it is thin and watery, especially in persons of the scrofulous constitution, and in other cases it is thick, dark-coloured and fetid, and occasionally appears to approach the nature of tubercles. When minutely examined, its particles are found to be opaque, of an oval form, and larger than those of the blood, and to float in a thin fluid, which, like serum, is congulable by heat and acids. It is curious, and shows how little chemistry, at least in its present state, can explain the phenomena of or-

ganised beings, that there is no difference discoverable between the composition and properties of the pus of a common sore, and that of variola—though, if introduced into the blood, the one would occasion only a slight local irritation, and the other would probably create a violent febrile disease.

Along with these various inflammatory effusions, and especially towards the termination of the disease, there is always to a greater or less extent, a process of absorption or removal into the system of the substances secreted, or even of the natural solids of the body. Thus, we find the swelling which has accompanied any ordinary inflammation gradually subside by the removal of the serum which produced it. In like manner, the matter contained in pustules, and the lymph which formed their bases, are absorbed; and as examples of the removal of the natural substance, we may mention the escape of a foreign body, or the pointing of an abscess to afford a ready outlet to its contents, and the process of ulceration by which the separation of a slough from the living parts is effected.

This general law, however, like all the arrangements of nature, which tend, upon the whole, to a beneficial result, may be extended to an injurious length, or may take effect in situations where it is productive of more evil than good. Thus, an ulcera-

tion is established around pulmonary tubercles, which is the occasion of more injury than the existence of the tubercles themselves, pus may be reabsorbed, as we have seen, and create great constitutional disturbance, an abscess may burst into the peritoneum, so as to produce speedy death, and the process of absorption may extend to the solids, where it is unnecessary, and constitute an ulcer or chronic sore.

I shall not enter upon the description of the various kinds of ulcers, but shall merely observe, that their differences are, for the most part, the result of the different degree in which the various effusions take place, and the proportion of the process of absorption to that of granulation. With the exception of those called phagedenic, the majority of ulcers do not present the phenomenon of loss of substance to any extent. Ulceration is a process more common in the skin and mucous membrane, and next to that in the bones and cartilages, than in any other tissue.

MORTIFICATION.

Sometimes we find, that instead of returning to its natural condition, an inflamed part, or at least the most severely affected portion of it, becomes gradually of a darker colour, till it is nearly black,

is covered with yellowish or livid vesications, loses its heat and sensibility, and is changed into an inorganic mass, which speedily begins to be decomposed by the action of the atmosphere, and of its own elements on each other. While this process is beginning, all that microscopical examination discovers is the blood, which has been arrested in its motion by the severe stage of inflammation, gradually concreting into dense irregular masses, and losing the distinction of globules. Before life has quite forsaken the part, it is said to be in the state of gangrene, and after that, of sloughing or mortification. When the system is in a tolerably healthy condition, a line of absorption is formed between the dead and living substance, by which the former is gradually separated.

It is not known by what causes this termination of inflammation is induced in one case more than another. It bears no proportion to the general severity of the disease, for in some cases, as in the dry mortification, which so often attacks the extremities of persons advanced in life, it occurs with scarcely a vestige of inflammatory action. It appears, however, to have some relation to the severity of the injury which has produced the inflammation, especially, as we might anticipate, if it has been effected by mechanical violence, or ex-

tremes of temperature. It is also almost invariably produced by certain animal poisons, and some unwholesome articles of food. Its chief predisposing cause appears to be debility either of the system or the individual part, especially in the latter, whatever impedes the circulation, as distance from the heart, disease of the vessels, or the part being itself a morbid production. Mortification may take place in any tissue, but is most frequent in the skin and the cellular, mucous, and osseous textures, and most rare in the nervous substance.

As the "hyperemia," or simply congestive part of the inflammatory process, may occur with very little of those morbid secretions usually considered its effects, so the latter may take place where there is little or no evidence of vascular irritation or hyperemia. Thus, dropsies, both of the cellular substance and the serous sacs, are frequently produced without any discoverable inflammation. We often find adhesions in the pleura, and abscesses in various parts of the body, when the supposition of inflammation, in the full sense of the term, is en-

tirely gratuitous,—and though a determination of blood may increase the predisposition to various tumours and other products of morbid nutrition, and some degree of irritation must frequently be the effect of such diseases, there is little evidence of its ever being their direct exciting cause.

I have already noticed, as an instance of sphacelus occurring without acute inflammation, the dry gangrene of the toes of persons, the arteries of whose extremities are diseased. I may also mention here the frequent occurrence of ulceration, with paleness rather than redness of the skin.

II.—THE LOCAL EFFECTS OF INFLAMMATION.

The derangement of the function of the organ affected, and those immediately depending on it, is the principal local effect of inflammation. Next to that in importance are the various sympathetic affections produced by it in organs which appear to have no particular functional relation to the part primarily disordered. Of the first of these we have familiar examples in the dyspnea and cough produced by inflammation of the contents of the chest or upper part of the abdomen, in the derangements of the senses of sight and hearing in disease of their appropriate organs, in the stoppage of the secretion

of urine in inflammation of the kidneys, in the deranged functions of the whole digestive system, in inflammation of any one part of it, and in the varying sensations and secretions of the skin, in disease of almost every organ of the body.

Of the second of the above-mentioned classes of symptoms, familiar specimens are afforded by the cough occasioned by irritation of the stomach, the nausea and vomiting in inflammation of the kidneys, testicle, joints, uterus, and particularly of the contents of the cranium, the pain of shoulder produced by hepatitis, of the knee in disease of the hip joint, and to these I may add, the headach and pain of the loins, which form part of the common inflammatory fever, and also the metastasis of inflammation from one organ to another, as, from one part of the muscular system to another in rheumatism, from the joints to the stomach in gout, the testicle to the parotid gland, and many other well-known interchanges of inflammatory action.

III.—THE CONSTITUTIONAL EFFECTS OF INFLAMMATION.

These may be conveniently divided into the alterations effected by inflammation on the *nervous system*, on the *circulation* and *secretions*, and lastly, upon *the blood*. It is plain, that the line drawn between the

three first of these groups, and what I have called the *local* effects of inflammation, is by no means a distinct one; and many of the former will be found to be mere extensions of the latter.

The phenomena included in these three divisions, lesions of the *nervous function*, of the *circulation* and the *secretions*, form, for the most part, the symptoms of that general affection or succession and combination of affections called inflammatory fever.

1. In the first stage of inflammatory fever, of that kind generally produced by acute or sthenic inflammation, the nervous system seems to be in a state of depression, the senses are blunted, the mental acts are slow, the muscular motions are feeble, and there is a sense of coldness over the body which no external heat can rectify. There appear to be good grounds for believing that the nervous system is the first part of the general frame which is affected by local disease, and is the medium through which the other functions of circulation, nutrition, and secretion become disturbed. It would be incompatible with the limits of this essay, to state all the reasons for this opinion; but the principal of them are these:—1st, The universality of the attack of fever, and the nature of the first symptoms which become apparent, render it proba-

ble that the nervous system is first affected; and we all know the influence which in other cases it exercises over the heart's action, and also on the capillary circulation, and the changes which there take place. 2dly, Fever is a phenomenon peculiar to beings endowed with a nervous system; while inflammation, or at least local diseases somewhat analogous to it, occur in vegetables, though without in them affecting the general health of the individual. Besides, we find that fever is most easily and early excited in persons possessing from youth or peculiar temperament, an irritable nervous system.

In the asthenic or typhoid fever, which occasionally accompanies inflammation, the nervous system is more deranged than in the sthenic; and during the reaction there is less excitement, but a greater tendency to the low muttering form of delirium. In the sthenic, on the contrary, the reaction takes place more strongly in the circulating than the nervous system; being in the latter generally confined to a certain degree of hurry of the mental acts, acuteness of the senses, and increased energy of the muscular motions.

In hectic, as the constitutional attendant upon long-continued irritation, and particularly chronic suppuration, the nervous system is seldom deranged

beyond slight periodical depressions and reactions, occurring for the most part twice in the day, with certain burning sensations, particularly in the extremities.

2. The influence of inflammation upon the circulation is chiefly comprehended, like that upon the nervous system, in the phenomena of fever. Before describing this, however, I may notice that the arteries leading to an inflamed part, pulsate with more force, and project their contents to a greater distance, and that the veins leading from it discharge in a given time a greater quantity of blood than in the natural state. This, however, is probably confined to the first stage of inflammation.

During the depression in inflammatory fever, the circulation, though quick, is feeble and oppressed, and the respiration laborious; but, in the stage of reaction, it becomes strong and excited, the respiration is hurried, and the surface rises in temperature. When, however, the fever is of the typhoid type, which occasionally happens in debilitated cases, or, when the inflammation has been excited by certain animal poisons, the reaction is more feeble and less permanent, and, as is stated above, the nervous seems to be more affected than the circulating system.

In some inflammations also, particularly in those of the abdomen, reaction scarcely takes place until some artificial means of alleviation have been resorted to, and the patient may die from the depressing influence of the disease on the action of the heart during its first stage. This particularly powerful effect of abdominal disease on the circulation, is illustrated by those cases of sudden death from blows on the stomach, which sometimes occur.

3. The secretions during the cold stage are generally much diminished, excepting perhaps that of the kidneys, which is then sometimes plentiful and limpid, but during the reaction becomes scanty and high-coloured. At the termination of the hot stage, there is generally a copious secretion from the skin, and occasionally from the bowels, which has a temporary alleviating effect.

In typhoid cases the secretions are generally more deranged both in quantity and nature, than in the more ordinary inflammatory fever, as is shown by the state of the tongue and lips, the skin, and the evacuations from the bowels. In hectic they are seldom much altered, except in the instances of the profuse sweating and diarrhœa, which so often follow the stage of excitement.

4. In most cases of acute inflammation, which has existed for some days, there is produced throughout the blood a tendency in the fibrin to separate itself from the serum and colouring matter. This forms, when the blood is drawn into a vessel, that yellow covering of the coagulum, called in practice the *Buffy coat*. The more slowly the coagulation takes place, the more strongly is the *buff* formed, hence it is best seen when the blood is drawn in a full stream, and into a deep vessel. When the particles of fibrin have a strong mutual attraction, the stratum appears contracted at the edges, when it is technically said to be "cupped." This is commonly the effect of an unusually violent inflammation.

This state of the blood exists in very plethoric persons, without the occurrence of local inflammation, and also in that of women during pregnancy; indeed, there appears to be a strong analogy between the latter state and the inflammatory diathesis, probably from the resemblance of the process, by which the fœtus is nourished, to slight inflammatory action.

Inflammation may produce the death of the individual in several different ways; first, the direct

sympathy of the heart with the inflamed part may occasion such depression of its action as to cause death by syncope in the first stages of the disease ; this we see in some inflammations of the abdomen, and sometimes of other parts, when it is very severe ; secondly, death by syncope may be produced by the gradually exhausting effect of the inflammatory fever ; lastly, inflammation may kill by some of its effusions, mechanically or otherwise, interrupting the performance of functions necessary to life ; thus, death by coma may be produced by effusions within the cranium, and by amphyxia in cases of serum poured into the lungs or pleura, or in dropsy of the glottis.

IV. THE CAUSES OF INFLAMMATION.

Inflammation, like most other diseased actions, arises as often spontaneously, that is to say, from circumstances unknown to us, as from any appreciable cause.

Those exciting causes with which we are acquainted may be divided into such as produce their effect directly on the part to which they are applied, and such as act indirectly through sympathy with some other organ.

To the former of these classes belong most me-

chanical and chemical irritants, as direct injuries, extremes of temperature, strong acids, pure alkalies, the substances called epispastics and rubefacients, and such excitants as increase by direct contact the natural function of the part.

As examples of the second class, I may mention, cold applied to the skin or extremities when it produces internal inflammation—poisons which act through the nervous system, such medicines as produce excitement of particular parts without entering the circulation—stoppage of accustomed secretions; and, lastly, inflammation of some other part which produces it at a distance by sympathy or by metastasis.

Less is known with regard to the predisposing than the exciting causes of inflammatory diseases—general debility of the system and weakness of the particular part are certainly predisposing circumstances, and the same may be stated of plethora, especially when it is produced by deficiency of exercise and superabundance of nourishment. Particular habits of body, and the undue exercise of particular functions, predispose to inflammations of particular kinds.

V.—THE MODIFICATIONS OF INFLAMMATION.

It would be unreasonable to expect that the same morbid process taking place in the very varied tissue of the human body, and produced also by a great variety of causes, should always present exactly the same phenomena. Accordingly, we find that inflammation is subject to many modifications both in its nature (as in the proportionate intensity of its various symptoms, and its tendency to one termination or another) and in its degree and duration, as in the usual division of it into *acute*, *sub-acute*, and *chronic*.

It would be impossible here to enumerate all the circumstances which modify inflammation, but probably they may all be classified, even with regard to what are called specific inflammations, under the heads of variety of *seat*, or the tissue in which the disease occurs, and of *causes* both predisposing and exciting.

Pustules of a particular nature, for example, are produced by the poison of variola, which is the exciting cause, joined to the predisposing condition of the system having never before been subjected to the disease.

The peculiarities of the scrofulous inflammation are the production of the predisposing scrofulous

diathesis, and the exciting cause of cold, deficient food, &c.

Nearly the same may be stated with regard to the gouty and rheumatic inflammations; for though the causes of the peculiarities of these are not perfectly understood, they may be safely classed under the above mentioned divisions.

VI.—OF THE ESSENTIAL NATURE OF INFLAMMATION.

As my object is merely to give a short account of the present state of our knowledge of the subject, I shall not enter minutely upon the history of the theory of inflammation, but shall only observe, that it accompanied the general doctrines of disease through all their modifications of *humoral*, *chemical*, and *mechanical* pathology, and the hypothesis so frequently revived under different names, of some single agent, as the “*φύσις*” of Hippocrates, and the “*anima*” of Stahl, by which all vital changes were supposed to be effected, until the time of Sydenham, when a more philosophical and laborious method of prosecuting medical science began to take the place of vague theory and fanciful attempts to account at once for all phenomena without the attentive observation of facts.

In more modern times, the controversies with re-

gard to inflammation have been principally confined to the questions of whether the vessels of an inflamed part have their action increased or diminished, and whether the velocity of the blood is greater or less than in health.

I have already stated, in describing the phenomena of inflammation, that the conclusion generally received is, that the vessels are at first *constricted* or excited, and in a subsequent stage *dilated*, or, as some would term it, *relaxed*. Among the names of those who have chiefly contributed to the advancement of our knowledge of the subject, it is almost unnecessary to mention the very distinguished ones of Hunter, Thomson, Allen, Hastings, and more lately of Gendrin and Haltenbrunner, to whose microscopical observations I have before alluded.

The conclusion above mentioned, though an important step in our progress, does not throw much light either on the immediate cause of the increased quantity of blood in an inflamed tissue, or on the connection between the distended state of the vessels and the morbid secretions which accompany it.

Our ignorance of the essential nature of inflammation obviously arises from its being a phenomenon which occurs at a point of the physiological process of circulation with which we are very imperfectly acquainted. Until we better understand

what are the agents of the capillary circulation, and of the interchange which is continually taking place between the solids and fluids, it is impossible for us to arrive at the true theory of a morbid action so nearly connected with these processes.

Closely allied to this difficulty is that arising from the fact, that in inflammation there are two classes of phenomena, whose mutual dependance we do not understand, and that we have no means of determining which of these is the primary derangement or the cause of the other.

We may suppose, 1st. "That the state of hyperemia or congestion increasing beyond a certain degree, is necessarily productive of certain morbid secretions."

Or 2d. We may imagine "that the morbid secretions in beginning to act, attract, as it were, the blood to the part."

Or 3d. We may conceive both of these actions to be the co-effects of some one unknown cause.

The first of these hypotheses is the one which at first sight appears the most probable, and for a long time no other seems to have occurred to pathologists, obviously because the redness of an inflamed part is usually apparent before any effusion has taken place. It is, however, difficult to conceive how a

mere accumulation of blood can produce such changes in the nature of the substances secreted from it; especially as we have seen that, after the greatest quantity of blood has collected, there is little or no increase of the contractility of the capillaries.

By the "morbid secretions" in the second of the above suppositions, I do not mean the substances effused, but the deranged *vital affinities* which are the cause of their production. This hypothesis seems to be favoured by the consideration, that, according to the most generally received doctrine, the vital affinities or laws of attraction and repulsion between the particles of the solids and fluids at the termination of the capillaries constitute a powerful auxiliary agent in the circulation, especially among the smaller vessels; and it is therefore natural to suppose that alterations of the former should produce derangements of the latter.

The connection also of the phenomena of unusual nutrition or secretion in health, with a degree of vascular congestion, as in the uterus during pregnancy, and the mamma in lactation, is favourable to this idea.

The hypothesis of the agency of a common cause in the production of both the derangements is also reconcileable to the considerations adduced in fa-

your of the second supposition, and somewhat assisted by the following facts :—

1. The well-known influence of the nervous system in modifying and increasing many of the secretions, as that of the salivary glands, stomach, liver, mucous membrane and testes, and its power of producing congestions, and the contrary, as in blushing, paleness of the face from passion, &c.

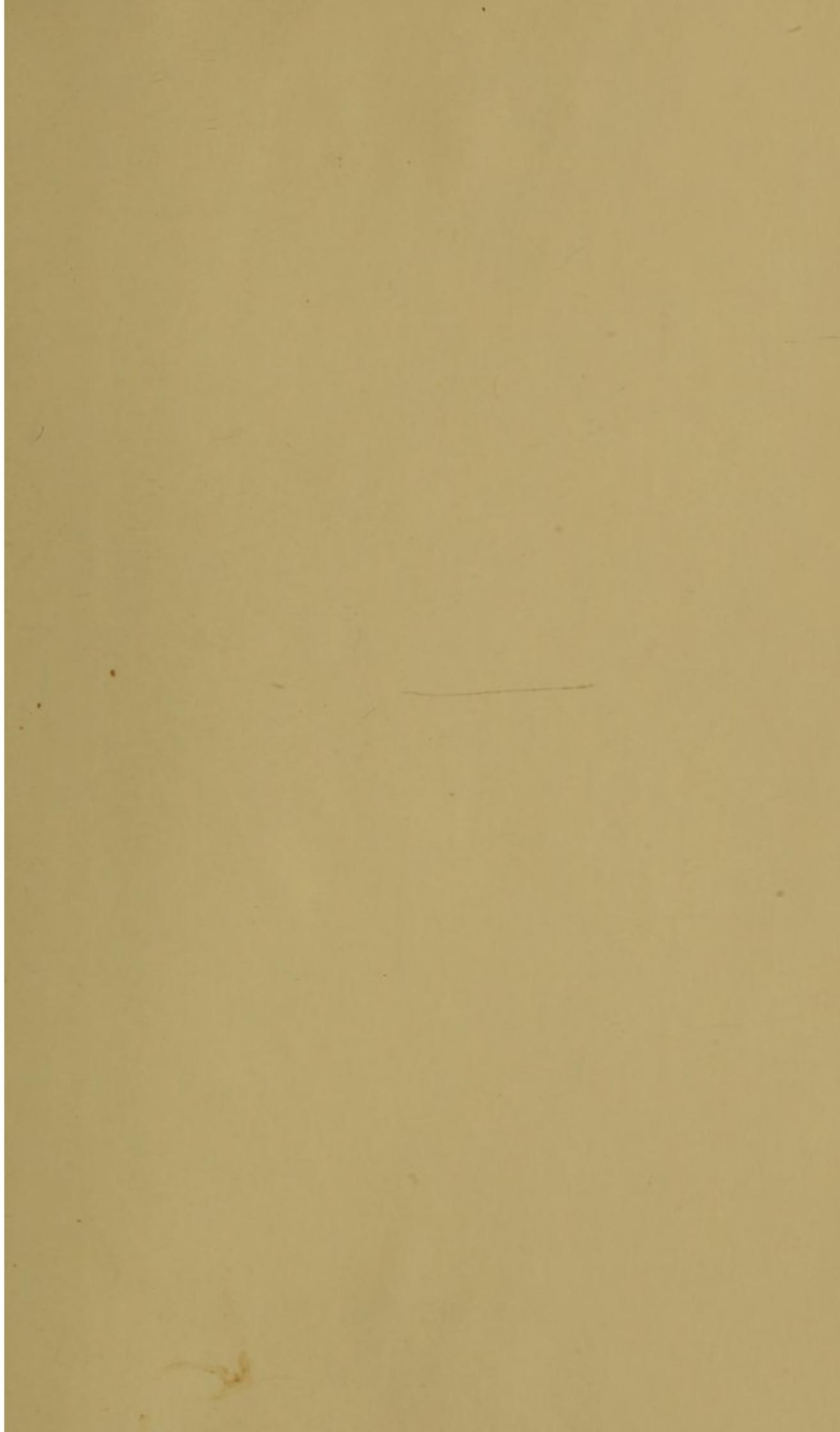
2. The phenomena of metastasis, and of sympathetic inflammation—and the fact of inflammation frequently extending itself, as in opposite sides of the pleura, rather by *contiguity* than by *vascular continuity*,—and, lastly, the great disproportion between the degree of the two processes in different cases of inflammation, all suggest more strongly the idea of a third derangement either of the nervous function, or of something totally unknown to us, which may be variously modified in different instances, than that of either of the two phenomena being the cause of the other.

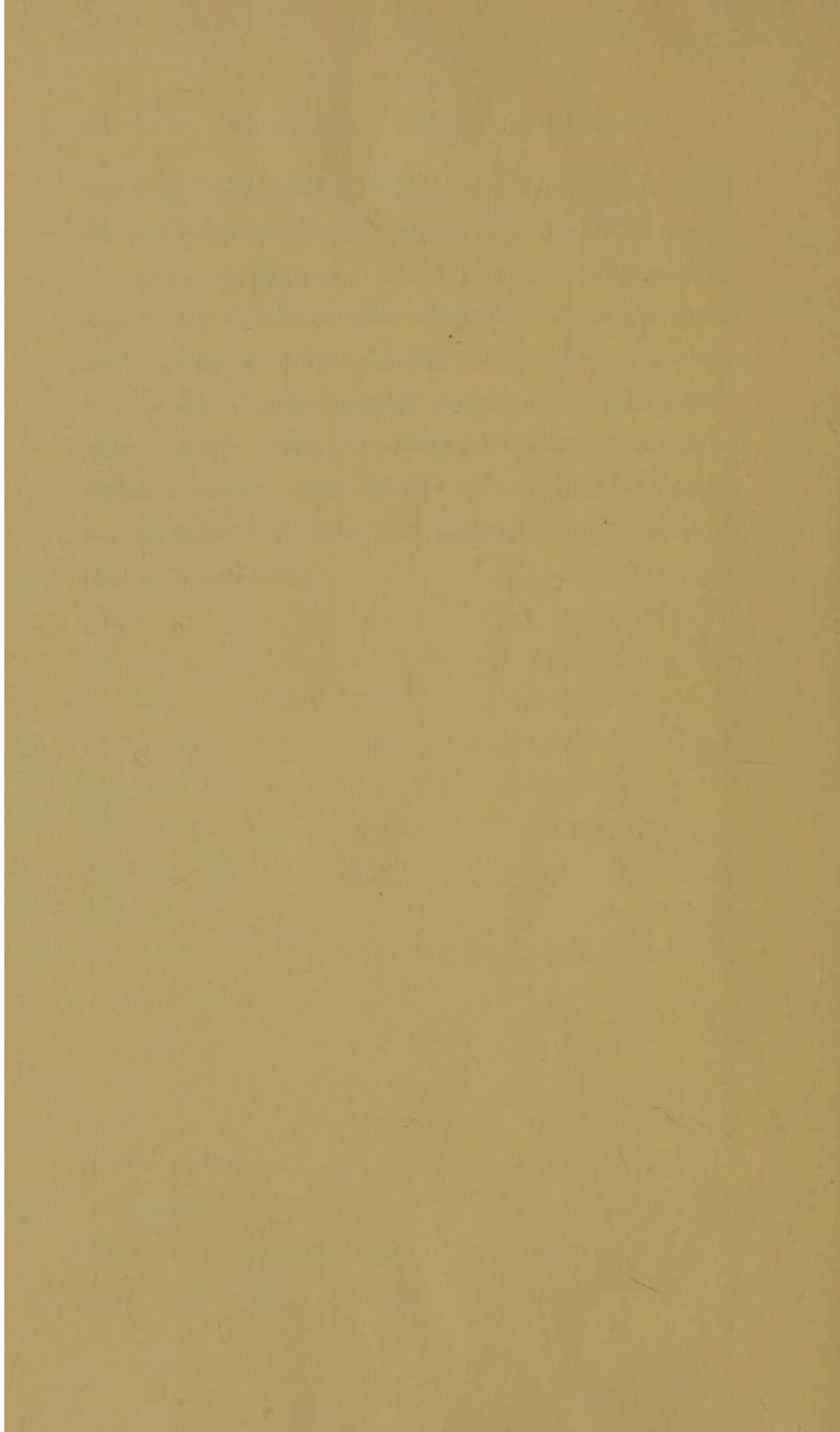
Whatever be its proximate cause, inflammation probably deserves more than is commonly supposed, or at least more than is usually stated in the writ-

ings of pathologists, to be considered as a provision of nature for the remedy of accidental evils, either local or constitutional, though it must be confessed that she frequently overdoes her office, or chooses a very inconvenient situation for its accomplishment. In many cases of plethora, for example, which has been produced by a pernicious regimen, and a disproportion between the nutrition and the exhalation, the occurrence of local inflammation readily suggests the idea of the sacrifice of a part for the whole, while the accompanying fever has the salutary effect of checking the appetite for food, and sometimes of producing critical evacuations from the skin and bowels. The final causes of inflammation in the case of wounds and hæmorrhage, and of absorption in freeing the body of foreign substances or morbid productions, acting as such, are sufficiently obvious.

It was my original intention to have given a few generalizations, with regard to the treatment of inflammation, and more particularly its diagnosis, both before and after death, but I find that the shortness which I conceive to be essential to an

essay of this kind, would be incompatible with its performance in a manner which would be in the least satisfactory. It is almost superfluous to say, that all which this essay lays claim to is to have given a very general, but, I hope, a clear statement of the present condition of our knowledge of the very important diseased process of which it treats. My object has been rather to leave out all that is not certainly known, than to give all that is ascertained.





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