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A COURSE OF LECTURES ON SURGERY,

DELIVERED IN THE
MEDICAL SCHOOL OF CAMBRIDGE.

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LECTURE II.

Destructive Inflammation; Changes in Vessels, Blood and Tissues, may be confined to any one, but generally occurs in them all; Effusions of Serum, Lymph, Pus, Colouring Matter of Blood, Pigment; Influence of Nervous System on Inflammation; Inflammation most vigorous in strong Persons, most easily excited in weak Persons and in loose Tissues; Symptoms of Inflammation; Pain, Cause of, Circumstances under which it Varies, Effect of Pressure; increased Heat, Cause of; Redness; Swelling; Alteration or Suspension of Function; Variation of Symptoms and Effects of Inflammation.

The condition of active congestion, or the first stage of inflammation, I described in the last lecture to consist in a mere exaltation of natural forces, often occurring to effect some desirable end, and to be regarded as morbid only when it exists without a sufficient natural exciting cause. When the stimulus is removed, the hyperæmic state commonly soon subsides, the circulation becomes more tranquil, and the vessels resume their usual size. Sometimes it ceases suddenly, an exhalation of serum taking place from the capillary vessels, which seems to be somewhat of the same kind as the critical sweat in fever.

If the exciting cause be continued, the phenomena of destructive inflammation, or inflammation strictly so called, probably begin to exhibit themselves; the action ceases to consist simply in an exaggeration of natural processes, for other changes more clearly of a morbid nature are observed. One of the earliest and most remarkable of these is the adhesion of the red globules, which, instead of floating separately and quickly in the middle of the capillary streams, begin to stick together, and to the sides of the vessels, forming by their agglomeration little masses, which more or less retard the current. Soon their connection with one another is so close, that they seem to have lost their individuality, and to become fused. Some of the colouring matter maybe, at the same time, dissolved out of them, and mixed with the serum. The distended vessels, which before had tightly embraced their

contents, become relaxed, the circulation is carried on more slowly through them, the motion of the blood becomes irregular, oscillating or completely stopping. At the same time that this retardation or stoppage of the flow of blood is taking place in the centre of the inflamed part, the circulation may be still maintained with preternatural rapidity in the circumference. If the inflammation ceases when matters are in this condition, the globules again separate from one another, shewing that their fusion had been but apparent, the stagnant blood begins to oscillate again, and yielding to the *vis a tergo*, moves forward. The vessels resume their natural size, and the inflammation is said to terminate by resolution.

The increased attraction of the red globules for one another, may be observed in the blood which has been drawn from an inflamed part, and is so characteristic a sign of the disease, that the quick adhesion of the globules into rolls and masses, in a drop of blood placed under the microscope, is, of itself, sufficient evidence of the existence of inflammation. The mottled appearance of inflamed blood when spread over a wide surface, caused by this peculiar change in its globules, did not escape the observation of John Hunter, who remarks that the "red blood attracts itself forming spots of red."

The other changes occurring in inflamed blood are a diminution in the number of the red globules, an increase in the white globules, and a proportionate increase in the quantity of the fibrin, which has undergone certain alterations in its qualities. Its specific gravity is less, and its great disposition to coagulate and become transformed into tissue, proves it to be endued with higher vitality than usual. The fibrin of inflammatory venous blood is also insoluble in nitrate of potash, in which respect it resembles the fibrin of arterial blood.

In what relation these several changes stand to one another, is not very certain. It may be that the unusual formation of white globules is taking place to supply the deficiency of the red globules, which, on the other hand, are undergoing rapid transformation into fibrin, possessing great force of organization. The process still seems to consist, in part at least, in an exaltation of the natural forces, but it takes place in a disorderly manner, some of the changes being out of proportion to the others, some are of a new or morbid nature, and the whole is uncalled for by the existence of any natural stimulus of nutrition. Far

from there being an increased demand on the part of the tissues to call forth such rapid formation of highly-wrought fibrin, their nutritive powers are commonly weakened in consequence of the existence of the inflammation, for we shall find as we proceed, that the impairment of the nutritive energies of the tissues is one of the most constant and most important effects of the second stage of inflammation. It must be remembered, too, that this modified fibrin is ill fitted to supply the material for healthy nutrition, in proportion to its deviation from the ordinary or healthy state. The perfection of nutrition depends upon the due relation between the coagulating property of the fibrin, and the assimilative influence of the tissues, and the increase in the independent force of organization of the fibrin, necessarily renders it less amenable to such influence, particularly when the nutritive energies of the part are weakened by the inflammation. Adhesions, thickenings, and a variety of new formations, are the consequence of this disordered state of the nutritive functions; the altered fibrin bids defiance to the laws of nutrition, and uncontrolled, or but little controlled, by the weakened assimilative forces of the tissues among which it is effused, coagulates and becomes developed into structures, which have no exact counterpart in the natural condition of the body.

While these changes are going on in the blood, the dilated and relaxed condition of the vessels permits the transudation through them of the constituents of the liquor sanguinis, in greater quantity than natural, which takes place probably in consequence of the altered mechanical condition of the parts concerned in the circulation. The minute vessels are preternaturally distended, and are beginning to lose the proportionate increase of those forces, of whatever kind they be, which had been maintained during the first stage of the inflammation, by which the current was accelerated in them, and the filtration of the constituents of the blood through their walls regulated. At the same time the pressure of the blood upon their stretched and weakened walls has undergone no diminution, because the excited action in the adjacent vessels is continued, and the force of the heart's pulsation is as great as ever. It is no wonder, therefore, that their contents escape in preternatural quantities.

The serum first escapes, and passing from point to point in the interstices of the areolar tissue, may extend to a considerable distance, causing, perhaps, œdema in the whole limb, of which a small part only is inflamed. This occurs most largely in loose structures, and in weak persons. The serum carries with it the saline ingredients of the blood. The filtration through the walls of the vessels of the serum and salts before the other constituents of the blood, accords with the results of experiments made to test the permeability of animal membranes, for it is found that water with saline matters dissolved in it will pass through these structures more quickly than when it is mixed with viscid, gummy, or albuminous substances.

Some of the fibrin soon follows, and becomes diffused in the adjacent areolar tissue, but does not travel far, because it soon coagulates, and evinces its tendency to organization by the commencement of

cell-formation in this unnatural position. A quantity of cells called exudation-corpuscles are formed in the interstices of the tissues, and these cells originating on the exterior of the vessels, often resemble very closely the pale corpuscles which are accumulating in such abundance within them; perhaps they are of the same kind, having undergone some little change, in consequence of their position. However this may be, the coagulation of the effused and altered fibrin, or lymph, as it is now called, blocks up the interstices of the areolar tissue, and gives rise to an indurated condition of the inflamed part. By further development it is sometimes transformed into a structure nearly resembling the areolar. As the inflammation proceeds, some of the fibrin, still further modified by the morbid process, is formed into round or oval granular corpuscles, differing from the exudation cells in their appearance, but more particularly in their inability to undergo any further transformation into tissue; they stand, therefore, in the same relation as foreign bodies. These corpuscles floating in the liquor sanguinis, constitute pus, and this pus enclosed in the previously effused and coagulated lymph, is called an abscess. To these effusions of serum, lymph, and pus, I shall again revert at greater length.

I have said that during inflammation the red corpuscles seem to lose their individuality, and the colouring matter dissolved out of them, and mixing with the serum, may escape through the walls of the vessels. Occasionally the red corpuscles themselves pass through the distended or lacerated vessels, and lodge in the interstices of the tissues. When either the colouring matter or the corpuscles have thus escaped from the vessels, the inflamed part presents a mottled-red hue, and the colour cannot be removed by pressure, as it may be when it depends only on the greater quantity of blood in the vessels. This effect of inflammation varies much in different cases; it takes place most readily in persons advanced in life, or of feeble or disordered constitution. You have probably observed how frequently the pus evacuated from the abscesses of such persons is of a red colour. Sometimes the colour becomes set, and gives rise to those brown or fawn-coloured spots and streaks which mark the seat of former inflammation, or, perhaps, of scorching, in the legs of old people.

The spots of darker hue occasionally found, and looking as if the skin had been stained with nitrate of silver, seem to result from the deposit of pigment caused by inflammation; they are commonly permanent, the colouring material not being again absorbed. The track of an old sinus is sometimes stained of a dark colour in this way, and after chronic inflammation of the bowels, the mucous membrane of the intestinal canal is occasionally covered with minute black spots, looking as if soot had been sprinkled over it.

Finally, the texture of the inflamed part undergoes alterations, independently of those caused by the effusion of new products into its interstices. The changes, dependent, not simply on the altered qualities of the blood, but in part the effect of an impairment of the vital powers of the tissues, produced by the inflammation,

are,—first, diminution of nutritive or reparative energy, associated with preternatural rapidity of dissolution, giving rise to atrophy, softening, interstitial absorption; and, secondly, loss of vitality or death of the part, causing ulceration or mortification, according to the mode in which it takes place, whether piecemeal, or *en masse*.

Such are the more important changes which mark the second stage of inflammation:—Continued distension, but lessened activity, of the minute vessels; diminution in the number and loss of the repulsive qualities of the red particles; increase of the number of white globules; increased quantity and altered quality of fibrine, and impairment of the nutritive forces of the tissues.

You see, therefore, that the inflammatory process is not confined to any one of the agents of nutrition,—to the blood, the vessels, or the textures, but that it usually involves them all, in a greater or less degree. I do not mean to say that it is essential to the existence of the process that all three should share in it; forasmuch as it may occur in the blood alone, without involving either vessels or textures, and it may be present in textures which have neither vessels nor red blood supplied to them,—that is to say, the phenomena of inflammation peculiar to each of the three great agents in nutrition may occur in one alone, without either of the others participating in them. For instance, the adhesion of the globules, the alteration in the qualities of the fibrin, and the formation of pus, may take place in coagula, removed from the influence of the capillary system; and the evidences of inflammation, effusions of lymph and pus, softening, ulceration, and mortification, may be observed in the substance of the cornea, which has neither vessels nor red blood. These changes in the cornea are, it is true, commonly associated with inflammatory disturbance of the conjunctival and sclerotic vessels, which supply the materials of nutrition to that texture, but they sometimes exist without any such increase of vascularity, and are often the precursors and cause of that inflammation of the surrounding tunics, on which they are supposed to depend. Again, the excited action of vessels, existing and continuing for a time, without any other concomitant inflammatory symptom, is so ordinary an occurrence, as scarcely to attract notice. This occasional limitation of the effects of inflammation to each of the three agents commonly participating in it, is of much interest, and clearly shews that to be a very narrow and mistaken description of the process, which represents it as consisting merely or chiefly in an altered condition of the vessels. To obtain a right apprehension of the inflammatory process, it is necessary to take a more comprehensive survey of the changes which accompany it than such a description would induce, and to regard it as consisting in an altered or morbid condition of blood-vessels and textures, commencing in either, but commonly involving them all.

Upon what this morbid condition actually depends, by what influence the adhesion of the red globules, the dilatation of the vessels, and the changes in the textures, are produced, and how these effects are related to one another; what, in short, is the *rational*

of process, we are at present unable to say. In the same sense that we use the terms life, assimilation, &c., to express the unknown forces whereby certain effects are produced, so must we be content to signify, by the word inflammation, that equally recondite influence which gives rise to the various phenomena indicating its presence.

I have thus far made no allusion to the part which the nervous system plays in the processes of inflammation; that it does exert some influence can scarcely be doubted, but as the connection between the nervous system and nutrition are at present but imperfectly understood, we must not expect to arrive at any very clear ideas of the mode of operation of nervous agencies in the production or modification of inflammation. The existence of animals and textures, in which no traces of nerve-structure can be found, is, perhaps, sufficient to shew that nervous influence is not essential to nutrition; but that a nervous system, whenever present, does exert an important controlling or regulating influence upon nutrition, is equally proved, by the numerous instances in which parts have been unable to maintain their natural condition, when deprived of nervous agency. The wasting of limbs paralysed as to motion, by disease or injury of the spinal cord,—their more rapid wasting and liability to inflammation, ulceration, and mortification, when the sensitive influence is in addition suspended,—the destructive inflammation of the eye, consequent on division of the fifth pair of nerves, which is said to follow most rapidly if it be made in front of the Gasserian ganglion, so that the sympathetic filaments are involved in it, seem to shew that the three kinds of nerves, the sensory, motor, and sympathetic, are alike capable of exerting their influence on nutrition. The well-known effect of nervous agency in controlling nutrition is also in favour of the same view.

The inflammatory process being but a modification of nutrition, is probably in like manner, and to the same extent, subject to nervous influence. Indeed, the evidence of the operation of nervous agency in nutrition derived from the experiments above quoted, is founded chiefly upon the observation of the inflammatory disturbance consequent on its suspension. Many examples of the same kind might be adduced, but I will mention only that well-known one of the inflammation occasioned in a paralytic limb by water, heated to a temperature insufficient to injure the opposite sound extremity. If such results be shown to follow the suspension of nervous influence, it is not improbable that disturbances of an inflammatory kind may be produced also by an extraordinary accession of the same, from excitement or other cause. The effect of the emotions upon the circulation through the heart and capillary system is obvious enough, and would no doubt operate prejudicially upon a part already inflamed. That nervous irritation, as it is called, sometimes induces, as well as contributes to, the maintenance of inflammation, is rendered highly probable, if not proved, by the sympathetic affections, which are of such constant occurrence. I know not in what other way to explain the attacks of inflammation of the brain consequent on teething and worms in

the bowels, or a still better instance, the frequent association of inflammation of the testicle with gonorrhoea, than by supposing that the irritation is communicated from one part to the other through the medium of the nervous system.

Possibly the extension of inflammation from point to point along a surface, and from one tissue to another in its immediate vicinity, may be in some measure due to the radiation of nervous irritation occasioned by it, in addition to some direct influence of an assimilative kind upon the surrounding nutritive forces, inducing in them a change similar to that which exists in the part first affected.

The inflammatory being a modification of the nutritive and vascular processes, is carried on most actively where they are in greatest force,—where the vascular system rather predominates, in strong and plethoric persons, and in textures rich in blood-vessels. Its activity and the well-marked character of its products are a fair criterion of the vital energy of the individual and of the organ in which it occurs. On the other hand, where the vital powers are feeble, it is languid in its progress and its products are ill formed. Hence the slight amount of inflammation which is sometimes observed, to follow serious lesions of important organs, which have been attended with great constitutional depression, and the fact that vesication does not follow the application of a blister when the patient is falling into a state of collapse.

Although the disturbance of the nutritive and circulatory processes attending inflammation, is most clearly developed where those processes are usually conducted with the greatest energy, it is nevertheless, most easily excited, and its effects are most destructive, in the tissues of low vital force, in feeble persons and in the lower extremities—in the parts last developed and most distant from the centre of the body. Hence the frequent occurrence of troublesome sores and mortification in the lower extremities of old persons, the rapid formation of bed-sores in paralysed limbs, and the frequent occurrence of ulcers and other inflammatory affections in parts which have been weakened by disease or severe injury. A considerable number of persons whose health is broken and strength failing under the effects of long-continued and wasting disorders, are carried off by some attack of inflammation of the skin, lungs, liver, or other parts, which runs into its most destructive stages before we are well aware of its existence. Patients with cancerous affections of the breast, rectum, or œsophagus, often die suddenly and unexpectedly, on having caught cold, which under ordinary circumstances would soon have passed away, but in their enfeebled state, is quickly followed by pneumonia or gangrene of the lung.

Cæteris paribus, tissues of loose structure are most liable to inflammation. It is of frequent occurrence, and soon runs on to suppuration, in the areolar structure, especially in that of the axilla, around the anus, and in other similar situations. It affects the back of the hand and foot, more readily than the sole and palm; and erysipelas of the face generally commences, and spreads most quickly, in the fine loose skin about the eyelids, bridge of the nose, cheeks, and

ears, and does not extend, except in severe cases, to the tougher parts of the integument from which the hair grows—the lips, chin, and scalp.

Let us consider briefly the local symptoms of inflammation, as they are presented to us in case of inflammation of the finger, originating, it may be, in a prick or slight wound. The first indication of commencing mischief is pain, of an aching or burning character; it keeps the patient awake during the night, and extends from the finger up the arm to the shoulder. In the morning the finger is found to be red, somewhat swollen, and hotter than natural; the pulse at the wrist beats with greater force than on the opposite side; and the veins of the finger and hand are turgid. The symptoms increase, more particularly the swelling, which becomes firm at the centre of the inflammation, but remains soft in the circumference, and is diffused over a considerable part of the limb. By and by the pain alters in character, becoming heavy and throbbing, even more insufferable than before. In the centre of the hard swelling, a soft spot is discovered, from which we infer that suppuration has commenced; the soft spot increases in size, so that the presence of fluid, or fluctuation, is distinguishable by the touch; at the same time the surrounding induration and edematous swelling begin to diminish, as though the disease were concentrating its forces upon the centre, where the pus is being formed. Gradually the parts intervening between it and the surface become thinner, and are raised by the pressure of the pus, the white colour of which may be seen through them. Ultimately they give way, affording a vent to the pus, and much relief to the patient. It seems as though the object of the inflammation were now accomplished, for it gradually subsides, its effects are removed, the discharge soon ceases, the orifice is closed, and the hand is restored to its natural condition.

Such is the ordinary course of an attack of phlegmonous inflammation, or inflammation of the cellular tissue of the hand, when the progress of the affection is quick, and the formation of an abscess takes place, the four symptoms which most especially attract our attention being pain, redness, heat, and swelling. Of these, the pain is generally the precursor, and cannot, therefore, be a consequence of any of the others. It cannot depend, as it has been supposed to do, upon the pressure of the nerves between the distended vessels, inasmuch as it sometimes exists, to a severe degree, before the vascular disturbance has commenced. It is more probably owing to some altered condition of the nerve-fibres, which share the disease in common with the other tissues involved. It is proportionate to the natural sensibility of the patient, and of the part affected. It is severe in inflammation of the skin, particularly of the fingers, and very acute when the enveloping serous membranes of the internal organs are affected, being of a more dull heavy character when their parenchyma or lining mucous membrane is attacked.

Pain is the general term used to express the exaggeration or alteration of the sensation of the inflamed parts; and as different parts have their peculiar sensations, so does the character of the pain in inflammation

vary in a similar manner. Inflammation of the eye, more particularly when it affects the retina, is attended with acute sensitiveness and intolerance of light, and with the appearance of flashes, stars, and scintillations of various kinds. And corresponding morbid acuteness, as well as erroneous impressions of sound, smell, and taste, are observed in inflammation of the ear, the olfactory and gustatory organs.

In the well-ordered constitution, the pain is a fair measure of the activity of the inflammation, but in nervous and sensitive patients, and in persons out of health, it is often very disproportionate to the real disease, and is sometimes so acute that we may be induced to resort to treatment of unnecessary and injurious severity, or, on the other hand, may overlook the inflammatory part of the disorder, and imagine the affection to be entirely of an hysterical nature. This frequently happens in young women, whose nervous system is particularly sensitive. In such persons, a slight attack of inflammation of a joint is often attended with excessive pain and tenderness, which are not confined to the part immediately affected, but extend to a considerable distance from it, perhaps all over the limb. These cases of inflamed joints, in which the pain is disproportionate to the other signs of inflammation, are very difficult to cure; the affection lingers on from week to week, and month to month, bidding defiance to one mode of treatment after another. Sometimes the inflammatory condition subsides altogether, and leaves behind merely a state of preternatural sensibility; the joint continues painful and tender, so that slight blows cause severe suffering, felt for a long time; and a little more exertion than usual in the day is followed by a sleepless night, in consequence of the pain. You have seen several cases of this affection of the knee-joint, lately under treatment at the hospital; in all of them pain and tenderness were the prominent symptoms, in some of them the feeling of crepitation in the joint was greater than natural, and in a few there was slight swelling in the evening. In addition to the tonic regimen, or constitutional treatment, which the particular symptoms seemed to require, more benefit was derived from pressure, by means of adhesive plaster, or plaster containing opium, than from any other local application.

Secondly. The pain of inflammation is generally greatest in dense resisting structures—as the fibrous and serous membranes, bones, the testicle, and the eye-ball.

Thirdly. Pain is proportionate to the activity of the inflammation. You will sometimes be surprised at the slight amount of suffering caused by extensive and destructive inflammatory affections, of a languid character, in scrofulous persons. The pain varies also with the stage of the inflammation, being dull, heavy, or throbbing, when suppuration begins, and very severe when the inflammation is passing into ulceration and mortification. This is more particularly the case in phagedenic ulceration, and when mortification supervenes quickly on the occurrence of inflammation, as in traumatic gangrene, and some other cases to be described in treating of mortification.

I have said that the pain of inflammation depends

upon a deranged condition of the nerves rather than upon the vascular fullness of the part, because the pain often occurs before the other symptoms have set in. Nevertheless, there can be no doubt that it is materially increased by the pressure of the tender nerves between the distended vessels, as well as by the general stretching of the part, the resistance of some tissues and the yielding of others; and it may occasionally be diminished very much by the expulsion of the blood from the inflamed part, and the support afforded by well regulated pressure. In this way great and sudden relief may sometimes be obtained from the severe pain of acute inflammation. Patients have been able to walk about immediately after the application of pressure to an inflamed testicle, the pain of which had before been almost intolerable, and the disease has thus been cured. To effect this the pressure must be steady, uniform and continued, so as to support the distended vessels and the stretched tissues, without exerting violence at any particular part; and unless the pain be relieved in a short time, the pressure should be removed, for the continuance of the pain is a sure sign that the treatment is doing no good, and it may be productive of much mischief.

Although pain thus occasionally admits of much relief from uniform external pressure, it is greatly aggravated by collections of pus within the part, causing stretching of the inflamed and resisting textures which surround the abscess. Many of you have probably experienced the immediate relief afforded by the opening of a small subcutaneous abscess or boil, over which the skin was inflamed and tense, and you may conceive how dreadful must be the agony of acute suppuration going on in the interior of the eye-ball.

The increased heat of the inflamed part, though not so great as the altered sensations of the patient would imply, is, nevertheless, appreciable by the thermometer. The average heat of the body ranges from about 98° to 100° , but in fever it has been known to rise to 107° ; and Hunter's well-known experiment is sufficient illustration of the rise of temperature in the inflamed part. Having tapped a hydrocele, and introduced a thermometer through the trocar, he found the heat to be 92° ; on a repetition of the experiment next day, when the inflammation had set in, the thermometer rose to $98\frac{1}{2}^{\circ}$, shewing an increase of $6\frac{1}{2}^{\circ}$. This increase of temperature in the inflamed part, is due to the preternatural rapidity of those changes in the blood and textures upon which the natural heat of the body depends;—to the greater afflux of arterial blood, the quick formation of fibrin, &c., during which, oxygen is combined and heat generated. A sort of combustion is going on, of the same kind as that which usually takes place in the body, but with increased rapidity. The heat of an inflamed part within reach of the thermometer is not very likely to exceed that of the blood in the centre of the body, but it is possible that this may occur when an internal organ is the seat of acute inflammation.

The redness attendant on inflammation depends, as I have already explained, upon the dilated vessels admitting a greater number of red corpuscles, which find their way into capillary tubes in sufficient numbers

to become visible. The shade of colour is bright when the inflammation is active, dull or bluish when it is sluggish and chronic. The swelling results in part from the distended condition of the vessels, but chiefly from the effusion of the constituents of the blood into the surrounding tissues; it is, therefore, greatest in parts where looseness of texture offers least resistance to the passage of these fluids into them—as the scrotum, the neighbourhood of the eyes, and the face. It is at first soft, being occasioned by the presence of serum, which extends to a considerable distance from the inflamed part; then it becomes firm in the middle, in consequence of the effusion and coagulation of fibrin or lymph; and, thirdly, the existence of a soft central swelling, with an indurated circumference, is a tolerably sure sign of the presence of pus.

I must not omit to mention another important symptom and effect of inflammation, which is nearly allied to the alteration or suspension of nutrition,—I mean, the alteration or suspension of function. The inflamed brain either acts in a disorderly manner, giving rise to erroneous ideas and convulsive movements, or it ceases to convey impressions to the mind, and to exercise volitional sway over the muscular system; and an inflamed muscle refuses obedience to voluntary impulses—it cannot act. The alteration and suspension of secretion is still more obvious, and constitutes one of the symptoms on which the physician most relies, in forming his diagnosis of the inflammation of an internal organ.

I have described to you the symptoms of inflammation, as they commonly occur, illustrating them by the instance of inflammation of the finger, which may be taken as a fair specimen of the disorder in its complete or fully developed condition, where its chief symptoms are presented to our observation, but I should greatly mislead you if I were to induce you to imagine that this protean disorder always presents the same symptoms, or follows the same course. Any, or indeed all, of the above-mentioned symptoms, may be absent, and we are sometimes cognizant of the existence of the process only by witnessing its effects; still, more frequently, the inflammation is seated in a spot concealed from our view, so that we can gain no information respecting the redness, the heat, and the swelling, and have to take as our guide the pain, the most uncertain of all the symptoms, because it is the least likely to be proportionate to the severity of the disease, and because it is communicated to us through the medium of the patient.

In its effects also, inflammation is no less variable than in its symptoms; in one case effusion, in another, ulceration, takes the lead, and in a third the invasion of the disease is quickly followed by mortification, without our being able to offer an explanation of the particular result in either case. I cannot present a more striking illustration of the numerous forms in which inflammation may occur in a single tissue, than by directing your attention to the diseases of the skin. A chilblain, carbuncle, erysipelas, and lepra, are all inflammatory affections, yet how greatly do they differ from one another, and how little do we know of the causes upon which these differences depend. Equally

unintelligible, in the present state of our knowledge, are those peculiar changes in the blood, dependent (as we suppose,) upon the influence of subtle poisons, which attach to inflammation the distinctive characters of scarlatina, measles, small-pox, and syphilis.

THE

CONTAGION OF ASIATIC CHOLERA.*

By E. O. SPOONER, Esq., Blandford.

If we examine the official reports of the cholera in Great Britain for the *first nine weeks*, from September 28th to December 1st, we shall find the number of cases 1,590, of which 741 have died. Of these cases the metropolis gives 413, and the deaths 225. The whole number of cases reported at this period of more than two months, after the first invasion, in the remainder of England and Wales, is only 148, and the deaths 77. The proportion is more than 3 to 1; yet, when we further take into consideration that the metropolis contains two millions and a quarter of inhabitants, while fifteen millions inhabit the cities and villages of England and Wales, (a large number living in towns far worse than the metropolitan district in point of sanitary arrangements,) we must be still more struck with the disproportionate mortality nine weeks after we had been told the epidemic influence had reached the shores of England!

In Scotland, or rather in about seven localities there, are reported in the same time 1,011 cases and 439 deaths, yet, all Scotland does not number three millions. Here again we have 3 to 1 against Scotland. If we take into account the number of pest vessels which have entered the mouth of the Thames and the Firth of Forth from the infected ports on the continent, *we shall be able to explain this anomaly.*

Each focus of contagion has its own radius. The intercourse of the Firth of Forth soon reaches Glasgow and Dumfries. The first nine weeks of cholera in England, however, clearly show that for the most part, those places only had been then visited which have *primarily* had a large tonnage of *northern shipping.*

The *secondary spread* of cholera by inland communication with our own affected ports has not yet penetrated very far into the interior of the country. A tramp arrives at Hertford or Reading, and originates a few cases; or a family with the disease about them, migrate from London to Offchurch, in the neighbourhood of Leamington, and, with indecent haste, Leamington is reported by the Board of Health to be cholera smitten.

Indignant contradications to these misstatements are common enough, and it is scarcely worth while to say that Portland, some eight weeks ago, was reported in the cholera list.