

## **On the laws of contagion, from a clinical standpoint.**

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Hutchinson, Jonathan, Sir, 1828-1913.  
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### **Publication/Creation**

Manchester : J. Heywood, Excelsior Printing and Bookbinding Works, [1891]

### **Persistent URL**

<https://wellcomecollection.org/works/tuurkphn>

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## ON THE LAWS OF CONTAGION, FROM A CLINICAL STANDPOINT.

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MR. PRESIDENT AND GENTLEMEN,—With your permission, I will begin by a general assertion that all the various forms of the inflammatory process are attended by the production of something which is capable of spreading that process by contagion. The only exceptions to this statement with which I am acquainted are those mysterious inflammations in which the peripheral nerves are concerned, and of which herpes and morphœa are the types, and probably almost the sole examples. In these, by a nearly invariable rule, nothing of the nature of infective spreading ever takes place. The extent of the disease is declared at the onset, and no advance is ever afterwards made. In all others, whether the local process be due to injury, to the presence of a cryptogam or a burrowing insect, or to an animal poison; whether the type assumed be erysipelatous or urticarial, eczematous or furunculoid, whether we call the resulting malady diphtheria, pleurisy, pneumonia, or carbuncle, there is risk of infective spreading. That risk is not always the same either in degree or in duration, but it is always there.

It is to the examination of the laws under which inflammation exercises its powers of infection that I have to ask your attention this evening. I will endeavour to be as concise as possible, and, in the attempt to attain that end, must ask you to pardon any expressions which may seem too dogmatic.

It is desirable perhaps to interpose a few definitions. The term infective must, I think, be used, as it now commonly is, in its widest sense, and not as being distinctive from contagion. Although in my student days I was taught that an infectious disease was one conveyed from person to person by the air, and a contagious disease one which required actual contact, yet I think that general usage has ignored such distinction, and employs the words much as if they had the same meaning. We must, therefore, when we intend to designate infection through the medium of the air employ some precise adjective, and speak of aerial-convection, air-convection, or air-infection. When a morbid

process tends to spread in the tissues of its original subject, we say that he is autoinfective, or self-infective, and with a little straining of language, pardonable under the circumstances, we apply the term to the disease as well as to the patient. If the evidences of self-infection occur in close proximity to the part first attacked we speak of such neighbouring results as satellites, and we imply by that term that the material of contagion has probably spread, not by the blood, but through the solid tissues, or by the lymphatic spaces. If, on the other hand, the disease has shown a tendency to become general, we think of blood-infection. Under such conditions we speak of diffuse or general reproduction, and we recognise that this may be either accurately symmetrical, or only partially so.

The terms specific and specialised must also be carefully used with distinct meanings. A specific disease is one which can be produced only by infection with germs which always produce the same results. A specialised disease is any malady which, without regard to unity of cause, and possibly as the result of a combination of several, has nevertheless acquired peculiarities and attained to individuality.

Before proceeding to speak of the laws of contagion, I will briefly enumerate the principal means by which, so far as is at present known, it may be effected :—

(1) By some insect, or other well-organised external parasite, which may breed on, or in, the tissues of the body, and transfer itself from part to part—*e.g.*, scabies.

(2) By some lower form of animal life of which psorosperms may serve as an example.

(3) By some low form of vegetable organism of which the moulds may stand as examples—*e.g.*, the *tinea* group of skin diseases.

(4) By some yet more lowly vegetable organism, capable of very rapid multiplication, and often in the blood as well as in the tissues, of which the various forms of bacillus are illustrations—*e.g.*, pyæmia, anthrax, gonorrhœa.

(5) By some, as yet, unknown form of virus (probably microphytic), to which the term "specific animal poison" is, in our present ignorance, applicable—*e.g.*, smallpox and the other exanthemata, syphilis, etc.

(6) By some inorganic substance of the nature of aptomaine.

(7) Lastly, it must be asserted to be possible that the cell structures of the body itself, independently of the introduction of any parasite or the development of any chemical poison, may assume qualities enabling them to convey disease to the parts with which they come in contact.

The list which I here submit to you has, of course, no claim to be more than a mere recapitulation for the guidance of the investigator. There is, obviously, no strong line of demarcation between several of the

groups. Concerning the last, especially, it is, perhaps, desirable to add a few words of explanation. The results of modern discovery have tended to greatly widen our conceptions as to the sphere of parasitic elements in the production of disease. We are now scarcely able to think of contagion without at the same time calling up the image of a bacillus as its cause. It may be that in this direction we are going too far and too fast. At any rate, it will, I think, be admitted that it is desirable for the present to keep in mind the possibility that the tissues of the body itself may, without any parasitic addition, become themselves the causes of infective spreading. This I would submit is a possibility under most of the various conditions of disturbed nutrition, whether we name them new growths or inflammations. The phenomena of infective spreading in the case of Melanosis are very instructive. They are, by way of example, definite beyond the possibility of misconception. From one little pigmented mass a thousand just like it are produced, and are scattered in every part of the body. It would appear to be an example of contagion by cells, or, at any rate, by cell-forming plasma. There is certainly no strong presumption that parasites have any share in it. What is here true of the infection-process is true also, with modifications, of all forms of malignant new growth, or, as we had perhaps better name them, malignant inflammations. Similar laws not improbably apply to other conditions, which, without any dispute, will be allowed to stand in the category of inflammations. I am thinking of boils, of acne, of contagious eczema, of psoriasis, lichen planus, and a multitude of other ailments in which the mode of spreading, multiplication, and also our methods of cure, favour the theory that they advance by the intervention of a contagious element. It may be that in many of these the contagious material is neither a bacillus, a psorosperm, nor a ptomaine, but a living cell, the product of the tissue whose nutrition has been disturbed. In connection with this important part of my subject I must ask attention to the important law that "when once a focus of local inflammation has developed for itself peculiar and, so to speak, individual characters, it tends in all its subsequent stages of infection-spreading to keep to its type." This is illustrated in all the diseases which I have just named, and in many others. In order to explain it, we must resort, I think, to one of two hypotheses—either the inflammation has been produced by some specific contagion, or it has, in the course of its evolution, produced something equivalent to such.

In order that I may illustrate what has just been said I will ask your attention to one of the very rarest of maladies; I allude to infective angioma of the skin. I show you two drawings, from different patients, which will, I think, convince all that this morbid process keeps to type. The two are exactly alike. I do not know of more than four examples of it

on record, and they were all exactly alike and quite different from everything else. The peculiarities of the malady are that it begins, in early life, by what looks like a very superficial port-wine-stain. This stain advances gradually and forms faintly marked rings which, in the course of years, cover the whole limb. They are attended by what may be called "cayenne-pepper grains," little tufts of dilated capillaries, in which blood is impounded and which you cannot empty by pressure. Our interest with the malady on the present occasion is its infectivity. About this there can be no doubt, for it spreads by continuity with its border and also by the production of satellites near to it. Clearly one explanation of its always assuming the same features is that it always affects the same structures. It keeps to the small blood vessels of the skin and travels in their coats. But what makes it travel? What is the cause of its infectivity? Is it more probable that it is some bacillus-parasite having a special fondness for these structures and for none others, or is it more probably a changed condition in the cell structures of the perivascular spaces, which is contagious from one to another? The great rarity of the disease, and the fact that it always begins in infancy, seem to favour the latter view. If it were due to a specific bacillus it is scarcely likely that we should have identified one case in Norwich, one in Canterbury, one in Berlin, and one in Edinburgh (as has been the case), and none elsewhere. I mention this disease the more willingly as an example, because it is so rare, but it is in all essentials like some others much more common. Whoever can explain for us the infectious spreading of serpiginous angioma will at the same time probably explain that of lupus erythrmatosus and many other peculiar varieties of the lupus family. These all spread serpiginously just in the same way.

If time permitted I would ask you to look at another series of drawings which I have with me illustrating another rare malady which needs an explanation of its contagiousness.

The disease to which the name of Rhinoscleroma has been given by Hebra may serve very conveniently to illustrate several of the points for which I have been contending. In it a chronic inflammatory process is attended by thickening and induration of the structures about the orifice of the nostrils. The disease runs a slow and very definite clinical course, and is attended usually after a duration of some years by similar disease in the palate and throat. Obviously it is an infective malady, and obviously it begins as an inflammation. Its usual exciting cause is, I believe, excoriation of the nostrils by catarrhal discharges. Recent investigators have identified in some cases a bacillus probably allied to that of tuberculosis and occasionally present in lupus. Yet the disease is in its phenomena very different from both lupus and tuberculosis. It is a very rare malady, and especially so in England and America. The

drawings which I show you are from Vienna, India, and England. I beg you to note their close similarity one to another, and I ask you, as in the instance of serpiginous angioma, is it a probable hypothesis that there exists a specific bacillus, the sole and efficient cause of this remarkable affection, which, although present all over the world, affects not one in a million of the population?

I will now pass to a different department of my subject and will endeavour to illustrate some of the laws of contagion by reference to common maladies.

We are not to think of the itch insect making its burrows in the skin simply as we should of a pholas boring into a harbour-pile; or, perhaps still better, a mole seeking his food in a meadow. We have to reckon rather with the results of irritation to a living structure, and the fact of life in the object attacked introduces at once important complications. The skin, irritated by the *acarus*, inflames, and the products of inflammation are in themselves infectious, and tend to spread disease. In many patients three-fourths of the eruption called scabies is caused by the contagion of inflammation-products, and not directly by the parasite. The eruption may indeed spread to parts at a considerable distance from the burrows of the *acarus*, and unless properly treated may persist long after all the *acari* have been killed. No two persons are alike in their proneness to develop these secondary inflammations. As a general rule, the younger the patient the greater the amount of inflammatory complication; but the difference is by no means one solely of age. Of two persons of the same age, and apparently in equally good health, one may show only the burrows and characteristic vesicles, with little or no surrounding inflammation, whilst another may be covered from neck to foot by an impetigo-eczema, the result of general infection by inflammatory products. The cure of many cases of scabies is that of eczematous dermatitis rather than the mere destruction of the parasite. Precisely similar statements are applicable to all the other irritative parasites, whether animal or vegetable. We all know how ringworm may pass into kerion, and how favus may sometimes entirely destroy the scalp, and even in rare cases affect the nutrition of the bones. There are other lessons in reference to the general doctrines of contagion well worthy the attention of the pathologist, which are to be learnt from observation of the diseases of the skin due to vegetable parasites. We are here dealing with simple and known causes, and from them we may argue as to the probabilities under more complex conditions. We may then profitably note respecting such a disease as *tinea versicolor* that its fungus grows with much greater freedom on the skins of some persons than others; that it may in one man persist for many years as a few spots only, whilst in another it will cover the whole trunk.

There is a curious group of diseases which are contagious, not only upon the patient himself, but also to others, which although not in the least resembling specific fevers, are yet subject to some law which brings them to an early termination. The rare malady known as *keratosis follicularis*, and that recently designated *pityriasis rosea*, are examples of this class. But the one best known, and which on that account I will take as an example, is *molluscum contagiosum*. This malady, not infrequent in young people, but occurring also occasionally in the middle-aged, and even in those advanced in life, is unattended by any derangement of the general health. It usually begins as a single spot or group of spots, around which others rapidly develop. It rarely becomes general, although it may cover a considerable extent of surface. It never lasts indefinitely, and I do not think that I have ever in my own experience seen a case which had a twelve months' history. As to its causes, excepting that it is probably invariably the result of contagion, and that in some obscure way it is, in adults, connected with the use of the Turkish bath, we know nothing. No one can doubt that it has some quite special cause, as special and specific, in all probability, as is that of scabies. Whether it is of the nature of a *psorosperm* must as yet be held to be doubtful, and it is in the present state of our knowledge quite impossible to give any explanation of the invariable fact of spontaneous cure. It is meanwhile of great importance to keep that fact in mind, since it is quite possible that some other maladies of a less definite nature come under the same law.

The Erysipelatous type of inflammation is one which offers, in reference to the doctrine of contagion, numerous points of great interest. No one doubts that erysipelas is self-infectious, *i.e.*, that it spreads locally on the skin of the patient. Most usually it travels by continuity of issue and without breaks, but not unfrequently satellite patches may be observed, and in rare instances, if I mistake not, something closely allied to symmetrical generalisation is witnessed. As regards its transference to other persons, no one, I suppose, doubts that this may occur whenever a breach of surface is exposed to contact with the contagious material. It is established beyond a doubt that erysipelas can spread in hospitals, and that it may affect not only the skin, but mucous and serous membranes, and that in this way erysipelatous dermatitis may be transmuted into puerperal metro-peritonitis. Our experimental investigators have even succeeded in isolating the parasitic organism which is supposed to be the cause of the spreading of erysipelas. Yet in connection with these established facts we may suitably call to mind that erysipelas is, after all, very rarely indeed prevalent as an epidemic, that medical men and nurses do not as a rule catch it from their patients, and that in private practice we seldom see more than one case in the

same house. It appears to be certain that the virulence of its contagious property is capable of great intensification, and that for the most part it is but feeble. The facts on record in reference to puerperal fever prove, however, that the virus may be conveyed by the hands or clothing of a medical attendant, himself in perfect health, during periods of many weeks together.

Having argued just now that the contagiousness of Erysipelas is an element which may vary very widely in its degree, I next have to ask your attentive consideration of the clinical facts which show that the disease itself does not keep closely to any one type. Nothing is easier than to foreclose such a discussion by the assertion that traumatic erysipelas is one thing and idiopathic erysipelas another, and that the one is probably due to bacillary infection and the other capable of spontaneous origin. Dogmatism of this kind cannot, however, settle such a question, and it will still remain for the truth-seekers in pathology to search out the facts which underlie the connection between the two. You will see that we are here face to face with an all-important question in reference to the doctrines of contagion, and that we have to ask whether it is possible for a disease which has originated independently of contagion, and in connection with some common cause of inflammatory action, to acquire for itself microphytic or other organisms, and to become virulently contagious. Are we to say of erysipelas that it stands side by side with smallpox and measles, as a wholly peculiar and specific malady, capable of production only by specific seed-sowing, or are we rather to consider it as a somewhat ill-defined form of inflammation of skin and mucous membranes, susceptible of variations within very wide limits and spreading only exceptionally from person to person by means of contagion? The first supposition would seem to me, however tempting from a histological standpoint, to ignore arbitrarily a whole army of facts. Let us turn for a few moments to the consideration of what is known as "medical erysipelas." First among the facts, as regards this malady, we recognise that those who have had one attack become liable to others, and that the disease, as a rule, diminishes in severity when it is frequently recurrent. The first attack of erysipelas of this type is almost always due to some local exposure, such, for instance, as to a cutting wind, a draught of air through an open window, or to the glare of sunlight reflected from snow. Cases which have originated from such causes may manifest precisely similar phenomena to those displayed by the traumatic form. The disease will spread over large tracts with a running edge. It is attended by vesication and much œdematous swelling; it is productive of high fever, and may be followed by death. That these cases of medical erysipelas are occasionally contagious to nurses, and that it is very dangerous to admit

them into surgical wards, are facts concerning which I have myself no doubt, and you will see that it follows from their admission that I believe that idiopathic and traumatic erysipelas are the same malady so far as the means of its spreading from patient to patient are concerned. Those, however, who accept this doctrine must see clearly what lies before them. The group of maladies closely cognate with idiopathic erysipelas is a very large and very interesting one, and does not keep at all closely to one type. In some cases, or, perhaps, it would be better to say in some persons, the inflammation may be evoked by causes wholly different from those which I have mentioned. Thus, we may have an arnica-erysipelas, a vaccination-erysipelas, and from whatever cause it have originated it will leave behind some tendency to its own reproduction. Everybody knows that patients who have had erysipelas once, whatever may have been its type or kind, are dangerous subjects for surgical operations, and are very prone to have the disease re-develop in connection with any wound. The disease known as elephantiasis, or elephantoid hypertrophy of limbs, almost always takes its origin in an attack of erysipelas, and runs its course by periodic recurrences of the same. The solid œdema of the face, which often produces such remarkable disfigurement, is again constantly attended by recurrences of erysipelas. There is a modified form of this latter malady in which the face becomes almost permanently eczematous, but with remarkable exacerbations, during which the eyelids swell up, and to which the name eczema-erysipelas is applicable. This disease, like most of the other peculiar forms, begins by an attack not distinguishable from idiopathic erysipelas, and assumes its own peculiar characters as it progresses.

I have been detailed in what I have ventured to say respecting the relations of erysipelas on the one hand to the ordinary causes of inflammatory action, and on the other to some more or less specific contagion. I have done so in the hope of throwing some light upon the problems to which I have now to ask your attention. Dermatologists in the metropolis have, as many will be aware, from what has been written in the journals, been much interested, during the summer which is just passed, with what has been called "an epidemic of eczema" in two of our largest work-house infirmaries. Dr. Savill, of the Paddington Infirmary, was, I believe, the first to call attention to a group of about 30 cases which were at the same time under his care in the infirmary of which he has the medical charge. He was followed immediately by a communication from Dr. Lunn, of the Marylebone Asylum, where precisely the same thing was taking place. Dr. Lunn has had, during the summer, not less than 100 cases under his charge. Through the courtesy of the two gentlemen I have named I have been permitted opportunities of becoming acquainted with the facts and of seeing the cases. I will briefly say to you now

that these eczema epidemics seem to me to prove, very conclusively, what some of us had long ago suspected, that eczema may, in certain forms, become contagious from person to person. That it is self-contagious—that is, that it spreads by its own infection on the skin of the sufferer, is a doctrine which I have long taught in the most explicit terms that I could find.

The facts as to contagion in the case of ordinary Boils must detain us for a moment. It is well known that although boils are often solitary, yet they also often come in crops, and that when once the liability to them has commenced, it is very apt to persist. I do not think that any one who has observed the phenomena of a crop of boils, or of persisting liability to them, can doubt that the element of contagion takes its share in their production. The ill-health which often attends them is more probably produced by them than in the relation of cause. It is usually not difficult, by the simple expedient of covering the part with a leather plaister on the very first day that the boil is threatened, to entirely prevent its development, and by preventing the one you prevent the whole crop. When a succession occurs, they are almost always produced in close proximity to the original one, being, as it were, satellites to it. The cure of a tendency to boils consists not so much in attention to the general health, though that may be important, but in the suppression, by local treatment, of the individual furuncles, and thus breaking the chain of contagion.

There are forms of pustular skin disease to which the terms Impetigo and Ecthyma are applicable, in which yet more definitely than in common boils the fact of contagious spreading is demonstrated. Large areas of skin may become covered with them, and no treatment other than local measures is of any material avail. The success of the latter, however, usually completely proves the local nature of the malady. These affections are to be placed in the same group with boils, differing chiefly from the latter in the small size of the furuncle which is developed.

We have yet another malady of the furuncular class, which obviously owes its character to its locally infective qualities, but which instead of producing satellites and a group of detached pustules, spreads from the original spot in depth and width. The form of dermatitis known as a Carbuncle begins as a boil, but manifesting very active qualities of self-infection, almost resembling those of erysipelas, it spreads widely in all directions. In the not unfrequent cases in which it ends fatally, death usually occurs before this process of infective spreading has come to an end. The object of treatment is, of course, to put an end to this process of circumferential spreading, and we attain that object by local and not by constitutional measures. Although this fact is to be distinctly asserted, and although we may venture to add to it with great confidence

the statement that in the majority of cases carbuncles occur, as a sort of accident, to persons in good health, and might have been arrested in the early stage by appropriate treatment, yet we must also admit that in many cases constitutional measures take an important share. The liability to carbuncles to develop extensively in those who are the subjects of diabetes is well known. The admission of this fact may perhaps afford me a suitable opportunity for discussing briefly the possible influence of blood-conditions upon the development of morbid processes which have taken their origin quite independently of them. There is nothing in the least inconsistent with the theory of the local and almost accidental origin of boils and carbuncles and the admission that they develop more rapidly and more widely when there is sugar present in the blood. Probably, indeed, we have here only an illustration of a law of wide significance. It may be that in all cases in which the infective spreading of an inflammatory process is observed, that process is greatly under the influence of the food which is supplied to the tissues. We can easily understand that such may be the case with the specific bacilli. It would appear that a free supply of the animal fats is unfavourable to the development of the bacillus of tuberculosis. It is quite possible, may I not say even probable, that the bacillus of leprosy is much assisted in its development by a liberal supply of salt fish. And respecting the bacillus of anthrax, a disease chiefly incident to ruminants, it is held by at least one competent observer that its growth in the human subject may be stopped by refusing a supply of vegetable food. "Upon what meat does this our Cæsar feed, that he is grown so great?" is a question which we may do wisely to ask ourselves respecting each and all of the parasitic organisms which cause disease. It is not merely the introduction of the parasite into the body, but its supply of suitable food, which influences the production of a specific disease. Obviously there is something in the presence of mercury in the blood which is prejudicial to the life of the virus of syphilis. It has been supposed that the use of iodide of potassium very much favours the extension of erysipelas, and it may easily be the fact that there is something in the diabetic blood which helps that of carbuncle.

Perhaps there is no disease in the treatment of which it is more necessary to recognise the fact of contagious spreading than in common Acne. Although it is, of course, beyond doubt that the production of acne has relation to the age of the patient and the thickness and coarseness of his skin, yet I hold that it is equally beyond doubt that when large crops of acne spots are present they are the consequences of contagion from their predecessors. Constitutional treatment avails little or nothing. You may give purgatives, tonics or arsenic, to any extent, but if you neglect the local treatment of acne it will persist. On the other hand, although by no means recommending the omission of

constitutional measures, I yet venture to assert that persistent attention to local treatment will cure even the worst cases. These measures must be much the same in character as those necessary for boils. Acne pustules are indeed to be regarded as being a modified form of furuncle. They are to be destroyed or rendered abortive by the application of some caustic, such as the acid nitrate of mercury, or by the use of some ointment or lotion containing that mineral. It may be of interest in connection with acne to make the observation that there is nothing in the fact that a disease occurs symmetrically and manifests a distinct preference for certain localities, which stamps it as definitely, or as by any means certainly, of constitutional origin. Undoubtedly, whenever such tendency is observed, constitutional, or in many cases, anatomical, explanations are to be sought for it. But there is a partnership both as regards local and general causation, and neither anatomical peculiarity, nor a general proclivity, attaching either to the tissues at large, or to the blood, will explain the whole. I might instance many diseases which become quite symmetrical in their development, but which are yet in their origin due to an external and local cause. Scabies is frequently quite symmetrical, and pityriasis versicolor is almost invariably so. Thus there is nothing in the symmetry or in the wide diffusion of acne spots, nor in their limitation to certain regions, which opposes the idea that the disease is in the main aggravated and perpetuated by contagious elements derived from preceding pustules.

May I venture in connection with what has just been said to speculate a little as to the possible nature of that obscurely wonderful malady which we name Psoriasis? The eruption of scaly patches, capable of almost indefinite enlargement and multiplication, which constitutes this disease has obviously little or nothing to do with the general health. Its subjects are always in a good constitutional state, and should an acute disease occur it usually vanishes; to return, however, with returning strength. To a slight extent it is undoubtedly hereditary, yet it but seldom affects several members of the same family. It is not due to any inherited peculiarity in the structure of the skin, for those who suffer from it have usually enjoyed a perfectly normal state of the integument up to the time of its attack. Its development is usually so accurately symmetrical, and we know so well the precise localities which it prefers, that it has hitherto seemed almost impossible to place it in any other category than that of maladies due to constitutional causes. Guided, however, by the explanations which have just been given, we may now assert that these considerations are not in themselves sufficient to justify us in putting wholly aside the possibility of local causation. It is possible that in psoriasis one patch may be the parent of others, as it is obviously the cause of

spreading at its own edge. If, however, we entertain for one moment such a suggestion, it is obvious that we must face the difficulty of hereditary transmission, as well as that of explanation of the origin of the first patch. Only in entire default of a more plausible hypothesis can we venture the suggestion that it may be that some germ, of the precise nature of which we are as yet totally unacquainted, may, in rare instances, pass over from parent to child, and become the cause, when the proper age has been reached, of this most definite and most singular malady. We possess no facts which in the least favour the belief that psoriasis ever spreads from one patient to another. I will not trouble you with any statements in reference to a group of maladies which are clearly and closely cognate with psoriasis, such as pemphigus, lichen planus, and certain forms of nummular eczema. I will take at once a longer step, and adduce for your consideration the facts as regards the contagiousness of Lupus.

Of Lupus, we have two type forms—vulgaris and erythematosus, and, concerning these, the laws as to infective spreading are somewhat different. The patches of lupus vulgaris, as is well known to every one, spread, most persistently, by infection at their edges, but do not usually multiply in number. The suspicion as to blood infection is far greater in the case of lupus erythematosus, in which malady the patches often become very numerous, and are, as a rule, arranged symmetrically; yet these differences, when we look at them closely, are differences in degree, and not such as should absolutely separate one malady from the other. There are cases of common lupus in which the patches are very numerous and placed at great distances one from the other. It is a curious, and I cannot but think, an important observation in reference to these, that the tendency to multiple production is almost always manifested early on in the case and quickly comes to an end. We never think of suggesting to a lupus patient, after once the disease has well declared itself, that he may probably have other patches break out. We know well that the disease will restrict itself to the steady enlargement of those which are present. There is, however, in the very earliest stage, before, it may be, the disease has become well marked as lupus at all, in which it is distinctly inflammatory, and in which there is a definite tendency to general infective spreading. I will adduce a case as an illustration of what I refer to, and then pass on. A little boy in whom whilst in good health an inflammatory patch appeared on one leg, had it quickly followed by a general eruption, which was lichenoid in some parts, pustular in others, and in yet others assumed an almost rupial character. His trunk and limbs were almost covered with spots, but the large majority of these disappeared under treatment, whilst the

sores which had looked like rupia lost their crusts and settled down into patches of non-ulcerating lupus vulgaris. These latter, near twenty in number, have, during five or six years from the onset, continued to spread. Since the first outbreak, however, no new patches have been produced.

It is customary in the present day to consider lupus vulgaris as a tubercular disease, and to attribute its infective spreading to the presence of the bacillus. This may be so, but we must not forget that there are plenty of connecting links between lupus erythematosus and lupus vulgaris; that the former malady often manifests much more active properties than does vulgaris, whilst yet the presence of the bacillus has never been demonstrated in it. The frequent origin of the latter in connection with chilblains or sunburns is, I think, undoubted, and may be cited with many other items of evidence as opposing the idea that the disease is obtained from some external contagion. The remarkable liability of both forms of lupus to be attacked by erysipelatous inflammation must not be lost sight of, since it may possibly supply us with a hint as to the true nature of lupus on the one hand and of erysipelas on the other.

The interest of the lupus family of diseases does not, however, in reference to contagion, end with the two common types which I have mentioned. There are many other most interesting affections of the skin, which are clearly allied to lupus, in that they are capable of indefinite infective spreading. If we are to attribute the various forms of Lupus to parasitic causes it becomes almost certain that the bacilli may remain long latent. There is scarcely ever the history of an injury likely to have been attended by infection.

Concerning this possible latency of infective material, the clinical observer has many interesting facts to supply for the investigation of the histologist. In some cases there is a prolonged, possibly indefinite, period of latency after the reception of the poison before it manifests any effects. The facts are numerous which favour the belief that the tubercular bacillus may remain for many years without producing symptoms. We know also that a patient may have left a leprosy district for many years and have resided during the interval in a country where the malady is unknown, and may then become its victim. In some instances of this late development of leprosy the disease, when once it has begun, runs its usual course without any apparent retardation.

In respect to many of the specific animal poisons which produce exanthematic fevers, we know with tolerable accuracy the duration of the stages which they observe. This is true of smallpox, scarlet fever, measles, chicken pox, and syphilis. In most of these, however, exceptional facts occur which require further investigation. Thus chicken

pox is very apt to vary, within very wide limits, in the length of its stages, and there are remarkable cases in which its eruption may appear over and over again for some months.

Similar phenomena are also not unfrequently seen in Syphilis, but inasmuch as the cases have usually been complicated by the use of a drug which appears to restrain or even to destroy the specific cause our inferences must be made with more caution. In Hydrophobia, however, we appear to have an undoubted example of a disease the poison of which may remain at rest in the tissues for an indefinite time, and then suddenly reveal its presence by the production of acute symptoms due to blood-infection. It cannot be doubted that whilst in some cases symptoms may develop within a fortnight, and in most come on within six weeks, they may in some instances be postponed for two years or possibly even for ten. This fact, so well demonstrated in this very definite disease, is one which we must keep in mind in our investigation of other and more complicated conditions.

The facts are very curious which seem to prove that specific contagia may after the occurrence of an infective outbreak pass into a condition of rest, and then, after a prolonged interval, again manifest their presence and power. Most of them must be regarded as still needing further elucidation and proof. They occur, however, in almost all departments of clinical observation. The recurrence of eruptions of syphilis and of varicella I have just mentioned. Some of us believe firmly that alopecia areata is often a sequel of ringworm, and that it may be produced many years after its predecessor has been apparently quite cured. The phenomena of recurring erysipelas, more especially as almost constantly observed in elephantiasis, are well known to all. In the intervals of these attacks the part is quite free from erysipelatous inflammation. Yet more startling, however, are the cases in which a patient after some trivial operation develops erysipelas, and enquiry elicits the statement, that some years ago the same part suffered from the same disease. I have at present two patients under care who were cured of lupus of the nose by vigorous treatment in early life, and in both of whom, after an interval of twenty-five years, the disease has returned in the same part. It is impossible not to suspect that in such cases some germ-material was left behind in a very inactive condition, which remained undeveloped during the vigour of adult life, but again assumed growth when the advent of senility had weakened the tissues. To sum up, I may assert that we are as yet very far from knowing the limitations of the laws under which infective material may remain latent in the body.

## CONCLUSION.

It is time, Gentlemen, that I should attempt to state the conclusions to which the facts I have brought before you seem to point. They are mainly these:—That it is not possible in the case of most of the ordinary forms of inflammation for the process to continue long without being productive of, or attended by, a contagious material; that it is not reasonable to suppose respecting the very various inflammatory maladies which we recognise that they are severally due to accidental infection with some specific particulate virus, destined in each instance to provoke its special train of phenomena; that it is more likely that the inflammatory process takes its peculiarities from the tissues which are first involved, and from the character of the influence which acted as the exciting cause, linked together with peculiarities pre-existing in the patient's state of health. I have not ventured to theorise as to what may be the exact nature of the materies which constitutes the means of contagion in common inflammation. It may or it may not be the fact that it is invariably of a bacillary nature. We are not as yet in a position to dogmatise on this point. Undoubtedly bacillary elements do attend certain of the forms of the inflammatory process which we have been discussing. It may be that elements of this nature are constantly present in our tissues, and wait only for that sort of damage, or disturbance of vital energy, which inflammation brings to become prolific, and thus to assert their force. Whatever may be our ultimate developments of knowledge on this point, I venture to believe that the only safe working hypothesis for the present is that all inflammations, with the exceptions which have been noted, tend to produce a materies competent to perpetuate the process after the pattern of its original type. Erysipelas remains erysipelas, a furuncle begets a furuncle, and an eczema produces eczema. Whilst it may, I think, be reasonably insisted that our principal measures of treatment ought always to be directed to the prevention of the local spreading of the malady, and that, too, chiefly by means of local measures; and whilst I believe that the acceptance of this doctrine would effect a great simplification in therapeutics, I would by no means venture to disregard other and contributory causes. That there do exist peculiarities in the patient's state of tissues and general health, which are not only personal, but may be transmitted by inheritance, and which may very materially influence the course of any inflammation which may be excited, cannot, I think, with any reasonableness be denied. Despite the long-recognised infective qualities of tuberculosis, and the recent discovery of the bacillus, I am far from thinking that the "scrofulous diathesis" has become a fetish. In not a few, however, of the diseases to which I have adverted the element of constitutional predisposition appears to play an exceedingly small part,

and we have to seek an explanation of the malady in the laws of infective inflammation. I have even ventured to extend those laws to another domain, namely, to that of the diseases known as malignant or cancerous. I must not now enter upon this topic in any detail, but will simply say that, respecting a large majority of cancerous diseases, more especially those of external parts, it appears to me that common inflammation usually precedes that of a malignant type. The chief practical difference is, perhaps, that the cancerous process is but very rarely capable of spontaneous resolution, and still more rarely amenable to treatment directed to that end. The infinite varieties of type which it assumes are to be explained in precisely the same way that we explain the different types of the inflammatory process—they depend in the main on the nature of the tissue first attacked. That tissue (as in the instance of melanosis) produces an infective materies by which the process is extended and multiplied. It may be that some form of bacillary growth attends almost all forms both of inflammation and of cancer ; but that there exist specific germs which are the sole causes of the various types of these maladies, and potentially contain their peculiarities, in the same sense as the virus of smallpox does that of variola, seems to me in the present state of knowledge very improbable.

In making these remarks, I can but hope that you will not accuse me of dealing in a merely transcendental pathology—in other words, of beating the wind. On this point I have myself no misgiving, but, on the contrary, feel assured that, whatever may be its explanation, the doctrine of the infectiveness of almost all forms of inflammation is of primary importance in the attempt to develop better rules for prompt and effective treatment.