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BY

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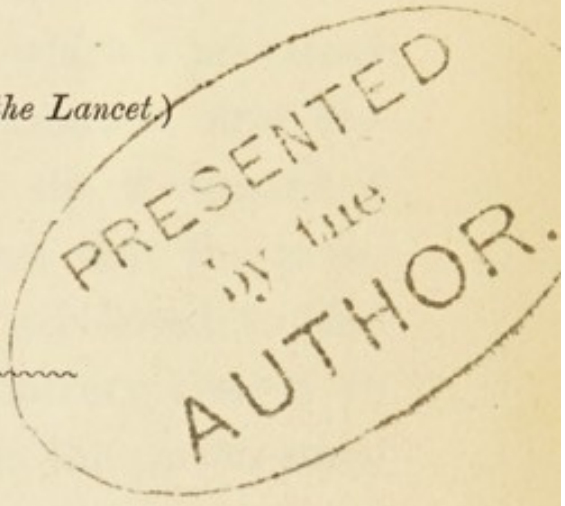
(Reprinted in part from the Lancet.)



PUBLISHED BY
J. & A. CHURCHILL, NEW BURLINGTON STREET,
LONDON.

1872.

LONDON:

HARRISON AND SONS, PRINTERS IN ORDINARY TO HER MAJESTY,

ST. MARTIN'S LANE.

PREFACE.

GREAT part of the following remarks appeared in the *Lancet* during the course of the past year. The facts which they embrace are familiar to those who have given attention to the subject of tumours, whatever may have been the different views deduced from them. I have, however, been led to publish my observations chiefly from noting the prejudicial influence, as I deem it, which a prevalent theory concerning the mode of formation and dissemination of Cancer exercises in the treatment of that disease. It will be perceived that the principal purport of the arguments advanced in the following pages in support of a contrary view is to urge upon Surgeons promptitude in the performance of operations for the removal of cancerous tumours at the early stages of their formation; as the surest means, if in any case practicable, of averting the direful sequels of the disease.

Wishing, therefore, to keep strictly within the

limits of an inquiry into the origin of Cancer, and the practical conclusions to which such an inquiry would lead, I have abstained from entering on considerations either of its histological characters, or its course, or symptoms. For the same reason I have left untouched the modes of treatment calculated to alleviate the sufferings attending it. There is no lack of works in which these points are amply considered.

The subject was most ably treated, under various aspects, by my friend and colleague, the late Mr. Moore; and I believe that at the time of his lamented death he was collecting materials in further support of his views. The careful observation, the exactness of detail, and the happy ingenuity which characterised all his work, could not have failed to make a deep impression on the minds of his readers. That his writings greatly modified the general opinion of Surgeons upon the nature of Cancer, there can be no doubt. But as yet, even amongst those who admit the local origin of Cancer, the result has been rather a vague and inoperative acceptance than a practical realisation of its truth. This, in great measure, has arisen from the question being regarded as interesting to the Pathologist rather than to the Surgeon. The converse I believe to be the

fact. However instructive it may be to trace the analogies of morbid growths amongst themselves, or to establish differences between them and the natural structures, the value of the whole knowledge gained, if it ended there, would be outweighed by a single case of life prolonged or suffering averted, through sounder views of treatment based upon it. It is to the Surgeon in his daily practice that the questions are really important.

In conclusion, I would wish it to be understood that my observations are intended, not as a complete treatise but rather as headings for fuller discussion than the subject has as yet received.

I must take this opportunity of expressing my obligations to some of my colleagues, and especially to Mr. Shaw, for the assistance he has afforded me.

Jan., 1872.

ON THE ORIGIN OF CANCER, ETC.

WHAT is the origin of Cancer? Few questions in pathology are of greater interest and importance. On the answer we are prepared to give to it depends the practice we should be prepared to follow. On its true solution depends the probable success of that practice. Not until it is correctly answered can we rationally approach the yet more important one, Is cancer curable?—and if so, through what channel, and by what agency?

There is in the present day a considerable diversity of opinion as to the origin of cancer. By most it is considered as a blood disease; by some it is believed that while there is a morbid element in the blood, there must be a special condition of tissue as well. Some, while hesitating as to there being any *materies morbi* in the blood, yet look on it as necessarily constitutional; and some would regard it as, in its early stages, a local disease, either with or without a pre-existing constitutional tendency. It is in favour of this latter view that the following remarks are made.

From the earliest times the difficulty of eradicating the disease has been recognised. Hence it was looked on as arising from some unwholesome state of the

blood or humours, and there is no doubt that a large majority of surgeons in the present day hold to, and act upon that view, although at no time has it been universally adopted. There is, perhaps, less of positiveness, certainly less of unanimity, on this point than there was some years since, when it was generally taught that cancer was essentially a blood disease, manifesting itself in a part, much as an inflamed toe is supposed to come on from a gouty state of the blood. If this is not now so generally held, yet still the majority would maintain that there must be a special condition of the blood antecedent to the appearance of a cancerous growth.

It would be strange if a disease which holds its own with such a terrible grasp, in spite of all efforts to tear it away, were not regarded as having an origin far deeper in the system than a fatty or an adenoid tumour. Its constitutional origin seems to be assented to on the grounds of the general belief of our predecessors, and by the indisputable facts which daily pass under our own eyes: and these facts are strong. The Horatian dictum with regard to the self-assertion of Nature herself will apply to cancer —remove it, cut it or burn it out, but it will spring up again. Such is the general and sad experience of all surgeons. Happily, cases do occur which show that the rule, though general, is by no means universal. Patients from whom cancer has been removed have lived for many years, and died of other disease, no trace of cancer having shown itself in the intermediate time. But this, as the believers in the

doctrine of blood-poisoning very justly say, is no proof, even in the individual case, that the disease is not still present in the system, since we often find that a patient remains, after operation, to all appearance absolutely free from it; and that, years after perhaps, fresh tumours become developed. Or, it may be said again, that the blood-taint, though originally present, may have become exhausted at the time the tumour was removed.

Then, again, we have evidence that cancer is very often hereditary; and it is a not uncommon impression that hence it must arise from some general morbid cause. Though the notion of any necessary connection between hereditary tendency and a morbid condition of the system is questionable, the fact that such tendency does exist is indisputable. Sir James Paget traces hereditary tendency in one out of every four cases; Mr. Sibley, from the cancer records of the Middlesex Hospital, in one in every nine.* It is not improbable that the hereditary tendency may be more common still. We get more evidence of it from private than from hospital patients; the latter as a rule knowing less of their remote family history than the former; and our averages are made up largely from hospital records.

Another and a very common event in the history of cancer, and which seems to lend countenance to the view that it proceeds from some general cause, is the outburst of tumours in various parts of the body; in any or all tissues—brain, muscle, liver,

* "Medico.-Chirur. Trans.," vol. xlii, p. 111.

kidney, bone, lung, heart—all may be found the seat of cancerous deposit, and, so far as we can judge, in some cases of nearly, if not entirely simultaneous occurrence. But reasons will hereafter be given for doubting whether cases of multiple *primary* cancer are really ever met with.

Evidence of the constitutional nature of the disease has been sought in the assumed fact that cancer is found in families of consumptive tendency. It is, on the other hand, however, admitted that cancer and tubercle, though not antagonistic, rarely co-exist in the same individual: and, under the recent investigations on the causation of tubercle, the views of pathologists as to the constitutional origin of this condition have been very greatly modified.

Lastly, we have the evidence of the general contamination of the whole system—the wasting, the peculiar cachexia, the disorganisation of the digestive system; and these not, perhaps, always dependent upon the deposit of the disease in vital organs, nor on excessive discharge, but apparently either on some vitiation of the blood and the tissues, or on defective or perverted assimilating power of the stomach. Dr. Fenwick has shown that, in the later stages at least, the mucous membrane of the stomach is diseased.

It is not surprising, then, that surgeons should have come to regard cancer as from the first a constitutional or blood disease. Indeed, it is not easy to account for all that we observe in cancer without adopting some such hypothesis. But, on the other

hand, there are many facts which oppose themselves to this view, and there are other modes of accounting for those characters which most strongly support it. I do not think that the importance of the question is in general so fully realised as it should be. Some, indeed, seem to consider that, practically, the question is not worth discussing. Yet, surely, if cancer be a constitutional or a blood disease, we must strive to find some corrective to the constitutional taint or to the blood poison. It should be our first and most imperative duty to ascertain, if possible, whether the local disease be the result of some error in the organising or nutrient function of the tissues; or whether it be the actual deposit of some poison previously existing in the blood.* If the former, our aim must be to find out the source of this error; if the latter, to learn the nature of the poison, and to be able to detect it. Then we might have a reasonable hope of being able to do, what has as yet proved beyond our reach—viz., to cure or even to modify cancer by general treatment. But if cancer be, at any period of its existence, a purely local disease, we should hope that by earlier and more complete removal, better and more generally permanent results may be obtainable than we can at present boast of.

Admitting fully the difficulties which lie in the way of arriving at a perfectly satisfactory conclusion,

* "For the present I will only say that I think malignant tumours are local manifestations of some specific morbid states of the blood, and that in them are incorporated peculiar morbid materials, which accumulate in the blood, and which their growth may tend to increase."—Paget, "Lectures on Pathology," p. 383.

and notwithstanding the high authority of those who adhere to the more commonly received opinion, I may state that the more I consider the question, the more do I hold to the view which has been so ably advocated by my late colleague, Mr. Moore; and which is maintained by many in this country, and by Virchow and other German pathologists. That there may be an inherent or constitutional tendency to cancer I fully admit; but that it is in any sense to be regarded as a blood disease seems to me to require stronger evidence than we have yet obtained. I should say that cancer and allied diseases partake more of the nature of parasitic disease than of the results of previous blood poison. The final destiny of such tumour will depend, not on any special chemical or nutrient element, but on the nature of the growth itself.

This seems the view taken by Mr. Huxley. In his presidential address to the Association for the Advancement of Science (1870), he says, speaking of xenogenesis, "It is only in pathology that we find any approximation to true xenogenesis; and it is furnished by the various structures in which, under the influence of certain external conditions, elements of the body which should have developed in due subordination to its general plan, set up for themselves, and apply the nourishment they receive to their own purposes. From such innocent productions as corns and warts there are all gradations to more serious tumours, and in the terrible structures known as cancers, the new growth

has acquired powers of reproduction and multiplication, and is only distinguished by form from the parasite worm, the life of which is neither more nor less closely bound up with that of the infested organism."*

To a certain extent I admit an inherent tendency to this disease; but I admit equally an inherent tendency to warts, or to fatty and other simple tumours. I cannot suppose that there is in the body material which must work itself out of it, and which selects this situation or that, indiscriminately; or perhaps makes use of one in preference to another from finding a tissue better prepared for its reception. I cannot suppose that there are various kinds of this morbid material—one breaking out as scirrhus, another as epithelioma, &c. If the cancer poison be of one kind only, we should surely find it more frequently appearing in the same individual at one time as encephaloid, at another as scirrhus, at another as epithelioma, or some other form of malignant disease. Yet this is seldom the case. I quite admit that the nature of a cancer will be modified by the character of tissue in which it appears, and by the general activity of the tissues. We may find this in gout, or rheumatism, or syphilis. But the sufferer from either of these diseases will be liable to attacks of it at different times in every possible form, or in many forms at once, and this we do not often find in cancer. Other general or blood diseases, as the exanthemata, will produce structural change only in certain tissues. But, however mild

* See also Mr. C. H. Moore, "Antecedents of Cancer;" and article "Cancer—System of Surgery." 2nd edition.

and however limited the local manifestations of any recognised blood disease (so called) may be, we find evidence of a general affection of the system as well. We cannot say as much for cancer.

Before entering further into the question, it will be desirable to settle what we include under the terms "cancer" and "malignant:" and here we find at once wide divergencies in the opinions of pathologists. Paget says, "The chief distinctions [of malignant tumours] are to be traced in certain characters which in the malignant tumours or cancers (for these terms are synonymous) are superadded to those already cited as belonging to the whole class"—*i.e.*, of tumours. And he lays down six characteristics more or less prominent, and more or less divergent from any found in innocent tumours. These are—

1. Dissimilarity in structure from natural tissue.
2. Tendency to infiltrate the structures around them.
3. Tendency to softening and ulceration.
4. The indisposition of the ulcer to heal, and the continual formation round the ulcer of new morbid material, which goes through similar changes.
5. Not only enlargement of original tumours, but tendency to multiply and propagate themselves.
6. That in their multiplication and ulceration there is scarcely a tissue or organ which they may not invade.

While thus defining malignancy, Sir J. Paget would limit the application of that term to cancer. Assuming, however, that these are the signs of malignancy, we cannot absolutely limit that term to

what are generally recognised as cancers; but we must, I believe, include such diseases as cystic sarcoma, enchondroma, fibroma, lymphoma, &c., which, as we shall see, *may* present all the characters here laid down. Sir J. Paget, it is true, while not prepared to admit that these growths are truly malignant (unless in those cases where true cancerous structure is mixed up with that of the tumours), yet cites cases in which, he allows, there are characters of malignancy which should make us cautious.

The view generally accepted is, that the term "cancer" should be restricted to tumours having in common one special character, in addition to those above enumerated. This character is the presence, in greater or less abundance, of ununiform cells with large nuclei, having no cohesion with one another, and, indeed, for the most part floating freely in a clear fluid in the alveoli of a fibrous stroma. This is the view taken generally by Virchow and his school, and, as appears from the published reports of their committees, by many distinguished members of the Pathological Society of London. Most of these authorities, however, do not limit the term malignancy to cancer, but admit the malignant nature, the infecting power, the dissemination, the tendency to recurrence, of other forms of tumours, calling them malignant sarcoma, malignant enchrondroma, &c. This is not a mere matter of definition of terms; on the contrary, it is one on which depends, to a great degree, the solution of the question—Is cancer a blood disease?

Although I shall use the term cancer in its ordinary acceptation, I may here state that I do not regard this disease as essentially distinct from other recurrent and infiltrating growths. I mean that I do not suppose that there is any difference in the albumen, and the gelatine, and the blood of one or other of these; that there is a special *materies morbi;* on the contrary, I conceive that the difference is one of arrangement only—a difference of more or less. The reason why cancer shows so much more of the nature of malignancy than other forms of tumour may be found perhaps in the simple fact that the elements which compose it are so much more free from cohesion, so much less organized; and that they are not, for the most part, separated from the tissues in which they lie by any limitary membrane, but grow at the expense of these tissues. Thus the free unadherent germs of growth can readily be taken up by the absorbents or blood-vessels or loose connective tissue spaces of the parts in which they are growing. We shall see that this takes place in regard to structures far more compact than cancer.

We may now consider in detail those special characters which have led to so firm a belief in the blood origin of cancer. Perhaps that which seems to be the most conclusive evidence to the large majority of those who hold this view is the almost constant recurrence of the disease after removal. Entire and permanent immunity does occur, but it is undoubtedly rare. In such cases it would be said, first, that the blood-poison having worn itself out, or

been eliminated by the formation of the tumour, no further development took place when the local tumour was removed; or, second, that two conditions were necessary for the formation of cancer—one, the blood-poison; the other, a fit state of tissue in which it might manifest itself; and that, a tumour having been removed, there remained no fit nidus for its reproduction. The first view is that taken by Mr. Simon, who considers that the tumour stands in the same relation to the *materies morbi* as a secreting gland does to the matter eliminated by it. The second view is that maintained by Sir J. Paget.* It need scarcely be remarked that these two conceptions would necessarily lead to opposite modes of practice; for if the tumour be an eliminative organ it would be undesirable to remove it at all, as the disease must find some outlet; and many surgeons, acting on this view, object to early operation. But if it be supposed that on the removal of a tumour no other tissue is in a condition to take on the diseased action, it would be well to operate early, if only on the chance of such a want of consent between the blood and the tissues.

These cases of permanent cure after operation are, we must admit, exceptional. The more common event is that, after the removal of a tumour,

* "The general history of cancers and their analogy with other diseases that are in the same senses, specific and constitutional, imply that, before the formation of a cancerous growth, two things at least must coexist: namely, a certain morbid material in the blood, and some part appropriate to be the seat of a growth incorporating that material, some place in which the morbid material may assume of enter into, organic structure."—Paget, "Lectures," &c., p. 785.

there is immunity for a longer or shorter period—some months or some years. Is the blood diseased during this time? Are the other tissues free from disease? It is most important here to consider the mode of recurrence of the disease. It is a recognized fact that cancer rarely returns either in an organ corresponding to its original seat, or indeed in any organ which is the usual seat of the primary disease. A cancer in the breast, *e.g.*, rarely returns in the opposite breast; so in the testicle, or the eye, or the side of the lip. Primary scirrhus, again, is rare in the lymphatic glands, in the integuments of the trunk or limbs, in the lungs; while its most common seat is the female breast or the uterus. Now, supposing that recurrent cancer is a result, *de novo*, of the continuity of action of a morbid process originating in a diseased state of blood incombination with a fitting tissue, should we not expect that the return would be almost always in some organ which is the common seat of the disease? Take, for example, an excision of the female breast. The patient remains well for two years, and the disease then returns. If this be a new development dependent on constitutional causes, it would be strange indeed if we did not often find it taking place in the other breast, or in the uterus; still stranger that it should occur in nineteen cases out of twenty in tissues or organs which are rarely the seat of primary cancer. Yet such is the fact. Mr. Sibley,* in his careful analysis of 520 cases of cancer observed

* Sibley, "Med. Chir. Trans.," vol. xlii.

in the Middlesex Hospital, did not find one in which a recurrence of the disease took place in the ordinary seats of the disease. Mr. Henry Arnott has more recently met with two or three instances, out of many hundred post-mortem examinations, of the recurrence of cancer evidently as a new disease. Dr. O'Meara, of Carlow, mentioned to me the case of a gentleman who was operated on for lip cancer, which remained quite sound, but four years after he died from cancer of the pylorus.

There can be no doubt then that cancer may spring up as a primary disease in more than one organ. The wonder is that it does not do so more frequently. But surely the fact of the extreme rarity of this occurrence should make us pause ere we admit that a cancer-poison in the blood is one of the factors in the production of cancer. I quite admit the plausibility of the argument that an operation may so change the tissue of the part operated on as to make it a fitting seat of future disease. I admit it as an argument, but not as a fact at all proved. Indeed, the weight of evidence lies the other way, for patients with cancer, or who have had cancer removed have been subjected to injuries, and have undergone operations in other situations, and for other diseases, but in no case, I believe, has a cancerous growth taken place in consequence of or in connexion with the injury. I once removed a large tumour weighing four pounds from the left breast, and which had been growing for five years, from a healthy looking woman of fifty-five. This was considered by the morbid growth

Committee of the Pathological Ssciety to be a form of small-celled sarcoma. In the opposite side was a well marked cancerous tumour of a year and a half's growth which had already involved the whole breast, and the neighbouring glands. Yet, notwithstanding this the wound healed very rapidly, and she never had any recurrence of disease on that side, but died two years and a half after the operation from the cancer in the opposite breast.* Here, if the effect of operation were to render the part prone to take on cancerous action, where cancer was present in the blood, we should have expected to find some cancerous growth in or about the cicatrix, but none occurred. A single case of course proves nothing; but I adduce it as a marked instance of a not uncommon fact. But even supposing the argument to be valid, it will only apply to those cases in which the return is in or around the cicatrix, not to those where distant lymphatics, or lungs, or other internal organs are affected, the cicatrix remaining sound. And still the difficulty of accounting for the fact that, with a cancerous state of blood existing for a length of time, no recurrence takes place in the organs most prone to the disease would remain the same. The influence of local condition must be at least more powerful than that of blood.

And during all this time, as well as before the discovery of the original tumour, the patients are usually in robust health. Nothing can be more erroneous than the belief entertained by those who have not had much experience of the disease that

* "Transactions of Pathol. Soc.," vol. xix, p. 394.

there is a cachectic condition in the early stages of cancer. To use the words of Professor Humphry, "So much is said and written about cancerous cachexia, that cachexia comes to be regarded as a necessary associate of cancer. Hence physicians and surgeons rely upon it as a means of diagnosis, and conceive that a disease cannot be cancerous because the patient's health is good. Whereas, in reality, cancer, especially in early and middle life, fastens itself often, I would say oftenest, upon those who are well nourished and florid, who seem the most healthy and robust, and so give promise of long life and vigour."* This point is of the utmost practical importance; yet it is generally ignored, or rather the opposite opinion is generally entertained. Tumours are discovered, and are allowed to grow till too late for removal, the patient, or perhaps the medical attendant, considering that there was nothing of consequence in them because there was no appearance of cancerous cachexia. In reality, however, the fact that a tumour is developed in the breast of a person otherwise in sound health, and over thirty—a tumour painless, and only discovered when already of considerable size,—is enough to justify more than a suspicion that it is cancer. If cancer ought under any circumstances to be removed by operation, I suppose few will deny that the sooner it is done the better. But what chances of successful removal are daily thrown away owing to the presence of those very conditions which should most surely excite suspicion in

* Holmes's "System of Surgery," 1st edition, vol. iv, p. 597.

the mind of the surgeon! I hope I may not be misunderstood in what has been here stated on this point. It refers to the large majority of cases. There is no doubt that cancer does attack those who have been delicate, and have suffered from one complaint or another all their lives; but even in such persons there is usually nothing from which one could predicate the after-development of cancer as one usually can in the states of health leading to tuberculosis.

There is another circumstance in connexion with the recurrence of cancer after operation which to my mind is very significant. I have noticed, and it has been verified by the observation of many others, that concurrently with, or following on, the development of cancer, small outgrowths of warty, or vascular, or dermoid structure are frequent. Now one would imagine that, if there were a cancer-poison in the blood, these or one of them would become the seat of the disease. But it is never the case, although a large outbreak of cancer may have taken place in other situations, which are the usual seats of the disease after operations, but the rare ones independent of them. The frequent coexistence of cancer with other growths will be again alluded to.

The hypothesis of the double origin of cancer—a morbid state of the blood and an abnormal state of local tissue fit for its invasion—presents then this difficulty. It implies that this diseased blood-condition may exist and be long present—indefinitely long for aught we know—without any, even the

slightest, deviation from robust health. Something allied to it may be seen in syphilis, but with a difference. A person may have a syphilitic taint, of which there will not for a length of time be any external manifestation. But after an accident, or other derangement, the influence of the poison may display itself. In cancer, on the contrary, whether previous to its recognised development or while it is present, or in the interval between operation and its recurrence, up to the time, in short, when cachexia has actually set in, any injury, as a wound, a bruise, or a fracture may occur, and no influence of the disease be manifested. Unless in the case of syphilis all blood diseases are attended by a state of deviation from sound health, even when there is no external or local expression of disease.

There are other and stronger grounds perhaps for considering that the persistent redevelopment of cancer is no proof of the presence of a blood-poison. There are few forms of unencapsuled tumours which do not from time to time exhibit precisely the same tendencies to reproduction as we see in cancer itself, and these are indeed sometimes manifested even in encapsuled tumours. Fibroma, enchondroma, myxoma, sarcoma, myeloid, &c.—all may show the same tendency, though no trace of cancer structure can be detected. In many forms of tumour—as the recurrent fibroid, for example—the disease, after apparently complete extirpation, returns only in the original neighbourhood. It may be remarked, too, that a long period may elapse between the

operation and any appearance of return. But often we have a general dissemination as wide-spread as is ordinarily found in recurrent cancer. Thus, in a case of fibro-plastic tumour which I brought before the Pathological Society,* there were secondary tumours in the liver and kidney, and the lungs were remarkably studded with them. These secondary growths in the lung were all encapsuled, and in no place could any trace of cancer structure be found. In another case, recorded in volume xx of the same Society's Transactions, a wide-spread deposit of cartilaginous and of spindle-cell tumours in the abdomen and chest followed the removal of a cystic disease of the testicle two years previously. The original tumour contained cartilage-nodules, and was perhaps, as Virchow has pointed out, originally an enchondroma. No cancer structure could be found. Such cases are by no means rare. Indeed some do not hesitate to say that owing to the large size and extreme delicacy of the vessels, which frequently allow the elements of the growth to be carried freely to the lungs and liver,† more numerous secondary deposits may often be found in those organs in cases of sarcoma, than are seen even in cancer. Be that as it may, the fact of the dissemination of the elements of many diseases, not cancerous, is now so universally recognised that it is hardly necessary to do more than call attention to it.

* "Pathological Society's Transactions," vol. xxi, p. 71.

† Dr. Green, "Outlines of Pathology."

Although, however, we have this tendency to recurrence and wide dissemination in non-cancerous tumours, there is often, it must be admitted, a difference in the seats of recurrence. In the fibrous or cartilaginous, or other non-cancerous growths, the secondary tumours appear sometimes in the line of the absorbents leading to the more central parts, but most commonly in the direct line of the venous circulation, as toward the lungs or liver; and we rarely, if ever, find recurrent non-cancerous growths in organs out of the direct line—if we may so speak—of infection. Thus we should not expect a myeloid or a sarcomatous tumour of one limb to be followed by a similar outgrowth in the brain, or in the muscles of a distant part, or in one of the other limbs. In cancer, scirrhous and encephaloid particularly, we are not surprised to find recurrence in any situation or in any tissue. This is, after all, a question of degree. Epithelioma is as truly cancer as scirrhous, yet we find very little disposition in it to contaminate distant organs; the neighbouring lymphatics and the parts surrounding them are the chief homes of its secondary deposit and growth. It must be admitted, too, that cancer gives rise, in its later stages, to a cachexia far more marked, in proportion to the amount of actual structural disease, than is usually seen in the case of non-cancerous growths. But, as we shall see, the cancerous cachexia is the result for the most part of cancerous ulceration.

No doubt exists in the mind of most pathologists

as to the mode of recurrence, in some tumours, cancerous or non-cancerous. The diseased structure finds its way into the absorbents, or the veins. In the former, it lodges and grows. In the latter, it is borne away, deposited, just as other minute emboli would be, and sooner or later is developed at the seat of arrest. Paget* relates a case in which the matter of an enchondroma was found in the lymphatics of the testicle, and had made its way by ulceration into the interior of the vena cava; the lungs were studded with secondary enchrondromatous deposits; many small shrub-like growths were also attached to the inner membrane of the branches of the pulmonary artery. Nothing could be clearer than the course of the disease in this instance: a cartilaginous tumour in the testicle; cartilage-growth traced up the lymphatics of the cord; one of these growths ulcerating into the cava; particles of this growth washed away in the current of the blood; some adhering to the pulmonary artery, others, forced onwards to the smaller ramifications, arrested and forming encysted nodules of the disease. We have, in fact, the ordinary conditions of embolism; but the emboli are living and growing, instead of being mere inert exudations. It is far easier to explain the recurrence of disease in such cases, whether cancerous or not, than in those in which, without extending to distant organs, the disease pertinaciously refuses to be eradicated from the site of its first invasion. Take keloid or some forms of recur-

* "Lectures on Pathology," 3rd edition, p. 525.

rent fibroid for example, which cannot surely be reckoned amongst blood diseases. In the former, especially, the whole course of disease is so purely local that we could no more attribute it to a general cause than we could a wart or an atheroma or a nævus. The cicatrix keloid of Dieburg is frequently associated with the removal of some innocent tumour, such as chronic mammary. As the wound heals, which it may do readily, the cicatrix assumes the peculiar character of keloid. The places in which sutures have been inserted take on the same character. The affection increases up to a certain point, and there stops. Remove it, with a large amount of the healthy skin around it, and as healing takes place the keloid re-forms. Here, then, we have a condition dependent on the cicatrisation of an apparently healthy skin; stationary, or nearly so, when once formed, but recurring after removal, however freely the operation may have been performed. But while it will take place on cicatrices in some situations, wounds in other parts may heal without any appearance of the disease. Save in the disposition to recurrence in a cicatrix, there is no point of similarity to cancer or other malignant disease. The course of some recurrent fibroid tumours is very similar, but in them there is a far greater tendency to extension and to recurrence at a distance from the original seat of disease, yet still within narrow limits. Now, although these could under no circumstances be regarded as blood diseases, but must be the results of some peculiar state of tissue, the

tendency to recurrence is, I believe, far more difficult of explanation than it is in such diseases as recurrent enchondroma, where the morbid structure can be traced into absorbents and blood-vessels; or as in cancer itself, where, besides in these, it can be found spreading in the connective-tissue spaces.

It will be necessary to enter at length on the subject of the dissemination of cancer. We may start from the recognised physiological fact that every tissue has its own special power of reproduction. The blood brought to the several tissues is the same; the particular tissue uses what it requires, and produces its like. I do not discuss the question where, in the tissue, the power resides—whether in granule or nucleus or in cell. The experiments of Ollier have demonstrated that the scrapings of the soft inner layer of periosteum will form bone-nodules in whatever tissue they may be implanted. The recent practice of transplantation proves that epithelial cells planted on granulations will germinate and form layers of new epithelium. It is in tissues of low vitality and great tenacity of life that such experiments succeed; but they are sufficient to prove the fact. Hence we should expect that in cancer this growth from transplantation would be even more likely to occur, as it exceeds other tissues in the low vitality of its elements. Intentional experiment has, of course, not been made on the human subject; but chance indications have not been wanting. Several cases, some of which have occurred within my own experience, are recorded of men, whose wives have had uterine cancer, having

themselves been victims to cancer of the penis. These *may* be, and probably are, mere accidental coincidences. We must own that there is no sufficient proof that cancer may be communicated from one person to another. Further evidence is still required on this point. There is, however, no want of evidence of auto-inoculation. My colleague, Mr. Shaw, attended a patient whose pendulous breast, the seat at its most dependent part of ulcerated cancer, rubbed against the skin of the thorax. At the point of contact a circular patch of cancerous ulceration of the size of a florin took place, the intervening skin between this and the fold of the mamma remaining healthy. Dr. Reinecke* has related two cases in which abdominal cancers were tapped, in error, with a trochar, and cancerous growth took place in the abdominal walls along the track of the puncture. A somewhat unusual case of reproduction from contact (as I believe) occurred to me lately in the Middlesex Hospital. The patient, a very stout florid woman of 59 years of age, had a deeply excavated irritable cancer at the upper and outer part of the right breast. She was also subject to a lichenous eruption over the chest and arms, and her skin was generally very irritable. From the large size of the breast, the discharge, which was profuse and sanious, lodged on its upper surface and trickled down the axillary fold. In these situations there sprang up a number of very small pinkish excrescences, which looked something like crops of minute vascular warts.

* Virchow's "Archiv," 51 Band. 3 Heft.

They were attached to the superficial layers of the skin only. They were found, too, only in situations where the discharge could lie, and while in these they became more and more numerous, so as in the end to coalesce and form elevated patches—not one appeared above the level of the ulcer. Even after many months these little growths had hardly extended to the deep layers of the skin. I have no doubt that the lodgment of the cancerous discharge on her irritable skin had allowed of implantation and superficial growth of cancer germs. Cancer is constantly found in the serous cavities at points opposed to those which have been the previous seat of the disease; and surgeons are familiar enough with the fact that, whenever a cancer is cut into in operation instead of being cut out, the neighbouring parts become at once the seat of wide-spread disease. Dr. Moxon* showed at the Pathological Society a very interesting specimen, in which it was clear that numerous small nodules of epithelial cancer, occupying the lower lobes of the lungs, had been transplanted from a primary growth in the trachea. Dr. Dickinson lately brought a specimen before the same Society, showing numerous outgrowths in the peritoneum from the bursting of a spindle-celled sarcoma into the cavity. Nor does it, I think, admit of doubt that in a case of my own, where encephaloid tumour within the cranium was followed by small cancerous growths at the lowest part of the cerebro-spinal sheath, the same kind of migration and implantation

* Transactions of Pathological Society, vol. xxviii, p. 28.

had taken place.* It may be admitted, therefore, that the fact of the auto-inoculation of cancer and allied diseases is clearly established.

What thus takes place on surfaces has been shown to occur within the tissues. That the absorbents and blood-vessels take up and disseminate cancer is admitted. There is as good evidence that the same may occur in any space through which minute particles can travel. The original observations of Van der Kolk have been confirmed, that dispersed cancer elements may be found in the connective-tissue spaces of the gland at a considerable distance from the parent tumour. The same may be found in the connective tissue of fat. If careful sections be made around and beyond the cancer tumour, cells similar to those found in the tumour may be seen clustered here and there, and lying free, in the areolæ of the connective tissue. This occurs in parts which appear to be perfectly healthy, and it shows that we may, and probably often do believe, that in operation we have got beyond the range of disease when in reality these germs have spread beyond our reach. I may recall one case which illustrates this. In the patient just referred to as having had encephaloid at the lower part of the spinal cord, the original disease was an intraocular cancer. The eye had been extirpated, and it was believed that the removal had been effected beyond the range of the disease: but the cancer rapidly returned. On carefully examining the stump of the optic nerve of the eye

* Transactions of the Pathological Society, vol. xviii, p. 220.

which had been removed, Mr. Hulke found that, lying in the meshes of the delicate connective tissue between the outer fibrous sheath of the nerve and the mass of nerve-filaments, were small clusters of cancer-cells, and these were traced up to the point of section of the nerve. Of course they did not end there, but extended into the nerve beyond the point of section; and hence the speedy return. The nerve, be it remarked, appeared to the naked eye perfectly healthy.

If now we look to clinical cases, we constantly find evidence of the fact of this travelling of the cancer elements to a distance from the parent tumour. A very common phase of cancer is this:—A tumour is seated in the mammary gland, and the skin becomes adherent and puckered. The tumour does not grow faster than is usual; but at some distance from it, from half an inch to three or four inches, small hard tubercles will be developed in the skin. There may be only one or two at first. The surrounding skin will appear to be soft and natural. By and by more will appear, and will perhaps coalesce and form broad hard plates. No surgeon should ever think of operating when these outlying tubercles have appeared. He ought to know that the disease will return at once in the seat of operation.

It may be said that I am begging the question in taking this fact as illustrating the dissemination of cancer from a parent stock. When, however, it is considered that the fact of dispersion is proved in the dead-house and by the microscope—that primary

scirrhus of the skin is extremely rare—that here we have it developed in a number of separate nodules around an original gland-tumour, I imagine that no would be disposed to deny that these outgrowths were from germs thrown off from that original tumour.

Another view has been put forward of the mode in which dissemination causes the secondary growth of cancer. Dr. Charlton Bastian, in his able introductory Lecture at Univ. Coll. Hosp.,* while he appears to admit that cancer and other malignant growths may in some persons be caused by local irritation without the aid of any ascertained predisposition, advances an opinion at variance with that generally entertained as to their mode of propagation, but which I think is not borne out by our present knowledge of the conditions of growth generally. The main point is contained in the following passage, which I quote at length:—

"Is there anything specific in the mode of growth of these products (cancer and tubercle) and in their subsequent distribution within the body of the affected person? Just as an erysipelatous inflammation spreads by gradually inducing a similar morbid action in adjacent parts, so does a cancer or a mass of tubercle grow by a slower extension of the morbid modes of growth. * We have no more to do with a kind of implanted something increasing by a multiplicative reproduction in the one case than in the other. In both alike there are deviations from the ordinary modes of growth, which gradually ex-

* "British Medical Journal," Oct. 7, 1871.

tend to adjacent healthy parts. Neighbouring lympathic glands become affected in the case of tubercle and cancer-growths, just as they do where simple inflammations exist; and just as the change in the gland in the case of inflammation must be regarded as the result of a mere induced morbid action, rather than as the product of the multiplicative reproduction of a transmitted germ, so is a similar explanation open in the case of cancer and tubercle. Modes of growth which may have been primarily induced may be also secondarily induced. The kind of agency which is at least probably potential where the lymphatic system is concerned, or where particles of morbid growth come into contact with serous or mucous surfaces, seems almost certainly operative when we come to consider that wider distribution which is occasionally brought about through the vascular system. The potency of the 'exciting causes' are here weakened, and new growths cannot be initiated in distant parts or organs by contact with disseminated particles, unless the 'predisposing causes' are favourable and there is an ability in the part to take on the morbid mode of growth. The action may be similar in kind to that which the transplanted fragment of epidermis exerts upon the ulcerated surface. This becomes covered, not so much by an actual increase of the imported fragment as by the formative changes which its presence incites. A crystal thrown into a mixed solution of saline substances will determine, by its mere presence, the crystallisation of similar

materials from the solution; nay, it may determine, in addition, the crystallisation of other products, whose modes of aggregation are more or less similar (isomorphous salts). The contact of any number of germinal particles with the tissues of an organ will not produce the formation of a new growth unless the molecular actions (or modes of growth) existing in the part are such as to make the transition an easy one. The mere presence of 'germs,' therefore, is not all that is necessary. Cancerous masses may grow into the vena cava, and yet no cancer springs up in the lungs: the stomach may be absolutely infiltrated with cancer, and yet, as I have recently seen, no similar growths may exist in the liver. Detail, however, is needless on such a subject. The distribution of morbid growths throughout the body, as is well known, takes place, if at all, in a manner so irregular in different individuals, as to make the result wholly beyond the possibility of predication. Having to do with a case of syphilis, who would venture to fix upon the internal organs which would become affected? Who can account for all the irregularities observable in the generalisation of tubercle either in man or in the rodent animals. When cancer exists, who will affirm which organ shall be secondarily affected and which not?

"The old notions as to the specific nature of cancerous and tubercular products are, therefore, supported neither by the anatomical characters of their growths, by their mode of origin, nor by their mode of distribution; and the known facts concerning the

hereditary transmission of a tendency to the formation of such growths is certainly not more explicable in accordance with the old hypothesis than it is by the more modern view. And the history of these local so-called 'specific' growths will be found, as others have in part indicated, to throw much light upon the history of general so-called 'specific' affections, and their mode of distribution through communities, or from individual to individual."

It will be seen that, to some extent, Dr. Bastian supports the view that secondary cancer is the result of induced morbid action from the presence of some element of the original cancer; though he conceives also that in certain situations there must be local conditions favourable to the growth. He does not admit that the germ itself is the seat of growth. But it has yet to be shown that there is, in cancer and other morbid growths, any special irritant element, as there is in erysipelas, to induce a peculiar mode of growth in the tissues in which the disease has appeared primarily, or in which it has been implanted in a secondary manner. Nor have we evidence of any special aptitude in a part to take on a morbid mode of growth, without which the cancer germs brought to it could not be attended by development of the disease. A piece of living periosteum implanted in muscle will develope bone, and this is seen to take place by the calcification of the existing cells and the formation of new ones. A piece of ivory imbedded in bone will be eaten away by the advancing granulations; which here apparently grow around them, at the

expense of the dead ivory, and this can scarcely be supposed to participate in their actions. So we find nodules of sarcoma, while completely encapsuled, studding the lungs and other parts. In such cases the disposition of the surrounding tissue can hardly influence the growth of the disease. In the case of epiphytes, again, the growth of the vegetable germs takes place at the expense of the animal tissue.

The argument which Dr. Bastian uses, that the distribution of morbid growths is so irregular as to make the result beyond the possibility of predication, is valid so far as secondary growths are concerned. But this would seem to me to favour the view that a predisposition in the part which becomes the seat of secondary growth is not a factor at all in its production. For we know that while there are "seats of election" in the primary disease, the secondary disease occurs, as we have before seen, mostly in parts which are not primarily favourable to it. Wherever, then, a germ happens to light, whether in skin or lymphatic gland or lung or kidney, there it will take root, and we can never predicate the direction which the germs will take, or the channels which will convey them. They will course through the body just as will a packet of needles in any or all directions. The fact that cancer may project into the cava without producing cancer of the lung, or that the stomach may be infiltrated with it, without affection of the liver, proves nothing in the face of the long interval which may intervene between the deposit of cancer germs and their active growth. The hypothesis of the necessity of a predis-

posing cause seated in the tissue in which secondary cancer arises, is, I conceive, practically dangerous; inasmuch as it might induce the surgeon to think the more lightly of the influence of the cancer germs.

We have, then, three channels through which cancer may diffuse itself—the lymphatic system, the vascular system, and the interstitial system of the various tissues. Through one or other of these channels we may conceive that any part of the body may be sooner or later infected by the migration of some of the cancer elements. But admitting this, there seem to be difficulties in the way of accepting the doctrine that cancer is at one period a purely local disease. How account for the apparently simultaneous development of cancerous growths in various parts of the body? Why the almost constant return after removal? Why should an operation give immunity for years, and then the disease return? Why should cancer sometimes retrograde and disappear, especially when another disease is making progress?

The simultaneous development of multiple cancerous tumours has been already adverted to. But evidence is wanting of the existence of such a case. Indeed it is scarcely capable of proof; for how can it be shown that in no part of the body was there a tumour existing before these multiple ones appeared? The rapidity with which melanosis and encephaloid will be disseminated when once a tumour has formed is well known. I have mentioned a case*

* "Brit. and For. Med.-Chir. Review," Jan., 1866.

in which, on the removal of a solitary encephaloid tumour on the sole of the foot, a host of similar tumours were rapidly developed in the whole limb and lymphatic glands. How often, too, do we meet with cases like the following, which prove to what a great extent cancer may be present without suspicion of its existence:—A lady, previously in good health, save from slight goutiness, became troubled with pains in the loins, and afterwards with sciatica. These were not constant, and were generally worse at night. Her appetite was impaired. For months the pains were attributed to gout or rheumatism. She did not lose flesh, and retained a healthy appearance, and a slow pulse. It was not until after four months that any suspicion of internal tumour arose, and then, in consequence of œdema of one leg; but, from her stoutness, no tumour could be felt for two months more, when a hard prominence was noticed over the liver. After death extensive cancer was found, extending from the pelvis to and involving the liver. I adduce this case merely to show how impossible it may be to recognise the early states of deep-seated cancer; for here there must have been some amount of cancerous deposit even before the first trifling symptoms. Now, supposing that some weeks after the early development of the disease an irruption of cancer had taken place in various parts of the body, it would perhaps have been set down as a case of multiple primary cancer. Until some undeniable case of the multiple simultaneous development of primary cancer can be produced, it is

needless to argue the point; more especially as, even then, it would be no more conclusive proof of blood-poison, than would a simultaneous eruption of warts.

The next question is—why the almost constant return after removal? The conditions of cancer, viewed by the light of other recurrent disease, give us a solution. Enchondroma, fibroma, &c., we find, return in distant parts after removal. We have the evidence that these structures may be carried by the lymphatics or blood-vessels, and when arrested at any point may grow. If this may occur in structures so coarse (if one may use the expression) as those named, how much more likely would be its occurrence in connection with a structure, the essential character of which is absence of coherence of its elements. It may be illustrated by the difference we see when a recurrent non-cancerous growth and a true cancer are cut into. In the former case, in order to get at any of its component parts for microscopic purposes, we must cut off or scrape up a portion of the tissue. In the latter, the cells, which constitute or contain the active part of the cancer, exude on the cut surface, presenting a creamy character. Nothing is more easy to conceive than that the elements which compose this creamy matter, lying free and without limitary membrane in the midst of soft tissues, would be taken up by them, by their lymphatics or blood-vessels or connective tissue spaces, and be carried anywhere and everywhere through the body. We should expect to find them chiefly localised within the immediate range of the primary tumour, and on the

same side of the body; and so in reality we do. But there is no real limit. Just as we find that when a number of pins are swallowed, they may course through the body to any extent, upwards or downwards, or in any direction—so, only infinitely more readily, might these minute germs of disease travel to any extent or in any direction. The differences observable in the mode of recurrence of various forms of cancer offer a support to this view. Take the four forms of cancer rodent—epithelioma, scirrhus, and encephaloid. It is, I am aware, a disputed point, whether rodent ulcer be really cancerous.* I believe it to be so, inasmuch as the structure of the deposit around the ulcer is like that of epithelioma, and it has the same tendency to recurrence; its elements are, however, very localised; it does not travel usually even to the neighbouring glands. Epithelioma, of which the elements are grosser and more coherent than those of the higher forms, will affect the neighbouring glands, but will not readily pass beyond them; though it *may* do so, and give rise to secondary growths, just as will scirrhus. Scirrhus readily affects the glands, and will contaminate distant parts, but with nothing like the rapidity that is often seen in encephaloid, the structure of which is far softer, and the fluid more abundant, and laden with minute elements, nuclear and granular. Yet it is found that of all the true cancerous diseases encephaloid is the one

* For a full description of this subject see Mr. C. H. Moore's work on "Rodent Cancer;" and Mr. Hulk's observations in the "Pathological Transactions," vol. xxii, p. 326. Longman and Co, 1867.

which may go most readily on to spontaneous cure or to long quiescence. This would appear to militate against the view that cancers contaminate in proportion to the fluidity of their contents. But an explanation is found in this: encephaloid is often the least infiltrating of cancers; it pushes the tissues aside, and forms connective-tissue capsules around it, and hence in a large number of cases it is not brought into connection with and disseminated amongst the tissues, as is scirrhus. And this very fact, that the most malignant of cancers, the most rapidly growing, and the most destructive when it is disseminated, is often encapsuled, often non-infiltrating, and often less venomous than other forms, confirms the notion that it is not to constitutional but to local conditions that we must attribute the malignancy of the disease.

The laxity of the surrounding tissues and the activity of vital action going on in them exercise a marked influence on the dissemination of cancer. In young persons, and in those in whom there is much fat, tumours grow rapidly, and are quickly and widely disseminated. I have removed cancers from the midst of abundant fat, where minute points of disease have been traceable in all directions around, to the distance of from two to three inches. Surgeons know that they cannot take the fat away from around a cancerous breast two widely. Surely no one, considering that the fat is not a tissue in which primary cancer is formed, would regard this as evidence of a blood-disease setting up cancer *de novo*.

I believe few doubt that the secondary growths of

cancer are as often the results of implantation as are those of non-cancerous diseases. The difficulty which underlies the admission of an invariable local origin is the long immunity found at times after operation. A patient may go on for eight or ten years, or longer, apparently free from disease, and it may then return. The return in these cases is often in the neighbourhood of the original tumour. This opens up a very wide field of inquiry. As has been before stated, those who maintain the blood-origin of cancer suppose that there must be another and concurrent cause—a certain aptitude in the tissue to develop the disease. The tissue alone may be in a fit state, or the blood alone in a fit state, but no cancer will be formed. It is argued then that, when the operation was performed, either the whole existing disease was taken away, and the blood, although still containing the poison, had no fit tissue on which to act; or that the operation was done at a time when the blood had been deprived of its poisonous qualities by the previous growth; and that, though the tissue might be fit, the blood was not; and that a length of time might elapse before the two conditions came into conjunction. How long may the blood be cancerous without cancer being developed? It may be for life according to this view. But it would be, to my mind, more difficult to receive this than accept all that lies in the way of the contrary hypothesis.

There is no lack of facts relating to development

which we cannot explain, and are content with saying that they occur in obedience to a law. But in so speaking we never imagine an altered state of blood. Two children of different sexes are born, and the mammæ remain alike up to a certain age; when in the female only they begin to develop; they remain effective for a certain time, and then, while her other organs are in full activity, they decline. In some families the hair will fall at a certain age from a definite part of the scalp; elsewhere it will grow as well as ever, or a patch of hair may become white, while in other parts it will retain its natural colour. Cartilage will remain as cartilage for eighteen years, and will then ossify. In the first of these cases, we see a tissue remaining quiescent for years and then starting into activity; in the second, the degeneration of a structure being limited to a small spot, the remaining structure undergoing no change; in the third, a tissue undergoing continued and active growth of one kind for a long period, and then taking on a new phase of development. Now I believe that in instances such as these—and they are plentiful both in the animal and vegetable world—we have a clue to the fact that cancer may be present *potentially*, and remain for a time quiescent, to be at last developed, independently of the condition of the blood. In breast cancer, it is constantly noticed that, for years before the disease has declared itself, the gland has been functionally if not physically imperfect. The patient has been unable to nurse with it; or she has always noticed

that it was not so full as the sound one; or that the nipple had never been so prominent. In the testicle it may happen that the diseased gland has always been a small one, or that it has not fully descended. In the case of epithelioma, a wart, or mole, or scale, has been seen seated on the skin for thirty or forty years, perhaps, before the disease has developed itself. I have been more and more led to the notion that, in many cases, the conditions determining a cancer exist in the tissue from the first, and that the disease has declared itself in due course. just as has the local degeneration of the hair. But I should not limit this to cancer. The same would apply, I believe, to other tumours and degenerations; and I can see no greater reason for supposing that an altered state of the blood is a cause of these growths and degenerations, than I should of the local baldness or the local greyness.

The very conditions under which both scirrhus and epithelioma arise strongly confirm this. In the latter, especially, it often happens that there are several such moles or scales which remain unchanged for years, and then the disease develops rapidly in one, the others still remaining quiescent. Now, considering the recognised proneness of such scales to become epitheliomatous, we should expect that, if a cancer poison were in the blood, several of them would take on cancerous action. But this we never see. In scirrhus, as has been before mentioned, various forms of aberrant growth frequently precede or accompany the de-

velopment of the cancer; but no cancer attacks them. What is seen in cancer in relation to these outgrowths is seen as often in connection with other tumours not cancerous, and not even malignant in their nature. This will be again referred to when the hereditary tendency to the disease is discussed.

It is maintained, then, that in some individuals cancer is impressed on the tissue long before the tumour shows itself, even from the embryonic state. But besides this, it seems not improbable that in many there is a condition of tissue, in one part or another which readily takes on cancerous degeneration under irritation, while without that irritation it might never occur at all. It is only what we see in the case of other diseases. A thousand people may have a blow over the tibia in one an exostosis will form, in another a myeloid tumour, in a third an enchondroma, while in the others, though the inflammatory action may be of greater or less intensity, no special disease will arise. There must be some predisposition to the disease; yet this is no ground for belief that it would have arisen without some exciting cause. I know no disease which better illustrates this than the cicatrix keloid before referred to. In some situations it will follow the healing of any wound. Yet the individual may be quite healthy and the skin apparently quite natural, and wounds may be made in other parts of the body which will heal without the development of keloid. Putting time out of consideration, this is just what we see in the return of rodent cancer or of epithelioma round

the edges of a part cicatrised after operation. But though a greater *tendency* to cancer may exist in more than one part, that is widely different from the actual existence of a blood poison, which, when the disease is removed from one part, will be seeking other habitations in which to work mischief.

What is here stated with regard to the long existence of a cancerous or other tendency in a tissue will apply to the rate of growth of cancer elements when they actually exist. In the young girl the breast tissue is present, and there is abundant growth going on in the body; but the special development of the mamma takes place only at a certain period, which may be hastened or retarded by physical or by moral circumstances. The same may be seen even in a fatty tumour. A small lump will be felt under the skin, and remain unchanged for years, and then rapidly grow into a large lipoma; but the general fat of the body will not increase—it may diminish. The like is often seen in other tumours. Now let us take a common case. A patient tells you that she has that day discovered a lump in the breast. You find one as large as a walnut. It is watched, and at the end of many months has made but slight progress. The growth of a cancer will probably be, *cæteris paribus*, proportioned to the amount of active growth elements; and should be the quicker the larger the cancer has become—*i.e.*, the more of these elements it contains. If, then, but a very slight enlargement have taken place in the six months or more during which

the tumour has been watched, how long may it not have been since the first true cancer tissue was developed? In some cases it may have been years. Of course in the large majority of cases the growth is from the first far more rapid. Take now a case on which an excision has been performed. Seven or eight years may elapse, and then there may be return. These, again, are exceptional cases; but the disease may have been present, though inactive, all that time. Two of the last cases which have occurred to me are these. I removed a cancer from the breast of a lady in July, 1866. She remained quite well, save that a little fulness was found in the axilla in 1869; but this underwent no perceptible change till the end of 1870, when there was a distinct tumour. This began to grow rather quickly, and I removed it in March of the present year 1871. It consisted of a congeries of enlarged cancerous glands. In November, 1864, I removed a cancer from the breast of a lady who had had symptoms of the disease for more than three years. For six years after the operation there was no appearance of return. Then there was found a hard tumour, not larger than a small pea, about an inch above the middle of the cicatrix. There appeared also a fulness above the clavicle on the same side which led me to think that there might be some disease behind this bone. The nodule near the cicatrix enlarged, and the skin adhered to it. The fulness above the clavicle increased for a time and then gradually diminished. She had no constitutional

symptoms, however, and I removed the nodule a year after its appearance, and seven years from the time of the operation. Are we to suppose that in these cases the cancerous state of blood was in abeyance for years; or that the cancer poison was in the blood, but found no fitting tissue during all this time, and that then the axillary glands, and the single point near the cicatrix on the diseased side, assumed this fitting condition? This would be strange, considering how rarely scirrhus is developed primarily in the lymphatic glands and skin. Is it not much more likely that some cancer elements were in the glands or beneath the skin at the time of operation, and remained dormant—just as a lipoma or an atheroma will remain dormant? If this may be the case for two or three years, there is no assignable reason why it may not be so for double that time, or indeed for any time.

As if to illustrate the point, my colleague, Mr. Nunn, called my attention, while this was being written, to the case of a patient in the hospital, who was admitted six weeks ago with a very large ulcer of the leg. Soon after his admission the house surgeon grafted several small pieces of skin upon it, and several more at different times after. For more than three weeks these grafts remained as mere raised spots on the ulcer, then suddenly started into activity, and in the course of a week or less the whole ulcer was nearly cicatrised over. The patient was a red-faced, sturdy countryman. It might be said that the cases do not admit of comparison. I

believe that they do, as showing that, under certain conditions which we do not recognise, the actions of growth will be in abeyance; and that then, under certain conditions, of the nature of which we are equally in ignorance, growth of unusual energy will set in. The vegetable seed, we know can be kept for centuries without action, and can be made to germinate under recognised amounts of heat and moisture. In the animal kingdom, however, the higher we proceed the more difficulty do we find in determining the vital stimuli necessary to bring each part into action. I fully admit that there is great difficulty in accounting for the long delay which may occur between removal and recurrence. I fully admit that, in some cases, there may be the same disposition in other tissues to develop cancer *de novo* as there was in the tissue originally attacked. But the difficulty is not removed by accepting the doctrine of blood-poisoning, especially when all the facts are taken into consideration, the almost invariable return particularly in some organ near the original seat, or in some internal organ, neither being the usual situation, save in very rare instances, of the primary disease.

The retrogression of cancer, either standing alone or connected with the development of other disease, is a subject of great interest. It has been proved from the records of the cancer cases in the Middlesex Hospital, that the occurrence and growth of cancer are not influenced by the majority of diseases.* But

* Sibley, "Med.-Chir. Trans.," vol. xlii.

cancer is known to be occasionally arrested in its growth and to retrograde spontaneously. And the development of pulmonary tubercle seems sometimes to have favoured that tendency.

But Mr. Sibley's paper shows that the disappearance of cancer while tubercle is developing, is by no means a necessary, or even a common, event. Out of 173 cases in which a post-mortem examination was made, there were 11 in which active tuberculosis was present at the time of death, and in not one of which the cancer appeared to be influenced by the presence of tubercle. The occurrence of cancer, moreover, is very common in families of which other members are consumptive. While it may be admitted that cancer and tubercle do not often coexist, there is no proof that they are antagonistic the one to the other. The very fact of the general healthiness of cancer patients may afford one reason why tubercle is so rarely found in them. Another may be the fact that cancer is generally the disease of advanced life—tubercle of early life. Before any conclusion can be arrived at as to the relation between cancer and tubercle, and to the bearings of that relation on the question of blood disease, it must be ascertained whether the same does not exist between tubercle and other morbid non-cancerous growths.

Some of the recorded cases of retrogressive cancer show that the disease may diminish or disappear in one part, while in another it may still be active. Mr. Moore*

* Art. "Cancer," "System of Surgery," 2nd edition.

relates the following: "A female patient had a scirrhous tumour in the right breast, with an enlargement of cancerous nature in the right axillary glands. A tumour likewise existed beneath the nipple of the left breast, which was less distinctly cancerous, only because it was more movable than that in the substance of the right mamma. In this state I took charge of the patient. Cancerous enlargement and hardening soon appeared in a gland behind the edge of the left pectoral, and that the whole muscle was raised by œdematous swelling. Meanwhile every trace of the doubtful cancer of the left breast disappeared. The swelling of the left pectoral region next diminished, and there remained on that side only a very hard gland of the size of a nutmeg. The primary tumour on the right side, which had meanwhile remained without increase, resumed its growth as the activity of the growth on the left side abated; and after nearly doubling its size, it in turn stopped growing, and partly but decidedly shrunk." If it were admitted that one of the factors in the production of cancer growth was a special disposition of the tissue in which it occurs, the explanation of such a case might be, that this disposition was worn out in some parts while it still remained in others. But it is very difficult to maintain this view in the face of the fact that secondary cancer attacks all tissues, especially those which are least prone to primary disease, and consequently least likely to be the seats of predisposition. Those who support Mr. Simon's doctrine that the cancer tumour stands in the relation

of a gland to the cancer material, and serves for its elimination, might argue that there was a deficiency of the material, and that the function of the tumours was partially suspended. The difficulty of accepting this doctrine lies in the fact, that the larger the cancer mass the greater is its growth; while at the same time, if an actively growing cancer be removed, no fresh tumour may form, and the patient may remain in perfect health for years.

It seems to me that in such cases we have another form of a condition often seen in epithelioma, and sometimes in scirrhus, namely, the spontaneous cicatrisation of one part of an ulcer, while in another part the ulcer is spreading.

We may now pass on to the consideration of the inheritability of cancer. From careful inquiry into the family history of private patients, I am inclined, as I before mentioned, to consider the disease as more frequently hereditary than does Sir J. Paget. The family histories of hospital patients are not, as a rule, so readily obtained as those of private patients. This is mentioned by Mr. Morant Baker, in his valuable paper on the subject.* If I do not enter more fully on the question, it is because I am quite ready to accept it as a fact that cancer is a highly heritable disease. This would by some be thought to yield the point I have been arguing against. But it does not touch the question one way or the other, or, if anything, shows that cancer obeys the general laws of

* "St. Bartholomew's Hospital Reports." 1866. Vol. ii, p. 137.

development. Every condition of our conformation, mental or bodily, is, or may be, inherited—disease no less than natural condition. Seeing how frequently the peculiarities of the parents or grandparents are repeated in the descendants, it can be no matter of surprise that their diseases should be transmitted as well. In the case of innocent tumours surgeons do not, perhaps, make strict inquiry into the family histories of their patients. They will find, if they do, that there is quite as strong a tendency to hereditary transmission of such tumours as lipoma or atheroma, as there is of cancer. I may mention a few cases, and some of them tend to indicate what I have long suspected, that where a disposition to aberrant growth is transmitted it may show itself in the formation of tumour of a different nature from that seen in the parent. Sir James Paget has pointed out the hereditary tendency to sebaceous tumours. "Of these sebaceous or epidermal cysts, it is interesting to notice the frequent hereditary origin. Perhaps in the majority of cases, the bearers of these have known one or more members of their family similarly endowed. They are certainly more commonly hereditary than are any forms of cancer."* I may mention some instances of this hereditary tendency in other simple tumours, as well as in sebaceous tumours.

A woman came under my care at the Middlesex Hospital for cancer of the uterus. She had as well

* "Lectures on Pathology," 3rd edition, p. 441.

numerous lumps under the skin, apparently fatty; they were movable and painless. There were eighteen in the left arm, and fourteen in the right. There was one in the left hip. The largest was about the size of a small walnut. She was sixty-three years old; and these tumours had appeared when she was sixteen. Her sister, aged sixty-seven, has numerous subcutaneous but tender tumours in the left arm—more than twenty in number,—four or five in the right arm, one in the abdomen, and one in the hip. She has had them for twenty years. The father had had two large movable tumours in the left arm.

Dr. Murchison* mentions a case in which a father and two daughters had been the subjects of fatty tumours.

A gentleman recently consulted me about several tumours which had been developing for years. There was a large one in each buttock, one on the right arm, three on the left, and one in the left palm; they were as hard as cartilage, and movable. His father had had several atheromatous tumours removed from his head. Two of his brothers had had the same, and he himself had some coming forward. His grandfather's cousin had been subject to these head tumours, so that probably the tendency had been inherited from the great-grandparent.

I saw about the same time a gentleman with atheromatous tumours in the head and a large fatty

* "Edinburgh Medical Journal," 1857.

tumour in the back. His father had had a number of tumours removed from the head.

Shortly afterwards another gentleman showed me a cluster of these tumours on the head, and on inquiry I found that that his father had had several similar ones removed.

I have noted many other cases in which the parent or some near relatives of those who have had simple tumours have been subject to some form of tumour. The tendency to wart-growth, *e.g.*, is frequently hereditary. We should expect this, knowing that the disposition to disease or peculiarity, gout, rheumatism, insanity, deaf-mutism, early baldness, stammering, and many others, is constantly inherited. Now, if we take the case of atheroma or fatty tumour, for example, we find that, though the individual is born with a tendency to abnormal developments, it remains for years dormant and inoperative, and that then the change, purely local in its nature, first manifests itself. We have no proof here that cancer, which is equally hereditary, may not depend on the development of a blood-poison; but neither is any proof afforded that it may not be as purely local. Some of the cases, indeed, show that we might expect a tendency to cancerous outgrowths in more than one situation, even though the disease were purely local. Experience, however, leads to a different conclusion, since we so seldom find secondary outgrowths of cancer in situations which are the ordinary seats of the primary disease.

With regard to the general contamination of the

system by cancer—the cancerous cachexia,—this, as has been said, is not a primary condition: it does not occur until the disease has made considerable advance; it may not occur at all. Cases are numerous of patients having open cancer for years without any appearance of being the subjects of serious disease: they neither lose flesh nor appetite. Again, patients often die from unulcerated cancer, especially of the internal organs; wasting away and becoming exhausted, without showing the characters of the cancerous cachexia. But they also die in the same way from the internal development of enchondroma and fibro-plastic disease. It is in the cases of ulcerated cancer that we see this cachexia most strongly marked. And, no doubt, in these cases the whole of the fluids of the body become contaminated; the continual absoption of so foul a discharge as is then present would quite account for this. We know that the continual discharge from an unhealthy ulcer or a foul abcess will induce destructive poisoning of the system; and we can readily conceive that the discharge from a cancerous ulcer will be far more poisonous, and vitiate the blood to a greater degree and possibly in a special manner. All that can at the most be shown is, that when cancer is formed, and has grown to a certain extent, it may become a source of contamination to the system; but it does not afford the slightest confirmation to the view that the primary seat of cancer is in the blood. Nay, it is evident that this cancerous cachexia must be something very

different from any supposed blood-condition which precedes or accompanies the earlier stages of the disease. For, as we have seen, the cancer may exist for years, and no cachexia manifest itself; but if the cachexia once appear death within a short time is inevitable. It is quite clear, then, that this vitiated state of the blood, and indeed we may say of all the tissues of the body, is in no sense, or at any time, the cause of the primary development of cancer, but is always the result of the advanced progress of the disease, in time or extent. As a rule, we do not find any special tendency to new growths, even though the system be poisoned by this absorption of effete cancer elements. The expectation of finding this cachexia, as a diagnostic sign of the disease, is fraught with most serious evil.

There is yet one point in relation to the dissemination of cancer which I confess, is, inexplicable; and which seems, at first sight, to favour the view that, the disease may be propagated in its secondary stages at least, by means of a poisoned state of blood. It is the remarkable manner in which a morbid state may pervade a large part of the osseous system. I do not know that it affects the question of primary blood-poisoning, for I am not aware of any cases in which the peculiar state I allude to has not been secondary, and associated with cachexia. The cases I especially allude to are not those common ones of cancerous tumour in one or more of the bones, causing their disposition to fracture. These may be accounted for in the same

way as we might account for similar tumours in the muscles, or any other tissues. But we do sometimes get a cancerous wasting of some of the bones, accompanied often by deposits of cancer in other parts of the skeleton. It corresponds, I imagine, with that condition to which Lobstein has given the name of osteolyosis, though different in some respects. A case—the preparation connected with which is in the museum of the Middlesex Hospital—affords a striking instance. The patient had cancer of the breast. Latterly she complained of pains in the back. It was noticed that the trunk was becoming much shortened, but there was no tumour to be detected. After death it was found that some of the vertebræ had so completely disappeared that the intervertebral substance of the adjoining vertebræ, quite unaltered in character, had come into apposition. Others had partially wasted, but there was no deposit in or around them. The sternum and ribs also were the seats of cancerous deposit, while the cranial bones were studded with cancer nodules, which seemed to have their primary seat in the diploe. I have seen one or two instances of the same condition in a minor degree. The softening of the pelvic bones is very common in the latter stages of cancer, and to it may perhaps be attributed those pains which so often usher in the cancerous cachexia, and which somewhat resemble sciatica. There is no doubt that the cancellous structure of bone is often thus the seat of cancerous and other deposit, and of cancerous degeneration. Dr. Moxon showed at the

Pathological Society, a very interesting specimen of general colloid cancer of the skeleton, in parts presenting the character of sarcoma. The peculiar character of the medulla seems to point to it as a tissue very likely to run into these morbid conditions. The pathology of the wasting of the bone in cancer is yet to be made out. With regard to the especial predilection for a special tissue, which is at times seen in diffused cancerous disease of the bones, it may be in obedience to some such conditions as determine the formation of neuromata, of which over a hundred have been seen in the same subject; or of the cartilaginous growths on the fingers; or of the multiple exostoses which sometimes exist.

The general conclusion at which I should arrive is, that in some persons, and in some parts, there is a tendency, local in its origin, to the formation of tumours. That this tendency may in some have been implanted in the tissue, even in its embryonic condition, though the actual development may not take place till years after birth; in others, although there may be a disposition to morbid growth, the actual tumour will not be developed unless under some irritation. That the morbid growth having once taken place, it will remain localised, or become diffused, in proportion to the facility with which its elements can be taken up and carried off by the structures amongst which it lies. That the period during which these elements may remain dormant is indefinite. That, save in degree, there is no real difference between the malignancy of cancer and that

of some other forms of tumour, and that even the line between malignant and non-malignant growth is not clearly defined. I should place cancer, then, at the top of a scale, at the lowest point of which might be placed the simplest forms of outgrowth identical in structure to the affected parts.

It may be asked, what is gained supposing these views to be established? Were it the case that no practical conclusion could be drawn from the argument, and that we were to be left still in our present miserable hopelessness, face to face with so terrible a disease, it would be a matter of interest to the pathologist; but of the most trifling consequence to the practical surgeon. But as has been before stated, our views of the treatment of cancer must be based on the convictions we hold respecting its origin and true nature. Now, as long as the opinion is held, that cancer is a blood, or a constitutional disease, that it is the local result of some general affection, as an inflamed toe is of gout—or or a gummy exudation of syphilis, so long will surgeons be trying to persuade themselves that by some so called constitutional treatment they can affect or even arrest the course of the disease. So long, it is certain, will they pursue the fatal course of watching the tumour instead of attacking it. I believe it may be stated positively, that as yet we do not know of any medicine which will have the least special effect on any true tumour. Exudations, or hypertrophies, or inflammatory enlargements may be touched by general or local treatment, but not what surgeons

mean by tumours, even in their simplest form as lipomata, &c. The belief, then, in the possible benefit of constitutional treatment, at all times fallacious, is, in the early stages of the disease, absolutely mischievous. I say in the early states of the disease, because in the later ones, when surgical interference is no longer admissible, some good may be done in the way of alleviation of the general symptoms which have supervened, and some also in the way of giving local comfort. But it cannot be too generally understood that as yet no medicine has been found which has the slightest influence on the growth of cancer: and I fear I must add that it is probable that none will ever be discovered. To my mind, it would be as reasonable to look for some drug which, without interfering with the general nutrition of the body, would check the growth of nerve, or of muscle, as to seek for one which would act specially on cancerous or other tumours. Admit that cancer is like other tumours, of local origin, that the blood or the general constitution have nothing to do with it, and we shall hear less perhaps of Missisquoi water, or Cundurango or Hydrastes. Every day brings us a new medicine, or a new treatment, which is a certain cure for cancer; but all the same, cancer remains incurable. And it is surely better that patients should know this at the first than that they should waste time and money, and be exposed to the misery of continually disappointed hope; to find, in the end, that they have allowed the time to go by when something useful might have been done.

When, from the determination of the patient, or the condition of the disease, an operation is inadmissible, it is well to adopt some treatment, which may serve to sustain the general health, or to allay pain. But to hold out delusive hopes which may induce the patient to neglect what will give the only chance of benefit is, to say the least, a cruel act.

Outward applications, with a view to producing dispersion of cancer are as useless as internal medicines. They may have more effect than medicines in moderating local action, and thus to a slight extent in retarding growth. But I doubt whether any of them act even to this limited degree save by reducing temperature. The *constant* application of ice, or of evaporating lotions, does probably, by lowering the local action, diminish the rate of growth. To be beneficial, however, the cooling applications must be used continuously, not intermittingly. This involves so great an amount of trouble and attention on the part of the patient, that, since the result is at most but a possible and partial benefit, the plan of treatment will not be long sustained. The same remark applies to the use of well-regulated pressure; it will diminish local action, but the difficulties in the way of keeping it up equally and uniformly will be a bar to its general adoption. Both cold and pressure have been recommended as a means of destroying the disease. The cold has been applied by putting a mixture of ice and salt into an ice bag, and keeping it over the tumour. In this way the tissues may be destroyed

to a certain but limited extent. The cake of frozen tissue which is formed seems to protect the parts below from the full influence of the freezing mixture. It might answer in small superficial tumours; but here other modes would be simpler and more certainly effective. The plan was tried at the Middlesex Hospital on the suggestion of Dr. James Arnott.

The history of the treatment of cancer by pressure is interesting. It affords another example of sanguine expectation ending in deep disappointment. Mr. Young, formerly a surgeon at Bedford, published a series of "cases of cancer and cancerous tendency," successfully treated by pressure.* His book attracted great attention, and went through two editions. There is no doubt that local improvement often followed the use of pressure, and in some cases the tumours decreased in a remarkable manner. But there is great reason to believe that in some the spread of disease to internal organs was hastened. The cases were watched by Mr. Whitbread, the founder of the Cancer Establishment at the Middlesex Hospital, and it was highly recommended by Dr. Denman, then, in the height of practice. We may be sure, then, that had any real benefit attended the pressure treatment, it would have held its ground. Mr. Whitbread urged that a full trial of it should be made at the Middlesex Hospital; and this was done by Mr., afterwards Sir C. Bell, and the other surgeons of the hospital. Sixteen cases were put under treatment. The results appear in a

* Minutes of cases, &c., by Samuel Young, 1816.

report of the Medical Committee which was drawn up by Mr. Bell, and the general conclusion was, "That in some of the cases of open cancer, combined with considerable œdema, the pressure was useful in lessening the volume of the tumour; but that it had not, even in a single instance, any salutary influence upon the specific nature of the disease. It frequently gave so much pain that the patients could not, after repeated trials, endure it, under any modification whatever; and often it appeared to hasten the fatal result,"* At the request of Dr. Neil Arnott, Mr. Shaw tried the effect of elastic pressure, by means of an india-rubber bag, capable of distension by air. But the general result was unsatisfactory, though in the first case it seemed to do good.

It may at first sight appear as though the statement that a cancer might be to some extent kept in check by lowering the general activity of the part in which it lies, were opposed to what has been previously alluded to, viz., that the disease constantly appears in an organ which was deficient in functional activity, either originally or by ordinary lapse of time. But the causes which determine the first laying down of a tumour have probably no necessary relation to those which regulate its rate of growth. And just as we find that an accident, an abrasion, or a blow, will determine a malignant growth in parts which, while disposed to disease, might have remained quiescent had such an exciting cause not occurred, so when disease actually exists anything which

* Surgical observations, &c., by Charles Bell, 1816.

determines blood to the part will give activity to its further development.

A case occurred to me some years ago in the Middlesex Hospital which may serve to illustrate this. A woman, who had had a swelling in one breast which for some time gave her little trouble and increased very slowly, became pregnant. As the mammary glands enlarged, the tumour grew beyond all proportion to their increase, and before her confinement, there was an enormous pendulous cystic tumour which had ulcerated, and thrown out cauliflower excrescences. It was removed as soon after her confinement as possible, and she made a good recovery. The tumour weighed nearly seven pounds. Amongst its substance were found small tubules and cysts containing milk.

My colleague, Mr. Hulke, kindly called my attention a short time since to a very interesting case of cancer progressing rapidly under similar circumstances. A woman aged forty had noticed a kind of knot in the left breast for two years before seeing Mr. Hulke. It was about as large as a walnut when she first discovered it. It gave her no inconvenience, and underwent little change in size. Eight months before she came to the hospital she was confined, and for six months suckled her child with both breasts. Coincidently with lactation tumour began to grow, and between the second and third month the growth of the disease was very rapid. The increase was not so much in the tumour as in the skin and tissues around; these became the seat of

numerous separate nodules, which soon coalesced, and there is now a hard casing of cancer over the whole surface of the left side of the chest, extending over the clavicle, and involving also the whole circumference of the upper half of the arm.

What has been here stated as to the absolute uselessness of the medicines, which credulity, or other motives have induced ignorant or interested persons to advertise as cures for cancer, is well known to all surgeons. At the Middlesex Hospital the cancer establishment gives to the surgeons an opportunity of trying the various remedies which are proposed; and the only result has been to show their utter worthlessness. Glad indeed would all right-thinking members of the profession be if they could find but the slightest clue towards the cure of this fearful malady.

There are but two courses to pursue; either to leave the tumour to run its course, or to extirpate it as completely as possible. When the cancer attacks the limbs, or the lip, or eye, or testicle, or superficial parts generally, no surgeon would hesitate, in the absence of evidence of secondary disease, to recommend an early operation, even though he might anticipate a return. In the case of scirrhus of the female breast there is not the same unanimity of opinion. High authorities have preferred to leave the disease untouched; seeing the little permanent benefit which, in a majority of cases, operation of any kind has conferred. And had we not, in the present day, the inestimable advantage of chloroform, I do not know but that, notwithstanding the strong

feeling I have in favour of removal, I should sometimes hesitate to recommend it even in fitting cases. Before the introduction of anæsthetics however, surgeons would never have thought of subjecting their patients to the protracted pain and shock of many other operations which are now frequently and properly performed, with a view to temporary relief, and not to permanent cure or long immunity.

This very averseness to operations in cancer was, I believe, a main reason why they were formerly so often unsuccessful. They were delayed till too late, and when performed were done as rapidly, and within as small an area as possible. Careful removal of all suspected parts after the chief mass was taken away was not sufficiently practised, and in consequence the operations were very commonly useless or even injurious; the disease returned rapidly *in situ*, and the state of the patient was worse than it had been before. In the present day the results of operation are in every way more favourable. By the aid of chloroform, and with the modes of dressing now in use, our patients, in the large majority of cases, suffer neither during nor to any extent after operation by the knife. Operations too are done earlier, though still in most cases not early enough, and are or should be done thoroughly.

It is not an easy matter to define absolutely the circumstances which justify or forbid an operation. In the majority of cases no doubt the surgeon will make up his mind very readily. If the patient be in a condition to bear an operation, if the tumour be

movable, the glands unaffected, and the skin free from detached tubercles; if there be an absence of those symptoms which indicate a general affection of the system, as wasting of the body, an uniformly accelerated pulse, a failing appetite, a tendency to sciatic pains, loss of appetite, &c., most surgeons would now unhesitatingly recommend removal, in the hope of obtaining permanent or long-continued freedom from return of the disease. If the disease be wide spread, immovable, with evidences of distant outgrowths, of general contamination, &c., no good surgeon would suggest an operation; as it would be ineffectual from the first. But there are many gradations between these conditions where special considerations might lead to different conclusions in very similar cases. Thus the sensitiveness to pain in one patient might induce the surgeon to advise the removal of the main tumour, with the view, not of prolonging life, but of sparing suffering; on this account cancer of the tongue is often removed; while in another and perhaps a more favourable case, but in which the patient suffered little, he would recommend that no interference should be attempted. There are certain indications which would prevent the surgeon from operating, even though the general condition of the patient and the state of the glands and parts beyond were favourable; such as the presence of the before-mentioned cancerous tubercles in the neighbourhood of, though not attached to the main tumour. In this case the disease would certainly return *in loco*, and nothing would be gained by

the operation. On the other hand, he would be justified sometimes in advising operation, even although the neighbouring glands were largely affected; foreseeing that there would be in a short time a large open sore, with all its distressing accompaniments of pain, discharge, bleeding, &c. There are many such points which must be left to the judgment and discrimination of the surgeon. Mention has been made of sciatic pain as an index of general contamination. The fact was pointed out to me by the late Dr. Ferguson, many years ago, and of its truth I have had abundant proof. Why it should be so I do not know; sometimes it appears to be connected with that softening of the iliac bones, which we find in cancerous patients.

Great obesity is regarded as unfavourable to operation for cancer, and as a rule it is so. It is difficult to eradicate the whole disease from amidst a great mass of fat, and such patients do not always bear the operation well. Yet one of the fattest patients I ever operated on had breast cancer; she was 5 ft. 3 in. high and weighed 14½ stone; but she recovered without a bad symptom and was alive and well four years after the operation, when there was a reappearance of disease. In this case the operation was done because the tumour was advancing very rapidly and would soon have formed a huge ulcerated mass.

It was at one time generally thought that a more rapid cancerous growth was lighted up by operation. This is not the case if the cancer

be thoroughly removed. Where the growth is imperfectly removed and some of the cancer tissue lies in contact with the exposed flesh, the most rapid outgrowths may take place both in the immediate seat of the operation, and in distant parts. In some cases it appears that glands secondarily affected with cancer become more quiescent after the removal of the parent tumour. In one case, operated on by Mr. J. M. Arnott, an enlarged hard gland remained unchanged in the axilla for certainly 13 years; possibly much longer; I never heard of its increasing.

If an operation be resolved on, the knife is however not the only instrument for the removal of tumours: caustics and other agents are employed in various ways. It is necessary to form some estimate of the comparative advantages of the means at our command.

Caustics have long been used for the extirpation of cancers, and at times with excellent results. One great reason why they were adopted in preference to the knife was the frequency with which wounds in former days were attended by erysipelas, pyæmia, profuse suppuration, and at times even hæmorrhage. These, often disastrous, attendants on cutting operations were, to a very great extent, warded off by the substitution of caustics. As a rule, before the eschar produced by the caustic is thrown off, a healthy granulation has covered the surface. It signifies little what form of caustic is used so long as the main purpose is attained. The object may be to

produce rapid removal, so as at once to destroy the vitality of the diseased and surrounding parts; or to procure an equal destruction in a slower manner, step by step.

There are three principal modes by which the first object may be effected. 1st, by the use of the actual cautery, especially the galvano-cautery; 2nd, by the use of sticks of caustic, thrust at short intervals deeply around the circumference of the tumour—the *flèches* of Maisonneuve; or, 3rd, by the continuous application of powerful chemical agents, such as strong sulphuric acid. By either of these methods the tumour may be attacked at one treatment, though the time during which this must be carried on varies in different cases.

In the second mode of using caustics—the destruction of the tumour by repeated operation—the Vienna paste and the chloride of zinc have been the main agents. This plan has at times great advantages.

There is yet another mode, which, however, so far as my experience goes, is applicable only to very small tumours, such as small infected glands, or small secondary subcutaneous growths. This is the injection of solution of acetic acid, or of some other solvent, as was recommended by Dr. Broadbent. I have often used it, and with decided benefit, but not where the diseased structure has been larger than a bean.

The removal of a tumour by the galvano-cautery is perhaps the best of all the immediate methods of caustic treatment. It may be done while the

patient is under chloroform; there is often no hæmorrhage, though this does sometimes occur; it may give a chance of the after removal of such diseased parts as have not been included in the first cauterisation. Independent of the difficulty and trouble attending the management of the battery, this operation is open to the objections which are common to all those performed on large tumours by caustics, viz., that the healing is necessarily a long process; and that there is not that amount of assurance that all the diseased structure is removed which is possessed when the tissues are divided by the knife. These objections were formerly counterbalanced by others which used to be fairly urged against cutting operations, as the occurrence of pyæmia, erysipelas, hæmorrhage, &c. The improvements which have of late years been introduced in the plan of dressing wounds, and the attention which is given to the surroundings of patients have, however, greatly diminished those risks. We find, in fact, that, from one cause or another, surgeons generally come back to the operation by the knife.

Where tumours are small and superficial, their removal by galvano-cautery is, no doubt, a good plan: but whether the advantages gained by its use counterbalance the inconveniences attending the management of the apparatus, I must leave to the decision of those who have had more experience than myself.

The operation by the "*flèches*" has found little favour in England; it is open to every objection

which can be urged against the caustic treatment generally. Incisions or punctures are made, at short intervals, round the circumference down to the deep part of the tumour; sticks of Vienna paste, or other caustics, are inserted into these, and are left to destroy all the intervening tissue, thereby isolating and killing the diseased mass. As may be supposed, this process gives rise to frightful pain during many hours. But the greatest evil is, that in many cases of breast tumour the surgeon cannot ascertain what the precise limits of the disease may be, and in some he would not be able to use the caustic, even if he could define these limits.

The same objection applies to the rapid treatment by sulphuric acid, as was practised by Dr. Michel in Paris, and recently by Dr. Bell, in London. The patient has to remain under the action of a paste, made of the strongest sulphuric acid and powdered asbestos, often for as many as 24 hours. The suffering is sometimes most intense during this period. The healing, after the eschar is thrown off, is necessarily slow. But again there is the uncertainty as to the whole disease having been reached at one operation. If it be not, the discovery may not be made till the extension of the growth has been so great as to preclude a second attempt.

The method of destroying cancerous tumours by repeated applications of different kinds of caustic has been common from time immemorial. That introduced into this country by Dr. Fell some years

ago* is perhaps the best; namely, the formation in the first instance, by nitric acid, of an eschared surface over the tumour; and then the scoring of this surface with parallel incisions, into which strips of linen covered with a chloride of zinc paste are inserted. These scores are deepened day by day, and fresh strips inserted, till the entire mass of disease is penetrated. The whole eschar after a time drops away, leaving a healthy granulating surface, as is seen in surfaces generally when a cauterised mass exfoliates. Here again, we have the objection that the treatment is generally accompanied by great suffering, continued day after day perhaps for a fortnight or three weeks; while, in the end, it may be found that some disease has been left, and that new cancerous growth has made progress even before the wound is healed. There is, I think, another evil attending slow cauterisation, viz., that while the caustic is doing its work, increased action is going on in its neighbourhood, with increased growth of that part of the cancer which the caustic has not yet reached. Indeed, I have seen this take place, in some instances, to such an extent, that the destructive could not keep pace with the formative processes. The same objection may be made against caustics generally. If the whole diseased structure be not included in one operation, the chances are that the undestroyed tissue will grow with increased rapidity, and quickly affect distant parts.

* See "Middlesex Hospital Report on Cancer, 1857."

Still, in many cases, the method by gradual cauterisation is safe and effective.

The caustic treatment is especially useful in cases where the patients have an invincible horror of the knife, or where chloroform can not be safely used. Nor can it be denied that, when properly carried out, it is at times, and in all its forms, a successful mode. While admitting this, I would most emphatically denounce the partial and imperfect use of caustics in cancerous or suspicious growths. One constantly sees small epitheliomata, or mere scaly excrescences, which can hardly yet be pronounced malignant, irritated into activity by the application of nitrate of silver or some other weak escharotic. It should be an absolute rule, that if caustics are used with a curative intention, they must be used fully and decisively. Half measures here are whole evils.

The cases in which cauterisation, carried to its fullest extent, produces the most marked and beneficial results, are those of rodent ulcer; of epithelioma about the head and upper parts of the face, and of cancer of the orbit or globe of the eye. As before mentioned, it is a moot point whether rodent ulcer be truly cancerous. But as this ulcer presents all the essential characters of cancer, in the deposit of new tissue around it, containing free epithelial cells, in its obstinacy, and in the tendency to recurrence after long intervals, I must consider it as a form of cancer removed from epithelioma in the same direction and to about the same degree as epithelioma is removed from scirrhus. It is true,

that the glands are not secondarily affected, and that distant parts never suffer. But many forms of epithelioma are present for a long time without contamination of the glands; nay, even schirrus may almost destroy a patient by ulceration without glandular affection. At the present time, I have a patient under my care, in whose breast is a large ulcerated tumour. It has the appearance of scirrhus, but is probably epithelioma. It was first noticed about six years ago. After a year it was removed, but a return of the disease took place in a short time, and for more than two years there has been ulceration. She has no appearance of cachexia, retains flesh, and the axilla and neck are quite free from any enlargement. The tumour is not adherent below, and the only circumstance which deters from operation is the large extent of diseased and thickened skin. The density and coherence of the textures which form the boundary of rodent ulcer may be a bar to secondary growth taking place in the glands; and this may be the case in such forms of malignant non-cancerous tumours as recurrent fibroid.

The success which has attended the destruction of these rodent ulcers and other malignant growths, at the Middlesex Hospital, should encourage surgeons to attack them more decisively than is usually done. The plan which we have adopted, is to dissect away with the scalpel as much of the diseased structure, especially at its margins, as can be removed; then to cauterise the whole surface and its dissected margins with the hot iron; and lastly, to cover the whole with

linen well smeared with the strong chloride of zinc paste—the whole being padded up with cotton wool. These coverings are left undisturbed until they begin to separate; the separation begins at the margins, and the cloths and eschar may be cut away day by day. Below will be found a healthy granular surface which soon cicatrises.

In this way ulcers involving the greater part of the side of the face have been dealt with. Although the nasal cavities and orbit have been entirely exposed, the patients have remained well and in comfort for years. Where the ulcer is creeping on towards the eye, or where one eye is destroyed and the disease is advancing towards the other side, this mode of treatment is imperatively called for. It is equally efficacious in the true epitheliomata and other cancerous growths about the side of the head and face. I was asked to see a gentleman in his eighty-fourth year, but a hale man for his years. He had had for years a small dark scaly growth over the side of his left malar bone. It had given him no trouble until about a year ago, when it became somewhat irritable, and he consulted some medical men, who applied caustics and caustic lotions to the surface. Soon a rapid outgrowth of epithelioma took place, and when I saw him there was a tumour as large as half a small egg, intensely painful at times, pulpy and often bleeding. Notwithstanding his age I recommended its complete removal in the manner described: and, though there was considerable bleeding, the free

removal with the scalpel involving the temporal and facial vessels, he recovered without a bad symptom. The operation was done in March last, nine months ago, and he is strong and well, without an appearance of disease. I doubt whether any less formidable operation would have been attended with so favourable a result. In the case of intraocular and orbital tumours the same success has been repeatedly obtained; the orbital bones exfoliating, and, of course, all the disease contained within the orbit being destroyed. In one case operated on by Mr. Lawson, the whole walls of the orbit exfoliated entire: and the orbital bones, preserved in the Museum of the Hospital, look as if they had been removed from the skull by the saw. Had any such complete removal been attempted by the knife alone, it need scarcely be remarked, the chances of recovery would have been slight indeed. But many cases of undoubted soft cancer have been so treated, and the patients are alive and well. In no case has any direct fatal result taken place.

In those cases of breast cancer where the amount of diseased or adherent skin would render it necessary to leave a large exposed surface, I believe that this mixed mode of operating would be better than by either knife or caustic alone. The whole operation might be done under chloroform, the diseased structures fairly cut away, the actual cautery applied if necessary, and the surface covered with the caustic paste. The pain-causing agents would have done their worst before the patient recovered from insen-

sibility. By the time the eschar was ready to be detached a healthy granulating surface would have been formed, and there need be little fear of evil consequences from the formation of a large wound.

While in some cases, then, the use of caustics, with or without the use of the knife, is preferable to the simple removal by the latter, both on account of completeness and safety, the operation by excision is, I believe, on the whole the better mode of treatment in cases where the tumour is movable on the parts below it, and where the surgeon can be sure of dissecting it out thoroughly. The shock of the operation is removed by the use of chloroform, and in most cases the healing is now, with the improvements in dressing recently introduced, rapid and painless. The amount of surface to be healed where breast tumours are removed by caustics must be, in all cases, large; and in voluminous breasts, I have seen granulating wounds of from 6 to 7 inches in diameter. The fact that the surface of skin destroyed must be as great as, if not greater than, the area of the tissue to be removed, necessarily renders the healing after this operation more tedious than would be generally the case after excision. In the latter operation, the skin may usually be reflected off the tumour, and may be laid down again and heal at once. This would be a minor matter if a more complete result could be obtained by the caustic, but it is not so. It often occurs, especially in stout patients, that in proceeding to extirpate a tumour, the surgeon finds that beneath the edge of the

pectoral muscle—or running up towards the axilla, are small nodules, glandular or otherwise, of which the presence had not been previously suspected. Under operation with the knife, they can be at once and freely removed, but the chances are but slight that they would be attacked by caustics.

If the surgeon consider the case a proper one for operation, whatever be the mode he may fix on, there are two positive rules which, if there be any truth in the views of cancer here maintained, he must obey—1, to operate early; and 2nd, to operate thoroughly. Reasons have already been given why an operation should be done as early as possible. There can be no reason, according to any ordinarily received opinion on cancer why a cancerous tumour should not be removed as soon as discovered. There are many reasons why it should. Given a defined tumour in the breast of a woman over thirty, and however negative other signs may be, sooner or later we may be sure that an operation will be required. There may be cases of general, or partial enlargement of the breast with pain and hardness which, while in the end they may prove cancerous, yet may result from simple chronic irritation and which subside under proper treatment: such cases it will be right to watch. There may be cases in which a lump in the breast presents characters which leave a surgeon in doubt whether he has to deal with a tumour, or a deep abscess, or a cyst. Here exploration may be necessary, and if this reveal the existence of abscess or cyst, simple

evacuation of the contents may be all that is required.

But if tumour be undoubtedly present, such as sarcoma, or colloid, or adenoma, it is true that no harm might come from waiting, though no good would be done. But suppose it to be cancerous; what irreparable mischief may not ensue from delay? To day the glands may be free; to-morrow they may be infected; not to such an extent as to attract notice, but not the less to be the nidus of future cancer growth. To-day all existing disease may be within the range of our operation; to-morrow disease may be distributed far beyond. Yet what is more common than for a surgeon, when a patient has pointed out to him "a lump" in her breast, and he has found that she is in good health, that there is no puckering of skin or retraction of nipple, and that the glands in the axilla are not enlarged, to assure her that she need not be uneasy, but that she should watch the swelling, and apply ointments, lotions, &c. A month or two afterwards, perhaps, she is seen again; and then there is adhesion of skin and a small hard gland in the axilla. What does this puckering of skin, &c., imply save that the influence of the disease, or rather the disease bodily has been spreading in all directions, and that possibly it may have extended beyond reach, even if it could be detected. Are the chances of success equal under these altered circumstances? I shall believe that only when I find that leaving behind a visible piece of cancer structure in an operation is of no consequence. So insidious is cancer, that I

suppose no patient has ever had a suspicion of its existence, and no surgeon or pathologist has ever seen it in its strictly primary stage. Can it be doubted that if removed at that time, the chances of re-appearance would be enormously diminished?

I should say then, that in the case of a doubtful tumour the surgeon ought not to wait till its true character has revealed itself; but that he should proceed forthwith to ascertain its nature by exploration, and be prepared at once to remove it if it turned out to be cancer, or any disease likely to become serious. He would save his patient much risk and much anxiety.

But we find nevertheless that early operations are often very unsuccessful ones. And this can, for the most part, be explained by the conditions, local and general, under which the disease is growing. As is well known, encephaloid, scirrhus, and epithelioma manifest very marked differences in their respective general rates of recurrence; and this has been explained by the difference in their tendencies to dissemination, owing to the greater or less amount of mobility of their ultimate elements. The same differences exist even in similar kinds of cancer. Thus, in scirrhus we may sometimes find the structure from the first compact and dense; the fibrous largely preponderating over the cellular elements; which are themselves surrounded by a minimum amount of fluid. In other cases there may be at first such a preponderance of the fluid and cellular elements that when the tumour is cut into, these may exude, as if squeezed from a

sponge. In such states of tumour we find occasionally minute spots of disease at a little distance from the parent tumour. Here we should expect that an early operation might be attended by less prolonged benefit than would a much later one in the former state. Again in the young, in whom all vital processes are active, and the tissues lax, or in stout plethoric persons, cancer generally spreads more widely and with greater rapidity than in persons in opposite conditions. If what is here advanced be true, it should induce us to operate as early as possible, for a cure might follow the extirpation of even the worst forms of tumour, if only done in time.

Putting aside the better chance of good results there is another reason, and an important one to the patient, why an operation should be done as speedily as possible, especially in breast cases. However much the surgeon may try to quiet his patient with the suggestion of merely watching the tumour, and of its perhaps turning out to be of little consequence, the fact of its presence, and the fear of its being cancerous, are never absent from her thoughts. Even when she can be assured that the tumour is positively harmless, it is a constant source of anxiety. The relief given to the mind by its removal is worth the risk of the operation, even in such cases; how much more where she sees that the surgeon is doubtful, and is himself waiting for some more marked indication. The patients, perhaps, can be brought only with difficulty to submit to an operation, and may have the greatest dread of it, but all

will confess how immense is the relief to the mind when the tumour is once away. This is no small matter, and especially in cancer cases, in which anxiety seems to, exert so much influence.

The second direction, to operate thoroughly, is of as great, perhaps of greater importance. Many cases do well in which the operation has been deferred for a long time, though we can never foretell that it will be so; but the chances of benefit are small if parts of the disease are left behind. Mr. Moore, from a careful analysis of cases of recurrence in and near the seat of operation, showed how often this event was due to the inadequate removal of the adjacent structures.* It may be safely said that the surgeon never errs on the side of too free removal, but very often on that of insufficiency. It would be well, in all cases of breast cancer, to excise not only the whole gland, but every portion of thinned or altered skin; and where there is much fat to leave only so much on the flaps as will help to preserve them from sloughing; while on the deep surface, it and the fasciæ covering the muscles, should be fairly dissected off. Should there be adhesion of the diseased parts to the fascia, it is well to remove a layer of the muscular structure beneath. If it be found that there are glands in the axilla which it is desirable to remove, the dissection should be carried at once towards the axilla, and the glands and intervening line of absorbents should be removed while still in connexion with the

* "Medico-Chirurgical Trans.," vol. l, p. 245.

tumour. The tumour should on no account be cut into during the operation; as, in consequence, the elements of disease would be dispersed amongst the tissues; and though they might be, and to a great extent are, washed away by the blood, and by the spraying or washing of the wound, yet some may be arrested in the tissues, or carried into the veins, and so find their way into the system. The cases which have been mentioned of the propagation of cancer by germs set free from a growing tumour show that this is no imaginary view. Should any part of the disease be cut into, it is well at once to sponge the whole cut surface of the sound as well as of the diseased tissue with a strong solution of chloride of zinc (40—50 grains to the ounce of water).

It sometimes occurs, and especially in stout people, that portions of disease are so situated as to render their removal impracticable. For example, only one or two glands may be felt in the axilla before operation, but when the axilla is opened a chain of them may be discovered, running up to and amongst the vessels and nerves. In such a case the best plan is to isolate the cord of glands and absorbents, as far as they can be reached, and then having thrown round them and tied as firmly as possible a thick string soaked in carbolic oil, to cut away the mass, touching the stump with the solid chloride of zinc. Many cases do well for a time after this operation, but of course the growth goes on. As a rule the operation should not be done if there be neuralgia down the arm, or œdema. But the deep glands

may become affected without the occurrence of these indications, which I believe are more frequently associated with secondary growths in the neck than in the axilla. Often we find the disease occupying a position beneath the pectoral muscles and running up to the clavicle. Here, although the glands can be pulled out with the finger to a great extent, it is impossible to ensure their all being fairly removed. I have often felt tempted in such cases to divide the pectoralis major and make a full sweep of all the submuscular tissue. I have never done it; though from the fair amount of success which has in a few instances attended the less complete operation. I believe it would be fair to try it. If, however, fullness beneath the pectorals can be discovered on examination of the case, no operation should be undertaken.

When the tumour is removed and the bleeding arrested, the wound should be thoroughly sponged with a strong solution of chloride of zinc (30 or 40 grains to the ounce). This acts, not only anti-septically but chemically on albuminous and gelatinous tissues, to some depth, rendering them pulpy and cream-like to the feel. Care should be taken not to apply it over skin which has been much thinned, as it causes it to slough; but a very thin layer of fat forms a protection. The zinc has very little effect on the fat globules, but it acts on the connective tissues around them. Any cancer elements which may have been set free and are adhering to the cut tissues, or which have been disseminated to a little

distance beyond, the point which the knife has reached would be disorganised by the zinc. Since using it, I have certainly found less tendency to recurrence in and around the scar. It tends to cause the blood to ooze from the surtace, which had been previously dry; the bleeding is soon stopped by pressure, but the first time the wound is uncovered the edges at the depending part should be slightly separated so as to allow the discharge of all accumulated fluid; after which direct union may take place.

The consideration of the after-treatment of the wound forms no part of my present object. I may state, however, that I believe the use of the carbolic acid spray during the operation and at each dressing is of great value in promoting direct union. No surgeon would now treat wounds without the use of some form of antiseptics, in large towns at least.

In some situations a tumour may be effectually removed by the ecraseur. The tongue is the organ to which this operation is best suited. But in cancer seated near the root of the organ it is always necessary to make a preliminary division of some of the textures beneath, or even to divide the lower jaw or the side of the cheek. Great care should always be taken so to arrange the working line of the chain or wire, that it may not draw obliquely through the diseased part. This may be effected by the introduction of strong needles set on handles, thrust perpendicularly through the tongue behind the disease. Or it may be done by making an incision beneath the jaws to the base of the tongue,

through which the wire may be passed. Towards the end the operation requires care and patience, so that the lingual arteries may not be divided too soon. With all the precaution that can be used, hæmorrhage will often take place. Unless in cases of cancer of the tongue, or of the cervix uteri, or of pedunculated tumours, I doubt whether the ecraseur will find much favour amongst surgeons.

A few words as to the management of patients affected with cancer. The hypothesis of a simply local origin precludes, as I have said, the notion of general treatment with a view to alter the condition which produces the disease. There is no doubt that by constitutional as by local means an impression may be made at times on the rate of progress; but, I am quite sure that no system of internal or external treatment hitherto discovered has the slightest special effect. The disease occurs for the most part in persons strong and well nourished, and remarkable for good general health. It *may* be found in those of a different character, who have been generally invalids or who have lived a life of hard work. Its prevalence, however, in those who are healthy and robust shows that the disease does not arise from want of tone or defect of nutrition. Hence it would appear very doubtful whether it is wise to recommend the patient, as is often done, "to keep up well," to take plenty of nourishment, to use stimulants, with a view to counteracting this supposed poisoned state of system. If an undue amount of nourishment is taken, a fair share of it will go to the increase of the

disease, and stimulants, which are taken to the extent of quickening the circulation, will at the same time increase that of the tumour and accelerate its growth. So far, then, from urging persons affected with cancer (and these remarks apply to the management of all morbid growths) to increase their ordinary amounts of wine and food, it would be better to recommend them to avoid a high diet, and to take little or no wine. Probably we all eat and drink more than is really necessary for the supply of the wants of the system, and the proper quantity for a cancer patient would, I think, be that which would afford this supply and no more. I have been assured by many that they have found great comfort from following this recommendation, and that when they have departed from it, in compliance with the advice of friends, they have been sensible of increased fulness and heat and pain in the tumour. The restriction to a light milk and farinaceous diet has been recommended, indeed, from early times. Lately, Professor Benecke has advised that a vegetable diet, containing but little nitrogen, should be adhered to, in cancer cases, on the special chemical ground that some of the elements which are found in cancer are derived from nitrogenous food. Hence he objects to peas and beans, as being rich in nitrogen. I doubt whether more extended observation will confirm this view. Cancer is, I understand, as common amongst the vegetarian Hindoos as amongst the flesh-eating Mahomedans. But many Hindoos, although their staple food be rice, are yet enormous

eaters, and it would be interesting to learn whether their habits in this respect, have any influence on the development or the growth of the disease. Let it be understood that these remarks apply only to the periods before the system is brought under the general influence of the disease. After that period the difficulty may be to get the patient to take and digest food enough.

Could the disease be starved out? Many years ago a gentleman of strong health and iron will told me that he suffered severely from hæmorrhoids. He disliked the idea of operation; and it was suggested by his medical man that if he would starve himself he might obtain a cure. For weeks he kept himself at starvation-point, or nearly so, and the tumours all became absorbed; nor has he been troubled with them since. Hæmorrhoids are not cancers, and of course the removal of congestion of the portal system would remove a cause of the disease; but the example shows that when the body is feeding on itself, it does not spare adventitious growths. One of the most distinguished physicians in this country, since dead, told me that his wife had had cancer of the uterus. He kept her for a long time on the sparest vegetable diet, just enough to sustain life. The disease disappeared. Years after, the cancer reappeared, and destroyed her: circumstances prevented his treating her case at that time, and he believed that she did not follow out the former plan. May the antagonism occasionally observed between tuberculosis and cancer

be dependent on the fact that tuberculosis is associated with waste of tissue? These are the slightest possible grounds on which to suggest a mode of treatment which might, possibly, prove injurious instead of beneficial. I should wish to see the experiment tried, though I confess I have not had the courage to recommend its adoption. Indeed it would require more than ordinary determination and faith on the part of the patient to carry out a protracted and painful treatment, when one could not conscientiously assure her that any good would come out of it. It is not mere restriction of diet that is meant, but the reduction of food to such an extent that the body would begin to feed on itself. Would, under these circumstances, the adventitious growths be amongst the first to undergo destruction? It may be thought, perhaps, that the contrary is proved, inasmuch as in the later stages of the disease the cancer grows rapidly, while the body is becoming emaciated from malnutrition. The conditions, however, are essentially different. In the latter case, the state of the blood and the tissues generally is such that due nutrition cannot take place, though abundant food may be supplied. No absorption of the new growth into the system then would be likely to take place But, in the former case, all the nutritive functions of the body going on actively and strongly, there would, under strict privation, be a general and powerful demand for nutritive material. Which would yield, the newer and less organised growth, or the natural and essential structures? The experiment might very

well be tried on a horse affected with melanosis, and otherwise healthy. It will naturally be said, however, that the experiment *is* constantly tried, and with results the very opposite to those which are here suggested as possible. In cases of cancer of the œsophagus, the patient is reduced to a condition of forced starvation; but the disease advances as rapidly as it would under ordinary circumstances. This objection is, I admit, a valid one, if, in any case, it is found that the starvation period comes on before the disease has advanced so far as to contaminate the system. In most, however, I have found, that before the patient complains of inability to take a proper amount of food, his general health is impaired, he has lost flesh, and his pulse is quickened. The conditions necessary to a fair trial of insufficient nutrition are therefore, in such instances, wanting.

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