A COURSE OF
LECTURES ON SURGERY,

DELIVERED IN THE
MEDICAL SCHOOL OF CAMBRIDGE.

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LECTURE XXX.—CANCERS (*Continued.*)

Softening; curative and retrograding processes; review of the changes taking place in a part affected with cancer tending to show that cancer depends upon a morbid state of nutrition in the system and in the organ affected, and that it consists in an altered condition of the original tissues of the part together with an infiltrated exudation in which new products are formed; this view supported by reference to the circumstances under which cancer occurs, by its mode of extension from point to point, by its liability to affect various organs in the same person, and to return after extirpation; occasional localization of cancer; question of its capability of propagation by inoculation; some objections to the above view of the nature of cancer answered; reasons for thinking that cancer is not parasitical and not dependent on a morbid condition of the blood; simple tumours very rarely become malignant; liability of inflammatory products to assume the cancerous characters; similarity of scrofula and tubercle to cancer; important points of difference between them; age, sex, and temperament most liable to cancer.

Treatment of cancer; preventive measures: extirpation; circumstances under which it may be attempted; precautions to be observed: pressure.

THE process of softening in cancer commences usually in the cellular element, and affects the fibrous stroma subsequently. It commences at several points, so that the section of a cancer in an early stage of softening, exhibits numerous cavities of irregular shape, containing a yellowish ichorous or semipurulent fluid, and separated from one another by tough opaque fibres. Subsequently the fibres are broken down and larger cavities formed, having ragged walls, with partially isolated bundles composed of softened and half-destroyed tissue hanging into them, or extending across them. The blood-vessels passing into the substance of the cancer are destroyed in the same manner as the other components of the tumour; not uncommonly they burst, permitting the effusion of blood, which coagulates, and gives a reddish-brown or yellowish tinge to the mass. Some times the effused blood quite fills up the cavities and obscures the original structure of the tumour, so that the whole mass may present the appearance of a sac filled with blood. This is rather a remarkable specimen; it contains several flat, circular, or oval cancerous ulcers upon the peritoneum lining the diaphragm. They present a peculiar appearance, being in their circumference a little raised above the rest of the

membrane, while their centres are depressed and reticulated, in consequence of a number of little open cavities being left, from which, doubtless, the softened cells have been removed while the fibrous network remains.

So determinedly and unceasingly destructive is the progress of cancer, that it is a question whether it ever has a favourable termination—whether a cancerous ulcer ever becomes *permanently* healed over, or whether a cancerous tumour ever *completely* retires. So seldom does this take place, that for all practical considerations we need scarcely admit the possibility of its occurrence. Still there can be no doubt that an attempt at *partial* healing does not unfrequently take place in cancerous ulcers. I have seen partial cicatrization in scirrhus ulcers of the breast; and cancerous disease of the skin, now and then, like a spot of *lepra*, spreads at the circumference, and disappears at the centre, so as to present a hard, knotty, ringlike elevation, encircling a smooth shining plate of cicatrix. Again the scirrhus tubercles of the liver immediately under the peritoneum, which are usually flat on the outer surface, are sometimes indented or cup-shaped, with a raised, knotty, puckered edge, like the coagulum of inflammatory blood. A section of such a tubercle will generally show the centre part to be composed only of the fibrous skeleton of the cancer which has become contracted; the cell-structure, which we may suppose to have been originally contained in the meshes of the fibrous stroma, appears in such cases to have softened, and to have been absorbed without an extension of the destructive process to the fibres themselves. However, these are rather matters of pathological curiosity than of practical importance, for so few are the recorded instances of spontaneous cure in well-marked cancer, that we can afford our patient very little hope from the probable results of nature's efforts in his behalf.

Dr. Bennett, as I have already mentioned, describes those yellowish masses so often found in the substance of cancer, particularly in cancer of the testicle, to consist of shrunken, abortive, and disintegrated cells, mixed with much oily matter. He finds, also, that cancerous exudation sometimes becomes infiltrated with saline particles, thus undergoing in his opinion, a kind of calcareous degeneration, analagous to that which takes place in ordinary tubercle. Granting these changes to be of the nature he suggests, and admitting that a retrograding or even a curative process is thereby shown to be at work, we cannot derive much consolation therefrom, because the changes are always limited to *parts*, and those usually very small parts, of the malignant growth, and they seem to have little or no influence upon the general work of destruction which is going on around them. A few cells may become abortive, or portions of the tumour may undergo calcareous degeneration without the mass being less fatal or even much less rapid in its progress. Dr. Walshe regards these calcareous particles, which he says are occasionally though rarely found in cancer, as depending upon a degeneration of the fibrin of blood extravasated in the tumour.

To review briefly the changes that take place in a

part affected by cancer. We find in the first instance, that certain of the natural tissues of the part, more particularly the fibrous and areolar, are thickened, rendered coarse and tough, indeed altered much in the same manner as when they are the subject of chronic inflammation with effusion of lymph. This change has been exemplified by reference to the elongation, thickening, and ossification of the periosteal fibres, by the condition of the muscular coat of the intestinal canal, of the septa between the lobules of the mammary gland, and by other instances of a similar kind. At the same time a change of a contrary nature is seen to take place in the other and more highly organized tissues—the glandular, muscular, &c.; these become wasted, degenerated, and perhaps loaded with oily matter. Thirdly, there are infiltrated amongst the tissues, thus hypertrophied and atrophied to a greater or less extent, taking the place of the latter, and, it may be, in process of time, of the former also, a number of nucleated cells, nuclei, or granules. These, of which one or all may be present, in the same specimen, very scantily or very abundantly, are possessed of a power of generating other bodies of a like kind; but they do not ordinarily seem capable of advancing beyond the cell-stage of organization. In very many instances indeed they do not attain even to that stage, their developmental powers being limited to the formation of nuclei. The production of these bodies, added to the hypertrophy of the natural structures just mentioned, gives that increase to the size of the part which we call a tumour, and the rapidity of its growth is as a general rule proportionate to the rate of *their* development. I say that these bodies do not seem *ordinarily* to be capable of advancing beyond the cell-stage of organization, because it is possible that they do sometimes, by a further effort of development, contribute to the formation of the fibrous element of the cancer. However that may be, they soon exhibit a tendency to decay, which is shared by the other components of the tumour, and which leads to the formation and spreading of an ulcer in the manner I have described.

The several phenomena just mentioned, viewed in connection with those we have found to attend the formation of simple tumours, and more particularly with those accompanying the growth of warts, polypi, and the like, unquestionably combine to give great countenance to the opinion before hinted at, that the cancerous disease consists in, and depends upon, an altered or morbid condition of the nutritive properties of the part affected, in consequence of which the original tissues undergo certain modifications—hypertrophy or atrophy as the case may be—and new products are formed from the elements of the blood, having little capability of organization, and much tendency to decay. When the disease is least virulent, the natural structures are least altered, and the new products are fewest in number, the destructive processes are most tardy, and the other inveterate qualities of cancer are least manifested. Many of the cutaneous and mucous cancers as well as the malignant varieties of fibrous tumours, exemplify the truth of this state-

ment. On the other hand, when the disease is more virulent, scarcely a trace of natural structure may be left, the new products abound so as perhaps to constitute almost the entire mass, the work of destruction is rapid, and distant as well as neighbouring parts are soon involved.

This opinion derives additional weight from the fact that cancer makes its appearance most frequently when, from some cause or other, the natural energy of the nutritive functions is diminished, between the ages of fifty and sixty, when the adult is beginning to lapse into the senile frame, after long exposure to anxiety, fatigue, or impoverished diet, after a lingering illness or a course of mercury. It is also most likely to appear in a part which has been the seat of some previous disease or continued irritation—in a cicatrix, an ulcer, or a wart; it is frequently traceable to a blow or a slight inflammatory attack, and it advances commonly with rapidity proportioned to the increasing debility of the sufferer. Perhaps the strongest argument of all is afforded by those cases of warty cutaneous growths, which, both in structure and qualities, seem to occupy an intermediate position between simple and malignant tumours. The gradual transition from common hypertrophy to cancerous disease, is so manifestly displayed by them in some cases, that it cannot be overlooked, and it furnishes most important evidence with regard to the question of the relation of malignant to simple disease.

The mode of extension of the cancerous disease from point to point, and from tissue to tissue, at the part affected, accords with the view of the nature of cancer just mentioned, at least as well as with any other theory, and corresponds with what we observe to take place in other diseases. In the healthy state of nutrition one tissue exerts no especial influence upon any other, the assimilative forces of each being manifested only upon the fluid elements of the blood that lie within its range, or that are received into its substance; but when a morbid condition has by any cause been induced at one part, it is communicated from that part to others in the immediate neighbourhood, radiating from the point first affected as from a centre, and spreading with a rapidity proportionate to its own force, and the ease with which the nutritive functions of the adjacent tissues admit of being disturbed. Thus an inflammation in the finger, excited by a wound, or arising spontaneously, spreads over the hand and arm, travelling furthest in the weakest subjects; and the cancer tubercle, overpowering in like manner the natural assimilative properties of the neighbouring parts, impresses its own qualities upon them, and spreads less rapidly it is true, but more surely than the inflammatory disorder. The exact cause of the *primary* aberration from the healthy standard must remain a mystery in both diseases; but having commenced they seem to advance in much the same manner. The more decided and inveterate progress of cancer, as compared with that of inflammation and other diseases, though constituting a feature of immense practical importance, is probably, after all, owing to a difference in the degree of its force, rather

than in the manner of its advance. Much has been said of its liability to affect the absorbent glands as an argument in favour of the theory which attributes the extension of cancer to the transmission of sporules by the circulating current, for it is supposed that these sporules are received into the absorbent ducts, arrested in the glands, and become there the germinating centres of fresh disease. Admitting that these sporules can find their way into the absorbent system, it is scarcely necessary to resort to the theory just mentioned for the explanation of the phenomena observed; for if a simple inflammatory ulcer is so often attended with inflammatory affection of the absorbent glands, it is no wonder that the more virulent cancerous disease is productive of corresponding results. We are equally ignorant of the *modus operandi* in either case; probably it is the same in both.

Further, the liability of cancer to return after complete extirpation, and to affect various organs in the same person, are features by no means at variance with the view we have taken. The fact of the existence of such a disease in any one part of the body, more particularly if it be of spontaneous occurrence, implies a defective condition of the nutritive functions, not of that part only, but throughout the whole system, for the several tissues and organs in each individual are very nearly balanced in their ability to resist disease, and their tendency to succumb to it; they resemble one another also in their liability to succumb to a particular kind of disease. In other words, the nutrition of the different parts of the body is conducted with nearly the same force, and is likely to show its defects in nearly the same manner. Thus in one person the organs are subject to acute inflammatory disorders; in another to slow tedious inflammations; in a third to such as we call scrofulous; in a fourth they fall at an early period into a state of atrophy or fatty degeneration, and the existence of such defect in one organ leads us to augur a similar condition of the others; in a fifth they become subject to cancer. Of course with cancer, as with any other disease, the existence of a particular local cause, impairing the nutrition of the part, and engendering the disease, such as a blow or long-continued irritation, renders us less apprehensive of the appearance of the malady in other parts of the body, and of its reappearance after extirpation. In such cases we are more willing to undertake an operation, for it is then, to a certain extent, though not entirely, a local affection. The fact that cutaneous cancers are less virulent and less likely to return after operation is, I apprehend, in great measure dependent upon their having been in so many cases induced by an external source of irritation.

Although the several organs and parts of the body are so nearly balanced in the energy of their nutritive functions, that the existence of cancer in one makes us apprehensive of its appearance in some other, you will, of course, suppose that the organ and region first affected are more likely to be the seat of fresh manifestations of the disease than any others. Thus separate scirrhus tubercles are very often developed in the vicinity of a

breast which is the seat of cancer. A return of the malady is most likely to take place in or near the cicatrix resulting from the operation for the removal of cancer, and in undertaking an operation you, for the same reason, should excise the neighbouring parts as freely as you can. If the breast be the seat of the disease, you should not be content without removing the whole organ; if a bone, you should amputate at or above the neighbouring joint. I have sometimes been surprised at the limitation of cancer to the organ or region primarily affected. In the case of a woman, whose breast I removed on account of scirrhus rather quickly advancing, the disease reappeared after a few months near, though not in, the cicatrix; in the substance of, or in close contact with, the pectoral muscle. This was also completely excised, and she remained well for two years, when a lump formed on the cartilage of the second rib; it increased to a large mass, bursting through the skin, and involving the adjacent ribs and sternum. A careful examination after death disclosed no trace of disease in any other part of the body. In this case, then, cancer appeared three times in the vicinity of the same spot, at length running its fatal course without any other organ being involved, not even the adjacent absorbent glands. I remember, also, the case of a man in whom scirrhus tubercles commencing on one toe, spread up the same extremity to the groin, existing in great numbers on that limb, though we could not find a symptom of disease in any other part of the body. Analogous cases are by no means uncommon, and the localization of cancer in this way is certainly no less reconcilable with the view of its nature I have given you than with the theory which supposes the primary element in the disease to consist in some morbid condition of the blood, or with the theory which explains its extension from one part to another by the propagation of germs through the medium of the blood.

This latter view of the mode by which cancers spread is, of course, closely connected with the question of their propagation by inoculation or contagion. The whole evidence afforded by every-day observation and by experiment is completely adverse to the possibility of the communication of this disease by inoculation, with one solitary exception, and that is the often-quoted experiment of Langenbeck, who succeeded in inducing secondary cancerous tumours in the lungs of a dog, by injecting into its blood-vessels fresh cancer-cells from a tumour, while still warm, which had been removed two hours and a half previously from the humerus of a man. The experiment has been repeated with great care by Vogel, Valentine, Gluge, and others, but without success. It remains, therefore, to be proved more clearly that cancer-cells, when removed from the parent mass and lodged in a new situation, can retain their vitality and become the nidus of a growth. Even granting the probability of this, it is difficult to understand how they can, under ordinary circumstances, find their way into the blood-vessels so as to be transmitted to distant parts, for they are usually of considerable size, exceeding the one hundredth of a line in diameter.

Admitting, however, both these points, there remains the still greater difficulty of accounting for the first appearance of the disease in each particular case. Is it not far more probable that both the primary and secondary manifestations of cancer are due to the same cause which, like the causes of most other diseases, we can refer, in the present state of our knowledge, only to an aberration of the nutritive forces at the parts affected.

I am quite aware that the view I have given you is open to certain objections, and that it is rather hard to be reconciled with some of the phenomena of cancer—such as the very decided features of the disease, which seem in many instances to mark it out as distinct from all other pathological conditions, and which have induced persons to regard it, perhaps too exclusively and completely, as an affection *sui generis*. This difficulty I have endeavoured to smooth down in the preceding lecture, by showing that it has its points of similarity to other maladies, and that it is connected with them by certain intermediate affections, which present in different degrees the characters of simple and malignant disease. Secondly, the peculiar structure of cancer, so unlike, to the unassisted eye at least, any of the natural tissues or any other morbid products, has greatly favoured the idea of its consisting of some new parasitical growth, feeding upon the body and propagating species in neighbouring and in distant parts by the dissemination of germs. The microscope has done much to dissipate such a notion, by showing that all the elements of cancer correspond to a considerable extent with those of the natural tissues, and that its peculiarity consists chiefly in the mode in which those elements are combined together. It must not be forgotten, in relation to this point, that certain of the tissues of the part affected, in a hypertrophied or altered condition, have been shown to constitute an ingredient, probably a very important ingredient, in the cancerous growths. Thirdly, the uniform appearance of the cancerous tumours, formed in various parts and in totally different organs in the same individual, is, perhaps, the most forcible argument against the view I have been maintaining. It is, I think, weakened by the observation made in the last lecture, that the more highly organized tissues, that is to say, the tissues upon which the peculiarity of an organ chiefly depends, vanish away before the advances of cancer, or are metamorphosed, while the simpler tissues, or those more common to various parts of the body, alone remain and enter into the composition of the growth. These objections—and some others of less weight might be mentioned—are not, in my opinion, sufficient to counterbalance the arguments and probabilities in favour of the view before expressed, that cancer consists in part of an altered condition of the areolar and fibrous tissues of the organ affected, and in part of new products formed from the elements of the blood, possessed of little capability of organization and much tendency to decay. Both the altered condition of the original tissues and the infiltration of the new products, as well as the peculiarities of the latter, are, according to this view, due to some abnormal state of the nutritive

functions of the organ which we cannot very well understand; but neither of the elements of the cancer are to be regarded as parasites any more than the blood-globules or natural formative cells are so considered.

These remarks on the pathology of cancer are opposed to the theory of the disease, which attributes it to some special change in the blood, nearly as much as to that which supposes it to consist of parasites. They show it to depend upon a faultiness in the processes by which the materials of the blood are converted into tissue, rather than upon a vitiated condition of the assimilative properties of the blood itself; that it belongs, in short, to the solid rather than to the humoral department of pathology. In a constitutional disease like cancer both solids and fluids, doubtless, participate in the defective condition, whatever it be, which engenders so disastrous a result; still the first and chief manifestation of the disease is presented by the solids, and I do not see that the mode in which that manifestation occurs affords a sufficient reason for referring the malady to any especial morbid change in the fluids. The qualities of the blood described by Rokitsanski and others, to distinguish what they call the “cancerous dyscrasia,” are very vague, and, for aught we know, are as likely to be the effect as the cause of the tumour.

It is a question of much practical importance whether a simple tumour is liable to be the seat of malignant disease. We often hear it adduced as an argument for the removal of a simple growth that though it may not be malignant at the present time it is likely to become so; and a very cogent argument it would be were there much truth in it; but I suspect that such an event is one of very rare occurrence, if we except the instances of cutaneous and mucous warts, to be spoken of more at length in the next lecture. The only case I have ever met with where there was any good ground for supposing that cancer had been engrafted upon a simple tumour was that of a woman who had long suffered under fibrous tumours of the uterus. One of these tumours of great size projected into the abdominal cavity, and in course of time became covered at one part by cancerous disease, which affected the whole surface of the peritoneum. In this case it certainly did appear that the malignant growth had extended from the peritoneal covering into the substance of the tumour at several places, and there were, nearer to the centre of the tumour, some isolated white tubercles, differing from the rest of its structure, and resembling the cancer found in other parts; but we could not be certain that these were really of cancerous nature. That lymph-formations and inflammatory exudations may become, and are very likely to become, the seat of cancer there is good reason to believe. Indeed a malignant growth often seems to extend itself, in great measure, by maintaining an inflammatory state of the surrounding parts; the lymph effused in consequence of such inflammation, being subject to the prevailing assimilative force of the cancerous growth, becomes likened to it, and is converted into the elements of cancer, instead of undergoing the transformations which

take place under ordinary circumstances and under ordinary assimilative influences. So, in like manner, lymph effused in any organ of a patient who is the subject of the cancerous diathesis is likely to participate in the morbid state, and to undergo the morbid transformation. Indeed it appears that the fibrin of the blood, coagulating within the vessels in such cases, may exhibit modifications of a similar kind. Thus, in a case, quoted by Dr. Bennett, of encephaloma of the stomach, mesenteric glands, and liver, Gluge and M. Nonat discovered cancer-cells in the clot of the right iliac vein, similar to those which existed in other diseased parts. The walls of the vein were smooth, and not red. Such instances are, however, rare; and further observations are required to confirm the correctness of this opinion.

I must say a few words with regard to the points of resemblance between cancerous and scrofulous diseases. These are so many that certain pathologists have regarded cancer as only a variety of scrofula, and *vice versa*; indeed it is the opinion of some of the most excellent of modern pathologists, both in our own country and in Germany, that the common tubercle is one of the varieties of cancer. To this opinion I cannot altogether yield assent, for, although there are many remarkable analogies between the two diseases, there are also, it appears to me, sufficient differences of an essential nature to induce us to retain in pathology that distinction which has the sanction of general experience.

Scrofula and cancer *resemble* one another, inasmuch as both consist in the infiltration of a new exudation-substance into the interstices of the texture of a part, that infiltration being attended with a wasting or degeneration of the original tissue; both have a tendency to soften and to ulcerate, causing a loss of substance in the affected organ, and leading to more or less extensive destruction of the body; both seem to be closely associated with, or dependent upon, a want of energy in the nutritive forces of the body generally, as well as of the affected organ in particular, so that the existence of either disease at any one part, leads us to apprehend its appearance in another; both affect all the organs and tissues of the body almost indiscriminately; each presents nearly an uniform appearance in whatever region it is found; and the one is often so much like the other, that it is scarcely possible, with the naked eye, to distinguish between them.

A cancer *differs* from a scrofulous mass in its greater inherent energy of growth; its more complete organization, which is evidenced by the formation of cells, of fibres, and of blood-vessels in its substance; its more complete independence of inflammation; its power of growth, of assimilating the adjacent fluids and tissues, and in its more determined progress. The scrofulous matter, as you remember, is composed chiefly of granules, hardly ever attaining even to the cell-stage of organization, and is dependent for its increase, not on its own assimilative power, but on fresh exudation, which is commonly the result of an inflammatory condition. It often falls into a quiescent state and is absorbed; or if it softens and ulcerates the disease does not generally go

on spreading in the circumference, and the ulcer for the most part heals. Such important pathological and practical differences are, undoubtedly, quite sufficient to justify the separation of these two kinds of morbid products into distinct classes.

That tubercle should be ranked with the least inveterate of these two classes—that it is the form which scrofula ordinarily assumes in the internal organs, I have already expressed my opinion. True, it is the form of scrofula, most nearly approaching to cancer in its comparative independence of inflammation, and in its greater fatality; but the tuberculous mass possesses no higher organization than the scrofulous; it has no cells, fibres, or blood-vessels, except those which chance to remain in it from the undestroyed tissue into which it is infiltrated, and these diminish in number and disappear after a time, so that they cannot be regarded as proper elements of the tubercle, but merely as accidental constituents. Tubercles have no power of assimilation or of increase; they are fatal on account of their numbers, not, like cancer, in consequence of the energy of their growth. Each tubercle having softened, burst, and discharged itself, has done its worst; it leaves no spreading remnant behind, and the cavity produced by it will contract and heal, provided it is not maintained and enlarged by other tubercles forming in its walls and bursting into its interior. The non-existence of any cells or other elements possessing a capability of reproduction, constitutes an important point of distinction between tubercle and cancer, connected as it is with the inability of the former to increase in size, and to exert a destructive influence upon the surrounding tissues. A cancer grows by virtue of its own inherent force; a tubercle is enlarged by some extraneous influence depositing fresh material upon it. It may, I grant, increase in size a little, but no more, probably, than is accounted for by the softening and imbibition of fluid and other changes going on in it. Moreover, tubercle very rarely co-exists with cancer in the same individual, though it is a frequent concomitant with scrofula. Indeed the ages and classes of persons most liable to scrofula and tubercle, are found to enjoy the greatest immunity from cancer.

Cancer has been known to occur at every period of existence. Instances are not wanting, though these are rare, of its having been developed during intra-uterine life. The general impression that the disease rarely occurs in early life, seldom originates in old age, and is especially frequent in both sexes between the ages of thirty-five and fifty, has been shown by Dr. Walshe not to be quite correct. He finds from the examination of the returns supplied by the Registrar-General, that the mortality from cancer goes on steadily increasing with each succeeding decade until the eightieth year; after that period the results are liable to error. The influence exerted by sex on the development of cancer is very decided. The same author shows that the female population of this country is destroyed to about two and three quarter times as great an extent by cancer as the male. His experience leads him to coincide unequivocally with those observers who have remarked that women of high colour and sanguineous temperament are

more subject to mammary cancer than those of a different constitution. My own impression is that the same remark may be applied to the liability of that particular temperament to cancer in both sexes, and in other parts of the body ; more particularly in the earlier periods of life. The young subjects of cancer whom I have seen have been, with few exceptions, dark-haired, and of rather florid complexion.

Cancer is a disease no less malignant in its resistance to treatment, than determined in its progress when left to itself. On this account we should be the more anxious to watch the circumstances under which it arises, and endeavour to adopt such preventive measures as are likely to ward off an attack in the persons who seem most liable to suffer from its inroads. We have found that it is most likely to occur towards the latter periods of life, and in those who have been subject to some distressing cause, such as long continued anxiety, an attack of illness, insufficient food, &c. It seems to be closely associated with a want of energy in the nutritive processes engendered by such circumstances ; and the obvious inference is, that in all cases of the kind, a liability to the invasion of a formidable enemy should make us more active and persevering in our efforts to restore the general health, and to give fresh vigour to the natural forces of assimilation. Very often, it is true, there is no such preliminary or preparative stage that we can discover ; the disease too frequently surprises us by laying hold with inveterate grasp on the young, the strong, and the apparently healthy, where we had not the slightest reason for suspecting its occurrence. In the earlier periods of life, more particularly, we have no chance of resorting to any preventive measures, because the presence of the enemy in the camp is always the first symptom to excite our apprehension ; but in later years, especially about the age of 50 or 60, when the physical powers are beginning to decline, and when some indisposition or illness is very apt to linger about the system, we shall do well to be on our guard against the terrible malady, and should remember not to treat lightly those ailments which, though insignificant in themselves, may pave the way for one so formidable. There can be no question that a proper attention to the slight indispositions at this time of life, would often prevent that depression of the vital powers which terminates in the development of cancer, or in some equally fatal disease. The knowledge also of the fact that cancer frequently makes its appearance in a part which had been the subject of a blow, an attack of chronic inflammation, or any long continued irritation will suggest the removal of some of the local exciting causes no less than the endeavour to diminish the general predisposing influences.

When the disease has made its appearance, there is little hope of a remedy except extirpation ; and it must be lamented that the success even of this treatment is not proportionate to its severity. The removal of a cancerous tumour is so generally followed by its re-appearance in the neighbourhood of the cicatrix or in some other part of the system, that surgeons of the

greatest experience are commonly most unwilling to subject their patients to the pain and risk of an operation which is not likely to be ultimately successful in its results. Such experience coincides, I think, completely with the view I have given you of the pathology of cancer. For according to that view, it is not, even in its very first stages, a local disease, breeding germs and extending to distant regions by the diffusion of those germs, so that we might hope by exterminating the parent at an early period, to prevent the propagation of the species ; but it is an altered state of the textures of a part, induced by a morbid condition of their nutritive functions, a condition which, in a greater or less degree, pervades the whole system ; and the manifestation of cancer in one organ, unless it have been caused by some local irritation, is a tolerably sure evidence of the existence in other organs of a condition similar to that which has led to such fatal results in the part first affected. At the same time, however, that I ask you to bear this view of the nature of cancer in mind, and more particularly ask you to remember the facts upon which it is founded, it is necessary that I should also remind you of the local qualities and the local influences of the disease, when speaking of the propriety of adopting any local means of treatment. For although cancer be a constitutional affection, and the result, in a great measure, of some particular state of the system, there can be no question that when it has once commenced it possesses the property of infecting the surrounding structures, and of inducing in distant parts, and in the system generally, that cachectic condition which is most likely to be productive of secondary manifestations of the disease. Moreover, it may have been excited prematurely in some one organ, in consequence of the nutritive functions of that organ having been lowered beneath the standard of the rest of the body. Of this we cannot always form a correct estimate, though the history of the case will often furnish valuable information to guide us.

In considering, therefore, the advantages derivable from operative surgery in the treatment of malignant tumours, we have to bear in mind the constitutional nature of the disease, the extent to which the local manifestation of the disease reacts upon the system, as well as the influence which it exerts upon the neighbouring glands and other parts ; and, thirdly, the various exciting causes operating upon the part affected, and predisposing it in a peculiar manner to become the subject of cancer. It unfortunately happens that in individual cases the relative weight that should be attached to information derived upon each of these points is necessarily uncertain, and our opinion after all must be formed very much upon general impressions. As an ordinary rule, I think it may be said, that when there is a fair probability of removing the entire disease and a certain margin of the surrounding healthy tissue, without endangering life, we ought not to decline giving the patient the chance afforded by an operation. That chance is not sufficient to warrant any great risk of the loss of life ; and, in my opinion, such formidable and dangerous procedures as amputation at the hip-joint, or removal of the superior maxillary bone, are not justifi-

fiable in cases of malignant disease, unless there be some peculiar reasons for anticipating that the disease will not return in the wound or in other parts. Sufficient has already been said of the nature and pathology of cancer, to assure you that an operation is useless, or worse than useless, unless the entire mass be removed, for the remnant is sure to spread, and the patient is subjected to all the distress, pain, and danger, attendant on the use of the knife without having gained a single advantage over the enemy.

To this rule of operating when there is a good prospect of removing the whole tumour without materially endangering the life of the patient, there are, of course, some exceptions arising from the age or general cachectic state of the system, &c; moreover, it is seldom advisable to remove a cancer when the loss of so much skin would be involved as to leave a large open wound, which must be closed by the tedious process of granulation and cicatrization, for in such a case the disease is almost sure to return before the wound is healed. There are also some particular cases in which general experience would seem to show the inutility of an operation under any circumstances.

A recurrence of the disease in or near the cicatrix after the removal of a cancer is so disheartening, both to the patient and the surgeon, that the latter has not commonly the perseverance to propose, or the former the courage to submit to another operation. Nevertheless, I believe the same remark applies as in the first instance, viz., that we should again remove the tumour, provided we can do so safely and completely. In many instances unexpected success has followed these secondary operations, indeed I have heard it remarked by surgeons of much experience, that they are on the whole more satisfactory than the average of primary operations for the same complaint.

But, you may say, if the constitutional predisposition form so important and decided a feature in the pathology of cancer, why should we be at the pains of taking such summary steps for the removal of the local manifestation of the disease. To this, the best answer that I can give is founded on the fact, that the extirpation of the primary cancerous tumour, with due regard to the provisos I have mentioned, certainly does have the effect, in a great number of cases, of arresting the malady for a time, and of prolonging life. The respite, it is true, is too commonly but short, nevertheless it is an equivalent for the price the patient pays, which in these days of anæsthetic agents has been materially diminished. It would be an important point to ascertain whether the secondary cancerous tumours are more rapid in their progress, or more liable to infect other parts of the body, when the primary tumour has been removed by operation. My own impression is, that they are not so, but extensive careful observation is required to enable us to decide a question of this nature. In some cases the disease has not returned at all in the neighbourhood of the operation, but has affected a distant part, perhaps an internal organ, and the patient has been spared the greater pain and loathsomeness of an external cancer.

In planning and performing operations for the removal of cancers, it is particularly necessary to remember that these tumours are often freely supplied with blood, the surrounding vessels being enlarged in a proportionate manner; also that the morbid structure is generally continuous with the adjacent tissues; not separated from them by a capsule, or even, in some cases, by any well defined line. This, added to the fact that the adjacent tissues are often prematurely adherent together and indistinct, may embarrass the operator a good deal and render it difficult to make sure of removing the entire disease without interfering with large vessels or other important parts.

The prospect of cure afforded by an operation is very different in the different varieties of cancer. In the epithelial form, to be described in the next lecture, the cure is often complete, which is probably to be explained in a great measure, by the fact that this variety of cancer, affecting chiefly the skin and mucous membranes, is attributable to some local source of irritation, and that it does not consequently indicate a constitutional predisposition so strongly as the scirrhous, encephaloma, or melanoma. Of these, the last, I think, usually infects the greatest number of organs in the same individual, and is most sure to reappear after extirpation.

After an operation has been performed, we should endeavour to facilitate the healing of the wound and the speedy restoration of the patient to air and exercise. Of course, the remarks made with regard to the prevention of cancer are especially applicable to the circumstances under which we have so much reason to apprehend its return.

The use of strong caustics for the extirpation of cancer is confined to the skin, and will be mentioned in the next lecture.

There can be no doubt that the growth of cancer, more particularly of encephaloid cancer, is restrained in some degree by pressure; it takes place slowly in proportion to the depth of the tumour from the surface, and proceeds with greatest rapidity when, having destroyed one stratum of tissue after another, it bursts through the skin, and throws out a luxuriant vascular fungus. The observation of this fact suggested a trial of artificial pressure by bandage, or, what is far better, by the air cushion, as proposed by Dr. Neil Arnott. Where this treatment has been perseveringly followed it has been found in several cases to retard the growth of the tumour, and add much to the comfort of the patient; it is even reported in some instances to have caused the complete removal of tumours of the breast which had been decided by competent judges to be of cancerous nature.

Various medicines have been employed in the treatment of cancer; some with the view of arresting the disease, and others for the purpose of alleviating the patient's sufferings. For an account of the effects of these I must refer you to the elaborate treatise on cancer by Dr. Walshe.