LETTSONIAN LECTURES ON THE OBJECTS AND LIMITS OF OPERATIONS FOR CANCER.

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By W. WATSON CHEYNE, F.R.S.,

Professor of Surgery at King's College; Surgeon to King's College
Hospital.

LECTURE I.

THE OBJECTS AND LIMITS OF OPERATIONS FOR CANCER.

MR. PRESIDENT AND GENTLEMEN,—In the first place, allow me to thank you for the high honour you have done me in selecting me as your Lettsomian Lecturer on this occasion. While your selection has done me great honour and given me much pleasure, it has also caused me great anxiety, more especially in the choice of a subject which would be of sufficient interest to the Fellows of the Society: for it seems to me that the great value of lectures of this kind is that they afford an opportunity, not so much of presenting original work, as of reviewing the present standpoint of medical science in some particular department, of criticising the advances that have been made, of seeing what of these advances are good and what are of doubtful value, and thus of furnishing a basis for further work.

One of the departments in which there has been such activity of late years is in the treatment of cancerous diseases. The last few years have seen marked alterations in the older methods of operating in these cases, and also the introduction of operations in regions and of an extent formerly not thought of. Opinions differ very much at the present time as to the utility of many of these surgical procedures, and it is a matter of much interest and importance to consider the results which have been obtained, and to come to some definite conclusions as to their value. And it is with a view of trying to estimate the value of the work done in this department that I have decided to discuss in these lectures the objects which we should aim at, and the limits to which we may go in operating for cancerous diseases.

By cancer I mean the carcinomata, the essential feature of which is continuous and excessive growth of epithelium. Once this growth has commenced, nothing that we know of has any power to stop it. It invades the surrounding tissues, it spreads along the lymphatic vessels, or is carried by these vessels to the nearest lymphatic glands; it passes from one lymphatic gland or one chain of lymphatic glands to another, till it ultimately reaches the main lymphatic trunks, through which it enters the blood stream, and is deposited in distant organs and parts of the body. Deposited in these distant organs it again grows, and the same cycle of events follows, or would follow, were it not that the patient soon succumbs from general poisoning as the result of absorption of materials elaborated at the seat of the disease, from interference with the vital functions owing to the presence of the growth in important organs, from repeated hemorrhages due to erosion of blood vessels, and so on. Once this overgrowth of epithelium has begun it goes on inexorably, unless we can arrest it, to the one fatal end.

[The lecturer then referred to the local and constitutional origin of the disease and the question of its curability as instanced by cancer of the extremities, lips, and uterus.]

Let us pass on now to the subject proper of these lectures, namely, the objects and limits of operation in cases of this disease. The primary object of operation in cancer is, of course, the prolongation of the patient's life and the alleviation of his local trouble, and what I propose to assert in these lectures is that these results are in most cases best attained by aiming, wherever it is possible, at the cure of the disease. Up till quite recently, and even now, many surgeons approach operation in these cases impressed with the view that real cure is practically hopeless, and that with few rare exceptions the most that can be expected is prolongation of life for a variable length of time. They, therefore, oppose elaborate and extensive operations which in themselves must involve

considerable risk to life, and are content with fairly free removal of noticeable disease; in some cases, indeed, they do not even go so far. For example, in cases of mammary cancer, even where some enlarged glands are to be felt in the axilla, they comfort themselves with the idea that the glands may only be enlarged from irritation and not from cancerous deposit, and, therefore, leave them alone until their true cancerous nature is only too evident. Of course, if operations are performed in this manner and with these views, it is no wonder that these surgeons are confirmed in their views, and go on operating on cancer with the sole object of prolonging life for a comparatively short time.

In discussing the curability of the disease, I have already mentioned evidence as regards cancer of the extremities, lips, and uterus, which shows that a real cure is obtainable in a very considerable proportion of cases, and in the following lectures I shall produce similar evidence as regards other parts. I therefore hold, and would strongly urge the view that the first question to be kept before us in investigating a case of cancer is whether there is any possibility of curing the disease or not. Such a point of view makes a very great difference in the operation, for it is not then sufficient to remove only the noticeable disease, but it is necessary to take away as far as possible the parts in which disease may have become disseminated, although still unrecognisable—in other words, possibly infected lymphatic areas. Thus, if the skin is affected, a considerable portion around must be taken away, and this is the more necessary where the infection of the skin has come from beneath, as, for example, where cancers of the breast reach the surface, for the dissemination in the cutaneous lymphatic plexus is often under these circumstances very rapid and extensive, and this is probably due in part to the larger size of the deep cutaneous plexus, which will, in the latter case, be first involved. Again, where muscle is infected, the cancer cells are very rapidly and early driven along the lymphatic vessels of the muscle, and even though there may only be one visible nodule in the muscle, the whole or the greater part of it must be looked on as suspicious, and must be removed if there is to be anything like certainty in attaining the object of the operation, namely, the patient's cure. Again, as regards the lymphatic glands, we know that from a very early period they become affected, and that, of course, without any visible enlargement in the first instance, and in addition to this infection of the glands without enlargement, plugs of cancer cells very often stick in the lymphatic vessels on their way to the glands. Hence it is necessary in all cases where the disease has lasted any time, or extended at all deeply, not only to remove the primary mass freely, but also to take away the whole lymphatic area up to and including the nearest lymphatic glands. Thus the operation performed with the object of curing the disease becomes a much more extensive one, and consequently much more serious than that which simply aims at getting rid of the main trouble for a time and prolonging the patient's life.

The first question to be considered, then, with regard to a case of cancer is the anatomical one, namely, whether it is anatomically possible to remove all the local disease and the probably infected lymphatic area so thoroughly as to give a fair chance of non-recurrence. If this is anatomically possible, the next questions are, What are the chances of death as the result of the operation? and what will be the subsequent functional result? In considering these questions, we must remember that we are dealing with an otherwise incurable disease, one which is comparatively rapidly fatal, and one which in certain regions—for example, the throat—is often the cause of very extreme suffering before death supervenes; and therefore, even although the risks are very great, unless the result of the operation is certainly fatal, the question of operation ought to be presented to the patient if there is a reasonable chance of removing the disease. There is at the present time a tendency with some surgeons to careful selection of cancer cases for operation, that is to say, only to operate on quite simple cases. This is not, I think, a proper point of view. No doubt it is the way to get good statistics, but what of the poor patients who are not operated on because the prospect of success is not good? I do not think that patients should be refused operation unless the disease cannot be removed, unless early recurrence is very

highly probable, or unless operation means almost certain death or yields a hopeless functional result. Of course, if one has something better to substitute for the radical operation, such as colotomy in extensive rectal cancer, the matter is quite different, but where this is not the case the patient should be told all the circumstances and allowed to take his choice.

The primary object of operation in these cases being therefore cure, the limits of the radical operation are where there is no reasonable prospect of removing the whole disease, or where, along with a very poor prospect of success, there is a very high mortality from the attempt. In such cases I do not think that operation should be mentioned at all, for even where the patient recovers from it, and has presumably two or three months added to his life, few would, I think, thank one for it, seeing that these two or three months have been spent in convalescing from a serious and, in the end, useless operation.

But even in cases where hope of cure or marked prolongation of life by a radical operation is out of the question, operation may sometimes be advisable with the object of removing symptoms which are immediately threatening to life,—such operations, for example, as tracheotomy, colotomy, etc.; or in the second place with the object of taking away the primary disease from a part, such as the mouth or throat, where its continued development means intense pain and trouble, and thus of substituting for these troubles an easier death from exhaustion. *A sine quâ non* of such operations must however be that they are reasonably free from immediate risk; and with regard to the second class, that there is a prospect of attaining the object of the operation—namely, the entire removal of the disease from the part operated on. I do not think that a dangerous operation is allowable for simple relief of symptoms, however proper it may be if a cure may be hoped for.

There are thus two different objects to be held in view, and two different questions as regards operation which we must bear in mind in treating a case of cancer—namely (1) Can we reasonably hope for a cure? for if we can, a serious or dangerous operation is permissible; or (2) Cure not being possible, can we decidedly ameliorate the patient's condition by operation, such operation, however, not involving any great risk of life?

It is, of course, impossible for me in the time at my disposal to discuss the objects and limits of operation for cancer in all parts of the body, and I have therefore selected three regions for examination—namely, (1) the breast, (2) the throat, and (3) the intestinal tract, as these three regions illustrate very well all the points bearing on our subject.

I.—CANCER OF THE BREAST.

The female breast is one of the most common seats of cancerous disease, and great attention has consequently been paid to cancer in this region, but it is only recently that any important advance has taken place. When I was attending classes on surgery twenty-four years ago the teaching which I received, except from Sir Joseph Lister, as regards the method of operation, was simply to remove the breast in these cases by an elliptical incision, including the nipple. The pectoral fascia was not taken away; indeed, it was held that on no account must it be touched, because otherwise the suppuration which was apt to follow might be extremely dangerous; and, lastly, only rarely and with the greatest hesitation were one or two glands excised from the axilla. As antiseptic surgery began to exercise its influence, and as it became evident that the extent of the operation did not increase the risk of septic disease, the tendency was towards more extensive operation, and in this, as in many other departments of surgery for which he gets no credit, Sir Joseph Lister took the lead and began to extend the area of operation, especially in the way of more extensive and finally of more or less complete removal of the axillary contents and of the pectoral fascia. It was not, however, till the researches of Heidenhain, and subsequently of Stiles, Johnson and others in this country, that we knew exactly how the disease extended, or indeed how extensive the mammary gland itself was. As the result of these researches, we now know that by the older methods of operating, and indeed by any method which does not take proper cognisance of the facts which

these recent researches have brought to light, the patient never really has a chance of cure, properly speaking, and the wonder is not that recurrence so constantly takes place, but that in any cases apparent cure follows.

Before going on to discuss the results of operation for cancer of the breast, I must very shortly indicate the sort of procedure which I think is necessary, and, as I have already written on this subject, I need not go at all fully into details. Knowing the very early period at which the cancer cells get into the lymphatic vessels, an operation to be at all complete must include the primary disease, the lymph channels leading from it, and the whole mass of the nearest lymphatic glands. It does not, however, follow that when these glands are enlarged it is absolutely necessary to go beyond the first group, because, for a time at any rate, the disease seems to be held back at that point; but, as I say, the minimum operation for cancer of the breast which will offer anything like a real chance of cure must take away everything up to and including the first chain of glands. Hence, in the case of the breast we must remove the primary disease, the whole breast, the tissue in which the lymphatics run from the breast to the axilla, and the whole of the axillary glands. In this connection we must remember that recent researches have shown that the breast is a very much more extensive organ than was formerly supposed, and that by the old method of operating practically only the central part was taken away. Lobules of the breast run in the fat over the pectoral muscle nearly up to the clavicle, well into the axillary line, almost on to the sternum, and downwards on to the origin of the abdominal muscles. In the deeper part also the lobules of the breast are intimately connected with the pectoral fascia, and the removal of the breast without simultaneous thorough removal of the pectoral fascia inevitably means that numerous lobules are left behind. Hence our skin incisions must be very much more free than formerly was the rule, and for my own part I always take away the skin coextensive with the prominent part of the organ.

There is another reason for taking away this large amount of skin, namely, the existence of the suspensory ligaments of the breast, in which lymphatic vessels run from the organ to the skin, and these are not at all infrequently infected with cancer cells. In addition to this portion absolutely taken away, the skin all around must be raised, leaving fat and lobules of the breast, as high as the clavicle, as far inwards as the middle of the sternum, downwards on to the abdominal muscles and outwards on to the latissimus dorsi; and one advantage of this free undermining of the skin is that in the great majority of cases one can subsequently bring the edges together by means of stitches. Where the tumour is situated towards one side of the breast, additional portions of skin must be taken away in a V-shaped manner, so that all the skin from the vicinity of the disease is removed. The skin flaps being held up, the pectoral muscle must be exposed at the upper part, and then in order to ensure the removal of the fascia, a layer of the whole surface of the muscle must be taken away, and when the lower and outer edge of the pectoral muscle is reached, the fascia over the serratus magnus and the whole fatty tissue containing lymphatics as far back as the edge of the latissimus dorsi must be detached. In this way the primary disease, the breast, and the lymphatic vessels running in the fat and pectoral fascia towards the axilla are separated, and then one proceeds to clear out the whole contents of the axilla, finally leaving the nerves and vessels thoroughly cleaned as in an anatomical dissection. One first follows the fat and fascia running between the pectoralis major and minor on to the costo-coracoid membrane, and then I expose the axillary vein at the lower part and tear open its sheath in its whole length; then, raising the pectoralis minor, I begin at the very apex of the axilla right up under the clavicle, and with a curved blunt instrument (the one I find most useful is a periosteum detacher invented by Dr. Greville MacDonald for operations on the nasal septum) and the finger detach the whole fat and included glands and lymphatic vessels, till everything except the important structures in the axilla has been got away. It is very important, also, that the whole tissue should be removed in one piece; in the first place, it is of great advantage in clearing the axilla to have the parts dragged down by the

weight of the breast; and, in the second place, it is very important not to cut through tissue which may be actually diseased, and which may lead to subsequent infection of the wound, as might be the case were the same taken away in the first instance, and the axillary tissues removed subsequently. And this risk of soiling of the wound is no imaginary one. Had I time, I could bring forward evidence to show that recurrence may be due to this cause, and that if it can possibly be avoided, a malignant tumour should not be cut into, and on no account should it be removed piecemeal, as is sometimes done in other parts of the body.

This operation is, in my opinion, the least extensive which ought to be done, even in a simple case, if the object is to cure the patient, but it must be modified and extended in most instances according to circumstances. Where the skin is much tacked down over the tumour, although it may not be actually involved in the disease, the cutaneous lymphatic vessels, and those running in the suspensory ligaments, are apt to be affected over a wide area, and hence it is necessary in such cases to cut exceptionally wide of the disease. Where the tumour itself actually involves the skin, we know that the disease has almost certainly spread widely in the cutaneous lymphatic plexus, and in such a case one must not hesitate to remove the skin extremely freely, and to leave a wound the edges of which it may not be possible to bring together. If such a wound is left, it can very readily be closed by skin grafting, either at the time of the original operation or, if the patient is too exhausted, about ten days or a fortnight afterwards.

Where the tumour is adherent to the pectoral fascia, as is very commonly the case, I think it advisable to take away the whole thickness of the muscle at that part, and as the lymph tends to be forced onwards in the direction of the muscular fibres the mass of the muscle removed should be detached along its whole length, from its origin to its insertion. In operating on such cases, as I approach the neighbourhood of the tumour, I usually sink my hand through the muscle and then rapidly separate the part grasped from origin to insertion, and detach it at both ends; and, as a matter of fact, in many of my cases, I have done this, and have thus removed a considerable part of the lower portion of the pectoral muscle. Halsted and others advise that the pectoral muscle, at any rate its sternal origin, should be taken away in every case, partly in order to get thoroughly rid of the pectoral fascia, and partly in order to be able to clear out the axilla more effectually. As will be evident when I come to compare my statistics with Halsted's, this is really not necessary unless there are actual nodules in the substance of the muscle; more especially where the lower portion of the muscle is removed in the manner I have described, there is no difficulty whatever in pulling up the remains of the pectoral muscle sufficiently to obtain complete access to the upper part of the axilla.

Where the muscle itself is actually diseased—that is to say, where there are one or more nodules in the muscular substance—it has been pointed out by Heidenhain that the whole muscle must be looked on as infected, for the muscular contractions very quickly distribute the contents of the lymphatic vessels over it. He therefore advises complete removal of the pectoralis major under these circumstances. I am inclined to think, however, that even in these cases it is often sufficient to take away the sternal origin of the muscle, and that the clavicular portion may be left unless there is actual disease present in it. The connection between the two portions is not very intimate, and from a functional point of view it is of great importance to leave the clavicular part.

Where the glands in the axilla are markedly enlarged the question arises as to how far one should go. In the first place, under such circumstances, it is certainly well to see what one is doing; and while if the pectoral muscle is not affected at all I prefer leaving it, I think it is well to divide it transversely, and after the operation stitch it up. The chief question, however, which has to be considered is whether, having found the higher axillary glands enlarged, one ought not to go further and remove the glands from the posterior triangle of the neck. Some have, indeed, tried to make it a universal rule that if the axillary glands are at all enlarged, those in the posterior triangle must also be taken away; but, as I have

already said, the first chain of glands opposes a barrier for a considerable time against the onward spread of the disease, and if only it is thoroughly removed I think one may in most cases be content. Where the cancer is a slow-growing one, and only the lower axillary glands are noticeably enlarged, I do not therefore open up the posterior triangle of the neck, and, so far as I can recall, I have only twice had recurrence in the supraclavicular glands. If, however, the highest axillary glands are noticeably affected, it stands to reason that the posterior triangle of the neck should be opened. Unfortunately, however, in these cases the line of infection does not so much run into the posterior triangle as along the subclavian vein into the thorax, along a route that is imperfectly accessible even when the posterior triangle is opened, and I have not seen much benefit in the way of finding and rooting out disease as the result of opening up the posterior triangle.

Mr. Arbuthnot Lane apparently advocates division of the clavicle and clearing out the supraclavicular glands in all cases, but this is a method which I cannot at all agree with, and I think that my results bear me out; and where the disease is noticeable in the supraclavicular glands, I believe that cure is hopeless. Some have also advocated amputation at the shoulder-joint, with the view of removing the axillary disease still more thoroughly, and this was first done by Sir Joseph Lister, partly at my own instigation. I do not, however, believe that when the disease has gone so far as to necessitate such a procedure, there is the slightest probability of curing the patient. The conditions under which amputation of the arm would be necessary are the presence of a large mass in the axilla involving the nerves, for involvement of the vein or the artery, or even of both, does not necessitate amputation. I have on more than one occasion removed portions of the axillary vein to which glands were firmly adherent, and in one case I removed both vein and artery without any loss of vitality or other trouble in the limb; but where the disease is so diffuse as to involve the nerves, I think it may be taken as certain that it has extended beyond reach.

As regards the limits of operation for cure in breast cancer, therefore, I would exclude from operation:

1. Cases of cancer *en cuirasse*.
2. Cases where there is a large mass in the axilla involving the nerves.
3. Cases where large glands can be felt above the clavicle.
4. All cases where secondary cancers already exist elsewhere.

In none of these instances is there any reasonable prospect of cure; and there will be but little to be gained by subjecting the patient to the elaborate operations to which I have referred. Short of these conditions, however, I think a patient ought to have the chance of operation, and though, as I have said before, I would not urge it in bad cases, I think she should be allowed to choose. Even when the operation fails to cure, the prolongation of life is often marked, much more so after those thorough operations than after the ordinary imperfect procedure. In this list I have not included cancerous cachexia, as is usually done, because it seems to be due to absorption of products from the cancerous growth, and does not necessarily imply a general internal infection. I have repeatedly seen patients with marked cancerous cachexia improve immensely after the operation.

In considering the results of former and recent methods of operation for cancer of the breast, we may look either at the question of cure or at that of local recurrence, and the most satisfactory conclusion is, I think, obtained when we take both together; indeed, since the most recent views have influenced practice, the time is too short for the accumulation of any large statistics as regards cure, and one must therefore judge of the effect to some extent by considering the question of recurrence.

As regards cure, I have adopted Volkmann's three-year limit, and include under cures all cases which for a period of three years or longer after the operation have had no local recurrence, and have shown no sign of internal cancer. Although this three-year period is not absolutely accurate—for a certain though small proportion of patients who have been alive and well at the end of three years have yet died of cancer—nevertheless it is near enough for all practical pur-

poses; and even if we only secured the patient three years of complete freedom from disease, such a gain would fully justify the most radical operation.

As regards the question of local recurrence, it will be seen that a very marked change has been produced by recent methods of operating. Formerly, and even now, local recurrence was extremely frequent (Gross puts it at 68.8 per cent., and that is not including the cases which have been lost sight of, probably many of which have also recurred). In considering this question of local recurrence, it must also be remembered that up till recently half of these local recurrences took place during the first three months after the operation, and over 80 per cent. during the first year. Halsted has drawn a distinction between what he terms local recurrence and regional recurrence. By local recurrence he means recurrence actually in the track or area of the wound; by regional recurrence he implies recurrence in the neighbourhood, or in glandular areas which were not included in the first operation. Such a distinction is, however, extremely difficult to carry out, and it must often be impossible to determine whether a particular nodule has appeared in the track of the former operation or in its immediate vicinity. As a matter of fact, Halsted's regional recurrences imply an imperfect operation just as much as his local recurrences do; they simply mean that the operation has not been sufficiently extensive, no doubt in many cases because it was impossible; hence I prefer to group both these so-called local and regional recurrences together under the heading of external recurrences, and in my own statistics I speak of two sets of recurrences, namely external recurrences in the wound, its vicinity, or the glands, and internal or metastatic deposits.

Cases of cure of cancer of the breast by operation were very rare in former times, and even at the present moment it is with many not so much a question of cure as one of prolongation of life; if cure happens to take place it is a lucky and more or less unexpected result. The prolongation of life by the old operation is variously estimated at from eight to thirteen months, but this is really longer than it should be by reason of the fact that some of the patients have lived several years and have thus raised the average. Excluding cases which have passed beyond the three-year limit, I do not think that the prolongation of life by the old imperfect operation is, on an average, more than from six to eight months, though at the present time where recurrence takes place after the more thorough operation this prolongation seems to be considerably increased.

In looking back over old literature one is very much struck by the great rarity of cure and the very desponding view which surgeons took of the chances of permanent freedom after operation. Velpeau knew of only twenty cases which had been cured, and it is by no means certain that all of these were cases of cancer. Many of the older surgeons state that they have not known a single instance of cure. According to Henry, Benedikt of Breslau only operated eight times in eighteen years, and during the last seventeen years he did not operate on breast cancer at all; he considered, from his own experience and that of others, that the chance of cure was so extremely remote that he was not justified in subjecting the patients to the risks of the operation, which were at that time considerable. Von Winiwarter, in publishing in 1878 Billroth's results, namely, 8 cures in 143 cases, says that this result is surprisingly good, and that no such favourable statistics had up to that time been published.

I need not recapitulate here the details with regard to various statistics, but I have in the second table put together results which I have worked out from papers published from various clinics; and in the first table I publish all the cases on which I have myself operated since the beginning of 1890, at which time I obtained beds at the hospital and began to operate in this thorough manner. I would lay stress on the fact that my cases have been in no way selected, only cases of the kind previously referred to having been refused operation. Many of them were very advanced, and would have been refused operation by those who select their cases; and I may add that in all of them I have found disease in the axillary glands. I may say also that all my cases were subjected to microscopical examination, so that there is no question as to the diagnosis in these instances.

With regard to the various statistics which have been pub-

lished, there is one very curious fallacy which has cost me a great deal of time and trouble to rectify in preparing the second table, and it is this—the total number of cases operated upon is given, and the cures have been calculated in reference to the total number, quite irrespective of the fact that in some the operations had been quite recently done. For example, taking the first line in Table II, we have the total number of cases given as 147, and the cures as 8 per cent., but then a very considerable proportion of these cases had been operated on within three years of the publication of the statistics, and none of these could by any possibility have lived three years. It is necessary, therefore, in order to study the results of cure according to the three-year limit, to exclude all those in which the operation was done within three years of the publication of the report. Thus, in the first line, we have to exclude no fewer than 61 cases, and when the number of cures is reckoned in proportion to the remaining 86 cases, we have the percentage at once raised from 8 to 15 per cent. Some writers exclude the deaths also, but I do not think that is quite fair, as a patient wants to know the chances—death, etc., included. Further, a considerable number of these cases were lost sight of and most writers exclude them also, but that I have not done, because it is highly probable—certainly from my own experience—that most of the cases of operation on cancer which are lost sight of either die or recur, and if they recur, knowing that the disease is cancer, the patients either decline to consider a second operation, or believe that a second operation is hopeless, and therefore do not show themselves again. It may be noted in the second table that the percentages given by me do not correspond with those in the original papers, and that it is mainly because the authors excluded the cases lost sight of, and thus got a better percentage result. I think that the second column, which takes into account all the cases which were operated on up to within three years before the publication of the report, represents fairly accurately the proportion of cures in the hands of these particular surgeons.

The study of the second table fully justifies, I think, what I have said as to the necessity for extensive operation and the advantage to be derived from it. Contrast the older results from Trendelenburg's with 4 per cent. of cures, to Fischer's, with 15 per cent., or taken altogether an average of about 10 per cent., with the more recent results, varying from 16 per cent. in Küster's practice up to 57 per cent. in my own, and we see that as the result of greater care in operating the chances of cure have been largely increased, and the recent results in this table ought to be really better, for a little study of the methods employed by some of the surgeons in the more recent period shows that even there the operations were not so complete as could be wished. The value of even an imperfect improvement is well shown in Esmarch's results, where, during the first period up to 1863, the old plan of operating was employed with only 4 per cent. of cures; while afterwards the axilla was cleared out more or less thoroughly, with a jump at once to 18 per cent., a result more than four times better.

Looking at my own results, it will be seen that the effect of thorough removal of the disease is very marked indeed. Taking the cases which have been operated on in the manner described up to three years ago, 21 in number, we have no deaths, 12, or 57 per cent. of cures, and 9, or 42.7 per cent. of cases recurring either externally or internally. And if it be objected that 21 is a small number to argue about, I would point out that 12 cures is more than can be shown by many of the older surgeons, although their cases exceed 100. Again, if we study my results from the point of view of the return of the disease, taking in the recent cases, we have a total of 61 cases with 19, or 31 per cent. of recurrence or metastatic deposits, and among these recurrent cases were two which were really inoperable (in one of them indeed visible disease being left behind), and which only raise the percentage of failures unnecessarily; and also included in these is one case in which I only assume that there was a metastatic deposit, but have nothing but suspicion to go upon. Excluding the two inoperable cases, as is usually done in the statistical reports I have quoted, we would have 59 cases operated on with reasonable hope of cure, with 16 certain recurrences, or 27 per cent. Some of these, it is true, have only been operated on quite recently, and they therefore are not of

much value, although it must be remembered that by the older methods local recurrences in half the cases took place within three months of the primary operation. At the same time, let us exclude the cases operated on during the last year (and, as I have previously mentioned, over 80 per cent. of the recurrences take place during the first year after operation), I say, excluding the cases operated on during the last year, we are left with 40 cases, with at the very worst 16 or 40 per cent. internal or external recurrences, and that is including Nos. 24 and 29. Taking the external occurrences alone, we have in the 61 cases only 11 external recurrences (again including No. 29), giving an average percentage of external recurrences of 18 or 19 per cent. As regards the 12 cured cases, of course recurrence may still take place in some, but taking the most unfavourable statements—namely, König's—that 15 per cent. recur even after three years, we would still be left with 9 cures (leaving out also Case 9, which died well after three years), or 42 per cent. of definite cures, a result far superior, however it is worked out, to that obtained by the ordinary operation.

I have already referred to Halsted's paper, which, up to the present, has shown the most favourable results as regards recurrences, and he points out that in his 50 cases he has had only 3 local recurrences, but he has also had 8 regional recurrences, and, as I have already said, I think it is much fairer to combine his local and regional recurrences under one heading, external recurrences, as I have done in my own statistics, and this gives him a percentage of 22 per cent. external recurrences. Contrast the results as regards external recurrence obtained by Halsted (22 per cent.) and myself (18 per cent.) with those of surgeons operating less completely, as worked out by Halsted: for example, Billroth, 85 per cent.; Czerny, 62 per cent.; Fischer, 75 per cent.; Gussenbauer, 64 per cent.; Volkmann, 59 per cent., etc.; and the difference between the old imperfect operation and the thorough one becomes more striking and unmistakable.

While the results, as I have pointed out, are steadily improving, the proportion of cases which succumb to cancer is still considerable, and will not, I think, be much reduced till patients and doctors understand that there is a good chance of radical cure from early and thorough operation in mammary cancer, and that a suspicious lump in the breast, especially in elderly women, is not a thing to be watched, for I may say that over 90 per cent. of the swellings of the breast in elderly women are cancerous.

Contrary to the usual dictum, it is now found that the most favourable of all cases for operation are those of atrophic scirrhus, and the more nearly a cancer approaches the atrophic form the greater is the chance of permanent cure; indeed, I believe that the malignancy of the cancer in the individual cases has a great deal to do with the favourable result of operation, more than the early period of the operation; but that, expressed in other terms, is only to say that in the less malignant forms of cancer the disease does not diffuse itself as rapidly or widely, and that by an extensive operation we have a better chance of getting beyond it. A patient who comes with a small tumour which has been noticed for several months, which has not markedly increased in size, and in connection with which we have only small glands in the axilla, has a much better chance than one who has found a tumour quite recently which is noticeably enlarging, and in which the axillary glands are of considerable size. In the former case the probability of getting beyond the disease is great on account of its slow spread; in the latter the reverse is the case. Hence while the sooner a cancer of the breast is radically removed the better, one cannot say that the chance of cure is necessarily proportionate to the early period of the operation; in any case, however, the chance of cure of necessity depends on the thoroughness of the operation.

I need not enter at length into the objections which are urged to these thorough operations. They are usually brought forward by those who only operate with the hope of adding a few months to the patient's life, and not of curing the disease. I may, however, refer to the one question of mortality. Formerly the mortality was great, and was much increased by opening the axilla, and this was due to sepsis. As that is avoided nowadays, we may safely conclude that when the argument of mortality is brought forward the arguer does not

keep his wounds aseptic. Halsted in his fifty cases has had no death; in my sixty-one cases I have had one death, with which probably the ether had as much to do as the operation; in fact, I think shock is practically the only risk which we have to face, and there is no question that the patients do suffer a considerable amount of shock in some cases; on this point I cannot agree with Halsted, who minimises the risk from this cause. In addition to shock, more than one writer has referred to pneumonia as occasionally occurring, possibly from long exposure in a cold room, in the case of predisposed individuals; and I had this experience in one case where I performed an extensive operation for recurrence (the primary operation having been done by another surgeon). As regards the question of functional disability which is also sometimes brought forward, there is really comparatively little. At first, no doubt, the patient finds that the movement of the arm is very considerably impeded; but as time goes on this becomes more free, and ultimately as a rule the patient is able to do most things which she wishes. After all, even if the arm were permanently useless, it would be a comparatively small price to pay for life.

Mr. Butlin is, as is well known, one of the chief opponents in this country of these thorough operations, and since I have written these lectures I have looked into his book on the *Operative Surgery of Malignant Disease*. While I find that some of his views are similar to those at which I have arrived, I have been much surprised at some of his dicta, more especially with regard to disease of the breast. Thus, he seems to consider it sufficient in some cases, where the tumour is quite small, to remove it alone, without taking away the rest of the breast, because he sees no reason to believe that fresh disease will necessarily break out in the part left behind. But the entire removal of the breast is advocated, not, as Mr. Butlin appears to imagine, so much on account of a degenerative precancerous condition of the rest of the organ, which will subsequently manifest itself in a fresh cancerous growth, as for the purely anatomical reason that the main lymphatic vessels of the breast run towards the nipple, as has been shown by Sappey, before they go on to the axillary glands, and as the cancer cells very early get into the lymphatic vessels there is the greatest probability that if the tumour alone is removed cancer cells will be left behind in other parts of the breast. Again, Mr. Butlin does not think it is necessary to remove the lymphatic glands unless they are noticeably enlarged, nor does he apparently lay any stress on the removal of the intervening lymphatic vessels. That cancer cells do not often stick in the larger lymphatic vessels is quite true, nor do I hold that it is necessary in all parts of the body to remove all the tissue between the primary growth and the nearest glands, but in the case of the breast we have ample evidence of this necessity as regards the lymphatic vessels in the pectoral fascia, which are frequently plugged with cancer cells, and as regards the lymphatic glands they come lower down in the axilla than is generally supposed, and are very apt to be overlooked unless the continuity of the breast and glands is maintained. That in quite early cases the glands may not be infected is of course probable; indeed, several instances of cure have occurred where the breast alone has been removed. This, however, very seldom happens, and to refuse to remove the axillary glands because it may not be necessary in a few very exceptional instances is to my mind quite illogical. It is surely better that these few patients should lose their axillary glands unnecessarily than that, in the case of the great majority, disease should be left behind.

As a matter of fact, as cases come into the surgeon's hands it is very rarely indeed that the disease has not attacked the glands, although they may not be noticeably enlarged before the operation, and in every one of my cases some, at any rate, of the axillary glands have been diseased. Hildebrand states that in 26 out of 135 cases which he publishes from König's clinic, no enlarged glands could be felt before the operation. In 13 of these cases the breast alone was removed, with 3 cures; while in the other 13 the axilla was also cleared, and with 6 cures. Mr. Butlin's conclusion, based on these views, is to the following effect: "We may regard operations for the removal of mammary cancer as successful in effecting a complete cure in rather more than 10 per cent. of all cases treated. I believe that a percentage of 12 to 15 is nearer the

TABLE II.—Statistics of Breast Operations.

Operator.	Total Cases.	Mortality.	Known Recurrences or Deaths from Metastases.	Cures.	Cases done more than 3 years before the Report.				No. of Cases Cured.
					Total.	Mortality.	Recurrences (or Metastatic Deposits.)	Cures.	
		Per cent.	Per cent.	Per cent.		Per cent.	Per cent.	Per cent.	
Fischer (Henry)	147	20	55	8	86	22	59	15	13
Esmarch (Oldekop).....	229	10	44	10	171	13	(?)	14	25
Before 1863	—	—	—	—	47	—	—	4	2
After 1863	—	—	—	—	124	—	—	18	23
Rose (Fischer)	61	26.3	(?)	6	—	—	—	—	4
Billroth (Winiwarter)	143	23.7	62	5	89	22	68	9	8
Trendelenburg (Neuendorff)...	97	11	54	2	50	12	68	4	2
Lücke (Dietrich)	110	7.6	(?)	9	69	8	60	13	9
Czerny (Schmidt).....	150	4.4	(?)	5	82	6	46	8.5	8
Krönlein (Horner)	144	4	58	18	121	4	68	20	25
Küster (Schmidt).....	222	10.8	(?)	9	132	14	(?)	15	20
König (Hildebrand)	135	—	—	17	118	9	61	20	23
Bergmann (Eichel)	114	4.3	62	11	43	7	62	30	13
Mitchell Banks	82	12	26.8	21.9	—	—	—	—	18
Halsted	50	0	43	4 OR 8	11	0	54	18 OR 36	2 OR 4
Watson Cheyne.....	61	1.6	31	19.9	21	0	42.8	57	12

truth." Contrast this with the 57 per cent. of cures which I have obtained with the more thorough operation.

I have previously mentioned several cases in which I do not consider that a radical operation is advisable, and the question in these is whether anything can be done in the way of prolonging the life of the patient, or of making the period of life that remains to her more comfortable. In some of these cases the patient's life can no doubt be prolonged by excision of the breast alone, or of the axillary glands as well, perhaps for three or four months, or even as long as a year, and she may then die of internal disease without suffering so much as she would have done from the local tumour. She should, however, be told that the object of the operation is merely to prolong life; and many women, knowing that, would prefer not to undergo it. In some cases where there is a foul ulcer, the patient may be relieved of much pain and trouble by removal of the breast. On the whole, however, I do not see any particular advantage in operating in cases of breast cancer unless with the view of curing the disease; and in cases where it is practically certain that the disease cannot be cured, the performance of an operation would depend entirely upon the patient's desire for a short prolongation of life, or on the possibility of relieving her of some serious trouble. As a matter of fact, we do not have here, as we have in intestinal cases, any substitute plan to offer which will either relieve the patient materially, or give any marked prolongation of life. It is practically either a thorough operation or nothing, and therefore the breast is not a situation in which the so-called careful selection of cases and exclusion of all but simple cases from operation are at all permissible.

TABLE I (Abstract).—All the Cases of Cancer of the Female Breast since 1890 (verified by Microscopical Examination), in which the First Operation was performed by Mr. Watson Cheyne.

A.—Cases where Three Years at least have elapsed since the Operation.

Total, 21 cases. No deaths from the operation.

12 cured—that is, well for more than three years.

(5 external recurrences, 3 of them with metastatic deposits as well.)

9 recurred } 1 recurrence (? external).

3 metastatic deposits without external recurrences.

In percentages, 57 per cent. cured, 42.8 per cent. recurred. The patients "cured" have lived 6 years, 5 years 9 months, 5 years 3 months, 5 years, 4 years 3 months, 4 years 2 months, 4 years 1 month (2 cases), 3 years 10 months, 3 years 1 month, 3 years; one died—well 3 years and 5 months after the operation.

B.—Cases where Three Years have not yet elapsed since the Operation.

Total number of cases where three years have not yet elapsed since the operation=40; of these

1 died of the operation.

2 have been lost sight of.

27 have had no recurrence as yet.

10 have shown further disease:

6 recurred locally; in one (No. 29) visible disease was left behind.

4 had metastatic deposits alone; one of these (No. 56) was really an inoperable case, and in one case (No. 24) I only assume that there was an internal deposit.

In percentages, 67.5 per cent. remain well, 25 per cent. recurred. The total is 61 cases. In 39, no recurrence=63 per cent. In 19, recurrences or metastatic deposits=31 per cent.

Excluding the cases operated on during 1895, which may be said to be too recent, we have 40 cases, of which

21 remained well = 52 per cent.

16 have shown further signs of cancer = 40 per cent. One of these (No. 29) really inoperable; and in one I am not sure (No. 24) whether there was a deposit or not.

2 lost sight of.

1 died after operation.

One other interesting calculation is to follow those cases which lived for a year after operation without further sign of cancer, thus showing the chances of a patient where a year passes without recurrence = 25 (including 2 recurrences about which I am not sure). Of these

20 remain well.

1 died—well after more than three years.

4 showed further signs of cancer (Nos. 7, 12, 17, 20), but in two of these (Nos. 7 and 17) the recurrence may have been noticed before the end of the first year.

This shows that the chance of recurrence is very slight if a patient is absolutely well after a year.

WILLS AND BEQUESTS.—By his will, the late Mr. David James has left £1,000 to Charing Cross Hospital, £500 to the Central London Throat and Ear Hospital, £500 to the Royal Eye Hospital, £1,000 to the Foundling Hospital, £1,000 to Guy's Hospital, £500 to the Golden Square Throat, Nose and Ear Hospital, £500 to the Hospital for Sick Children, £500 to the Royal Hospital for Incurables, £250 to the Hospital for Jewish Incurables.

MEMORIAL TO PROFESSOR LEIDY.—A Committee has been formed from among his old students to raise a fund for a memorial to perpetuate the name of the late Dr. Joseph Leidy, who for many years occupied the Chair of Anatomy in the University of Pennsylvania, and who was recognised throughout the scientific world as an anatomist of the first rank. It is intended that the memorial shall take the highly appropriate form of a Fellowship in Anatomy in connection with the University of Pennsylvania. It is estimated that a sum of 30,000 dollars (£6,000) will suffice to endow the Fellowship, the holder of which will be expected to pursue some original research in the University, and in particular to utilise the vast collection of material deposited in the Wistar Museum. Dr. W. Campbell Posey is the Chairman of the Committee, Dr. J. Howe Adams (1523, Locust Street, Philadelphia) being the Secretary.