

THE RESULTS OF OPERATIONS FOR THE CURE OF  
CANCER OF THE BREAST PERFORMED AT  
THE JOHNS HOPKINS HOSPITAL  
FROM JUNE, 1889, TO JANU-  
ARY, 1894.

By WILLIAM S. HALSTED, M.D.,

OF BALTIMORE,

PROFESSOR OF SURGERY IN JOHNS HOPKINS UNIVERSITY.

IN fifty cases operated upon by what we call the complete method we have been able to trace only three local recurrences.

Local recurrence is a return of the disease in the field of operation,—in the apparent or buried scar. The more extensive, therefore, the operation the more liberal our interpretation of local recurrence. Until it became the custom to remove in every case the contents of the axilla, a local recurrence was understood to be a return of the cancer in the apparent scar; but now that we regularly clean out the infraclavicular and usually the supraclavicular region and remove a part, at least, of the pectoralis major muscle, a return of the disease in any part of the explored regions should be considered a local recurrence. As *regional recurrence* Billroth designated a return of the cancer in or about the scar "after a long time." Recurrences after so long a time<sup>1</sup> he regarded as growths *de novo* and as absolutely independent of the original growth. To explain these late recurrences he assumes a cancer diathesis, or that conditions favorable to the development of cancer have been furnished by the scar.

<sup>1</sup> The exact time he does not state, but he is inclined to regard a local recurrence after one and one-half year's freedom from the disease as an independent new growth.

The great frequency of these late local recurrences and the comparative infrequency of cancer of both breasts make one hesitate to accept Billroth's explanation of what he terms regionary recurrence. However this may be—and I shall revert to the subject later on—I prefer to reserve the term regionary recurrence for the skin metastases at a greater or less distance from the scar. When operating for cancer of the breast we cannot be responsible for undiscoverable metastases in the skin. For the principal growth, the axilla, the pectoral muscles, and the supraclavicular region,—in other words, for the scar in its fullest sense,—we should hold ourselves responsible; but for the eradication of the so-called lenticular and apparently discrete metastases of the skin we have no guide. One might literally flay the patient's chest and side only to find, a few weeks or months later, one or more cancer nodules in the skin of the neck or back or abdomen.

These lenticular skin metastases or regionary recurrences, furthermore, distinguish themselves from local recurrences in that they are believed to have formed against the lymphatic current and to have no connection either with the parent tumor or with each other.

Thanks to the most persistent efforts of my house-surgeon, Dr. Joseph C. Bloodgood, the result of the operation has been ascertained in all but two cases. The two unheard-from cases were classed at the time of the operation with the most favorable ones. Only those who have tried it can know what an amount of labor it represents to have traced in this country, and in this part of it, the subsequent histories of such a large percentage of so many cases.

Only one of the three local recurrences was inoperable. In one, suspicious granulations excised one month after the operation were on microscopical examination pronounced carcinomatous. The patient is now perfectly well, without local or regionary recurrence, two years and three months after the second operation. The third case developed internal metastases prior to the local recurrence, which latter appeared two years after the operation.

In eight cases there has been regionary recurrence (*vide*

Table I). Four of these cases are living and four are dead. Of the dead, one, No. 13 (cancer of both breasts), had an inoperable recurrence. Two, Nos. 4 and 12, were operated upon successfully so far as the regionary recurrence was concerned. The fourth case, No. 9, developed cancer of the pleura prior to the regionary recurrence, which latter did not appear until two years and four months after the operation. This is the only case of recurrence in the supraclavicular glands. It is classed as a regionary recurrence because, being one of the earlier cases, the supraclavicular region was not explored. Hereafter we shall consider supraclavicular recurrences as local, for we now think it advisable to explore and clean out the supraclavicular region in almost every operable case. Of the four living, three, Nos. 35, 40, and 46, have been operated upon for their regionary recurrences, and are now well and without recurrence one year and three months, eleven months, and three months respectively after the second operation. One case, No. 41, has operable skin metastases, but has an inoperable carcinoma of the femur.

So far as local and regionary recurrence is concerned, the result is known in all but 5 cases. In 34 (73 per cent.) of these there has never been a local or regionary recurrence. Twenty-four are living and 10 are dead. In 43 of the 46 cases (93 per cent.) there has been no true local recurrence. In other words, there has, as I have said, been a local recurrence in only three cases (6 per cent.). These statistics are so remarkably good that we are encouraged to hope for a much brighter, if not a very bright, future for operations for cancer of the breast.

The prognosis at the time of the operation was recorded as hopeless or unfavorable in 27 of the 50 cases of complete operation. In every one of the 50 cases some or all of the axillary glands were cancerous. It is stated in the histories of 17 cases that the highest infraclavicular gland was involved. In only 7 cases is it recorded that the highest glands were not involved. In half of the cases, unfortunately, the historian has neglected to give precise information as to the extent of the involvement of the axillary glands. The supraclavicular glands were cancerous in at least 5 (10 per cent.) of the cases.

The pectoral muscles may be involved and the prognosis still be good. Volkmann, many years ago, noted the great difference, prognostically, between involvement of the muscle by simple extension of the growth and invasion of the muscle by metastases.

It is probable, as Ludwig says, that cellular elements, when they have once entered the lymphatic vascular system of a muscle, are soon swept along in the lymphatic current by the muscle activity. Hence the extension of the carcinoma into the muscle acquires an accentuated significance. For it is possible that the cancer cells may at any moment be carried with startling rapidity from one end of the muscle to the other. Fortunately the muscle itself is not usually invaded. In Schmidt's report of 226 cases operated upon by Küster, the tumor was adherent to the underlying parts in only twenty-two cases. Not one of these cases was cured. But the muscle may be involved when the tumor is not adherent.

In cases of muscle involvement Volkmann has had the best results. But at the time of Sprengel's report only three cases in thirty-six were living, and one of these had internal metastases. I am not quite prepared to announce positively in what proportion of cases we have found the muscle to be involved, but hope to do so in the second part of this paper, which will be devoted chiefly to the consideration of the microscopical work. I can say this, however, that the muscle is less frequently involved than I at one time was led to believe from the microscopical examination of what I now regard as an unusual series of cases.<sup>1</sup>

Many years ago, Volkmann offered an explanation for the fact that the carcinoma may lie in masses on the muscle and be adherent to its fascia and still not involve the muscle itself. He.

<sup>1</sup> In one winter it was my fortune to have three very small cancers of the breast to examine. They were so small that I could mount sections of the entire tumor on the ordinary German form of object-carrier. Two of these cancers had already invaded the muscle. The third had advanced to the muscle, but had been stopped by the pectoral fascia. Six years ago I exhibited before the Clinical Society of Maryland a section of one of these tumors. On this occasion I read a paper before the Society on the cure of breast cancer, and advocated the operation which I have since performed with such gratifying results.

believed that the lymphatic vessels spread themselves out in the fascia covering the pectoralis major muscle and do not follow the blood-vessels into the connective tissue septa between the muscle bundles; that there is not, as a rule, a free communication between the lymphatic system of the muscle and that of the fascia covering it. Haidenhain's observations support this theory of Volkmann's, and it is further strengthened, as Haidenhain says, by the physiological investigations of Ludwig and Schweigger-Seidel on the lymphatic vessels of fascia and tendon. These investigators have established the fact that there is an intricate net-work of lymphatic vessels on the surface of muscle and on the upper side of all fascias. The direction of the lymphatic current is from the muscle to the fascia, and not in the reverse direction. Injections pass readily in the former, but are impossible in the latter direction. So convinced was Volkmann of the accuracy of his observations and of the truth of his theory that he prescribed a method of operating which he followed until his death, and which has been adopted by almost every good surgeon up to the present time. In his "*Beiträge zur Chirurgie*," Volkmann wrote as follows: "I make it a rule never to do a partial amputation for cancer of the breast, but remove the entire breast even for the smallest tumors, and at the same time I take away a liberal piece of skin. The skin defect is, of course, very great when one operates in this manner, and the wound, in consequence, requires a long time for healing. Furthermore, in making the lower incision I cut right down to the pectoralis muscle and clean its fibres, as I would for a class-room dissection, carrying the knife parallel with the muscular fasciculi and penetrating into their interstices. The fascia of the muscle is, accordingly, entirely removed. I was led to adopt this procedure because, on microscopical examination, I repeatedly found when I had not expected it that the fascia was already carcinomatous, whereas the muscle was certainly not involved. In such cases a thick layer of apparently healthy fat separated the carcinoma from the pectoral muscle, and yet the cancerous growth, in places demonstrable only with the microscope, had shot its roots along the fibrous septa down between the fat lobules and had reached

and spread itself out in flat islands in the fascia. It seems to me, therefore, that the fascia serves for a time as a barrier, and is able to bring to a halt the spreading growth of the carcinoma." I quote Volkmann at such length because his operation is a classical one. His observations were accurate, and they have been confirmed in almost every detail by Haidenhain.

With reference to the involvement of the fat, which, in greater or less quantity separates the breast from the pectoral muscle, Haidenhain says, "I am firmly convinced from what I have seen that carcinomata, when they have actually made their way into the lymphatic channels, and such is usually the case, have invariably sent their outposts (*Vorposten*) at once to the surface of the muscle, no matter what the thickness of the layer of fat between breast and muscle may have been; in other words, that a tumor, however freely movable on the underlying parts, has almost certainly advanced as far as the surface of the muscle." The latter remains, as Volkmann has already observed, entirely healthy for a long time, and this is certainly no less remarkable. In only three of the eighteen cases placed by Küster at Haidenhain's disposition was the muscle invaded by the cancer.

A glance at the tables which I have made from the records of Bergmann, Billroth, Czerny, Fischer, Gussenbauer, König, Küster, Lücke, and Volkmann should convince one that the operation for the cure of breast cancer, as practised by the surgeons who have labored the most successfully for the mastery of the disease, is still a very imperfect one.

These tables have been made to determine the percentage of local recurrences after the operation for the cure of breast cancer. I am personally responsible for them, and publish them in full in order that authors who may be surprised at their own results may readily test the accuracy of my figures.

The efficiency of an operation is measured truer in terms of local recurrence than of ultimate cure. For some lives are rescued only by repeated operations for local recurrence, and others, free from local recurrence, are lost from internal metastases. Cures which have been effected by one operation should be distinguished from those which are the result of several opera-

tions; and deaths without local recurrence from those with such recurrence.

I wish that it had been practicable to separate the true local from the regionary recurrences in all of the tables. But the descriptions of the recurrences are sometimes so vague ("Recidiv," "Wiederum von Carcinom befallen," "Am Ende der Narbe nach dem Sternum zu") that I have not done so. Furthermore, the local recurrences are so greatly in excess of the regionary recurrences (of the latter alone there are very few) that it did not seem worth while to attempt to make this distinction.

Bergmann had local recurrence in at least 51 per cent., and not improbably in 60 per cent. of 114 cases operated upon between the autumn of 1882 and May, 1887. I venture to say *not improbably*, because of nineteen patients nothing is known except that they are dead. Eight patients whom I have tabulated as having no local recurrence survived the operation only seven and a half months (average time p. o.). Six cases died in from nine days to two months after the operation.

Billroth had local recurrences in 85 per cent. of 170 cases, from 1867 to 1876. *Vide* Table III.

Czerny, in 62 per cent. of 102 cases, from 1877 to 1886. *Vide* Table IV.

Fischer, in 75 per cent. of 147 cases, from 1871 to 1878. *Vide* Table V.

Gussenbauer, in 64 per cent. of 154 cases, from 1878 to 1886. *Vide* Table VI.

König, in from 58 to 62 per cent. of 152 cases, from 1875 to 1885. *Vide* Table VII.

Küster, in 60 per cent. of 228 cases, from May, 1871, to December, 1885. *Vide* Table VIII.

Lücke, in 66 per cent. of 110 cases, from 1881 to 1890. *Vide* Table IX.

Volkman, in 59 per cent. of 131 cases, from 1874 to 1878. *Vide* Table X.

I believe that this is a fair exposition of the best work that has been done in the treatment of cancer of the breast. Many of these cases were operated upon before it had become a universal rule to systematically clean out the axilla. But each of the dis-

tinguished surgeons whose results I have tabulated recognized the fact that the axillary glands were usually involved, even when they could not be felt, and had made for himself a rule to explore the axilla in almost every case. Volkmann (Sprengel) and Gussenbauer were perhaps the first to suggest that it might be well to explore the axilla in every case, but Küster was the first to advocate the systematic cleaning out of the axilla.

Every one knows how dreadful the results were before the cleaning out of the axilla became recognized as an essential part of the operation. Most of us have heard our teachers in surgery admit that they have never cured a case of cancer of the breast. The younger Gross did not save one case in his first hundred. D. Hayes Agnew stated in a lecture, a very short time before his death, that he operated on breast cancers solely for the moral effect on the patients, that he believed the operation shortened rather than prolonged life. H. B. Sands once said to me that he could not boast of having cured more than a single case, and in this case a microscopical examination of the tumor had not been made. There are undoubtedly many surgeons still in active practice who have never cured a cancer of the breast. But occasional cures of breast cancer have in all times been observed by reliable surgeons. C. v. Siebold removed the breast and subsequently the contents of the axilla for cancer, and for many years after the second operation had opportunities to see his patient and to convince himself that there was no recurrence of the disease.

Nélaton reports several permanent cures after operation for breast cancer. Velpeau, from 187 women operated upon for breast cancer, knew of seven who had lived for from five to twenty years after the operation.

Pauli excised first one breast and then the other for cancer, and saw his patient eighteen years later.

Encouraged by these rare but positive cures, German surgeons, led by Volkmann, have for many years been earnestly at work on this problem. But no positive advance in the pathology of breast cancer, and no essential improvement in the operation for its cure has been made since Volkmann's contribution in



1875. Indeed, with one or two uncertain exceptions, there have been no results better than his so far as local recurrence is concerned.

As to ultimate results—permanent cures effected by the operation—we again look to Volkmann and accept, as every one does, but with some modifications, his views as to what shall be called a radical cure. I must quote again the lines which have so often been quoted: "I unhesitatingly make this statement for all cancers, that when a whole year has passed and the most careful examination can detect neither a local recurrence nor swollen glands, nor any symptoms of internal disease, one may begin to hope that a permanent cure may be effected; but after two years usually, and after three years almost without exception, one may feel sure of the result."<sup>1</sup>

Billroth<sup>2</sup> thought that Volkmann expressed himself too cautiously, and said, "I think that one may express himself more boldly, and may declare that if the careful examination of an experienced surgeon detects no recurrence when one year has passed since the operation, one may be sure that there will be neither a local nor glandular recurrence, and may pronounce the patient as radically cured." Volkmann prophesied truer, for recurrences after one year are very common. Most surgeons have accepted Volkmann's views, and do not consider the disease as radically cured unless three years have passed since the operation. The best results after three years are as follows:

Bergmann (Eichel), 30.2 per cent.; Billroth (V. Winniwarter), 4.7 per cent.; Fischer (Henry), 9 per cent.; Gussenbauer (Fink), 16.7 per cent.; König (Hildebrand), 22.5 per cent.; Küster (Schmidt), 21.5 per cent.; Lücke (Dietrich), 16.2 per cent.; Volkmann (Sprengel), 14 per cent.

Volkmann's statistics seem to have some bearing on the question as to the advisability of removing in all cases the pectoralis major muscle. He excised the pectoralis major, and with it sometimes the minor, in thirty-eight cases. These were his

<sup>1</sup> Loc. cit., p. 325.

<sup>2</sup> Billroth, *Krankheiten der weiblichen Brustdrüse*. Handbuch der Chirurgie, Billroth and Lücke.

worst cases, cases in which one or both muscles were involved. They were sometimes hopeless and always more or less desperate. In only eleven of these cases was there recurrence in the scar; in seven there was regionary recurrence, and in thirteen there was neither local nor regionary recurrence. Four died from the effects of the operation. In three cases the result was unknown. Excluding deaths and unknown results (seven cases in all), there was a true local recurrence in only 35 per cent. of the cases in which the pectoralis major or major and minor muscles were removed. And in only 58 per cent. was there either local or regionary recurrence. Comparing these results with the 60 per cent. of local and regionary recurrences in the cases in which the pectoralis muscle was not removed (the milder cases), we are at a loss to explain them unless it be true that the excision of the pectoral muscle or muscles means altogether a more complete operation,—a more thorough removal of the fascia at the lower edges of the muscles and between the muscles, and a more radical cleaning out of the infraclavicular region. A large proportion of the recurrences occurred in hopeless cases. The comparatively large percentage of non-recurrence in such desperate cases is remarkable. I wish that there were time to consider the cases in detail. Any one interested in this subject would be rewarded for his labor if he should study these cases in the original.

If we may judge from the incomplete description of the operations, Volkmann is the only one, Billroth perhaps excepted, of the surgeons whose work we have considered who occasionally removed the pectoral muscle. I am at a loss to know how to explain this, for I operate not infrequently on cases in which the disease has involved at least the fat and areolar tissue between the muscles, if not one or both of the pectoral muscles.

Surely no one will question the fact that the comparatively good results in the operative treatment of breast cancer which the Germans are now getting are to be attributed to the systematic and comparatively thorough operation which they perform. But, excluding the great body of surgeons who, the world over, are improving their methods day by day, and occasionally curing cases of breast cancer, a thing which they had never done before,

the results of to-day are not very much better than Volkmann's were twenty years ago, if we base our calculations solely on the cases in which at the outset he performed the typical cleaning out of the axilla.

But Volkmann's operation is manifestly an imperfect one. It admits of the frequent division of tissues which are cancerous, and it does not give the disease a sufficiently wide berth.

Even if it were always possible to dissect a delicate layer of fascia (the so-called sheath) from the anterior surface of the pectoralis major muscle, it is surely a dangerous as well as an incomplete procedure whether the sheath is infiltrated with cancer or not. The manipulation of the tissues necessary for this nice dissection must often express cancer cells from the alveoli and lymphatic vessels even if one should be so fortunate as not to cut through the diseased tissues.

Why should we shave the under surface of the cancer so narrowly if the pectoralis major muscle or a part of it can be removed without danger, and without causing subsequent disability, and if there are positive indications for its removal?

*The pectoralis major muscle, entire or all except its clavicular portion, should be excised in every case of cancer of the breast, because the operator is enabled thereby to remove in one piece all of the suspected tissues.*

*The suspected tissues should be removed in one piece (1), lest the wound become infected by the division of tissues invaded by the disease, or of lymphatic vessels containing cancer cells, and (2) because shreds or pieces of cancerous tissue might readily be overlooked in a piecemeal extirpation.*

The operation which has been attended with such surprisingly good results in our hands is performed as follows :

(1) The skin incision is carried at once and everywhere through the fat.

(2) The triangular flap of skin, *ABC* (*vide* Plate I) is reflected back to its base line, *CA*. There is nothing but skin in this flap. The fat which lined it is dissected back to the lower edge of the pectoralis major muscle where it is continuous with the fat of the axilla.

(3) The costal insertions of the pectoralis major muscle are severed, and the splitting of the muscle, usually between its clavicular and costal portions, is begun, and continued to a point about opposite the scalenus tubercle on the clavicle.

(4) At this point the clavicular portion of the pectoralis major muscle and the skin overlying it are cut through hard up to the clavicle. This cut exposes the apex of the axilla.

(5) The loose tissue under the clavicular portion (the portion usually left behind) of the pectoralis major is carefully dissected from this muscle as the latter is drawn upward by a broad, sharp retractor. This tissue is rich in lymphatics, and is sometimes infiltrated with cancer (an important fact).

(6) The splitting of the muscle is continued out to the humerus, and the part of the muscle to be removed is now cut through close to its humeral attachment.

(7) The whole mass, skin, breast, areolar tissue, and fat, circumscribed by the original skin incision, is raised up with some force, to put the submuscular fascia on the stretch as it is stripped from the thorax close to the ribs and pectoralis minor muscle. It is well to include the delicate sheath of the minor muscle when this is practicable.

(8) The lower outer border of the minor muscle having been passed and clearly exposed, this muscle is divided at right angles to its fibres, and at a point a little below its middle.

(9) The tissue, more or less rich in lymphatics and often cancerous, over the minor muscle near its coracoid insertion is divided as far out as possible, and then reflected inward in order to liberate or prepare for the reflection upward of this part of the minor muscle.

(10) The upper, outer portion of the minor muscle is drawn upward (*vide* Plate II) with a broad, sharp retractor. This liberates the retractor which until now has been holding back the clavicular portion of the pectoralis major muscle.

(11) The small blood-vessels (chiefly veins) under the minor muscle near its insertion must be separated from the muscle with the greatest care. These are embedded in loose connective tissue which seems to be rich in lymphatics, and contains more

or less fat. This fat is often infiltrated with cancer. These blood-vessels should be dissected out very clean, and immediately ligated close to the axillary vein. The ligation of these very delicate vessels should not be postponed, for the clamps occluding them might of their own weight drop off or accidentally be pulled off; or the vessels themselves might be torn away by the clamps. Furthermore, the clamps, so many of them, if left on the veins, would be in the way of the operator.

(12) Having exposed the subclavian vein at the highest possible subclavicular point, the contents of the axilla are dissected away with scrupulous care, also with the sharpest possible knife. The glands and fat should not be pulled out with the fingers, as advised, I am sorry to say, in modern text-books and as practised very often by operators. The axillary vein should be stripped absolutely clean. Not a particle of extraneous tissue should be included in the ligatures which are applied to the branches, sometimes very minute, of the axillary vessels. In liberating the vein from the tissues to be removed, it is best to push the vein away from the tissues rather than, holding the vein, to push the tissues away from it. It may not always be necessary to expose the artery, but I think that it is well to do this. For sometimes, not usually, the tissue above the large vessels is infiltrated. And we should not trust our eyes and fingers to decide this point. It is best to err on the safe side and to remove in all cases the loose tissue above the vessels and about the axillary plexus of nerves.

(13) Having cleaned the vessels, we may proceed more rapidly to strip the axillary contents from the inner wall of the axilla,—the lateral wall of the thorax. We must grasp the mass to be removed firmly with the left hand, and pull it outward and slightly upward with sufficient force to put on the stretch the delicate fascia which still binds it to the chest. This fascia is cut away close to the ribs and serratus magnus muscle.

(14) When we have reached the junction of the posterior and lateral walls of the axilla, or a little sooner, an assistant takes

hold of the triangular flap of skin and draws it outward, to assist in spreading out the tissues which lie on the subscapularis, teres major, and latissimus dorsi muscles. The operator having taken a different hold of the tumor, cleans from within outward the posterior wall of the axilla. Proceeding in this way, we make easy and bloodless a part of the operation which used to be troublesome and bloody. The subscapular vessels become nicely exposed and caught before they are divided. The subscapular nerves may or may not be removed, at the discretion of the operator. Küster lays great stress upon the importance of these nerves for the subsequent usefulness of the arm. We have not as yet decided this point to our entire satisfaction, but I think that they may often be spared to the patient with safety.

(15) Having passed these nerves, the operator has only to turn the mass back in its normal position, and to sever its connection with the body of the patient by a stroke of the knife from *b* to *c*, repeating the first cut through the skin.

All that has been removed is in one piece (*vide* Plates I, II, and III). There are no small pieces nor shreds of tissue. I believe that we should never cut through cancerous tissues, when operating, if it is possible to avoid doing so. The wound might become infected with cancer either by the knife which has passed through diseased tissue, and perhaps carries everywhere the cancer-producing agents, or by the simple liberation of the cancer cells from their alveoli, or from the lymphatic vessels. The division of one lymphatic vessel and the liberation of one cell may be enough to start a new cancer.

This may explain some or all of the very late (from three to five or even more years) local recurrences which are not rarely met with. It is a more plausible theory, I think, than that offered by Billroth, of a cancer diathesis, and that conditions favorable to the development *de novo* of cancer are furnished by the scar. If the explanation which I suggest is the correct one, we should expect to find these very late recurrences somewhere in the field of operation rather than as lenticular metastases in the skin. And such is really the case. I have found thus far no positive instance

of recurrence as late as three years which was not in the scar in its broad sense. Of fifteen cases of recurrence after three years, not one is reported as having taken place primarily in the skin. One case (Gussenbauer, Case 71), the only one which might be construed as a late recurrence in the skin, was already an inoperable cancer *en cuirasse* when observed by the surgeon three years after the operation, and may have been an early and not a late recurrence.

Another argument in favor of this theory of inoculation is the following: When carcinomata have once begun to grow rapidly they continue to do so. The pace, if I may use the term, increases rather than decreases as the growth advances. The metastases of rapidly-growing carcinomata also increase rapidly in size; they seem to take the pace of the parent growth, although this is not invariably the case. We can readily understand why there should be exceptions to this rule. The metastasized cells may have the full virulence of the home cells, but may not at once find the conditions so favorable for their development.

The early local recurrence is probably always an uninterrupted growth so far as place is concerned, a direct continuation of the parent growth or its metastases. It makes its appearance very soon after the operation, and grows as fast as or faster than it was growing at the time of the operation. The lenticular metastases in the skin may appear in great numbers in a very short time, but the individual nodule grows slowly, and seldom attains a large size. The skin seems to offer a certain resistance to the growth of the cancer. Whether it does or does not offer this resistance, might we not expect to find these so-called late recurrences, occasionally at least, in the skin if they are always continuous growths? Consulting again our tables, we find that primary recurrences in the skin rarely, if ever, make their appearance as late as one year after the operation.

The operation, as we perform it, is literally an almost bloodless one. From the first to the last each bleeding point is stopped with an artery forceps as quickly as possible. When

practicable the vessels are clamped before they are divided. If no blood is lost, there is no perceptible shock from the operation. This is true of almost every operation. The symptoms which are so often ascribed to shock are due almost invariably to loss of blood. I have performed this operation for breast cancer on patients whose pulse before the operation was so feeble that the anæsthetizer and by-standers have pronounced it barely perceptible. As a rule, the pulse is little, if any, feebler after the operation than it was before it.

The edges of the wound are approximated by a buried purse-string suture of strong silk. Of the triangular flap of skin (*abc*) only the base is included in this suture. The rest of this flap is used as a lining for the fornix of the axilla. The apex of this flap is consequently shifted to a new and lower position. The axilla is never drained and invariably heals by first intention. The uncovered wound often heals by the so-called organization of the blood-clot.

Seventy-six operations (complete and incomplete) for breast cancer have been performed in the hospital, and not one death has resulted from the operation.

Twenty-six incomplete operations have been performed. Seven were incomplete because of the small size and recent appearance of the tumor. Four of these are living, one with a local recurrence. Two died with metastases,—one and perhaps both with local recurrence.<sup>1</sup>

Nineteen operations were incomplete because of the magnitude of the growth and the hopelessness of the case. These operations were undertaken for the moral effect upon the patient, and were usually little more than an ablation of the greater part of the new growth.

As to the disability produced by the operation, it has in some cases been so slight as to be absolutely inappreciable. In most cases the arm of the side operated upon has been quite as useful as before the operation. Some of the patients, when questioned, complain that they cannot dress their back hair. This

<sup>1</sup> The seven incomplete operations probably furnished as many (three) local recurrences as the fifty complete operations.



disability is due to the loss of skin, and not to the loss of muscle. The cicatrix sometimes prevents the patient from raising the arm high enough to dress the back of the head. We have twice relieved this trouble by skin grafting. In no case that I know of has the disability of which the patient complained been due to the excision of the muscle or muscles. Occasionally there has been temporary swelling of the extremity.

If we permitted the arm to become glued to the side—and this would often happen if we did nothing to prevent it—there would be disability from fixation. We are careful therefore to secure a high axillary fornix. This is accomplished by means of the triangular flap of skin (*abc*) which is devoted almost entirely to this purpose, and which is held in place by a carefully-applied dressing. After all, disability, ever so great, is a matter of very little importance as compared with the life of the patient.

Furthermore, these patients are old. Their average age is nearly fifty-five years. They are no longer very active members of society. We should, perhaps, sacrifice many lives if we were to consider the disability which might result from removing a little more tissue here and there.

I sometimes ask physicians who regularly consult us why they never send us cancers of the breast. They reply, as a rule, that they see many such cases, but supposed that they were incurable. We rarely meet a physician or surgeon who can testify to a single instance of positive cure of breast cancer. The conscientious physician could not under the circumstances advise his patient to be operated upon, and he was justified in treating her with salves and internal remedies. But now we can state positively that cancer of the breast is a curable disease if operated upon properly and in time. I cannot emphasize too strongly the fact that internal metastases occur very early in cancer of the breast, and this is an additional reason for not losing a day in discussing the propriety of an operation.

Surgeons should practise this operation on the cadaver. It is not an operation that can be properly performed after two or three trials. We operate for cancer of the breast better now than we did last year, and we operated better last year than five years

ago. I have not had a local recurrence for more than three years.

Now that surgery is specialized to such an extent, surgeons have plenty of time to drill themselves in operating. They should not cast about for easy operations,—for operations that any one can do at any time and in any place. I think that surgeons will some day contemplate with astonishment some of the handy, happy-go-lucky methods for intestinal suture which are now so much in vogue.

CASE I.<sup>1</sup> (Surgical No. 12.)—L. S., aged thirty-eight; married; ten children. Menstruation on decline. Tumor of left breast for six months. Pain in breast and arm for two or three months. The tumor now occupies the entire breast and is adherent to the pectoral muscle. The nipple is retracted. There is a large abscess in the axilla. May 28, 1889, abscess in axilla opened. June 14, breast and part of the major pectoral muscle excised; axilla not cleaned out at this time because of suppurating wound. July 21, excision of scar, remainder of pectoral muscle and axillary contents, which later were very adherent to vessels. The glands of the axilla were carcinomatous. Very unfavorable case. Discharged in two weeks; wound healing well. May 11, 1889, granulating area excised and grafted with skin. No local nor regional recurrence when last observed, one year after first operation. Lived about one and a half years. Died of cancer of the other breast.

CASE II. (Surgical No. 177.)—M. J. J., aged thirty-nine; married; eight children. Menstruation more profuse and frequent since appearance of tumor. Cancer of left breast for five months. Growth has been very rapid during the last four weeks. Pain for four months in the affected breast. Now the pain is also in the axilla, shoulder, and arm. October 15, 1889, complete operation. Favorable case. Discharged in five weeks with healthy granulating wound. Lived three years and three months. Cause of death unknown. Written report says no recurrence.

CASE III. (Surgical No. 326.)—M. A., aged sixty-three; married; one child; menopause at thirty-five. Tumor of left breast observed for four years. Began, says patient, one year after an injury.

<sup>1</sup> I wish to express again my thanks to Dr. Bloodgood for the following abstract of the histories.

Five years ago noticed oozing of blood from left nipple, which continued for one year. Nipple then began to retract and a nodule appeared at its outer side. The pains, shooting in character, are sharp, but not constant. The tumor is hard and involves the nipple and the skin surrounding it. It moves freely on the pectoral muscle. The supraclavicular glands have been enlarged for the last two weeks. February 21, 1890, complete operation. Glands in axilla were small, carcinomatous, and very hard, but not adherent to the vessels. Regarded as favorable case. Discharged in three weeks with healthy granulating wound. Result unknown. Patient cannot be found.

CASE IV. (Surgical No. 360.)—E. S., aged fifty-three; married; ten children; menopause three years ago. Tumor, size of orange, of left breast for eleven months, attributed to injury. Began as small, hard lump in outer hemisphere. Pain for past week only. It resembles the pain of a needle prick. The nipple is not retracted. Skin not adherent. Tumor freely movable over muscle. Axillary glands cannot be felt. March 11, 1890, complete operation. Glands in axilla hard and small, but not adherent to the vessels. Considered favorable case. Patient discharged in two weeks with healthy granulating wound. June, July, 1892 (two years and four months after the operation), regionary recurrence. A small nodule in skin on the outer side of the scar; also enlarged supraclavicular glands. Second operation. Glands and nodule excised. Wound healed in three weeks. No local nor regionary recurrence. January 3, 1894, reported dead.

CASE V. (Surgical No. 385.)—M. A., aged twenty-seven; married; two children; one miscarriage; menstruation normal. Has lost flesh of late. Cancer of the left breast for nine months. Began as nodule in outer hemisphere. Rapid growth and much pain in breast and arm for past two months. The nipple is involved but not retracted. Pressure on breast expresses a rusty-colored fluid from nipple. Axillary glands enlarged. March 21, 1890, complete and satisfactory operation. Favorable case. Discharged in four weeks with healthy granulating wound. Died three years and seven months after operation; cause of death unknown.

CASE VI. (Surgical No. 388.)—S. C. D., aged sixty; widowed; menopause at forty-seven; two children; one miscarriage. Has pulmonary tuberculosis. Two and one-half years ago first noticed an enlargement of outer half of left breast. A few months later the nipple became sore. A few months ago enlarged glands were noticed

in the axilla. Since then has had much pain. March 27, 1890, operation as complete as possible. Glands not very large, but matted together and so adherent to the vessels and other parts that a clean dissection was almost impossible. Discharged in four and one-half weeks with healthy granulating wound. Died in two years and seven months of internal metastasis. Letter from friends does not mention local return.

CASE VII. (Surgical No. 624.)—F. A. W., aged fifty-three; married six years; childless; menopause one year ago. General health good. Tumor of the right breast for four months, following an injury. Cancer the size of hen's egg in the outer and upper quadrant of right breast. It is freely movable on underlying parts and not adherent to skin. The nipple is retracted. A few small hard glands are to be felt in the axilla. September 6, 1890, complete operation. Glands in axilla are embedded in large amount of apparently healthy fat. Prognosis very favorable. Discharged in three weeks with healthy granulating wound. November 10, 1890, wound is healed. March, 1894 (three years and seven months after operation), patient enjoys best of health. No signs of recurrence. Small painless cicatrix. There is no swelling of the arm and patient has good use of it.

CASE VIII. (Surgical No. 650.)—K. B., aged thirty-nine; married twelve years; one child; menstruation regular. Tumor of left breast for three months. Cyst size of hen's egg in upper and inner quadrant of left breast, four centimetres to left of sternum. It is freely movable under skin on underlying parts. Nipple not retracted. Axillary glands not palpable. October 2, 1890, cyst excised. On microscopical examination the walls of the cyst proved to be carcinomatous. October 11, 1890, complete operation. Patient discharged in two weeks with healthy granulating wound. March, 1894 (three years and six months after operation), patient in excellent health, no signs of recurrence. Good use of arm.

CASE IX. (Surgical No. 691.)—V. U., aged forty; married; six children; menstruation normal; general health good. Tumor of left breast for three months, appearing, says patient, two days after an injury. When first observed was the size of a hickory nut. Growth has been gradual and without pain. Cancer the size of a walnut, freely movable on underlying parts. Skin not adherent. Nipple not retracted. October 31, 1890, complete operation except for supraclavicular glands. Glands below clavicle involved. Prog-

nosis almost absolutely bad. November 18, 1890, granulations excised and skin grafted to hasten healing. Discharged in five weeks with wound entirely healed. April, 1892, well. No return in scar or axilla, but supraclavicular glands enlarged. March, 1893 (two years and five months after operation), patient in excellent health and spirits. March 15, 1893, shortness of breath. July, 1893, signs of carcinoma of left lung and pleura; arm and shoulder swollen. Skin nodules over right breast and in right axilla. No return in scar nor left axilla. January, 1894, three years and two months after operation, died from internal metastasis. No local recurrence.

CASE X. (Surgical No. 758.)—P. H., aged thirty-five; negress; married seventeen years; fourteen children; menstruation normal. Abscess in right breast during first lactation. General condition good. Tumor of right breast for nine months. Cancer now occupies entire breast. Nipple is retracted. Large glands in axilla. December 12, 1890, complete operation. Highest axillary and supraclavicular glands involved. Prognosis hopeless. Discharged in four and one-half weeks with healthy wound. Died with symptoms of internal metastasis in seven months. Neither local nor regional recurrence.

CASE XI. (Surgical No. 821.)—Mrs. C., aged sixty-six; widowed. Maternal aunt died with cancer of the breast. Abscess in left breast with first lactation. Five months ago noticed pain in left breast, and then a tumor. Has now a cancer the size of a walnut in the upper and outer quadrant of the left breast. It is freely movable on the underlying muscle. Nipple slightly retracted. Skin not adherent. Axillary glands slightly enlarged. January 27, 1891, complete operation. Only a few enlarged glands in the axilla. Prognosis at operation favorable. Discharged in seven weeks with healthy granulating wound. July 6, 1891, five months after the operation, local recurrence. Small nodule at edge of scar of left breast. Fulness and diffuse induration in right breast, but no glands to be felt in the right axilla. Operation. Excision of a portion of the right breast for examination. Pathological report: nodule from scar carcinoma. Piece from right breast normal. February 17, 1892 (one year and one month after the first operation), diffuse recurrence in scar of left breast. Carcinoma of stomach. Sugar in urine. Excision of the recurrence attempted. Disease found to involve several of the ribs. Died of carcinoma of stomach in about one and one-half years after first operation.

CASE XII. (Surgical No. 978.)—M. Z., aged sixty-two; married; eight children. General health not good. Somewhat emaciated. Four years ago noticed three "pimples" under left nipple, which enlarged and ulcerated one year ago. Cancer now occupies centre of left breast. Nipple ulcerated. Glands can be felt in axilla. May 15, 1891, complete and satisfactory operation. Prognosis favorable. Discharged in four weeks with healthy granulating wound. October 20, 1891 (five and one-half months after operation), regional recurrence. Small nodule in skin on the outer side of scar. No return in scar or axilla. Nodule excised. Reported dead. Cause and time (?) of death unknown. No mention of recurrence.

CASE XIII. (Surgical No. 1109.)—J. J., aged thirty-five; married; menstruating. Cancer of both breasts. One year ago patient detected painless nodule in left breast. She had not noticed the nodule in her right breast. The left breast is uniformly enlarged. Skin is adherent. Nipple retracted. Tumor movable on pectoral muscle. In the right breast is a small nodule. Skin not adherent to it. Nipple not retracted. Glands in both axillæ enlarged. August 6, 1891, complete and satisfactory operation on left side. September 25, 1891, complete operation on right side. Satisfactory dissection. Discharged November 15, 1891. No recurrence in wound or axilla, but skin metastases on both sides of chest. July, 1892 (eleven months after first operation), numerous metastases in skin of chest. Some ulcerating. General health quite good. No recurrence in scar nor axillæ. Four inoculations with pure culture of the streptococcus of erysipelas with negative results.

CASE XIV. (Surgical No. 1123.)—A. W., aged fifty-nine; colored; widowed. Thirty years ago patient noticed painless lump in left breast. Two years ago the tumor began to grow perceptibly. Since then patient has had intermittent pain in breast. The cancer is movable on the muscle. Skin adherent. Nipple retracted. August 13, 1891, complete operation. Part of pectoralis minor removed. Highest gland in axilla involved. Prognosis unfavorable. No nodules in muscle discoverable by microscope. March, 1894 (two years and six months), patient in good health. No local nor regional recurrence.

CASE XV. (Surgical No. 1180.)—F. H. E., aged forty-one; married; two children; two miscarriages. Youngest child ten years old. One year ago lump noticed in upper hemisphere of left breast.

Pain during last ten days in breast and left shoulder, three weeks ulcerated. Cancer ulcerated, size of hen's egg, freely movable on muscle, but adherent to skin. Small glands to be felt in left axilla. September 16, 1891, complete operation. Prognosis very unfavorable. Discharged in four weeks. Patient died a few weeks after reaching home. No local nor regionary recurrence.

CASE XVI. (Surgical No. 1246.)—J. J. S., aged forty-five; married; seven children; two miscarriages; menstruation regular. Five years ago noticed small lump below right nipple. Pain for the last three months, intermittent, darting. Cancer below right nipple, size of a marble, tender, freely movable on pectoralis major muscle. Nipple retracted. Skin adherent. Axillary glands not palpable. October 22, 1891, complete operation. A few carcinomatous glands in axilla. Prognosis favorable. Microscopical examination. The cancer is a circumscribed one. A few epithelial masses in axillary glands. Patient discharged in four and one-half weeks. March, 1894 (two years and five months after operation), patient is perfectly well. Has no local nor regionary recurrence.

CASE XVII. (Surgical No. 1248.)—E. McG., aged forty-nine; widowed; seven children; one miscarriage; menstruation regular. Tumor above nipple of left breast for two years. For one year intermittent pains, ulceration of skin over tumor, and retraction of nipple. Cancer four by six centimetres in outer and upper quadrant of left breast. Movable on pectoralis muscle, but adherent to skin. Axillary glands enlarged. October 22, 1891, complete operation. Highest axillary gland involved. Nodule the size of a pea in the major pectoral muscle. No local nor regionary recurrence for two years, then return in scar. Died of internal metastases two years and four months after operation.

CASE XVIII. (Surgical No. 1255.)—E. E., aged fifty-four; married; four children; youngest child twenty-six years old; menopause four years ago. Five years ago patient noticed tumor of right breast. She attributes it to an injury sustained six years ago. Patient has a cancer in the upper and outer quadrant of the right breast. The nipple is retracted. The axillary glands are enlarged. October 27, 1891, complete operation. The highest gland of axilla is involved. Prognosis unfavorable. In four weeks a suspicious spot developed in the wound. This and the surrounding granulations were promptly excised. The microscopical examinations of the suspected granulations proved them to be carcinomatous. March, 1894 (two years and

four months after the operation), patient is very well, and has good use of the arm. There is no local nor regionary recurrence.

CASE XIX. (Surgical No. 1337.)—J. E. T., aged sixty-two; married; no children; menopause several years ago. Forty-six years ago noticed small lump in the left breast, which caused no discomfort until two years ago, when it began to grow and to become painful. The entire left breast is now involved, but it is freely movable on the pectoral muscle. In the upper and outer quadrant of the breast is a mass of bony hardness. The axillary glands are palpable. December 15, 1891, complete operation. The highest infraclavicular gland was involved. Prognosis unfavorable. On examination of the excised breast a calcified fibroma is found near the outer edge of the tumor. Patient died in twenty-one months without local or regionary recurrence.

CASE XX. (Surgical No. 1359.)—Aged thirty-seven; married three years; no pregnancies; menstruation irregular. Five weeks ago noticed nodule below left nipple. Has sharp intermittent pains. Cancer two by five centimetres below and to inner side of nipple, freely movable on pectoral muscle, and not adherent to skin. Nipple not retracted. Axillary glands not palpable. December 29, 1891, complete operation. Highest infraclavicular gland enlarged. Prognosis unfavorable. Discharged in two weeks. March, 1894 (two years and two months after operation), well. No local nor regionary recurrence.

CASE XXI. (Surgical No. 1393.)—M. E. D., aged forty-two; married; thirteen children; menstruation regular; youngest child one year old. Four months ago noticed small, painful lump above left nipple. The pain has steadily increased. The cancer now involves most of the breast; is movable on the pectoral muscle, and not adherent to the skin. The nipple is not retracted. One gland can be felt in the axilla. January 19, 1892, complete operation. Highest infraclavicular gland involved. Prognosis unfavorable. Microscopical examination. Adeno-carcinoma of breast and microscopic metastases in glands. July, 1892 (six months after operation), well. April 27, 1894, patient presents herself for examination. Is perfectly well. No local nor regionary recurrence. Good use of arm.

CASE XXII. \* (Surgical No. 1429.)—E. T. O., aged sixty; widowed; five children; three miscarriages; menopause five years ago. Has had a lump in left breast for forty years, which has



given her no trouble until five months ago. Then noticed nodules in left axilla and below left breast. Eight weeks ago the latter became ulcerated, and the nipple became retracted. Patient has had no pain. Has a cancer the size of a walnut in the outer hemisphere of the left breast. The skin is inflamed and adherent to the tumor. There are regionary metastases in the skin from the nipple to the axilla. The glands of axilla are enlarged. February 11, 1892, complete operation. The pectoralis minor muscle was removed. The highest infraclavicular glands were involved, and there were cancerous nodules in the pectoralis major muscle. Discharged in four weeks with healthy granulating wound. June, 1892, necrosed rib excised at bottom of small granulating wound. August, 1892 (six months after operation), died of internal metastases. No local nor regionary recurrence.

CASE XXIII. (Surgical No. 1532.)—S. A. L., aged sixty-four; married; four children; menopause twelve years ago. One year ago a small lump, accompanied by darting intermittent pains, appeared in the left breast. Nine months ago the nipple became retracted, and the pain became great in the axilla. Cancer in outer hemisphere of left breast, size of an egg, hard, movable on muscle, and not adherent to skin. A few small hard glands can be felt in the axilla. April 1, 1892, complete operation. Highest infraclavicular gland involved. Prognosis unfavorable. Discharged in two weeks. March, 1894 (one year and eleven months after the operation), well. Almost perfect use of arm. No local nor regionary recurrence.

CASE XXIV. (Surgical No. 1560.)—M. F., aged forty-two; married; menstruation normal. Eighteen months ago, at end of last lactation, had pain in right breast. Then noticed lump under skin. Has cancer now size of an orange, hard, adherent to skin, and to pectoral muscle. Nipple retracted. Enlarged glands in axilla. April 21, 1892, complete operation. Prognosis hopeless. Died in eleven months. (Local ret.?)

CASE XXV. (Surgical No. 1635.)—M. C., aged fifty-six; widowed; six children. Eight months ago noticed lump in skin in left axillary line, which ulcerated three months later, following application of caustic. Cancer twelve by nine centimetres. Ulcer six by three centimetres. Axillary glands enlarged. May 31, 1892, complete operation. Prognosis unfavorable. Pectoral muscle not involved. March, 1894 (one year and ten months after operation),

well. No local nor regionary recurrence. Good use of arm, which is somewhat swollen.

CASE XXVI. (Surgical No. 1676.)—A. J. A., aged fifty-four; widowed. Four months ago noticed tumor, size of walnut, just above nipple. Skin is adherent. Nipple retracted. Axillary glands palpable. June 21, 1892, complete operation. Prognosis favorable. March, 1894 (one year and nine months after operation), well, good use of arm. No swelling of arm. No local nor regionary recurrence.

CASE XXVII. (Surgical No. 1677.)—E. McC., aged sixty-one; married. A few weeks ago noticed pain and a small lump in left breast. Cancer the size of a pigeon's egg, movable on pectoral muscle, adherent to skin. Nipple retracted. Axillary glands enlarged. June 21, 1892, complete operation. Prognosis favorable. Patient not heard from since discharged.

CASE XXVIII. (Surgical No. 1710.)—L. S., aged sixty-six; married. Three weeks ago noticed a small, painless nodule in left breast. Has cancer in upper and outer quadrant of left breast. It is hard and adherent to skin, but movable on pectoralis major muscle. The nipple is retracted. The axillary glands are not palpable. July 15, 1892, complete operation. Prognosis favorable. The highest infraclavicular glands were cancerous, but very small. The pectoral muscle was not invaded by the cancer. March, 1894 (one year and seven months after the operation), well. Good use of arm. Chops wood with it. No local nor regionary recurrence.

CASE XXIX. (Surgical No. 1718.)—C. B. K., aged sixty-two; widowed; one child. Abscesses in both breasts during lactation, thirty years ago. Four months ago noticed soreness in left nipple, and a few days later a lump above the nipple. Cancer, now the size of a duck's egg, chiefly below but embracing nipple. Movable on muscle. Nipple retracted and fissured. Bleeds easily. A large mass of glands in the axilla. July 16, 1892, complete operation. Prognosis favorable as to local recurrence. Died in ten months from internal metastases. No local nor regionary recurrence.

CASE XXX. (Surgical No. 1729.)—M. S. J., aged sixty; negress; widowed; two children; menopause twenty years ago. Four months ago noticed shooting pains and tumor in right breast. One month ago the skin ulcerated at the inner side of the nipple. The cancer now occupies the entire breast. It is hard, and not freely movable on muscle. There is an excavated ulcer one inch to the

inner side of the nipple. Large, hard glands to be felt in the axilla. July 29, 1892, complete operation. The highest infraclavicular gland is involved. Prognosis very unfavorable. December, 1893 (one year and five months after operation), well. No local nor regionary recurrence. Good use of arm.

CASE XXXI. (Surgical No. 1736.)—J. S., aged sixty; married; nine children. Two years ago pain in right breast and shoulder. Breast was swollen for a short time. Pain and swelling disappeared. Three months ago pain began in right axilla. Three weeks noticed lump in right breast. Cancer now occupies outer and lower quadrant of right breast. It is ill-defined, hard, intimately associated with the gland, movable on the pectoral muscle, and not adherent to the skin. The nipple is slightly retracted. There is a hard mass of glands in the axilla. August 5, 1892, complete operation. Highest infraclavicular gland involved. Tumor adherent to the pectoral major muscle. March, 1894 (one year and seven months after the operation), well. No swelling and good use of arm. Soft scar. Skin movable on underlying parts. No local nor regionary recurrence.

CASE XXXII. (Surgical No. 1782.)—M. E. C., aged fifty-four; married; eight children; six miscarriages; menopause five years ago. One year ago noticed a small lump in left breast. Ulceration supervened very soon. Cancer twelve by thirteen centimetres in upper outer quadrant. A fungoid mass projects from the ulcer. September 7, 1892, complete operation. Cancer circumscribed. Remainder of breast and the pectoral muscle normal. Some of the axillary glands show metastases. Prognosis favorable as to local recurrence. Dead in ten months. No local nor regionary recurrence.

CASE XXXIII. (Surgical No. 1819.)—M. H., aged forty-six; married; one child, ten years old; menopause five years ago. One year ago noticed nodule size of a pea in the right breast. Growth of tumor has been slow. Five months ago the skin became adherent and discolored. Six weeks ago the skin ulcerated. Has had intermittent pains from the beginning. Cancer six centimetres in diameter in the upper hemisphere of right breast. It is freely movable on the muscle. Axillary glands not palpable. September 23, 1892, complete operation. Axillary glands small, hard, and slightly adherent to the vessels. Prognosis unfavorable. March, 1894 (one year and five months after the operation), no swelling, and good use of arm. Patient works hard. Has no local nor regionary recurrence.

CASE XXXIV. (Surgical No. 1835.)—M. McA., aged fifty; married. Three years ago noticed lump near right nipple. Ulceration began four months ago. Cancer now occupies the centre of the right breast, below the nipple. There is an ulcerating area at the outer side of the nipple from which projects a fungoid mass. The axillary glands are enlarged. September 30, 1892, complete operation. The minor pectoral muscle also removed. Glands very adherent to the vessels. Clean dissection. Prognosis unfavorable. Died in three and one-half months after the operation. No local nor regional recurrence.

CASE XXXV. (Surgical No. 1875.)—E. Z., aged sixty-nine; married; four children; youngest, thirty-eight years. Three months ago noticed a small nodule in the left breast. No pain. Rapid growth. Cancer two by three centimetres in upper and outer quadrant of left breast. It is nodular, freely movable on the pectoral muscle, but adherent to the skin. Nipple slightly retracted. A few glands to be felt in the axilla. October 27, 1892, complete operation. Highest infraclavicular gland involved. Prognosis unfavorable. Discharged in four weeks. January, 1894 (thirteen months after the operation), died of internal metastases. No swelling, and good use of arm. No local or regional recurrence.

CASE XXXVI. (1903.)—Aged fifty-nine; married; seven children. Eight months ago noticed a small nodule in the left breast. Tumor has grown very little since first noticed. Patient has had very little pain. Cancer in upper and outer quadrant of left breast, adherent to skin. A few small glands to be felt in the axilla. November 8, 1892, complete operation. Prognosis favorable. Discharged in four weeks. January, 1894 (thirteen months after the operation), died of internal metastases. No swelling, and good use of arm. No local nor regional recurrence.

CASE XXXVII.—K. A., aged thirty-four; married; two children; youngest child eight years old; menstruation regular. Seven months ago patient noticed two small lumps not larger than beans in the upper part of the right breast. The tumors have been enlarging slowly. For the past three months the patient has had sharp intermittent pains in the right breast. There is a small tumor three centimetres in diameter above the right nipple. The nipple is not retracted and the tumor is freely movable under the skin and on the muscle. One small gland is to be felt in the axilla. February 27, 1893, complete operation. The history says that the pectoralis major

muscle was divided but not removed. Inasmuch, however, as not a trace of the muscle is to be felt, I conclude that the historian must have made a mistake and that the operation was a complete one. May 3, 1894, patient presents herself for examination. She is perfectly well and has good use of the right arm. There is no local nor regionary recurrence, one year and two months after the operation.

CASE XXXVIII. (Surgical No. 2070.)—L. B., aged forty-six. Two years ago noticed small nodule in the right breast. Slow growth. Pains moderate and intermittent for the last six months. Cancer in the upper hemisphere of the right breast the size of a pigeon's egg. It is hard, nodular, freely movable on the pectoral muscle and not adherent to the skin. Nipple retracted. A few small hard glands to be felt in the axilla. February 21, 1892, complete operation. Prognosis favorable. Discharged in five weeks with healthy granulating wound. March, 1894 (one year after the operation), well. Good use and no swelling of arm. No local nor regionary recurrence.

CASE XXXIX. (Surgical No. 2107.)—M. Y., aged forty-six; married. Seventeen years ago noticed very hard lump in the right breast. At first there were shooting and intermittent pains. There are none now. Retraction of the nipple began three months ago. Cancer of the right breast occupies half of the outer hemisphere. It is movable on the pectoral muscle, but very adherent to the skin. Nipple retracted. Very large glands to be felt in the axilla. March 16, 1893, complete operation. The highest infraclavicular glands are involved. Prognosis unfavorable. Discharged in five weeks. March, 1894 (one year after the operation), well. No swelling, and good use of arm. No local nor regionary recurrence.

CASE XL. (Surgical No. 2166.)—S. C. S., aged forty-three; married. Five years ago noticed a small lump in left breast which was painful on pressure. For two years the growth has been very slow. For the last year the growth has been very rapid. A severe pain extends down the arm. For the last few months has not been able to lift the arm. Cancer now occupies the entire left breast. It is attached to the pectoral muscle and is adherent to the skin. The nipple is retracted. Glands to be felt in the axilla. April 15, 1893, complete operation. The highest infraclavicular gland is involved. Prognosis unfavorable. Discharged in four weeks. November 29, 1893 (seven months after operation), regionary recurrence. Enlarged

supraclavicular glands; also skin metastases at the outer side of scar. No local recurrence. Glands and skin nodules excised. March, 1894, well. No local nor regionary recurrence.

CASE XLI. (Surgical No. 2256.)—Mrs. O., aged forty-six; widowed; one child; menstruating. Four years ago noticed lump in left breast. The growth has been rapid for the last two years. Nipple became retracted eighteen months ago. Glands to be felt in axilla. Large cancer in outer hemisphere of left breast. May 22, 1893, complete operation. Supraclavicular glands removed. The highest infraclavicular gland involved. Prognosis unfavorable. Discharged in seven weeks. September, 1892, complains of pain in the left hip and walks with cane. Readmitted with fracture of femur, probably caused by bone metastases. December 16, 1893 (seven months after operation), skin metastasis noticed at the outer side of scar. Three in skin over shoulder. March, 1894, the skin metastases have enlarged very little and have increased in number. The enlargement of the femur continues. There is no return in scar, axilla, or supraclavicular region. No local recurrence. The regionary recurrence is easily operable. Operation contraindicated by cancer of femur.

CASE XLII. (Surgical No. 2339.)—M. P., aged sixty-five; widowed; seven children. Eleven months ago noticed lump in the left breast. Pain has been present for six months. Small cancer in upper and outer quadrant of left breast. Skin not involved. Nipple not retracted. One small gland to be felt in the axilla. Patient says it has been there for fifteen years. September 8, 1893, complete operation. The highest infraclavicular gland is not involved. The breast nodule is circumscribed. The remainder of the gland and muscle apparently uninvolved. There are microscopic metastases in the axillary glands. March, 1894 (seven months after the operation), well. No local nor regionary recurrence.

CASE XLIII. (Surgical No. 2517.)—A. S., aged forty-four; single. Two years ago noticed lump outside of right nipple. Retraction of nipple observed three months ago. Continuous pain from beginning. Cancer five by three centimetres in the outer and upper quadrant of right breast. Adherent to nipple and to skin near nipple. Movable on the muscle. A few glands to be felt in the axilla. October 6, 1893, complete operation. The highest infraclavicular gland not involved. Prognosis favorable. March, 1894 (four and one-

half months after the operation), no local nor regionary recurrence.<sup>1</sup>

CASE XLIV. (Surgical No. 2565.)—S. G., aged sixty; married; ten children. Five years ago injured right breast. Three months later a small lump appeared in the upper part of this breast. Severe pain extended to the shoulder and down the right arm. The cancerous nodule is at the outer border of the breast over the pectoral muscle. It is adherent to both skin and muscle. The nipple and remainder of breast apparently uninvolved. A few small glands can be felt in the axilla. October 20, 1893, complete operation. The pectoralis minor muscle also removed. Prognosis unfavorable because of the infiltration of both pectoral muscles. March, 1894 (three months after the operation), well. No local nor regionary recurrence.

CASE XLV. (Surgical No. 2594.)—P. B., aged forty; colored; widowed; three children. Five months ago noticed small lump in the left breast. Pain at first, but none now. Cancer five by five centimetres in upper and outer quadrant of left breast. Freely movable on muscle. A few small glands to be felt in the axilla. November 2, 1893, complete operation. Highest infraclavicular gland involved. Prognosis unfavorable. Cancerous nodule invades the fascia of the pectoralis muscle. March 15, 1894 (three and one-half months after operation), well. No local nor regionary recurrence.

CASE XLVI. (Surgical No. 2614.)—M. T., aged twenty-nine; married; one child; child four months old. Tumor of right breast, noticed two months ago. This breast gives more milk than the other. Cystic tumor occupies the upper and inner quadrant of the right breast, which is painful and tender. The tumor cannot be outlined from the remainder of the gland. Skin and nipple apparently normal. Axillary glands not palpable. November 11, 1893, operation. Incision revealed cyst filled with cheesy serum, resembling sero-pus. Piece of the wall excised for examination found to be malignant cystic-adenoma. November 17, 1893, complete operation. Pectoral muscle and axillary glands show no metastasis. December 6, 1893, small lenticular nodule in skin at lower and outer side of scar. Nodule excised. March, 1894, no local nor further regionary recurrence.

<sup>1</sup> April 4, 1894, recurrence in scar and axilla six months after operation. April 7, 1894, operation for recurrence. The axillary recurrence was in a gland near the apex of the axilla and adherent to the axillary vein. Neither operation was performed by me.

CASE XLVII. (Surgical No. 2628.)—P. S., aged sixty-four; male. Twenty years ago injury in breast. Has been tender and painful ever since this injury. Fifteen years ago noticed nodule near left nipple. Has now a cancer about two and one-half centimetres in diameter in the inner and upper quadrant of the left breast. Nipple, skin, and pectoralis major muscle are involved. November 16, 1893, complete operation. Highest infraclavicular gland not involved. Prognosis favorable. Microscopical examination. Cancer is circumscribed, but invades pectoral fascia and muscle. The axillary glands show metastasis. Tissue from apex of axilla normal. March, 1894 (three and one-half months after operation), well. No local nor regional recurrence.

CASE XLVIII. (Surgical No. 2654.)—S. M. D., aged forty-three; married; no children. Ten months ago noticed tumor of left breast. Pain and discomfort for first four months. Has now a small, hard cancerous nodule in the inner and upper quadrant of the left breast. Breast is movable on muscle. Skin slightly adherent. Nipple not retracted. Numerous miliary skin metastases surrounding nipple. A few palpable glands in axilla and above clavicle. November 20, 1893, complete operation. Highest infraclavicular gland not involved. Prognosis favorable. March, 1894 (three months after operation), well. No local nor regional recurrence.

CASE XLIX. (Surgical No. 2739.)—J. R., aged thirty-three; single; menstruation normal. One year ago attention drawn to tumor by a rusty-colored serous discharge from right nipple. Pain, which began one month ago, now radiates to the right shoulder. Small tumor of inner and upper quadrant of right breast. It is nodular, freely movable on muscle, and not adherent to skin. Nipple slightly, if at all, retracted. Axillary glands not palpable. September 12, 1893, operation. Excision of a cyst with suspicious wall. Microscopical examination of the wall. Cystic adenoma. Intracystic papillomatous growths. Here and there earliest stages of carcinoma. February 2, 1894, complete operation. Prognosis is most favorable. Only one cancerous gland found in the axilla. March 20, 1894 (two months after the operation), no recurrence. This patient has also a myoma of the uterus.

CASE L. (Surgical No. 2791.)—E. B., aged fifty-four; married; two children. Carcinoma of the cervix uteri removed by vaginal hysterectomy six months ago. Tumor of left breast, noticed four weeks ago. Darting pains. Cancer in outer hemisphere size



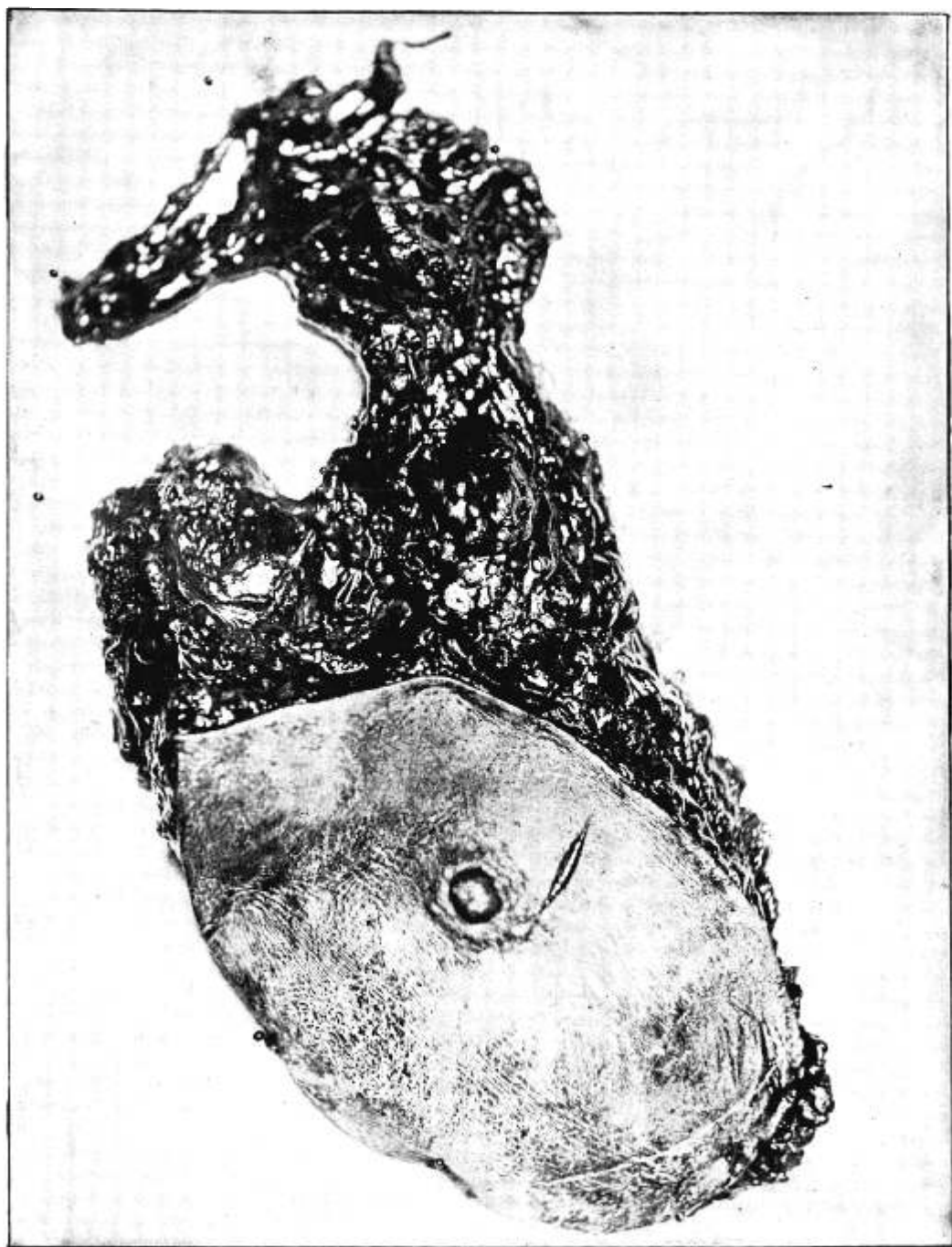


PLATE IV.

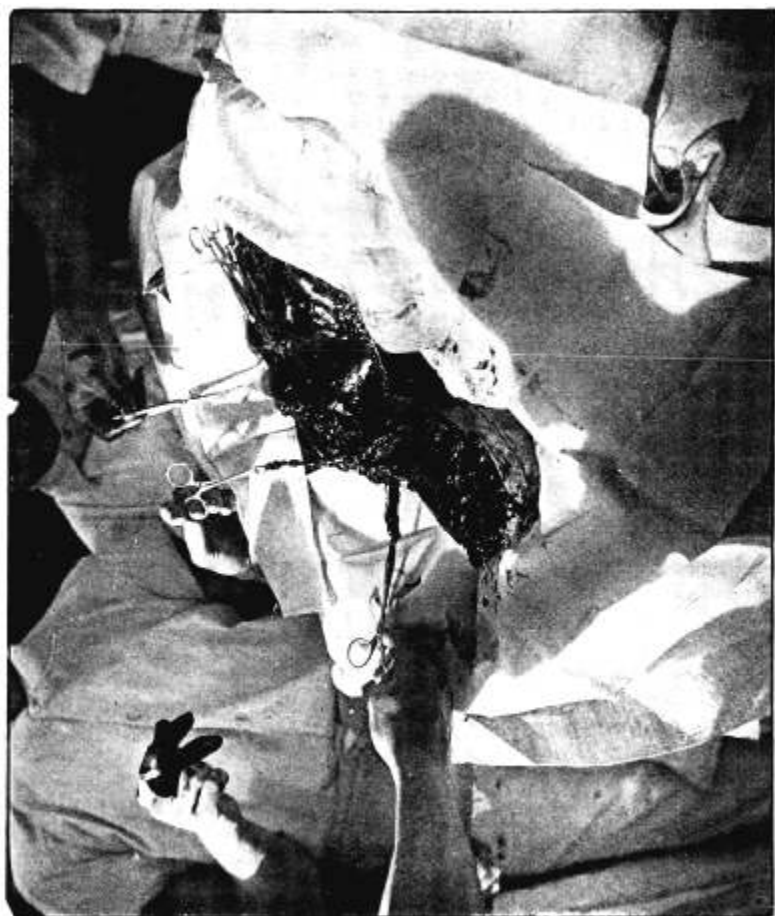
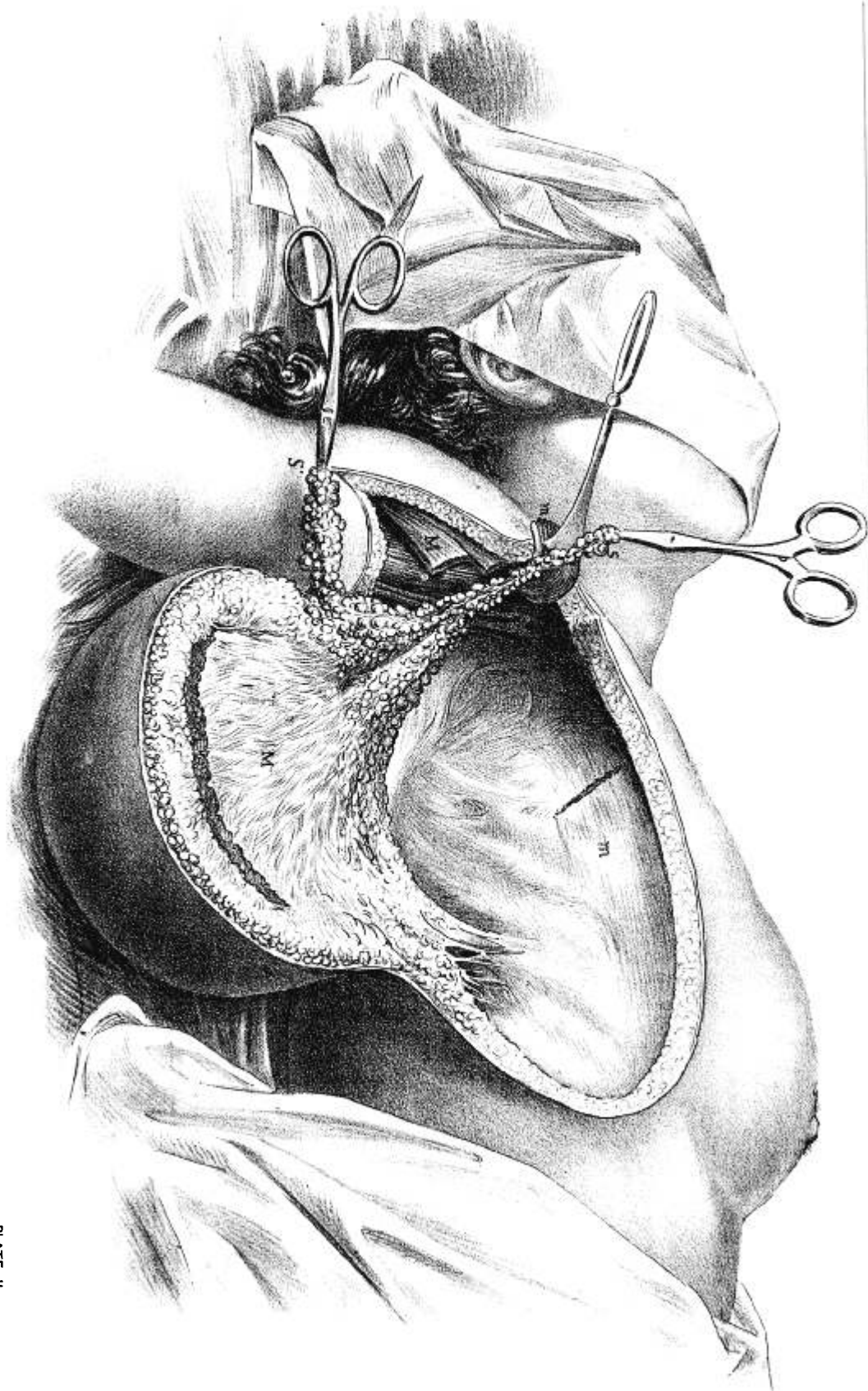
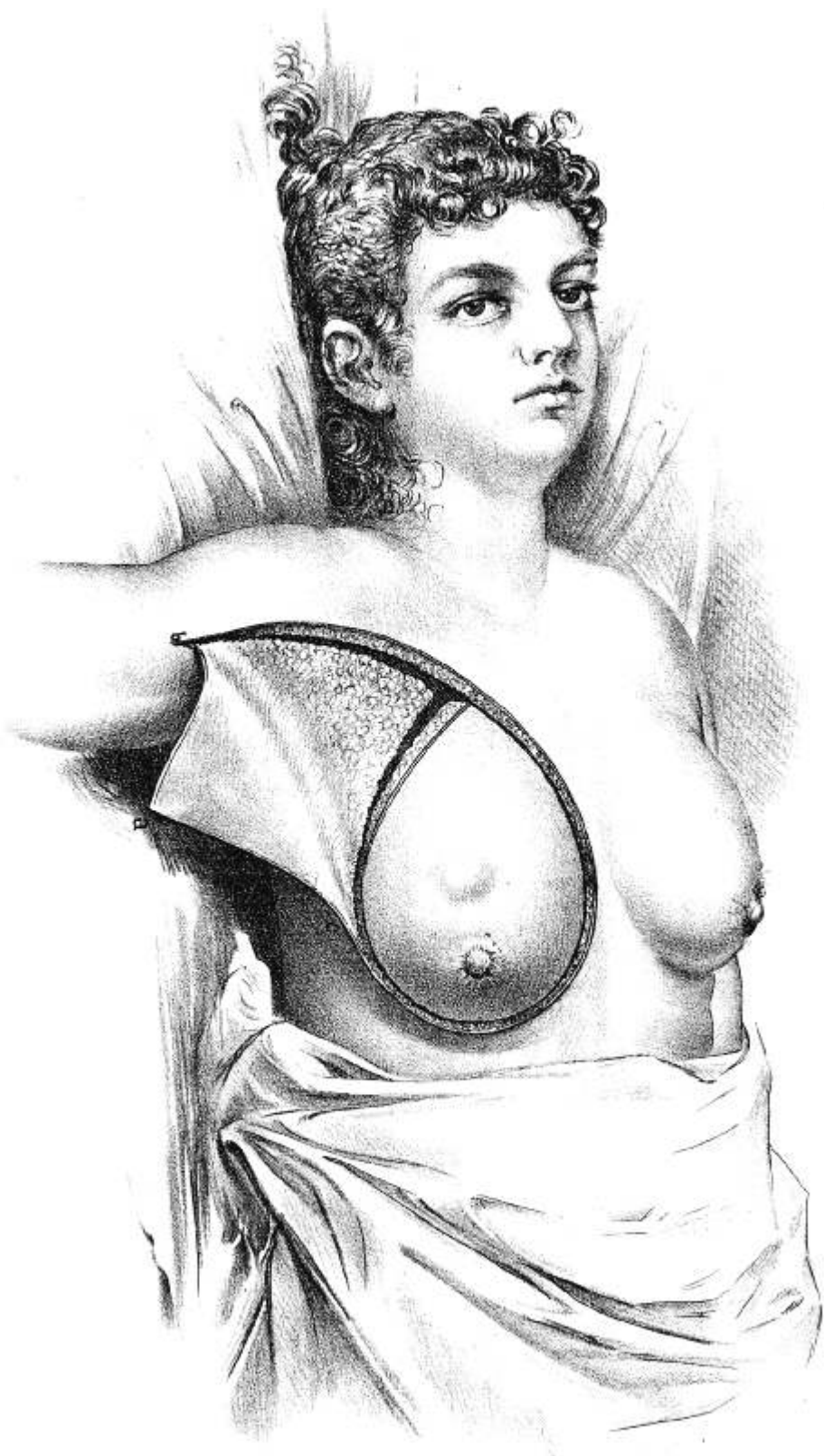


PLATE III.





of a hen's egg. Freely movable on muscle. Very hard and nodular. Not adherent to skin. Nipple slightly retracted. One small, hard gland to be felt in the axilla. February 2, 1894, complete operation. Prognosis very favorable. Highest infraclavicular gland not involved. March 20, 1894, no local nor regionary recurrence.

#### EXPLANATION OF THE PLATES.

*Plate I.*—Diagram showing skin incisions, triangular flap of skin, *abc*, and triangular flap of fat.

*Plate II.*—Diagram to elucidate Plate III. *M*, major pectoral muscle; *m*, minor pectoral muscle; *S*, apex of infraclavicular fat below the subclavian vessels; *S'*, apex of fat above the vessels.

*Plate III.*—Photograph of field of operation, taken just before the final cut which severs from the body the mass which has been extirpated.

*Plate IV.*—Photograph of the excised mass. The cancer was very small, and the glands, although involved, could not be felt before the operation.

TABLE I.—WM. S. HALSTED, JOHNS HOPKINS HOSPITAL, 1889-94.  
Fifty Cases.

| Special No. | Surgical No. | LOCAL RECURRENCE,<br>6 PER CENT.   | Special No. | Surgical No. | REGIONARY RECURRENCE.   |
|-------------|--------------|--|-------------|--------------|---|
| 11          | 821          | Scar. Five months post-operat. Second recurrence hopeless. Died carc. ventriculi one and a half years.                     | 4           | 360          | Skin and supraclav. gl. two and a third years post-operat. Excised successfully. Four years post operat. reported dead.   |
| 17          | 1248         | Scar. Two years post-operat. Nodule in pect. major at first operation Died two years and four months, internal metastases. | 9           | 691          | Supraclavicular glands. Lenticular metastases in skin over opposite breast and in opposite axilla two years four months. † Three years and two months post-operat.  |
| 18          | 1255         | Scar. One month post-operat. Excised successfully. Well. No recurrence two years and four months post-operat.              | 12          | 978          | One small nodule in skin outer side of scar five and a half months post-operat. Excised, presumably successfully. Dead. No local nor regionary recurrence reported. |
|             |              |  | 13          | 1109         | Cancer both breasts. Multiple skin nodules one and a half months. One year post-operat., no local recurrence.   |
|             |              |  | 35          | 1875         | Nodule under skin six months. Excised. Well. No recurrence one year and three months.   |
|             |              |  | 40          | 2166         | Skin nodules outside of scar seven months post-operat. Excised. Well. No recurrence eighteen months post-operat., eleven months after second operation.             |
|             |              |  | 41          | 2256         | Operable skin nodules outside of scar seven months post-operat. Living. Carc. femur.  |
|             |              |  | 46          | 2614         | Nodule, in skin lower and outer side of scar three months post-operat. Excised. Well. No recurrence three months after second operation.                            |

† Died.

TABLE I.—HALSTED. (Concluded.)

| No LOCAL RECURRENCE. |              |                     |             |              |               | Results as<br>to Local<br>Recurrence<br>Unknown. | Special No. | Surgical No. | Cases<br>Unheard<br>From.                |
|----------------------|--------------|---------------------|-------------|--------------|---------------|--|-------------|--------------|--|
| Special No.          | Surgical No. | Living.             | Special No. | Surgical No. | Living.       |  |             |              |  |
| 7                    | 624          | 3 yrs. 7 mos. p. o. | 1           | 12           | 1½ years.     | 5  | 385         | † 3 years    | Favorable<br>case.<br>Favorable<br>case. |
| 8                    | 650          | 3 yrs. 6 mos.       | 2           | 177          | 3 yrs. 6 mos. |  |             | 7 mos.       |  |
| 14                   | 1123         | 2½ years.           | 10          | 758          | 7 months.     | 6  | 388         | † 2 years    |  |
| 16                   | 1246         | 2 yrs. 5 mos.       | 15          | 1180         | 2 months.     |  |             | 7 mos.       |  |
| 20                   | 1359         | 2 yrs. 2 mos.       | 19          | 1337         | 1 yr. 9 mos.  | 24   | 1560        | † 11 mos.    |  |
| 21                   | 1393         | 2 yrs. 2 mos.       | 22          | 1429         | 6 months.     |  |             |              |  |
| 23                   | 1532         | 1 yr. 11 mos.       | 29          | 1718         | 10 months.    |  |             |              |  |
| 25                   | 1635         | 1 yr. 10 mos.       | 32          | 1782         | 10 months.    |  |             |              |  |
| 26                   | 1676         | 1 yr. 9 mos.        | 34          | 1835         | 3½ months.    |  |             |              |  |
| 28                   | 1710         | 1 yr. 7 mos.        | 36          | 1903         | 13 months.    |  |             |              |  |
| 30                   | 1729         | 1 yr. 7 mos.        |             |              |               |  |             |              |  |
| 31                   | 1736         | 1 yr. 7 mos.        |             |              |               |  |             |              |  |
| 33                   | 1819         | 1 yr. 5 mos.        |             |              |               |  |             |              |  |
| 37                   | 2064         | 1 yr. 2 mos.        |             |              |               |  |             |              |  |
| 38                   | 2070         | 1 year.             |             |              |               |  |             |              |  |
| 39                   | 2107         | 1 year.             |             |              |               |  |             |              |  |
| 42                   | 2439         | 7 months.           |             |              |               |  |             |              |  |
| 43                   | 2517         | 4½ months.          |             |              |               |  |             |              |  |
| 44                   | 2565         | 3½ months.          |             |              |               |  |             |              |  |
| 45                   | 2594         | 3½ months.          |             |              |               |  |             |              |  |
| 47                   | 2628         | 3½ months.          |             |              |               |  |             |              |  |
| 48                   | 2654         | 3 months.           |             |              |               |  |             |              |  |
| 49                   | 2739         | 2 months.           |             |              |               |  |             |              |  |
| 50                   | 2791         | 2 months.           |             |              |               |  |             |              |  |

† Died.

TABLE II.—CLINIC OF VON BERGMANN,<sup>1</sup> 1882-87. 114 Cases.

| LOCAL RECURRENCE, FROM 51 TO 60 PER CENT. |   |                            | DIED SOON AFTER THE OPERATION. |                         |                   |
|---|---|----------------------------|--------------------------------|-------------------------|-------------------|
| No.                                       | Situation.                                      | Time Post-Operat.          | No.                            | Cause of Death.         | Time Post-Operat. |
| 35  | Scar, axilla, infra- and supraclav. gl.         |                            | 51                             | Carc. liver and lungs.  | 2 months.         |
| 36  | { (1) Recurrence supraclav.                     | Both soon after operation. | 56                             | Carc. pleura.           | 2 "               |
|   | { (2) Recurrence.                               |                            | 85                             | Cause unknown.          | 2 "               |
| 37  | Scar in neck, infra- and supraclav. glands.     | 1 year 6 mos.              | 106                            | " "                     | 9 days.           |
| 38  | Scar and axilla.                                | 10 months.                 | 107                            | Ulcers ventriculi.      | 11 "              |
| 39  | Supraclav. and scar.                            | 3 "                        | 108                            | Pleuritis, suppurative. | 14 "              |
| 40  | Supraclav.                                      | 9 "                        | 109                            | Cause unknown.          | 28 "              |
|   | Scar.   | 9 "                        | 110                            | " "                     | 23 "              |
| 41  | Scar, supraclav.                                | 4 "                        |                                |                         |                   |
| 42  | Scar.   | 3 "                        |                                |                         |                   |
| 43  | Axilla, scar, right and left supraclav. glands. | 1 month.                   |                                |                         |                   |
| 44  | " Local recurrence."                            | Soon after discharge.      |                                |                         |                   |
| 46  | Scar, supraclav.                                | Soon after discharge.      |                                |                         |                   |
| 59  | Scar.   | 1 year.                    |                                |                         |                   |
| 60  | Scar, supraclav.                                | 9 months.                  |                                |                         |                   |
| 62  | Scar.   | 6 "                        |                                |                         |                   |
| 64  | Scar.   | Immediately.               |                                |                         |                   |
| 66  | " Local recurrence."                            | 1 month.                   |                                |                         |                   |
| 67  | " Local recurrence." Supraclav. gl.             | 6 months.                  |                                |                         |                   |
| 69  | Scar and supraclav. glands.                     | 4 "                        |                                |                         |                   |
| 70  | Scar.   | 10 "                       |                                |                         |                   |
| 71  | Scar.   | 18 "                       |                                |                         |                   |
| 72  | Scar.   | 3½ "                       |                                |                         |                   |
| 74  | Scar and axilla.                                | 6 months after operation.  |                                |                         |                   |
| 75  | Scar, axilla, and supraclav. glands.            | 2 months.                  |                                |                         |                   |
| 77  | Scar.   | 1 month.                   |                                |                         |                   |
| 79  | Scar.   | 9 months.                  |                                |                         |                   |
| 80  | " Local recurrence."                            | 9 "                        |                                |                         |                   |
| 82  | Scar.   | 5 "                        |                                |                         |                   |
| 84  | Skin near scar.                                 | 2 "                        |                                |                         |                   |
| 87  | Scar.   | Soon after op.             |                                |                         |                   |
| 88  | Axilla.   | 7 months.                  |                                |                         |                   |
| 91  | Scar and supraclav. glands.                     | Soon after op.             |                                |                         |                   |
| 92  | Scar.   | 17 mos. after op.          |                                |                         |                   |
| 93  | Scar.   | 5 months.                  |                                |                         |                   |
| 95  | Scar.   | 18 "                       |                                |                         |                   |
| 96  | Scar, axilla, and supraclav. glands.            | Soon after op.             |                                |                         |                   |
| 97  | " Local recurrence," also supraclav. glands.    | Few weeks after operation. |                                |                         |                   |
| 99  | Scar, infraclav.                                | 5 weeks.                   |                                |                         |                   |
| 101                                       | Scar.   | Soon after op.             |                                |                         |                   |
| 102                                       | Scar.   | 3 months.                  |                                |                         |                   |
| 103                                       | Scar.   | Few weeks after operation. |                                |                         |                   |
| 104                                       | Scar.   | Very soon after operation. |                                |                         |                   |
| 94  | " Local and regionary recurrence."              |                            |                                |                         |                   |
| 98  | " Local and regionary recurrence."              |                            |                                |                         |                   |
| 45  | " Recidiv."                                     | 4 months.                  |                                |                         |                   |
| 105                                       | Scar and supraclav. glands.                     |                            |                                |                         |                   |

<sup>1</sup> Eichel. Ueber die in der Von Bergmann'schen Klinik von Herbst, 1882, bis Mai, 1887, operirten primären Fälle von Brustkrebs. Inaug. Diss., Berlin, 1887.



TABLE II.—VON BERGMANN. (Concluded.)

| No LOCAL RECURRENCE. |                    | RESULT AS TO LOCAL RECURRENCE UNKNOWN. |                     | RESULT UNKNOWN. |
|----------------------|--------------------|--|---------------------|-----------------|
| No.                  | Time Post-Operat.  | No.                                    | Time Post-Operat.   |                 |
| 1                    | 4 years 9 months.  | 61                                     | † Less than 1 year. | III             |
| 2                    | 4 " 1 month.       | 63                                     | †                   | III2            |
| 3                    | 4 " 2 months.      | 65                                     | †                   | III3            |
| 4                    | 4 " 2 "            | 73                                     | † 1 year 2 months.  | III4            |
| 5                    | 4 " "              | 50                                     | † 5 months.         |                 |
| 6                    | 3 " 10 months.     | 54                                     | † 6 "               |                 |
| 7                    | 3 " 9 "            | 68                                     | † 2½ years.         |                 |
| 8                    | 3 " 6 "            | 76                                     | †                   |                 |
| 9                    | 3 " 9 "            | 78                                     | †                   |                 |
| 10                   | 3 " 3 "            | 81                                     | †                   |                 |
| 11                   | 3 " 1 month.       | 86                                     | †                   |                 |
| 12                   | 3 " 2 months.      | 90                                     | †                   |                 |
| 13                   | 2 " 10 "           | 83                                     | †                   |                 |
| 14                   | 2 " 10 "           | 89                                     | †                   |                 |
| 15                   | 2 " 7 "            | 100                                    | †                   |                 |
| 16                   | 2 " 2 "            |  |                     |                 |
| 17                   | 2 "                |  |                     |                 |
| 18                   | 1 year 11 months.  |  |                     |                 |
| 19                   | 1 " 3 "            |  |                     |                 |
| 20                   | 1 " 2 "            |  |                     |                 |
| 21                   | 1 " 1 month.       |  |                     |                 |
| 22                   | 11 months.         |  |                     |                 |
| 23                   | 1 year 5 months.   |  |                     |                 |
| 24                   | 11 months.         |  |                     |                 |
| 25                   | 6 "                |  |                     |                 |
| 26                   | 6 "                |  |                     |                 |
| 27                   | 6 "                |  |                     |                 |
| 28                   | 6 "                |  |                     |                 |
| 29                   | 7 "                |  |                     |                 |
| 30                   | 3 "                |  |                     |                 |
| 31                   | 3 "                |  |                     |                 |
| 32                   | 2 "                |  |                     |                 |
| 33                   | 2 "                |  |                     |                 |
| 34                   | 3 years 6 months.  |  |                     |                 |
| 47                   | † 9 months.        |  |                     |                 |
| 49                   | † 8 "              |  |                     |                 |
| 53                   | † 6 "              |  |                     |                 |
| 58                   | † 4 "              |  |                     |                 |
| 48                   | † 11 "             |  |                     |                 |
| 55                   | † 4 "              |  |                     |                 |
| 52                   | † 1 year 2 months. |  |                     |                 |
| 57                   | † 5 months.        |  |                     |                 |

TABLE III.—CLINIC OF BILLROTH,<sup>1</sup> 1867-76. 170 Cases.

| LOCAL RECURRENCE, 82 PER CENT. |                                    |                              |
|--------------------------------|------------------------------------|------------------------------|
| No.                            | Situation.                         | Time Post-Operat.            |
| 34                             | Scar.                              | Immediately.                 |
| 62                             | Skin near scar.                    | Two days.                    |
| 63                             | Scar.                              | Very soon.                   |
| 64                             | Miliary nodules near scar.         | One month.                   |
| 65                             | Axilla.                            | One month.                   |
| 66                             | "Local recurrence."                | ?                            |
| 67                             | "Local recurrence."                | About one year.              |
| 68                             | (1) Middle of scar.                | Six and a half months.       |
|                                | (2) Axilla.                        | One year.                    |
| 69                             | Scar and granulating wound.        | Very soon.                   |
| 70                             | Skin near scar.                    | Very soon.                   |
| 71                             | Scar.                              | Two months.                  |
| 72                             | (1) Scar.                          | Four months.                 |
|                                | (2)                                | Ten months.                  |
| 73                             | Scar.                              |                              |
| 74                             | Supraclav. glands.                 | ?                            |
| 75                             | "Local recurrence."                | ?                            |
| 76                             | Skin and axilla.                   | ?                            |
| 77                             | Near scar.                         | Two months.                  |
| 78                             | "Local recurrence."                | Soon after discharge.        |
| 79                             | Near scar.                         | Soon after healing.          |
| 80                             | Near scar.                         | Soon after healing.          |
| 81                             | Infraclav. glands.                 | Two months.                  |
| 82                             | Skin some distance from scar.      | Before complete healing.     |
| 83                             | In scar.                           | Soon after healing.          |
| 84                             | "Local recurrence."                | Soon after discharge.        |
| 86                             | Near scar.                         | Two years.                   |
| 87                             | Scar and axilla.                   | Three and a half years. ?    |
| 88                             | Supraclav. glands.                 | Soon after healing.          |
| 89                             | Near scar.                         | Very soon.                   |
| 90                             | Skin, pectoral muscle, and axilla. | During healing.              |
| 92                             | (1) Near scar.                     | One year.                    |
|                                | (2) Axilla.                        | Three and a half years. ?    |
| 93                             | Granulating wound.                 |                              |
| 94                             | "Local recurrence."                | ?                            |
| 95                             | Near scar.                         | One and a half years.        |
| 97                             | Near scar.                         | Soon after discharge.        |
| 98                             | "Local recurrence."                | Very soon.                   |
| 99                             | Axilla and edge scar.              | Few months.                  |
| 100                            | Infraclav. glands.                 | Very soon.                   |
| 101                            | Near scar and axilla.              | Soon after discharge.        |
| 102                            | (1) Near scar and axilla.          | Soon after discharge.        |
|                                | (2)                                | Soon after second operation. |
| 103                            | Near scar.                         | Soon after discharge.        |

<sup>1</sup> A. von Winniwarter. Beiträge zur Statistik der Carcinome. Stuttgart, 1876.

TABLE III.—BILLROTH. (Continued.)

| LOCAL RECURRENCE, 82 PER CENT. |  |                                |
|--------------------------------|--|--------------------------------|
| No.                            | Situation.   | Time Post-Operat.              |
| 104                            | Axilla and near scar.                                  | Four weeks after discharge.    |
| 106                            | Axilla and near scar, below scar.                      | Soon after operation.          |
| 107                            | Scar.  | Soon after healing.            |
| 108                            | Scar.  | Soon after discharge.          |
| 109                            | (1) Scar.  | Eighteen months.               |
|                                | (2) Axilla.  | Thirteen months.               |
| 110                            | Scar.  | Soon after healing.            |
| 111                            | Near wound before healing.                             |                                |
| 112                            | Scar.  | Eight months.                  |
| 113                            | Breast during healing.                                 |                                |
| 114                            | Scar.  | Nine months.                   |
| 115                            | Axilla below scar.                                     | One and a half months.         |
| 116                            | Skin and axilla.                                       | Soon after healing.            |
| 117                            | Axilla near scar.                                      | Soon after healing.            |
| 119                            | (1) Axilla.  | Sixteen months.                |
|                                | (2) Scar.  | Twenty-two months.             |
| 122                            | (1) Near scar.   | About three years.             |
|                                | (2) In scar and skin.                                  | Six months later.              |
| 124                            | Axilla.  | Immediately.                   |
|                                | (2) Lower edge of pectoral muscle.                     | Four and three-quarters years. |
| 125                            | (1) Skin, supraclav. and infraclav. gland, and axilla. | About three years.             |
|                                | (2) Skin and axilla.                                   | Six years.                     |
| 130                            | Axilla and extirpated.                                 | Immediately.                   |
| 131                            | Axilla and infraclav. glands.                          | Immediately.                   |
| 132                            | Scar and axilla.                                       | Thirteen months.               |
| 133                            | Scar and lower edge of pectoral muscle.                | One year.                      |
| 136                            | (1) Skin.  | Three months.                  |
|                                | (2) Scar and axilla.                                   | Five years.                    |
| 137                            | Scar.  | Few months.                    |
| 138                            | Axilla.  | One year.                      |
| 141                            | (1) Scar, axilla, infraclav. and supraclav. glands.    | One year.                      |
|                                | (2) Scar, infraclav. and supraclav. glands.            | One and a half years.          |
|                                | (3) Scar and near axilla.                              | Two years.                     |
| 143                            | Scar.  | Three months.                  |
| 146                            | Breast and axilla.                                     | Three months.                  |
| 148                            | Scar and axilla.                                       | Seven months.                  |
| 153                            | Scar.  | One year.                      |
| 155                            | (1) Scar.  | Two years.                     |
|                                | (2) Axilla.  | Four years.                    |
| 159                            | (1) "Local recurrence."                                | Immediately.                   |
|                                | (2) Breast.  | Six years.                     |
| 164                            | (1) Scar.  | One month.                     |
|                                | (2) Scar and axilla.                                   | Three months.                  |
| 165                            | (1) Above scar.  | Four months.                   |
|                                | (2) Scar.  | Five months.                   |

TABLE III.—BILLROTH. (Concluded.)

| DIED SOON AFTER THE OPERATION. |                            |                       | NO LOCAL RECURRENCE. |                     | RESULT UNKNOWN. |
|--------------------------------|----------------------------|-----------------------|----------------------|---------------------|-----------------|
| No.                            | Cause of Death.            | Time Post-Operat.     | No.                  | Time Post-Operat.   | No.             |
| 28                             | Septicæmia.                | 10 days.              | 120                  | 3 years.            | 91              |
| 29                             | Pyæmia.                    | 37 "                  | 154                  | 5 " 9 months.       | 113             |
| 30                             | "                          | 22 "                  | 156                  | 3 " 3 "             | 121             |
| 31                             | "                          | 12 "                  | 157                  | 6 " 1 month.        | 123             |
| 32                             | "                          | 11 "                  | 158                  | 3 " 8 months.       | 126             |
| 33                             | Erysipelas.                | 16 "                  | 160                  | 2 " 2 "             | 127             |
| 35                             | Septicæmia.                | 3 "                   | 162                  | 2 " 1 month.        | 128             |
| 36                             | Pyæmia.                    | 8 "                   | 163                  | 3 " 5 months.       | 129             |
| 37                             | Septicæmia.                | Day of operation.     | 167                  | 2 "                 | 134             |
| 38                             | Erysipelas.                | 11 days.              | 168                  | 1 year 1 month.     | 135             |
| 39                             | Septicæmia.                | 7 "                   | 169                  | 5½ months.          | 139             |
| 40                             | Erysipelas.                | 12 "                  | 166                  | 3½ "                | 142             |
| 41                             | "                          | 32 "                  | 170                  | 4 years 3 months.   | 144             |
| 42                             | Pyæmia.                    | 16 "                  | 140                  | † 1 year 11 months. | 145             |
| 43                             | "                          | 11 "                  | 161                  | † 1 year.           | 147             |
| 44                             | Erysipelas.                | 12 "                  |                      |                     | 148             |
| 45                             | Septicæmia                 | 14 "                  |                      |                     | 150             |
| 46                             | Peritonitis.               | 13 "                  |                      |                     | 151             |
| 47                             | Erysipelas.                | 7 "                   |                      |                     |                 |
| 48                             | Hæmorrhage axilla artery.  | 7 "                   |                      |                     |                 |
| 49                             | Erysipelas.                | 41 "                  |                      |                     |                 |
| 50                             | Septicæmia.                | 2 "                   |                      |                     |                 |
| 51                             | Erysipelas.                | 7 "                   |                      |                     |                 |
| 52                             | "                          | 39 "                  |                      |                     |                 |
| 53                             | Erysipelas and pneumonia.  | 12 "                  |                      |                     |                 |
| 54                             | Erysipelas.                | 10 "                  |                      |                     |                 |
| 55                             | "                          | 37 "                  |                      |                     |                 |
| 56                             | "                          | 28 "                  |                      |                     |                 |
| 57                             | Marasmus following erysip. | 63 "                  |                      |                     |                 |
| 58                             | Erysipelas.                | 16 "                  |                      |                     |                 |
| 59                             | Hæmorrhage axilla artery.  | 6 "                   |                      |                     |                 |
| 60                             | Pleuritis.                 | 1 day.                |                      |                     |                 |
| 61                             | Erysipelas.                | 8 days.               |                      |                     |                 |
| 152                            | Acute "internal disease."  | Soon after discharge. |                      |                     |                 |

TABLE IV.—CLINIC OF CZERNY,<sup>1</sup> 1877-86. 102 Cases.

| LOCAL RECURRENCE, 60 PER CENT. |  |                   | DIED SOON AFTER THE OPERATION. |                     |                   |
|--------------------------------|--|-------------------|--------------------------------|---------------------|-------------------|
| No.                            | Situation.                                 | Time Post-Operat. | No.                            | Cause of Death.     | Time Post-Operat. |
| 1                              | Scar.                                      | 3 months.         | 6                              | Erysipelas.         | 18 days.          |
| 3                              | Scar.                                      | 5½ years.         | 26                             | Erysipelas.         | 11 "              |
| 5                              | Scar.                                      | 8 months.         | 44                             | Erysipelas.         | 13 "              |
| 7                              | Scar.                                      | 3 months.         | 45                             | Iodoform poisoning. | 23 "              |
| 8                              | Axilla.                                    | 4 years.          |                                |                     |                   |
| 9                              | Suture holes, skin, muscle, supraclav. gl. | 4 months.         |                                |                     |                   |
| 10                             | Scar, supraclav. glands.                   | 1 month.          |                                |                     |                   |
| 11                             | Lenticular recurrence of entire side.      | 6 months.         |                                |                     |                   |
| 17                             | Scar, supraclav. and cervical glands.      | 2 years.          |                                |                     |                   |
| 18                             | Scar.                                      | 3 months.         |                                |                     |                   |
| 20                             | Scar and axilla.                           | 2 months.         |                                |                     |                   |
| 21                             | Axilla.                                    | 1 year.           |                                |                     |                   |
|                                | Scar.                                      | 1½ years.         |                                |                     |                   |
| 29                             | Scar and axilla.                           | 3¾ years.         |                                |                     |                   |
| 31                             | Scar and axilla.                           | 3 months.         |                                |                     |                   |
| 33                             | Axilla and pect. muscle.                   | 3 months.         |                                |                     |                   |
|                                | Scar.                                      | 3 years.          |                                |                     |                   |
| 34                             | Scar.                                      | 4 months.         |                                |                     |                   |
| 35                             | Scar.                                      | 7 "               |                                |                     |                   |
| 36                             | Scar and axilla.                           | 3 "               |                                |                     |                   |
| 38                             | Lenticular recurrence about scar.          | 8½ "              |                                |                     |                   |
| 43                             | Scar.                                      | 3½ "              |                                |                     |                   |
|                                | Axilla.                                    | 1 year.           |                                |                     |                   |
| 46                             | Axilla.                                    | 2½ years.         |                                |                     |                   |
| 48                             | Scar and axilla.                           | 1 year.           |                                |                     |                   |
| 50                             | Axilla.                                    | 11 months.        |                                |                     |                   |
| 53                             | Scar.                                      | 5 months.         |                                |                     |                   |
|                                | Axilla.                                    | Later.            |                                |                     |                   |
| 61                             | Scar.                                      | 1 month.          |                                |                     |                   |
| 64                             | Scar.                                      | 5 months.         |                                |                     |                   |
| 68                             | Scar.                                      | 7 "               |                                |                     |                   |
| 72                             | Scar.                                      | 2 "               |                                |                     |                   |
| 74                             | Scar.                                      | 1 month.          |                                |                     |                   |
| 83                             | Scar.                                      | 6 weeks.          |                                |                     |                   |
| 86                             | Scar and axilla.                           | 1½ years.         |                                |                     |                   |
| 88                             | Scar and axilla.                           | 4½ months.        |                                |                     |                   |
| 91                             | Lenticular in skin.                        | 2 "               |                                |                     |                   |
| 92                             | Above scar.                                | 3 "               |                                |                     |                   |
| 96                             | Lenticular recurrence about scar.          | 8 (?) "           |                                |                     |                   |
| 99                             | Scar.                                      | 6 "               |                                |                     |                   |
| 102                            | Scar.                                      | 2 "               |                                |                     |                   |
|                                | Axilla.                                    | 7 "               |                                |                     |                   |

<sup>1</sup> G. B. Schmidt. Die Geschwülste der Brustdrüse, Beiträge zur klinischen Chirurgie, Bd. IV, 1889.

TABLE IV.—CZERNY. (Concluded.)

| NO LOCAL RECURRENCE. |                   | NO NOTE AS TO LOCAL RECURRENCE. |  |                     | RESULT UNKNOWN. |
|----------------------|-------------------|---------------------------------|--|---------------------|-----------------|
| No.                  | Time Post-Operat. | No.                             | Cause of Death.                                    | Time Post-Operat.   | No.             |
| 5                    | 9½ years.         | 13                              | Enlarged axillary glands not removed at operation. | †                   | 4               |
| 12                   | † 1¾ years.       | 25                              |  | † 1 year.           | 12              |
| 16                   | † 1 year.         | 47                              |  | † 1 year 9 months.  | 14              |
| 22                   | 7 years.          | 51                              | Carc. ventriculi.                                  | † 11 months.        | 19              |
| 23                   | † 3 “             | 52                              |  | † 4 months.         | 27              |
| 24                   | † 7 “             | 54                              |  | † 1 year.           | 28              |
| 32                   | 7 years 2 months. | 55                              | Carc. other breast.                                | † 1 year.           | 30              |
| 40                   | † 5½ months.      | 57                              |  | † 6 or 8 months.    | 37              |
| 49                   | 5 years 7 months. | 59                              |  | † 3 months.         | 39              |
| 70                   | 4 “ 3 “           | 60                              |  | † 2 years.          | 41              |
| 77                   | 3 “ 10 “          | 66                              |  | † 3 months.         | 56              |
| 79                   | 1 year 10 “       | 73                              |  | † 6 “               | 58              |
| 80                   | 4 years 5 “       | 75                              |  | † 10 “              | 62              |
| 81                   | † 4 months.       | 76                              |  | † 7 “               | 63              |
| 84                   | 4 (?) years.      | 78                              |  | † 1½ years.         | 65              |
| 89                   | 1 year 8 months.  | 94                              |  | † 7 months.         | 67              |
| 90                   | 1 “ 8 “           | 98                              | Pleuritis.   | † Less than 1 year. | 69              |
| 93                   | 1 “ 7 “           |                                 |  |                     | 72              |
| 97                   | 1 “ 1 month.      |                                 |  |                     | 81              |
| 100                  | 2 (?) years.      |                                 |  |                     | 82              |
| 109                  | 2 (?) years.      |                                 |  |                     | 87              |
|                      |                   |                                 |  |                     | 98              |

TABLE V.—CLINIC OF H. FISCHER,<sup>1</sup> 1871-78. 147 Cases.

| LOCAL RECURRENCE, 75 PER CENT. |  |                       | DIED FROM THE OPERATION, OR TOO SOON TO EXCLUDE LOCAL RECURRENCE. |                     |                       | NO LOCAL RECURRENCE. |           | RESULT UNKNOWN. |
|--------------------------------|--|-----------------------|---|---------------------|-----------------------|----------------------|-----------|-----------------|
| No.                            | Situation.                               | Time after Operation. | No.   | Cause of Death.     | Time after Operation. | No.                  | No.       |                 |
| 15                             | Scar.                                    | 9 months.             | 109   | Exhaustion.         | Few weeks.            | 1                    | 8¾ years. | III             |
| 19                             | Scar and axilla.                         | 15 months.            | 118   | General carcinosis. | 4 weeks.              | 2                    | 7¾ years. | II4             |
| 26                             | Scar.                                    | "                     | 119   | Pyæmia.             | 1 week.               | 3                    | 7 years.  | II5             |
| 29                             | "Recurrence" probable.                   | 18 "                  | 120   | Croupous pneumonia. | 1 month.              | 4                    | 6 years.  | II6             |
| 30                             | Scar and axilla.                         | "                     | 121   | Anæmia.             | 1 "                   | 5                    | 6 years.  | II7             |
| 31                             | Scar.                                    | 28 "                  | 122   | Septicæmia.         | 8 days.               | 6                    | 5 years.  |                 |
| 32                             | Scar.                                    | 8 "                   | 123   | Pyæmia.             | 1 month.              | 7                    | 4½ years. |                 |
| 33                             | Scar and supraclav. glands.              | 12 "                  | 124   | Acute peritonitis.  | 15 days.              | 8                    | 4½ "      |                 |
| 34                             | Scar.                                    | 18 "                  | 125   | Pyæmia.             | 8 "                   | 9                    | 3¾ "      |                 |
| 35                             | Scar and axilla.                         | 7 "                   | 126   | Erysipelas.         | 18 "                  | 10                   | 3¾ "      |                 |
| 36                             | Scar.                                    | 11 "                  | 127   | " " " " " " " "     | A few weeks.          | 11                   | 3¾ "      |                 |
| 37                             | Scar and skin.                           | 18 "                  | 128   | Edema of the lungs. | 4 days.               | 12                   | 3¾ "      |                 |
| 38                             | Scar and axilla.                         | 3 "                   | 129   | Septicæmia.         | 2 "                   | 13                   | 2½ "      |                 |
| 39                             | Scar.                                    | 12 "                  | 130   | Pleuritis.          | 34 "                  | 14                   | 2½ "      |                 |
| 40                             | Scar, neck, and skin.                    | 18 "                  | 131   | Inanition.          | 2 months.             | 16                   | 1¾ "      |                 |
| 41                             | (1) Skin and axilla.                     | 6 "                   | 132   | Septicæmia.         | 8 days.               | 17                   | 1½ "      |                 |
| 42                             | (2) Scar.                                |                       | 133   | Pyæmia.             | A few days.           | 18                   | 1½ "      |                 |
| 43                             | Scar.                                    |                       | 134   | Pyæmia.             | 22 days.              | 20                   | 1 year.   |                 |
| 44                             | Scar and skin.                           |                       | 135   | Septicæmia.         | 10 "                  | 21                   | 1 "       |                 |
| 45                             | "Recurrence."                            | 9 "                   | 136   | Erysipelas.         | 12 "                  | 22                   | 1 "       |                 |
| 46                             | Axilla, skin, and under pectoral muscle. | 3 "                   | 137   | Erysipelas.         | 4 "                   | 23                   | 9 months. |                 |
| 47                             | Scar and sternum.                        | 5 "                   | 138   | Pyæmia.             | 18 "                  | 24                   | 1 year.   |                 |
| 48                             | "Recurrence."                            | 30 "                  | 139   | Septicæmia.         | 6 "                   | 25                   | 9 months. |                 |
| 49                             | Scar.                                    | 18 "                  | 140   | Gangrene.           | 6 "                   | 27                   | 4 years.  |                 |
| 50                             | "Recurrence."                            | 3 "                   | 141   | Erysipelas.         | 4 weeks.              | 28                   | 6 months. |                 |
| 51                             | Scar.                                    | 6 "                   | 142   | Erysipelas.         | 40 days.              | 107                  | 6 months. |                 |
| 52                             | Scar.                                    | 9 "                   | 143   | Diphtheria.         | 2 weeks.              | 113                  | 2 years.  |                 |
| 53                             | Scar.                                    | 6 "                   | 144   | Septicæmia.         | 9 days.               |                      |           |                 |
| 54                             | Scar.                                    | 6 "                   | 145   | Apoplexy.           | 48 days.              |                      |           |                 |
| 55                             | Scar.                                    | 3 "                   | 146   | Fatty heart.        | 3 weeks.              |                      |           |                 |
|                                |  |                       | 147   | Meningitis.         |                       |                      |           |                 |

<sup>1</sup> Arthur Henry. Statistische Mittheilungen über der Brustkrebs, 1871-78, Inaug. Dissert., Breslau, 1879.

TABLE V.—FISCHER. (Continued.)

| LOCAL RECURRENCE, 75 PER CENT. |                               | DIED FROM THE OPERATION, OR TOO SOON TO EXCLUDE LOCAL RECURRENCE. |     |                 |                       | NO LOCAL RECURRENCE. |     | RESULT UNKNOWN. |     |
|--------------------------------|-------------------------------|---|-----|-----------------|-----------------------|----------------------|-----|-----------------|-----|
| No.                            | Situation.                    | Time after Operation.   | No. | Cause of Death. | Time after Operation. | No.                  | No. | No.             | No. |
| 56                             | "Recurrence."                 | Less than one year.   |     |                 |                       |                      |     |                 |     |
| 57                             | "Recurrence."                 | 3 months.   |     |                 |                       |                      |     |                 |     |
| 58                             | "Recurrence."                 | 6 "   |     |                 |                       |                      |     |                 |     |
| 59                             | Axilla.                       | "   |     |                 |                       |                      |     |                 |     |
| 60                             | "Recurrence."                 | "   |     |                 |                       |                      |     |                 |     |
| 61                             | "Recurrence."                 | "   |     |                 |                       |                      |     |                 |     |
| 62                             | Axilla.                       | "   |     |                 |                       |                      |     |                 |     |
| 63                             | Scar.                         | 9 "   |     |                 |                       |                      |     |                 |     |
| 64                             | "Recurrence."                 | 6 "   |     |                 |                       |                      |     |                 |     |
| 65                             | "Recurrence."                 | 6 "   |     |                 |                       |                      |     |                 |     |
| 66                             | "Recurrence."                 | "   |     |                 |                       |                      |     |                 |     |
| 67                             | "Recurrence."                 | 12 "  |     |                 |                       |                      |     |                 |     |
| 68                             | Axilla.                       | 28 "  |     |                 |                       |                      |     |                 |     |
| 69                             | "Recurrence."                 | "   |     |                 |                       |                      |     |                 |     |
| 70                             | Scar.                         | 3 "   |     |                 |                       |                      |     |                 |     |
| 71                             | Scar.                         | Few weeks.  |     |                 |                       |                      |     |                 |     |
| 72                             | "Recurrence."                 | "   |     |                 |                       |                      |     |                 |     |
| 73                             | "Recurrence."                 | 6 months.   |     |                 |                       |                      |     |                 |     |
| 74                             | Skin.                         | 9 "   |     |                 |                       |                      |     |                 |     |
| 75                             | Scar.                         | 3 "   |     |                 |                       |                      |     |                 |     |
| 76                             | "Recurrence."                 | 6 "   |     |                 |                       |                      |     |                 |     |
| 77                             | Supraclav. glands.            | 6 weeks.  |     |                 |                       |                      |     |                 |     |
| 78                             | Scar.                         | 3 months.   |     |                 |                       |                      |     |                 |     |
| 79                             | Scar.                         | 6 months.   |     |                 |                       |                      |     |                 |     |
| 80                             | Scar.                         | Few weeks.  |     |                 |                       |                      |     |                 |     |
| 81                             | Skin.                         | 6 months.   |     |                 |                       |                      |     |                 |     |
| 82                             | "Recurrence."                 | 3 "   |     |                 |                       |                      |     |                 |     |
| 83                             | Scar.                         | "   |     |                 |                       |                      |     |                 |     |
| 84                             | Axilla and supraclav. glands. | 9 "   |     |                 |                       |                      |     |                 |     |
| 85                             | Scar.                         | 2 "   |     |                 |                       |                      |     |                 |     |
| 86                             | Scar.                         | 12 "  |     |                 |                       |                      |     |                 |     |
| 87                             | Scar.                         | 9 "   |     |                 |                       |                      |     |                 |     |
| 88                             | "Recurrence."                 | 6 "   |     |                 |                       |                      |     |                 |     |



TABLE V.—FISCHER. (Concluded.)

| LOCAL RECURRENCE, 75 PER CENT. |                  | DIED FROM THE OPERATION, OR TOO SOON TO EXCLUDE LOCAL RECURRENCE. |     | NO LOCAL RECURRENCE. |     | RESULT UNKNOWN. |
|--------------------------------|------------------|---|-----|----------------------|-----|-----------------|
| No.                            | Situation.       | Time after Operation.   | No. | Cause of Death.      | No. |                 |
| 89                             | "Recurrence."    | 6 months.   |     |                      |     |                 |
| 90                             | "Recurrence."    | 6 "   |     |                      |     |                 |
| 91                             | Scar.            | Few weeks.  |     |                      |     |                 |
| 92                             | Scar and axilla. | 12 months.  |     |                      |     |                 |
| 93                             | Scar and axilla. | 6 "   |     |                      |     |                 |
| 94                             | Scar.            | 3 "   |     |                      |     |                 |
| 95                             | Axilla.          | 15 "  |     |                      |     |                 |
| 96                             | "Recurrence."    | 12 "  |     |                      |     |                 |
| 97                             | Scar and axilla. | 3 "   |     |                      |     |                 |
| 98                             | "Recurrence."    | 3 "   |     |                      |     |                 |
| 99                             | Scar and axilla. | Few weeks.  |     |                      |     |                 |
| 100                            | Scar.            | 3 months.   |     |                      |     |                 |
| 101                            | Scar.            | 3 "   |     |                      |     |                 |
| 102                            | Scar.            | 2 "   |     |                      |     |                 |
| 103                            | Skin.            | 6 "   |     |                      |     |                 |
| 104                            | Scar and axilla. | 6 "   |     |                      |     |                 |
| 105                            | "Recurrence."    |   |     |                      |     |                 |
| 106                            | Scar.            | Few weeks.  |     |                      |     |                 |
| 108                            | Scar and axilla. | 3 months or less.   |     |                      |     |                 |
| 110                            | Scar.            | 9 "   |     |                      |     |                 |
| 112                            | Scar and axilla. | 8 "   |     |                      |     |                 |

TABLE VI.—CLINIC OF GUSSENBAUER.<sup>1</sup> 151 Cases.

| LOCAL RECURRENCE, 64 PER CENT. |                                      |                   | DIED SOON AFTER THE OPERATION. |                          |                   | NO NOTE AS TO LOCAL RECURRENCE. |                                       |     | NO LOCAL RECURRENCE. |     | RESULT UNKNOWN. |
|--------------------------------|--------------------------------------|-------------------|--------------------------------|--------------------------|-------------------|---------------------------------|---------------------------------------|-----|----------------------|-----|-----------------|
| No.                            | Situation.                           | Time Post-Operat. | No.                            | Cause of Death.          | Time Post-Operat. | No.                             | Time Post-Operat.                     | No. | Time Post-Operat.    | No. |                 |
| 38                             | Scar two places.                     | 10 months.        | 33                             | Sepsis and pneumonia.    | 1 month.          | 54                              | † Carc. lungs and vertebræ.           | 68  | † 2 years.           | 176 |                 |
| 39                             | Scar.                                | 2 "               | 34                             | Pneumonia.               | 21 days.          |                                 |                                       | 92  | † 1 year.            | 179 |                 |
| 40                             | Recurrence.                          | 12 "              | 35                             | Died on operating-table. |                   | 59                              | † Carc. sternum.                      | 94  | † 1½ years.          | 180 |                 |
| 41                             | Scar.                                | 7 "               |                                |                          |                   |                                 |                                       | 96  | † 6 months.          | 181 |                 |
| 42                             | Recurrence.                          | (?)               | 36                             | Erysipelas.              | 3 weeks.          | 75                              | † Carc. ventriculi.                   | 98  | † 4 "                | 183 |                 |
| 43                             | Scar.                                | 32 months.        | 37                             | Erysipelas.              | Few days.         |                                 |                                       | 114 | † 14 "               | 184 |                 |
| 44                             | Scar and axilla.                     | Immediately.      | 111                            | Metastases.              | 1 month.          | 77                              | † Carc. ventriculi.                   | 121 | † 9 "                | 185 |                 |
| 45                             | Scar, axilla, and neck.              | 12 months.        |                                |                          |                   |                                 |                                       | 126 | † 1 year.            |     |                 |
| 46                             | Scar.                                | 32 "              |                                |                          |                   |                                 |                                       | 135 | 9½ years.            |     |                 |
| 47                             | Axilla.                              | 3 "               |                                |                          |                   | 99                              | † Carc. ventriculi.                   | 136 | 9 yrs. 9 mos.        |     |                 |
| 48                             | Scar and axilla.                     | Immediately.      |                                |                          |                   |                                 |                                       | 137 | 7 " 2 "              |     |                 |
| 49                             | Axilla and skin.                     | (?)               |                                |                          |                   | 107                             | † "                                   | 138 | 6 " 9 "              |     |                 |
| 50                             | Recurrence.                          | (?)               |                                |                          |                   | 102                             | † Cachexia.                           | 139 | 6 " 7½ "             |     |                 |
| 51                             | Scar and axilla.                     | 4 months.         |                                |                          |                   | 113                             | † Carc. ven-                          | 140 | 5 " 9¾ "             |     |                 |
| 52                             | Scar and axilla.                     | 6 weeks.          |                                |                          |                   | 120                             | † triculi.                            | 141 | 5 " 7 "              |     |                 |
| 53                             | Scar.                                | 3½ months.        |                                |                          |                   |                                 |                                       | 142 | 5 " 6 "              |     |                 |
| 55                             | Supraclav. glands and skin.          | Few months.       |                                |                          |                   | 123                             | † Carc. pleuræ.                       | 143 | 5 " 5½ "             |     |                 |
| 56                             | Scar.                                | (?)               |                                |                          |                   | 128                             | † Carc. liver, and possibly stom-ach. | 144 | 5 " 15 days.         |     |                 |
| 57                             | Axilla and supraclav.                | 8 months.         |                                |                          |                   |                                 |                                       | 145 | 3 " 10 mos.          |     |                 |
| 58                             | Scar and axilla.                     | 6 "               |                                |                          |                   |                                 |                                       | 146 | 3 " 10 "             |     |                 |
| 60                             | Recurrence.                          |                   |                                |                          |                   |                                 |                                       | 147 | 3 " 8 "              |     |                 |
| 61                             | Scar and axilla.                     | 9 "               |                                |                          |                   |                                 |                                       | 148 | 3 " 10 "             |     |                 |
| 62                             | Recurrence.                          | 6 "               |                                |                          |                   |                                 |                                       | 150 | 3 " 10 "             |     |                 |
| 63                             | Scar.                                | 16 "              |                                |                          |                   |                                 |                                       | 151 | 3 " 30 (?) "         |     |                 |
| 64                             | Scar.                                | Immediately.      |                                |                          |                   |                                 |                                       | 152 | 3 " 2 "              |     |                 |
| 65                             | Skin.                                | 10 months.        |                                |                          |                   |                                 |                                       | 153 | 3 " 4 "              |     |                 |
| 66                             | Scar.                                | (?)               |                                |                          |                   |                                 |                                       | 154 | 3 " 3 "              |     |                 |
| 67                             | Recurrence.                          | (?)               |                                |                          |                   |                                 |                                       | 155 | 2 " 5 "              |     |                 |
| 69                             | Scar.                                | 4 weeks.          |                                |                          |                   |                                 |                                       | 156 | 2 " 1 month.         |     |                 |
| 70                             | Scar.                                | (?)               |                                |                          |                   |                                 |                                       | 157 | 2 " 1 "              |     |                 |
| 71                             | Inoperab. canc. <i>en cuirasse</i> . | 3 years.          |                                |                          |                   |                                 |                                       | 158 | 1 year 8 months.     |     |                 |

<sup>1</sup> Dr. Franz Fink, ein Beitrag zu den Erfahrungen über die operative Behandlung des Mammacarcinoms, 1878-86, Prager Zeitschrift für Heilkunde, 1888.

TABLE VI.—CLINIC OF GUSENBAUER. (Continued.)

| LOCAL RECURRENCE, 64 PER CENT. |                              | DIED SOON AFTER THE OPERATION. |     | NO NOTE AS TO LOCAL RECURRENCE. |                   | NO LOCAL RECURRENCE. |                   | RESULT UNKNOWN. |
|--------------------------------|------------------------------|--------------------------------|-----|---------------------------------|-------------------|----------------------|-------------------|-----------------|
| No.                            | Situation.                   | Time Post-Operat.              | No. | Cause of Death.                 | Time Post-Operat. | No.                  | Time Post-Operat. | No.             |
| 72                             | Scar.                        | 2 years.                       |     |                                 |                   | 159                  | 1 year 7 months.  |                 |
| 73                             | Scar.                        | 1½ years.                      |     |                                 |                   | 160                  | 1 " 6 "           |                 |
| 74                             | Scar.                        | 5 months.                      |     |                                 |                   | 161                  | 1 " 6 "           |                 |
| 76                             | Scar.                        | Few weeks.                     |     |                                 |                   | 162                  | 1 year.           |                 |
| 78                             | " Recurrence."               | ?                              |     |                                 |                   | 166                  | 4 yrs. 7 mos.     |                 |
| 79                             | Scar and axilla.             | 4 years.                       |     |                                 |                   | 167                  | 7 " 4½ mos.       |                 |
| 80                             | Scar and axilla.             | Immediately.                   |     |                                 |                   | 168                  | 3 " 11 "          |                 |
| 81                             | Scar.                        | Very soon.                     |     |                                 |                   | 169                  | 3 " 4½ "          |                 |
| 82                             | Scar.                        | 4 months.                      |     |                                 |                   | 170                  | 1 yr. 6 mos.      |                 |
| 83                             | Scar.                        | 10 months.                     |     |                                 |                   | 171                  | 2 yrs. 4 mos.     |                 |
| 84                             | Scar.                        | Immediately.                   |     |                                 |                   | 172                  | 1 yr. 1½ mos.     |                 |
| 85                             | Scar.                        | 11 months.                     |     |                                 |                   | 173                  | 1 yr. 1½ mos.     |                 |
| 86                             | Scar.                        | 3 years.                       |     |                                 |                   | 174                  | 2½ years.         |                 |
| 87                             | Middle of scar.              | 22 months.                     |     |                                 |                   | 175                  | 3 "               |                 |
| 88                             | Scar.                        | 3 months.                      |     |                                 |                   | 178                  | 9 "               |                 |
| 89                             | Scar.                        | 4 weeks.                       |     |                                 |                   |                      |                   |                 |
| 90                             | Scar.                        | 6 months.                      |     |                                 |                   |                      |                   |                 |
| 91                             | Scar, axilla, and supraclav. | 8 months.                      |     |                                 |                   |                      |                   |                 |
| 93                             | Scar.                        | Immediately.                   |     |                                 |                   |                      |                   |                 |
| 95                             | Scar.                        | Very soon.                     |     |                                 |                   |                      |                   |                 |
| 97                             | " Recurrence."               |                                |     |                                 |                   |                      |                   |                 |
| 100                            | Scar and axilla.             | Very soon.                     |     |                                 |                   |                      |                   |                 |
| 101                            | Scar.                        | Very soon.                     |     |                                 |                   |                      |                   |                 |
| 102                            | Scar and axilla.             | 3½ months.                     |     |                                 |                   |                      |                   |                 |
| 103                            | Scar.                        | 3 "                            |     |                                 |                   |                      |                   |                 |
| 104                            | Scar.                        | 12 "                           |     |                                 |                   |                      |                   |                 |
| 105                            | Scar.                        | 3 "                            |     |                                 |                   |                      |                   |                 |
| 106                            | " Recurrence."               | 11 "                           |     |                                 |                   |                      |                   |                 |
| 108                            | Scar.                        | Very soon.                     |     |                                 |                   |                      |                   |                 |
| 109                            | Scar.                        | Immediately.                   |     |                                 |                   |                      |                   |                 |
| 110                            | Scar.                        | Very soon.                     |     |                                 |                   |                      |                   |                 |
| 115                            | Scar and axilla.             | 15 months.                     |     |                                 |                   |                      |                   |                 |
| 116                            | Scar.                        | 3 weeks.                       |     |                                 |                   |                      |                   |                 |

TABLE VI.—CLINIC OF GUSSENBAUER. (Concluded.)

| LOCAL RECURRENCE, 64 PER CENT. |                                | DIED SOON AFTER THE OPERATION. |     | NO NOTE AS TO LOCAL RECURRENCE. |                   | NO LOCAL RECURRENCE. | RESULT UNKNOWN. |
|--------------------------------|--------------------------------|--------------------------------|-----|---------------------------------|-------------------|----------------------|-----------------|
| No.                            | Situation.                     | Time Post-Operat.              | No. | Cause of Death.                 | Time Post-Operat. | No.                  |                 |
| 117                            | Scar.                          | Very soon.                     |     |                                 |                   |                      |                 |
| 118                            | Scar.                          | " "                            |     |                                 |                   |                      |                 |
| 119                            | Scar and axilla.               | " "                            |     |                                 |                   |                      |                 |
| 122                            | Axilla.                        | " "                            |     |                                 |                   |                      |                 |
| 124                            | Scar and axilla.               | 4 weeks.                       |     |                                 |                   |                      |                 |
| 125                            | Scar.                          |                                |     |                                 |                   |                      |                 |
| 127                            | Scar and axilla.               | 6 weeks.                       |     |                                 |                   |                      |                 |
| 129                            | Scar.                          | 12 months.                     |     |                                 |                   |                      |                 |
| 130                            | Scar and axilla.               | Very soon.                     |     |                                 |                   |                      |                 |
| 131                            | Scar.                          | " "                            |     |                                 |                   |                      |                 |
| 132                            | Scar and axilla.               | " "                            |     |                                 |                   |                      |                 |
| 133                            | Scar and axilla.               | (?)                            |     |                                 |                   |                      |                 |
| 134                            | Scar, axilla, & supraclav. gl. | (?)                            |     |                                 |                   |                      |                 |
| 149                            | Scar.                          | 14 months.                     |     |                                 |                   |                      |                 |
| 163                            | Scar.                          | 4½ "                           |     |                                 |                   |                      |                 |
| 164                            | Scar.                          | 8 "                            |     |                                 |                   |                      |                 |
| 165                            | Supraclav.                     | 9 "                            |     |                                 |                   |                      |                 |
| 177                            | Scar and axilla.               | Immediately.                   |     |                                 |                   |                      |                 |
| 182                            | Scar.                          |                                |     |                                 |                   |                      |                 |

TABLE VII.—CLINIC OF KÖNIG,<sup>1</sup> 1875-85. 152 Cases.

| LOCAL RECURRENCE, 58-62 PER CENT. |                            |                    | DIED SOON AFTER THE OPERATION. |   |                   | NO LOCAL RECURRENCE. |                               | No. | RESULT UNKNOWN.                           |
|-----------------------------------|----------------------------|--------------------|--------------------------------|---|-------------------|----------------------|-------------------------------|-----|---|
| No.                               | Situation.                 | Time Post-Operat.  | No.                            | Cause of Death.                         | Time Post-Operat. | No.                  | Time Post-Operat.             |     |   |
| 1                                 | Skin.                      | 4 weeks.           | 5                              | Erysipelas.                             | 10 days.          | 3                    | 11 years.                     | 21  | Carc. vertebrae, died less than one year. |
| 2                                 | Skin and axilla.           | 3 months.          | 10                             | "Abdominal disease."                    | 51 "              | 4                    | 1½ "                          | 28  | General carcinosis.                       |
| 7                                 | Axilla.                    | 1½ years.          | 13                             | Apoplexy.                               | 50 "              | 6                    | 1¾ "                          | 35  | Result unknown.                           |
| 11                                | Axilla and skin.           | After 3 years.     | 15                             | Erysipelas.                             | 12 "              | 8                    | 13 months.                    | 58  | (?)                                       |
| 18                                | Axilla.                    | 3 years.           | 16                             | Septicæmia.                             | 8 "               | 9                    | 13 "                          | 64  | † 1 year.                                 |
| 22                                | Scar.                      | 2 "                | 19                             | (?)                                     | Few days.         | 12                   | 4 years.                      | 95  | † 18 months. (?)                          |
| 24                                | Scar, "cuirasse."          | 2 months.          | 20                             | Hæmorrhagic lung infarction.            | 2 days.           | 14                   | 6 "                           | 121 | (?)                                       |
| 25                                | Scar.                      | 1 year.            | 29                             | Septicæmia.                             | 9 "               | 17                   | 9 "                           | 122 | (?)                                       |
| 27                                | "Cuirasse."                | 3 months.          | 33                             | Pneumonia.                              | 16 "              | 23                   | 3 "                           | 130 | † 1 year.                                 |
| 30                                | Scar.                      | 3 or 4 months. (?) | 61                             | Erysipelas and pneumonia.               | 8 "               | 26                   | 6 "                           | 131 | † 6 months. Carc. liver.                  |
| 36                                | Scar.                      | 6 months or less.  | 69                             | Drowned.                                | 2 months.         | 31                   | 6 "                           | 134 | (?)                                       |
| 37                                | Scar.                      | 8 months.          | 74                             | Broncho-pneumonia.                      | 11 days.          | 40                   | 7 "                           | 138 | (?)                                       |
| 38                                | Axilla.                    | 16 "               | 98                             | Erysipelas.                             | 6 "               | 41                   | 6 "                           | 139 | † 1 year. Carc. liver.                    |
| 39                                | Axilla.                    | 1 month.           | 91                             | Pneumonia, cancer of lungs and bronchi. | 19 "              | 44                   | 6 "                           |     |   |
| 42                                | (?) Recurrence.            | 8 months.          |                                |   |                   | 45                   | 3 "                           |     |   |
| 43                                | Scar and above clav.       | 3 years.           |                                |   |                   | 46                   | 6 "                           |     |   |
| 47                                | Axilla.                    | 1 year.            |                                |   |                   | 49                   | 6 "                           |     |   |
| 48                                | "Recurrence."              | 6 months.          |                                |   |                   | 54                   | 6 "                           |     |   |
| 50                                | Axilla and scar.           | 11 "               |                                |   |                   | 62                   | † 17 months.                  |     |   |
| 51                                | Scar.                      | Never healed.      |                                |   |                   | 80                   | 4 years.                      |     |   |
| 52                                | "Local recurrence."        | 2 or 3 months.     |                                |   |                   | 83                   | 4 "                           |     |   |
| 53                                | Axilla.                    | 5 months.          |                                |   |                   | 84                   | 3 "                           |     |   |
| 55                                | Scar and axilla.           | Immediately.       |                                |   |                   | 86                   | 4 "                           |     |   |
| 56                                | Scar.                      | 2 months.          |                                |   |                   | 87                   | 4 "                           |     |   |
| 57                                | Above scar.                | Immediately.       |                                |   |                   | 90                   | 3 "                           |     |   |
| 58                                | Axilla and above clavicle. | † 2 years or less. |                                |   |                   | 97                   | 1 year.                       |     |   |
| 60                                | Scar. (?)                  | Immediately.       |                                |   |                   | 105                  | 2¾ year.                      |     |   |
| 63                                | "Recurrence."              | † 1 year.          |                                |   |                   | 108                  | † 1½ years. Cancer of kidney. |     |   |
| 65                                | Scar.                      | † 1 "              |                                |   |                   | 110                  | 2 years.                      |     |   |
| 66                                | Scar.                      | 4 months.          |                                |   |                   | 113                  | 3 "                           |     |   |
| 67                                | "Recurrence."              | 6 "                |                                |   |                   |                      |                               |     |   |

<sup>1</sup> Hildebrand. Beitrag zur Statistik des Mammacarcinoms der Frau, Deutsche Zeitschrift für Chirurgie, Bd. xxv, 1887.

TABLE VII.—CLINIC OF KÖNIG. (Continued.)

| LOCAL RECURRENCE, 58-62 PFR CENT. |                           | DIED SOON AFTER THE OPERATION. |     | NO LOCAL RECURRENCE. |                   | No. | RESULT UNKNOWN.     |
|-----------------------------------|---------------------------|--------------------------------|-----|----------------------|-------------------|-----|---------------------|
| No.                               | Situation.                | Time Post-Operat.              | No. | Cause of Death.      | Time Post-Operat. |     |                     |
| 68                                | "Recurrence," sternum     | (?) years.                     |     |                      |                   | 114 | 2 years.            |
| 70                                | pect muscle.              | † 3½ months.                   |     |                      |                   | 116 | † Less than 1 year. |
| 71                                | Scar never healed.        | 13 months.                     |     |                      |                   | 117 | 2 years.            |
| 72                                | Scar and axilla.          | † 8 "                          |     |                      |                   | 118 | 2 "                 |
| 73                                | Scar and skin. (?)        | Immediately.                   |     |                      |                   | 1   | 2 "                 |
| 75                                | Skin and axilla.          |                                |     |                      |                   | 123 | 6 months.           |
| 77                                | Scar.                     | 1 year.                        |     |                      |                   | 124 | † 1 year.           |
| 78                                | "Recurrence."             | † 6 months.                    |     |                      |                   | 128 | 1½ years.           |
| 81                                | Scar and axilla.          | 6 "                            |     |                      |                   | 129 | 1 year.             |
| 82                                | Scar (?) and axilla.      | 14 "                           |     |                      |                   | 135 | † 2 years.          |
| 85                                | "Recurrence."             | 6 "                            |     |                      |                   | 137 | 3 years.            |
| 89                                | Scar and axilla.          | 6 "                            |     |                      |                   | 145 | 3 "                 |
| 92                                | Axilla.                   | 10 "                           |     |                      |                   | 146 | 3 "                 |
| 96                                | Scar.                     | 6 "                            |     |                      |                   | 150 | 2 "                 |
| 98                                | Skin.                     | 6 "                            |     |                      |                   | 151 | 6 months.           |
| 99                                | Scar.                     | 8 "                            |     |                      |                   | 152 | 6 "                 |
| 100                               | Scar.                     | 6 "                            |     |                      |                   | 34  | † 1 year.           |
| 101                               | Scar.                     | 10 "                           |     |                      |                   | 32  | † 6 months.         |
| 103                               | Scar and skin.            | 2 years.                       |     |                      |                   | 28  | † 6 "               |
| 106                               | Scar and axilla.          | 2 years 7 months.              |     |                      |                   | 79  | † 6 "               |
| 107                               | Scar.                     | † 11 months.                   |     |                      |                   | 102 | † 6 "               |
| 109                               | Scar.                     | † 13 "                         |     |                      |                   | 111 | † 5 "               |
| 112                               | "Recurrence."             | 2                              |     |                      |                   |     |                     |
| 115                               | Scar.                     | Less than 3 months.            |     |                      |                   |     |                     |
| 120                               | Skin below and near scar. | † 6 months.                    |     |                      |                   |     |                     |
|                                   |                           | 6 "                            |     |                      |                   |     |                     |
|                                   |                           | † 1 year.                      |     |                      |                   |     |                     |
|                                   |                           | 2 months.                      |     |                      |                   |     |                     |
|                                   |                           | 5 "                            |     |                      |                   |     |                     |
|                                   |                           | 9 "                            |     |                      |                   |     |                     |

TABLE VII.—CLINIC OF KÖNIG. (Concluded.)

| LOCAL RECURRENCE, 58-62 PER CENT. |  | DIED SOON AFTER THE OPERATION. |     |                 | NO LOCAL RECURRENCE. |     | No. | RESULT UNKNOWN. |
|-----------------------------------|--|--------------------------------|-----|-----------------|----------------------|-----|-----|-----------------|
| No.                               | Situation.                                 | Time Post-Operat.              | No. | Cause of Death. | Time Post-Operat.    | No. |     |                 |
| 125                               | Recurrence scar and above clavicle.        |                                |     |                 |                      |     |     |                 |
| 126                               | Scar.                                      | 6 months.                      |     |                 |                      |     |     |                 |
| 127                               | Scar.                                      | Few weeks.                     |     |                 |                      |     |     |                 |
| 132                               | Pect. major near axilla.                   | 5 months.                      |     |                 |                      |     |     |                 |
| 133                               | Scar. (?)                                  | 1 year.                        |     |                 |                      |     |     |                 |
|                                   | Operated four times, still alive.          | 4 years.                       |     |                 |                      |     |     |                 |
| 136                               | Scar and axilla.                           | 9 months.                      |     |                 |                      |     |     |                 |
| 140                               | Scar (?) and axilla.                       | † 2 years with recurrence.     |     |                 |                      |     |     |                 |
| 141                               | Scar.                                      | 1 year. (?)                    |     |                 |                      |     |     |                 |
| 142                               | Scar.                                      | 6 months.                      |     |                 |                      |     |     |                 |
| 143                               | Scar.                                      |                                |     |                 |                      |     |     |                 |
| 144                               | Scar.                                      | Immediately. (?)               |     |                 |                      |     |     |                 |
| 147                               | Scar.                                      | 1 year.                        |     |                 |                      |     |     |                 |
|                                   | Second operation, alive three years after. |                                |     |                 |                      |     |     |                 |
| 148                               | Scar (?) and skin.                         | 3 months.                      |     |                 |                      |     |     |                 |
| 149                               | Scar.                                      | 1 year.                        |     |                 |                      |     |     |                 |

TABLE VIII.—CLINIC OF KÜSTER.<sup>1</sup> From May, 1871, to December, 1885. 228 Cases.

| LOCAL RECURRENCE, 59 PER CENT. |  |                        | DIED SOON AFTER THE OPERATION. |                              |                          | NO LOCAL RECURRENCE. |                   |     | NO NOTE AS TO LOCAL RECURRENCE.            |                   |     | No.                  | RESULT UNKNOWN. |
|--------------------------------|--|------------------------|--------------------------------|------------------------------|--------------------------|----------------------|-------------------|-----|--|-------------------|-----|----------------------|-----------------|
| No.                            | Situation.                                 | Time Post-Operat.      | No.                            | Cause of Death.              | Time Post-Operat.        | No.                  | Time Post-Operat. | No. | Cause of Death.                            | Time Post-Operat. | No. |                      |                 |
| 1                              | (1) Scar.                                  | 8 months.              | 2                              | Erysipelas.                  | 13 days.                 | 18                   | 15 years.         | 37  | † Carc. of pleura and stomach.             | 2 yrs. 5 mos.     | 57  | Probably recurrence. |                 |
| 2                              | (2) Axilla scar.                           | 14 "                   | 10                             | Erysipelas.                  | 18 "                     | 34                   | 8 "               | 38  | † Carc. of pleura.                         | 3 months.         | 65  |                      |                 |
| 3                              | Axilla.                                    | Soon after healing.    | 11                             | Erysipelas.                  | 9 "                      | 40                   | 3 "               | 39  | † Erysipelas.                              | 5 "               | 70  |                      |                 |
| 4                              | Scar.                                      | Immediately.           | 25                             | Pyæmia.                      | 12 "                     | 42                   | 3 "               | 41  | † "Recurrence" (pleura?)                   | 2 1/4 years.      | 78  |                      |                 |
| 5                              | (1) Scar.                                  | "                      | 28                             | Erysipelas.                  | 19 "                     | 43                   | 4 "               | 67  | † "Recurrence" (pleura?)                   | 2 1/4 "           | 83  |                      |                 |
| 6                              | (3) Breast and axilla.                     | 8 months.              | 31                             | Profuse diarrhoea.           | 5 "                      | 50                   | 4 "               | 69  | † "Recurrence" (carc. vertebral column).   | 2 1/4 "           | 92  |                      |                 |
| 7                              | (4) Near scar, axilla.                     | 11 "                   | 35                             | Erysipelas.                  | 10 "                     | 51                   | 7 "               | 107 | † "Recurrence" (vertebral column & liver). | (?) 13 mos.       | 106 |                      |                 |
| 8                              | "Local Recurrence."                        | 13 "                   | 47                             | Collapse.                    | 2 "                      | 55                   | † 3 "             | 131 | † "Recurrence" (vertebral column & liver). | 3 1/2 years.      | 168 |                      |                 |
| 9                              | "Local Recurrence."                        | Very soon.             | 53                             | Pleuritis carcinomatosa.     | 3 "                      | 56                   | 7 "               | 84  | † "Recurrence" lung cancer.                | 10 months.        | 169 |                      |                 |
| 10                             | "Local Recurrence."                        | Very soon.             | 59                             | Septicæmia.                  | 6 "                      | 58                   | 6 "               | 96  | † "Recurrence."                            | 1 year.           | 172 |                      |                 |
| 11                             | "Local Recurrence."                        | Immediately.           | 91                             | Collapse.                    | 3 "                      | 77                   | 6 "               | 95  | † Carc. of pleura.                         | † 5 years.        | 177 |                      |                 |
| 12                             | "Local Recurrence," pectoralis major, etc. | Very soon.             | 100                            | Erysipelas.                  | 16 "                     | 80                   | 4 months.         | 102 | † Probably metastases.                     | 1 year.           | 179 |                      |                 |
| 13                             | Under scar.                                | (?)                    | 104                            | Erysipelas.                  | 2 "                      | 80                   | 4 months.         | 95  | † Cause unknown.                           | 1 year.           | 180 |                      |                 |
| 14                             | Scar.                                      | 8 months.              | 108                            | Attack of dyspnoea.          | 2 "                      | 109                  | 3 "               | 116 | † Carc. of pleura.                         | 1 1/2 years.      |     |                      |                 |
| 15                             | "Local Recurrence."                        | 2 years.               | 122                            | Pleuritis.                   | 44 "                     | 112                  | 3 "               | 144 | † Carc. of abdomen.                        | 10 months.        |     |                      |                 |
| 16                             | "Local Recurrence."                        | 4 months.              | 125                            | Erysipelas.                  | 10 "                     | 118                  | 3 "               | 146 | † Carc. of abdomen.                        | 9 months.         |     |                      |                 |
| 17                             | "Local Recurrence."                        | Immediately.           | 128                            | Edema of lungs.              | 11 "                     | 119                  | 3 "               | 151 | † General carc.                            | 1 year.           |     |                      |                 |
| 18                             | (1) Scar.                                  | 3 months.              | 139                            | Sepsis.                      | 6 "                      | 126                  | 3 "               | 154 | † Metastases.                              | 1 yr. 2 mos.      |     |                      |                 |
| 19                             | (2) Axilla.                                | 6 "                    | 140                            | Sepsis.                      | Immediately.             | 182                  | 2 1/2 "           | 156 | † Carc. of pleura.                         | 3 months.         |     |                      |                 |
| 20                             | "Local Recurrence."                        | 7 "                    | 141                            | Sepsis.                      | 10 days.                 | 183                  | 3 "               | 157 | † Unknown Cause.                           | 1 year.           |     |                      |                 |
| 21                             | "Local Recurrence."                        | Very soon after opera. | 142                            | Sepsis.                      | 7 days.                  | 184                  | 2 "               |     |  |                   |     |                      |                 |
| 22                             | "Local Recurrence."                        | 4 months.              | 143                            | Pneumonia and nephritis.     | Very soon.               | 185                  | 2 "               |     |  |                   |     |                      |                 |
| 23                             | "Local Recurrence."                        | 1 year.                | 147                            | Carc. liver.                 | 6 weeks after discharge. | 186                  | 2 "               |     |  |                   |     |                      |                 |
| 24                             | Axilla and near scar.                      | 4 months.              | 127                            | Carc. liver.                 | 6 weeks after discharge. | 187                  | 2 "               |     |  |                   |     |                      |                 |
| 25                             | "Local Recurrence."                        | 4 1/4 years.           | 93                             | "Local Recurrence," 5 times. |                          | 188                  | 2 1/3 "           |     |  |                   |     |                      |                 |
| 26                             | "Local Recurrence."                        | 4 1/4 years.           |                                |                              |                          | 189                  | 2 1/2 "           |     |  |                   |     |                      |                 |
| 27                             | "Local Recurrence."                        | Very soon.             |                                |                              |                          | 190                  | 2 "               |     |  |                   |     |                      |                 |
| 28                             | "Local Recurrence."                        | Very soon.             |                                |                              |                          | 191                  | 9 months.         |     |  |                   |     |                      |                 |
| 29                             | "Local Recurrence."                        | Very soon.             |                                |                              |                          | 191                  | 9 months.         |     |  |                   |     |                      |                 |

<sup>1</sup> (1) Zur Statistik der Mammacarcinome und deren Heilung, V. Schmidt, Deutsche Zeitschrift für Chirurgie, Bd. xxvi, 1887. (2) Fünf Jahre im Augustahospital, Berlin, 1887. (3) Ein chirurgisches Triennium, Berlin, 1882. (4) Zur Behandlung des Brustkrebses, Verhandlung der deutschen Gesellschaft für Chirurgie, 1883.



TABLE VIII.—CLINIC OF KÜSTER. (Continued.)

| LOCAL RECURRENCE, 59 PER CENT. |                                       |                   | DIED SOON AFTER THE OPERATION. |                 |                   | NO LOCAL RECURRENCE. |                   |  | NO NOTE AS TO LOCAL RECURRENCE. |                              |                   | RESULT UNKNOWN. |
|--------------------------------|---------------------------------------|-------------------|--------------------------------|-----------------|-------------------|----------------------|-------------------|--|---------------------------------|------------------------------|-------------------|-----------------|
| No.                            | Situation.                            | Time Post-Operat. | No.                            | Cause of Death. | Time Post-Operat. | No.                  | Time Post-Operat. |  | No.                             | Cause of Death.              | Time Post-Operat. |                 |
| 30                             | "Local Recurrence."                   | 5 months.         |                                |                 |                   | 192                  | 1 yr. 10 mos.     |  | 161                             |                              |                   |                 |
| 32                             | "Local Recurrence."                   | 10 "              |                                |                 |                   | 193                  | " "               |  |                                 |                              |                   |                 |
| 33                             | "Local Recurrence."                   | Soon.             |                                |                 |                   | 194                  | " "               |  | 166                             | † Carc. of pelvis.           |                   |                 |
| 36                             | "Recurrence."                         | 3 yrs. 10 mos.    |                                |                 |                   | 195                  | 2 yrs. 3 mos.     |  | 162                             | † Carc. of pleura and lungs. |                   |                 |
| 45                             | (1) Scar.                             | 1 year.           |                                |                 |                   | 196                  | 1 2/3 years.      |  |                                 |                              |                   |                 |
|                                | (2) Scar.                             | 2 years.          |                                |                 |                   | 197                  | 1 yr. 7 mos.      |  |                                 |                              |                   |                 |
|                                | (3) Supraclav. glands and scar.       | 4 "               |                                |                 |                   | 198                  | 1 yr. 8 mos.      |  |                                 |                              |                   |                 |
| 48                             | "Recurrence."                         | † 14 months.      |                                |                 |                   | 199                  | 9 months.         |  |                                 |                              |                   |                 |
| 49                             | Skin and axilla.                      | 2 months.         |                                |                 |                   | 200                  | 1 yr. 7 mos.      |  |                                 |                              |                   |                 |
| 52                             | Axilla.                               | 1 1/2 years.      |                                |                 |                   | 201                  | 1 yr. 7 mos.      |  |                                 |                              |                   |                 |
| 54                             | "Recurrence."                         | 1 yr. 10 mos.     |                                |                 |                   | 202                  | 2 yrs. 1 mo.      |  |                                 |                              |                   |                 |
| 60                             | "Recurrence."                         | † 14 months.      |                                |                 |                   | 203                  | 1 yr. 4 mos.      |  |                                 |                              |                   |                 |
| 61                             | "Recurrence."                         | † 3 "             |                                |                 |                   | 204                  | 1 yr. 4 mos.      |  |                                 |                              |                   |                 |
| 63                             | "Local recurrence."                   | † 1 yr. † 2 yrs.  |                                |                 |                   | 206                  | 1 year.           |  |                                 |                              |                   |                 |
| 64                             | (1) Scar.                             | 8 months.         |                                |                 |                   | 207                  | 1 year.           |  |                                 |                              |                   |                 |
|                                | (2) Scar.                             | 11 "              |                                |                 |                   | 208                  | 11 months.        |  |                                 |                              |                   |                 |
| 66                             | "Local recurrence."                   | † 6 1/2 months.   |                                |                 |                   | 209                  | 5 years.          |  |                                 |                              |                   |                 |
| 68                             | Scar, axilla, and supra-clav. glands. | Immediately.      |                                |                 |                   | 210                  | 1 yr. 4 mos.      |  |                                 |                              |                   |                 |
|                                | "Local recurrence."                   | † 3 years.        |                                |                 |                   | 211                  | 10 months.        |  |                                 |                              |                   |                 |
| 71                             | Scar.                                 | 1 year.           |                                |                 |                   | 212                  | 13 "              |  |                                 |                              |                   |                 |
| 73                             | "Local recurrence."                   | 2 years.          |                                |                 |                   | 213                  | 7 "               |  |                                 |                              |                   |                 |
| 74                             | Cancer <i>en cuirasse</i> .           | † 1 yr. 4 mos.    |                                |                 |                   | 214                  | 5 "               |  |                                 |                              |                   |                 |
| 75                             | "Local recurrence."                   | 3 months.         |                                |                 |                   | 216                  | 5 "               |  |                                 |                              |                   |                 |
| 76                             | Near scar.                            | 1 year.           |                                |                 |                   | 217                  | 5 "               |  |                                 |                              |                   |                 |
| 79                             | Near scar.                            | Very soon.        |                                |                 |                   | 218                  | 4 "               |  |                                 |                              |                   |                 |
| 81                             | Near scar.                            | 1 yr. 7 mos.      |                                |                 |                   | 219                  | 8 "               |  |                                 |                              |                   |                 |
| 82                             | Scar.                                 | 5 months.         |                                |                 |                   | 220                  | 8 "               |  |                                 |                              |                   |                 |
| 85                             | (1) Local recurrence.                 | 18 days.          |                                |                 |                   | 221                  | 7 "               |  |                                 |                              |                   |                 |
|                                | (2) Scar and wall of thorax.          | 3 months.         |                                |                 |                   | 222                  | 7 "               |  |                                 |                              |                   |                 |
| 86                             | Near scar.                            |                   |                                |                 |                   | 223                  | 7 "               |  |                                 |                              |                   |                 |
| 87                             | Supraclav. glands.                    |                   |                                |                 |                   | 224                  | 7 "               |  |                                 |                              |                   |                 |
|                                |                                       |                   |                                |                 |                   | 225                  | 7 "               |  |                                 |                              |                   |                 |
|                                |                                       |                   |                                |                 |                   | 226                  | 5 "               |  |                                 |                              |                   |                 |

TABLE VIII.—CLINIC OF KÜSTER. (Continued.)

| LOCAL RECURRENCE, 59 PER CENT |                       | DIED SOON AFTER THE OPERATION. |     | NO LOCAL RECURRENCE. |                   | NO NOTE AS TO LOCAL RECURRENCE. |                 | No.               | RESULT UNKNOWN. |
|-------------------------------|-----------------------|--------------------------------|-----|----------------------|-------------------|---------------------------------|-----------------|-------------------|-----------------|
| No.                           | Situation.            | Time Post-Operat.              | No. | Cause of Death.      | Time Post-Operat. | No.                             | Cause of Death. | Time Post-Operat. |                 |
| 88                            | " Local recurrence."  | 1 yr. 10 mos.                  |     |                      |                   |                                 |                 |                   |                 |
| 89                            | Neck and scar.        | 2 months.                      |     |                      |                   |                                 |                 |                   |                 |
| 90                            | Scar and axilla.      | 7 "                            |     |                      |                   |                                 |                 |                   |                 |
| 99                            | " Recurrence."        | † 2 years.                     |     |                      |                   |                                 |                 |                   |                 |
| 105                           | " Recurrence."        | 1 year.                        |     |                      |                   |                                 |                 |                   |                 |
| 110                           | Supraclav. glands.    | 7 months.                      |     |                      |                   |                                 |                 |                   |                 |
| 111                           | Skin of breast.       | 3 "                            |     |                      |                   |                                 |                 |                   |                 |
| 113                           | " Local recurrence."  | 3 "                            |     |                      |                   |                                 |                 |                   |                 |
| 114                           | " Local recurrence."  | 6 "                            |     |                      |                   |                                 |                 |                   |                 |
| 117                           | Scar.                 | 4 "                            |     |                      |                   |                                 |                 |                   |                 |
| 120                           | Recurrence near scar. | 4 "                            |     |                      |                   |                                 |                 |                   |                 |
| 121                           | Axilla.               | 4 "                            |     |                      |                   |                                 |                 |                   |                 |
| 130                           | Scar.                 | 8 "                            |     |                      |                   |                                 |                 |                   |                 |
| 123                           | " Recurrence."        | Very soon.                     |     |                      |                   |                                 |                 |                   |                 |
| 124                           | " Recurrence."        | 13½ years.                     |     |                      |                   |                                 |                 |                   |                 |
| 129                           | " Recurrence."        | 6 months.                      |     |                      |                   |                                 |                 |                   |                 |
| 46                            | " Recurrence."        | † 1 year.                      |     |                      |                   |                                 |                 |                   |                 |
| 94                            | " Recurrence."        | † 4 years.                     |     |                      |                   |                                 |                 |                   |                 |
| 103                           | " Recurrence."        | † 1 year.                      |     |                      |                   |                                 |                 |                   |                 |
| 132                           | " Recurrence," twice. | 2¾ years.                      |     |                      |                   |                                 |                 |                   |                 |
| 145                           | " Recurrence."        | † 1 year.                      |     |                      |                   |                                 |                 |                   |                 |
| 147                           | " Recurrence."        | 6 months.                      |     |                      |                   |                                 |                 |                   |                 |
| 148                           | " Local recurrence."  | 3 "                            |     |                      |                   |                                 |                 |                   |                 |
|                               | several times.        | (?)                            |     |                      |                   |                                 |                 |                   |                 |
| 149                           | " Local recurrence."  | Few months.                    |     |                      |                   |                                 |                 |                   |                 |
| 152                           | " Recurrence."        | † 2 years.                     |     |                      |                   |                                 |                 |                   |                 |
| 153                           | " Recurrence." (?)    | 1 year.                        |     |                      |                   |                                 |                 |                   |                 |
| 155                           | Supraclav. glands.    | 5 months.                      |     |                      |                   |                                 |                 |                   |                 |
| 158                           | " Recurrence."        | Less than 6 months.            |     |                      |                   |                                 |                 |                   |                 |
| 159                           | " Recurrence."        | † Less than 2 months.          |     |                      |                   |                                 |                 |                   |                 |

TABLE VIII.—CLINIC OF KÜSTER. (Concluded.)

| LOCAL RECURRENCE, 59 PER CENT. |   | DIED SOON AFTER THE OPERATION. |     | NO LOCAL RECURRENCE. |                   | NO NOTE AS TO LOCAL RECURRENCE. |                   | No. | RESULT UNKNOWN.   |
|--------------------------------|---|--------------------------------|-----|----------------------|-------------------|---------------------------------|-------------------|-----|-------------------|
| No.                            | Situation.                              | Time Post-Operat.              | No. | Cause of Death.      | Time Post-Operat. | No.                             | Time Post-Operat. | No. | Time Post-Operat. |
| 160                            | "Recurrence" 3 times.                   | † 5 months.                    |     |                      |                   |                                 |                   |     |                   |
| 115                            | Supraclav. glands.                      | 2½ years.                      |     |                      |                   |                                 |                   |     |                   |
| 163                            | Pectoralis major.                       | 2 years.                       |     |                      |                   |                                 |                   |     |                   |
| 164                            | "Recurrence."                           | 3 times in 1 year.             |     |                      |                   |                                 |                   |     |                   |
| 166                            | "Local recurrence."                     |                                |     |                      |                   |                                 |                   |     |                   |
| 167                            | Pectoralis major.                       | 1 year.                        |     |                      |                   |                                 |                   |     |                   |
| 170                            | Pectoralis major and supraclav. glands. |                                |     |                      |                   |                                 |                   |     |                   |
| 171                            | "Local recurrence."                     | (?)                            |     |                      |                   |                                 |                   |     |                   |
| 173                            | Skin.                                   | 2 months.                      |     |                      |                   |                                 |                   |     |                   |
| 174                            | "Local recurrence."                     | 1 year.                        |     |                      |                   |                                 |                   |     |                   |
| 175                            | "Local recurrence."                     | 1 "                            |     |                      |                   |                                 |                   |     |                   |
| 176                            | Scar.                                   | 6 months.                      |     |                      |                   |                                 |                   |     |                   |
| 178                            | Pectoralis major.                       | 7 "                            |     |                      |                   |                                 |                   |     |                   |
| 181                            | Scar and pectoralis major.              | 2 "                            |     |                      |                   |                                 |                   |     |                   |
| 205                            | "Recurrence."                           | 1 year.                        |     |                      |                   |                                 |                   |     |                   |
| 215                            | Scar.                                   | 10 months.                     |     |                      |                   |                                 |                   |     |                   |

TABLE IX.—CLINIC OF LÜCKE,<sup>1</sup> 1881-90. 110 Cases.

| LOCAL RECURRENCE, 66 PER CENT. |   |                                 |
|--------------------------------|---|---------------------------------|
| No.                            | Situation.                                      | Time Post-Operat.               |
| 5                              | "Local recurrence."                             | 2 months. Patient lives.        |
| 11                             | Pect. major.                                    | 6 months. Patient lives.        |
| 13                             | Scar.   | 1 year.                         |
|                                | (2) Recurrence.                                 | 2 months. Patient lives.        |
| 24                             | "Local recurrence."                             | Died 3 months after operation.  |
| 26                             | Scar, vertebræ, leg.                            | 2 months.                       |
| 27                             | "Local recurrence."                             | months. (?)                     |
| 28                             | "Local recurrence."                             | Very soon after operation.      |
| 31                             | Scar.   | 6 months.                       |
|                                | (2) "Local recurrence."                         |                                 |
| 32                             | Scar.   | Few months.                     |
| 34                             | Scar.   | 17 months.                      |
| 35                             | "Local recurrence."                             | Died 4 years after operation. * |
| 36                             | "Recurrence."                                   | 1½ years.                       |
| 39                             | "Local recurrence."                             | Very soon.                      |
|                                | (2) "Local recurrence."                         | Very soon.                      |
| 40                             | Scar.   | 1 month.                        |
| 42                             | Skin. *   | 6 days before dismissed.        |
| 44                             | "Local recurrence."                             | 7 months.                       |
| 47                             | Axilla.   | Few months.                     |
| 49                             | "Local recurrence."                             | Immediately.                    |
| 50                             | Skin.   | Very soon.                      |
| 51                             | "Local recurrence."                             | Died 13 months.                 |
| 53                             | Axilla.   | 2 months.                       |
|                                | Second recurrence.                              | † 1 year.                       |
| 54                             | Scar  | 1 year.                         |
| 55                             | "Local recurrence."                             | 1 year.                         |
| 56                             | "Local recurrence."                             | † 3½ years.                     |
| 58                             | "Local recurrence."                             | † 7 months.                     |
| 59                             | Ulceration in scar.                             | † 2 years after operation.      |
| 61                             | Scar.   | 1 month.                        |
| 62                             | Scar.   | 24 days.                        |
| 63                             | "Local recurrence."                             | 6 months and 9 months.          |
| 64                             | "Local recurrence."                             | months. (?)                     |
| 65                             | "Local recurrence."                             | Very soon.                      |
| 66                             | "Local recurrence."                             | Very soon.                      |
| 67                             | (1) "Local recurrence."                         | 4 months.                       |
|                                | (2) "Local recurrence."                         | Very soon.                      |
| 68                             | "Local recurrence."                             | 1 year.                         |
| 70                             | "Local recurrence."                             | † 3½ years.                     |
| 71                             | "Local recurrence."                             | † 9 months.                     |
| 73                             | "Local recurrence," axilla, sup. and infraclav. | 39 days.                        |
| 74                             | "Local recurrence."                             | † 7 months.                     |
| 75                             | "Local recurrence."                             | 6 months.                       |
|                                | (3) Local recurrences.                          | †                               |
| 76                             | "Local recurrence."                             | † 11 months.                    |
| 77                             | "Local recurrence."                             | † 13 months.                    |
| 78                             | "Local recurrence."                             | 3 months or less.               |
|                                | (3) Local recurrences.                          |                                 |
| 79                             | "Local recurrence."                             | † 9 months.                     |
| 80                             | "Local recurrence."                             | † 7 months.                     |
| 81                             | "Local recurrence."                             | † 13 months.                    |
| 82                             | Scar.   | 4 months.                       |
| 84                             | Axilla.   | 6 weeks.                        |
| 87                             | Axilla.   | 22 days.                        |
| 88                             | "Local recurrence."                             | † 10 months.                    |

<sup>1</sup> Dietrich. Beitrag zur Statistik des Mammacarcinoms, Deutsche Zeitschrift für Chirurgie, Bd. xxxiv, 1892.

TABLE IX.—LÜCKE. (Concluded.)

| DIED SOON AFTER THE OPERATION. |  |                          | NO NOTE AS TO LOCAL RECURRENCE. |                   |                             | NO LOCAL RECURRENCE. |                   |
|--------------------------------|--|--------------------------|---------------------------------|-------------------|-----------------------------|----------------------|-------------------|
| No.                            | Cause of Death.  | Time Post-Operat.        | No.                             | Cause of Death.   | Time Post-Operat.           | No.                  | Time Post-Operat. |
| 25                             | Pneumonia.   | 16 days after operation. | 41                              |                   | † 7 months after operation. | 1                    | 10½ years.        |
| 29                             | Erysipelas.  | 14 days after operation. | 69                              | Phthisis.         | † 1¾ years.                 | 2                    | 7¾ “              |
| 30                             | Erysipelas.  | 16 days after operation. | 72                              | Metastases.       | † 15 months.                | 3                    | 7 “               |
| 33                             | Erysipelas.  | 16 days after operation. | 83                              | (?)               | † 1½ years.                 | 4                    | 6¾ “              |
| 37                             | Brain metastases.  | 39 days after operation. | 85                              | Old age.          | † (?)                       | 6                    | 4¾ “              |
| 46                             | Erysipelas.  | 14 days.                 | 89                              | Liver metastases. | † Less than 6 months.       | 7                    | 4¾ “              |
| 48                             | Lung embolism.   | 15 days.                 |                                 |                   |                             | 8                    | 4¾ “              |
| 60                             | (?)  | Soon after operation.    |                                 |                   |                             | 9                    | 4¼ “              |
| 86                             | Edema of lungs, cancer of lungs, liver, spleen, omentum. | 10 days.                 |                                 |                   |                             | 10                   | 3¼ “              |
|                                |  |                          |                                 |                   |                             | 12                   | 2 yrs. 10 mos.    |
|                                |  |                          |                                 |                   |                             | 14                   | 3¼ years.         |
|                                |  |                          |                                 |                   |                             | 15                   | 1¾ “              |
|                                |  |                          |                                 |                   |                             | 16                   | 1½ “              |
|                                |  |                          |                                 |                   |                             | 17                   | 13 months.        |
|                                |  |                          |                                 |                   |                             | 18                   | 1¼ years.         |
|                                |  |                          |                                 |                   |                             | 19                   | 1 year.           |
|                                |  |                          |                                 |                   |                             | 20                   | 1 “               |
|                                |  |                          |                                 |                   |                             | 21                   | 1 “               |
|                                |  |                          |                                 |                   |                             | 22                   | 1 “               |
|                                |  |                          |                                 |                   |                             | 23                   | 10 months.        |
|                                |  |                          |                                 |                   |                             | 38                   | † 4¾ years.       |
|                                |  |                          |                                 |                   |                             | 43                   | † 1 year.         |
|                                |  |                          |                                 |                   |                             | 45                   | † 2 yrs. 4 mos.   |
|                                |  |                          |                                 |                   |                             | 52                   | † 4 years.        |
|                                |  |                          |                                 |                   |                             | 57                   | † 4 “             |

TABLE X.—CLINIC OF VOLKMANN.<sup>1</sup> 1874-78. 131 Cases.

| LOCAL RECURRENCE, 59 PER CENT. |                                       |                            |
|--------------------------------|---------------------------------------|----------------------------|
| No.                            | Situation.                            | Time Post-Operat.          |
| 1                              | Pectoralis major.                     | Two years.                 |
| 2                              | Scar.                                 | Less than two years.       |
| 3                              | Scar.                                 | Less than two years.       |
| 4                              | Scar.                                 | Less than six months.      |
| 7                              | Scar.                                 | Three months.              |
| 9                              | Scar and axilla.                      | Less than six months.      |
| 10                             | Scar.                                 | Eleven months.             |
| 12                             | Near scar.                            | Two months.                |
| 13                             | Scar and axilla.                      | One year.                  |
| 15                             | "Local recurrence."                   | Before healing.            |
| 16                             | Above scar.                           | Two months.                |
| 17                             | Near scar.                            | Ten "                      |
| 18                             | Close to scar.                        | Eight "                    |
| 19                             | "Local recurrence."                   | Five "                     |
| 21                             | Above scar.                           | Less than two years.       |
| 23                             | "Local recurrence."                   | Very soon.                 |
| 25                             | "Recurrence," under pectoralis major. | One month.                 |
| 27                             | Scar.                                 | Very soon.                 |
| 29                             | "Recurrence" near scar.               | Four months.               |
| 32                             | Scar.                                 | Very soon.                 |
| 34                             | Scar.                                 | Five months.               |
| 36                             | Axilla.                               | Five "                     |
| 42                             | Scar.                                 | Five "                     |
| 43                             | "Local recurrence."                   | Very soon.                 |
| 47                             | Pectoralis major.                     | One year.                  |
| 48                             | "Local recurrence."                   | Eight months.              |
| 49                             | "Local recurrence."                   | One year ten months.       |
| 51                             | "Local recurrence."                   | One and a half years.      |
| 52                             | "Local recurrence."                   | Several times.             |
| 57                             | Scar.                                 | Ten weeks.                 |
| 59                             | "Local recurrence."                   | † One and a half years.    |
| 61                             | "Local recurrence."                   | One year.                  |
| 65                             | Near scar.                            | Few weeks.                 |
| 67                             | "Local recurrence."                   | Two years.                 |
| 73                             | "Local recurrence."                   | Very soon after discharge. |
| 74                             | Scar.                                 | One month.                 |
| 79                             | Ribs and sternum.                     |                            |
| 80                             | Near scar. (?)                        | One month.                 |
| 83                             | Axilla. (?)                           | (?)                        |
| 86                             | (?)                                   | About one year.            |
| 87                             | "Recurrence."                         | † One year.                |
| 89                             | Scar and axilla.                      | † Less than four months.   |
| 92                             | Skin and axilla.                      | Less than one year.        |
| 93                             | Sternum.                              | One month.                 |
| 94                             | Near scar and in axilla.              | Four months.               |
| 95                             | "Recurrence" about scar.              | Ten months.                |
| 98                             | Near scar.                            | Twenty days.               |
| 100                            | Scar.                                 | Two and a half years.      |
| 102                            | "Local recurrence," skin.             | One and a half years.      |
| 104                            | "Local recurrence" above scar.        | † Six months.              |
| 107                            | "Local recurrence."                   | Half year.                 |
| 108                            | Scar and axilla.                      | Three months.              |
| 111                            | "Local recurrence," scar.             | † Six months.              |
| 113                            | During healing above wound.           |                            |
| 116                            | "Recurrence," axilla.                 | † One and a half years.    |
| 121                            | "Recurrence," axilla and skin.        | Two months.                |
| 123                            | Scar.                                 | Eleven months.             |
| 124                            | "Local recurrence."                   | † One year ten months.     |
| 125                            | "Local recurrence."                   | One year seven months.     |
| 129                            | Scar.                                 | Two months.                |
| 130                            | Scar.                                 | One year.                  |
| 131                            | Scar.                                 | Six months.                |

<sup>1</sup> Spengel. Archiv für klinische Chirurgie, Bd. XXVII, 1882.

| Operator.      | 42 | 40 | 38 | 36 | 34 | 32 | 30 | 28 | 26 | 24 | 22 | 20 | 18 | 16 | 14 | 12 | 10 | 8 | 6 | 4 | 2 |
|----------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|---|---|
| Bergmann .     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |
| Billroth . . . |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |
| Czerny . . .   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |
| Fischer . . .  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |
| Gussenbauer .  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |
| König . . .    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |
| Küster . . .   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |
| Lücke . . .    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |
| Volkman . .    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |
| Halsted . . .  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |



TABLE X.—VOLKMANN. (Concluded.)

| DIED SOON AFTER OPERATION. |                          |                   | NO NOTE AS TO LOCAL RECURRENCE. |  |                   | NO LOCAL RECURRENCE. |                   | RESULT UNKNOWN. |
|----------------------------|--------------------------|-------------------|---------------------------------|--|-------------------|----------------------|-------------------|-----------------|
| No.                        | Cause of Death.          | Time Post-Operat. | No.                             | Cause of Death.                            | Time Post-Operat. | No.                  | Time Post-Operat. | No.             |
| 6                          | Erysipelas & pneumonia.  | 1 day.            | 5                               | † Metastases.                              | 4 months.         | 8                    | 7 years.          | 66              |
| 20                         | Exhaustion.              | 19 days.          | 28                              | † Cancer of lungs.                         | 2 years.          | 11                   | 6 "               | 68              |
| 24                         | Collapse.                | 15 "              | 31                              | † Metastases.                              | 1 year.           | 22                   | 6 "               | 77              |
| 26                         | Gangrene of skin.        | 20 "              | 41                              | † (?)                                      | 2 yrs. 4 mos.     | 33                   | 6 "               | 97              |
| 30                         | Septicæmia.              | 6 "               | 45                              | † Pericarditis.                            | 6 months.         | 35                   | 6 "               | 120             |
| 39                         | (?)                      | 2 mos.            | 50                              | † Metastases.                              | 2 years.          | 37                   | 6 "               |                 |
| 60                         | Bronchitis.              | 1 ½ mos.          | 70                              | † Exhaustion.                              | 1 year.           | 38                   | 6 "               |                 |
| 69                         | Septicæmia.              | 16 days.          | 81                              | † Cancer.                                  | 1 "               | 40                   | † 9 months.       |                 |
| 119                        | Secondary lung embolism. | 2 mos.            | 82                              | † Cancer other breast.                     | 6 months.         | 44                   | 6 years.          |                 |
| 122                        | Exhaustion.              | 16 days.          | 103                             | † Cancer of femur.                         | 6 "               | 46                   | † 6 months.       |                 |
| 128                        | Lung embolism.           | 23 days.          | 118                             | † Part of pectoralis major muscle removed. | 9 "               | 53                   | † 4 years.        |                 |
|                            |                          |                   |                                 |  |                   | 54                   | 1 yr. 3 mos.      |                 |
|                            |                          |                   |                                 |  |                   | 55                   | † 1 yr. 7 mos.    |                 |
|                            |                          |                   |                                 |  |                   | 56                   | 5 years.          |                 |
|                            |                          |                   |                                 |  |                   | 58                   | † 1 ½ yrs.        |                 |
|                            |                          |                   |                                 |  |                   | 62                   | 5 years.          |                 |
|                            |                          |                   |                                 |  |                   | 63                   | 2 years.          |                 |
|                            |                          |                   |                                 |  |                   | 64                   | 4 ½ years.        |                 |
|                            |                          |                   |                                 |  |                   | 71                   | † 1 yr. 3 mos.    |                 |
|                            |                          |                   |                                 |  |                   | 75                   | † 6 months.       |                 |
|                            |                          |                   |                                 |  |                   | 76                   | † 1 ½ years.      |                 |
|                            |                          |                   |                                 |  |                   | 78                   | † 2 ½ years.      |                 |
|                            |                          |                   |                                 |  |                   | 84                   | 2 years.          |                 |
|                            |                          |                   |                                 |  |                   | 85                   | 1 yr. after op.   |                 |
|                            |                          |                   |                                 |  |                   | 88                   | 4 years.          |                 |
|                            |                          |                   |                                 |  |                   | 90                   | 3 ½ years.        |                 |
|                            |                          |                   |                                 |  |                   | 91                   | 3 ½ "             |                 |
|                            |                          |                   |                                 |  |                   | 93                   | †                 |                 |
|                            |                          |                   |                                 |  |                   | 96                   | 3 years.          |                 |
|                            |                          |                   |                                 |  |                   | 99                   | 3 "               |                 |
|                            |                          |                   |                                 |  |                   | 101                  | † 2 "             |                 |
|                            |                          |                   |                                 |  |                   | 106                  | † 4 months.       |                 |
|                            |                          |                   |                                 |  |                   | 109                  | † 2 ½ years.      |                 |
|                            |                          |                   |                                 |  |                   | 110                  | 2 ½ "             |                 |
|                            |                          |                   |                                 |  |                   | 112                  | † 2 ½ "           |                 |
|                            |                          |                   |                                 |  |                   | 114                  | † 1 ¼ "           |                 |
|                            |                          |                   |                                 |  |                   | 115                  | † 9 months.       |                 |
|                            |                          |                   |                                 |  |                   | 117                  | † 6 "             |                 |
|                            |                          |                   |                                 |  |                   | 126                  | 2 ½ years.        |                 |
|                            |                          |                   |                                 |  |                   | 127                  | 2 ½ "             |                 |
|                            |                          |                   |                                 |  |                   | 72                   | 3 months.         |                 |
|                            |                          |                   |                                 |  |                   | 78                   | 3 "               |                 |
|                            |                          |                   |                                 |  |                   | 14                   | 3 "               |                 |