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An Address
ON THE
**MEDICAL ASPECTS OF CARCINOMA
OF THE BREAST.***

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THE physician sees carcinoma of the breast at two periods. Hoping against hope, and dreading the knife, women consult him, rather than the surgeon, about a "lump" which they have noticed. But far more important are the numerous and unhappy victims of the late internal metastases. Having for some years been much interested in the subject I have collected notes of cases, one

series of which I have already published.¹

The cases may be considered under two divisions.

I.—THE CONDITION OF THE BREAST ITSELF.

Apart from definite tumour or cyst, the consulting physician does not often see patients with trouble in the breast. Sometimes, indeed, he overlooks the true nature of a case by omitting the examination of the breast, forgetting that extensive general lesions may be associated with a small latent carcinoma. Such an instance I have reported (in the paper referred to). A woman, aged 29, was admitted with enlargement of the right cervical and axillary glands and a pleural effusion on the same side. Naturally enough the condition was supposed to be tuberculous. She made no complaint of the breast, nor was it examined. The true nature of the trouble was only discovered *post mortem*, when there was found in the breast on the same side a carcinoma not much larger than a walnut.

The importance of the character of the examination is well illustrated in Case VII of my first series; a large, powerfully-built man had suffered for some months with symptoms of disease of the spinal cord, and becoming paraplegic on his way home from Florida was admitted to the Johns Hopkins Hospital. When stripped for examination, as I looked at him from the foot of the bed, my attention was at once attracted to the greater prominence of the right breast. He had not noticed it himself, nor had his physician. It was the seat of a quite large carcinoma, and his remarkable spinal cord symptoms were due to metastases.

Mastitis Carcinomatosa.

An important local condition leading to error in diagnosis is a diffuse inflammatory infiltration of the breast, extending rapidly beyond its limits, and even

involving the side of the chest, the shoulder, and the arm. The cases have been described by Volkmann, Billroth, Aiken, and others. Both breasts may be involved, and the appearance may be that of a diffuse, rapidly-spreading inflammation, rather than of a new growth. Charbonnier gives a very good account of the cases in his essay, *Cancer Aigu du Sein*, Paris, 1900, and mentions instances in which the most distinguished surgeons have been in doubt; indeed, the breast has been incised for acute phlegmon. In two-thirds of the cases both breasts have been involved. The following case differs from others which I have found in the literature in the more chronic course, but it presented the same extraordinary appearance of a diffuse inflammatory condition, but widely spread beyond the breast. Shortly after I saw this patient there was a brief report of a similar case shown at one of the Paris societies, but both sides were involved, and the infiltrated areas met in front and extended behind almost to the spine.

Diffuse Inflammatory Infiltration of Right Breast, Right Side of Thorax and of the Arm.

May 11th, 1903, Dr. Friedenwald brought to see me Mrs. U., aged about 40, a very healthy-looking woman, who had had for several months swelling [of the right breast and right arm. It began gradually without very much pain in June, 1902, and had progressively increased. When stripped the patient presented a very remarkable appearance. The right breast was enormously enlarged, uniformly inflamed, and a reddened infiltration extended to the clavicle, to the sternum, and below almost to the costal margin. Laterally it reached into the axilla. The right arm and hand were greatly swollen, and the skin of the upper arm was uniformly red and oedematous. The lower arm and hand were oedematous and swollen but not red. On palpation the infiltrated skin over the thorax was brawny and hard. It pitted a little, and the erythema was rapidly replaced. Over the shoulder and biceps there was the same red, brawny infiltration. The skin of the entire arm was firm and hard; and, while it pitted on deep pressure, there was evidently an intense subcutaneous infiltration. The breast was everywhere uniform, tense, and brawny, but no nodules could be felt. There was a very hard, infiltrated area at the anterior axillary fold. Above the right clavicle an enlarged gland could be felt, and there was a smaller one just beneath the clavicle. The glands could not be felt in the axilla.

Altogether the patient presented an extraordinary appearance, and the question was raised as to the presence of malignant disease. I inclined strongly to the belief that it was one of those forms of diffuse carcinoma which had spread chiefly in the subcutaneous tissues. Dr. Halsted saw the case and was of the same opinion. Dr. Friedenwald tells me that throughout the summer she grew progressively weaker and thinner; before death the erythema and swelling reduced, so that the glandular enlargements could be more readily seen and the nature of the case became quite evident.

II. METASTASES. A.—Intrathoracic.

Direct extension through the chest walls to the pleura with secondary involvement of the lymphatic glands, more rarely disease of the lung itself, is one of the most common of the sequelae of carcinoma of the breast. Pleurisy with effusion may come on insidiously, with the

* Delivered before the Leamington Medical Society.

only symptom an increasing shortness of breath. In other instances there are severe pains with signs of involvement of the pleura itself by extension. The following cases illustrate the common type of pleuritic involvement.

Carcinoma of breast, concealed or unsuspected: Marked, long-standing neurasthenia: Onset with pains in the back and legs, thought at first to be due to pleurisy.

Nov. 20th, 1901. I saw this afternoon with Dr. Brinton Mrs. W., aged about 48, a large, stout woman, who complained of great pain in the back and legs. Dr. Brinton had known her for many years and had treated her repeatedly for nervous attacks, but she had been in other hands, and he had only seen her recently, and detected a large tumour of the left breast. Within a few weeks the pains in the back had increased, there was inability to lie down, and she had increasing difficulty in using her legs. The patient was sitting on the side of the bed, in great distress. There was a large, flat carcinoma of the left breast, with marked involvement of the axillary glands. There was pain down the spine, but no region of special swelling or tenderness. The left side of the chest was flat on percussion, the tactile fremitus was absent, and there was a very feeble distant respiratory murmur. The heart was pushed over and there were signs of pleural effusion. She could move her legs and could stand, but only with assistance, and she had much difficulty in taking a few steps. There were no disturbances of sensation. The knee jerks were increased. The pains were chiefly in the spine and down the legs, and were evidently of a very severe character. The patient died a few months later.

It is not always easy to say how much effusion is present in the pleura. I saw with Dr. Stavely in Washington Mrs. L., aged about 60, whose right breast had been removed three years before. A local recurrence took place a year ago. For three months she had had a cough with increasing shortness of breath. The slightest exertion caused the most severe dyspnoea. She was a remarkably healthy-looking woman, propped up in bed, slight cyanosis, moderate dyspnoea. Both arms were swollen, the right a little red, not coloured. There was a large recurrence in the scar, and a flat infiltration beneath the right pectoral fold, and extending into the axilla. On percussion the manubrium was flat, and there was a wooden dullness over the whole of the front of the chest on the right side and behind from the spine of the scapula. The heart did not appear to be dislocated. The breath sounds were feeble; fremitus was absent. The extensive flatness over the manubrium and the widespread local recurrences on the chest wall made it probable that the features were in great part due to extension of the disease in the pleura and mediastinal tissues. No fluid was withdrawn on puncture.

It is not always easy to say whether the pleurisy is really of a cancerous nature or not. I saw such a case with Dr. John Philips and Dr. Cross a few months ago. The pleurisy was not extensive, and there were no signs of effusion, but it was accompanied with a great deal of pain and signs of local recurrence.

The glandular metastases within the thorax are very common and associated with all the distressing pressure symptoms of tumour. There may be no local recurrence and no physical signs, though, as a rule, the mediastinal tissues are involved and there is flatness on percussion and, not infrequently, disease of the sternum itself. The glands above the clavicle may be enlarged. The literature contains many cases of this sort, and they are among the most distressing witnessed in practice. An extraordinary circumstance is the fact that even the mediastinal growth, with penetration of the manubrium, may undergo involution, as occurred in Case v of my first series. I have seen very few instances of carcinoma of the lungs secondary to that of the breast. The organ may be involved especially when the carcinoma extends from the costal to the visceral pleura. Scattered nodules are not very rare, but I have never seen a case in which the symptoms appeared directly due to the involvement of the lungs alone.

B.—Abdominal.

The peritoneum may be involved by direct extension, and the cases are not very infrequent in which there is a recurring carcinomatous ascites. Indeed, the breast

tumour may be latent, or the patient may have concealed it and have no suspicion that the abdominal symptoms have anything whatever to do with it. This was the history of Case xii of the first series. The omentum and lymph glands may be involved, forming large, irregular tumours which may be felt only after the fluid has been withdrawn.

Metastasis to the liver is perhaps more frequent than to any other organ, but it is not always associated with symptoms, and it is more commonly of *post-mortem* than of clinical interest. It occurred in 241 of the 735 *post-mortem* examinations in cases of cancer of the breast collected by Stephen Paget.² The liver becomes enlarged, irregular, nodular, and the patient is deeply jaundiced, with all the features of secondary carcinoma. In the following remarkable case the small tumour of the breast proved to be secondary.

Carcinoma of the Gall Bladder: Metastases in the Liver & Jaundice: Secondary Carcinoma in the Right Breast.

Sarah H., aged 64, a stout, well-nourished woman, was admitted with deep jaundice and pain in the abdomen, symptoms which had persisted for some months. She was a very stout woman, and it was impossible to make a satisfactory examination. The cause of the jaundice was doubtful. On examination one day I noticed at the edge of the left pectoral fold attached to the breast a small, hard tumour. This was removed and proved to be an adeno-carcinoma. Under these circumstances, we naturally thought that it was the primary growth, but the *post-mortem* examination showed a primary adeno-carcinoma of the gall bladder with metastases in the liver and lung. The small tumour of the right breast was also secondary.

C.—Cerebral.

The symptoms may be caused either by metastasis to the bones of the skull or to the brain itself. In my first paper I referred to a number of cases in the literature, and reported an instance. The following additional cases have come under my observation. In Case xvi, seen with Dr. Keown, the right breast was removed two years previously. For three months there had been gradual anaemia, loss of weight, headache, disturbance of vision, and difficulty in walking. There were double optic neuritis and an irregular, staggering gait, very suggestive of tumour of the cerebellum. I heard subsequently that the ataxia became much more pronounced.

On June 21st, 1904, I was consulted by Dr. J. R. Jameson about a remarkable case—a woman, aged 68, who had always enjoyed good health, but who had had the left breast removed by Dr. Allen of Cleveland seven years before. About three months ago she complained of numbness in the fingers of the left hand, which persisted. One month ago, without any warning, she had a typical attack of Jacksonian epilepsy, beginning in the fingers and extending to the forearm, the arm and shoulder, and finally to the muscles of the leg and foot on the same side, without any loss of consciousness. Gradually there was loss of power on the left side, which became complete. She gradually became comatose. When I last heard she was rapidly failing.

As in the case reported in my first paper, the symptoms of cerebral tumour may follow years after removal of the breast, or in a patient with old atrophic scirrhus. In the following case there was a remarkable scirrhus tumour of the breast which had persisted for years. The association of the hemiplegia with pains in the abdomen and swelling left, I think, but little doubt that the symptoms of the case were due to metastases.

May 12th, 1904. I saw to-day, through the kindness of Dr. J. H. Musser, Mrs. J., aged 76. The patient was in bed, looked pale, was quite conscious, and could talk, though with a little thickness. The left side of the body was paralysed. There was no disturbance of sensation. The paralysis had come on gradually within ten days without special pain in the head. The abdomen was full and large, the intestines distended with gas. The left lobe of the liver was enlarged and palpable, but no definite masses were felt. There was a great deal of pain in the upper region of the abdomen on deep pressure, and there was a distinct friction along the costal margin.

The left breast presented a very extraordinary appearance. It was smaller than the right. On the surface, extending directly across the situation of the nipple,

there was a reddish scar at least 3 in. in length by about 1½ in. in breadth, looking like the cicatrix of a fresh wound. It was perfectly smooth and dry. On palpation this was felt to be the surface of a large, flat carcinoma, feeling about the size of the two hands, board-like and hard, with very definite margins, and little or no infiltration of the adjacent tissues; no adherence to the ribs. The glands in the axilla and above the clavicle were not involved.

The patient had a remarkable history. Fully forty years ago she had a trouble in the left breast, which ever since has at intervals been sore, and she had always been very apprehensive of any blows or injuries. The nipple was affected and gradually became retracted. About five years ago there was a change in the breast, which gradually became smaller and harder. There has been no ulceration, but gradually of late the surface of the skin has become scar-like. She has been failing in health only for the past four or five months, and within three months has had a series of attacks of pain in the upper part of the abdomen and swelling and distension, with marked gastric features and putty-like stools, but no definite jaundice. The paralysis came on gradually about ten days ago.

A fourth case with cerebral symptoms I saw December 10th, 1902, with Dr. Kerr of Washington. The case is interesting in another respect, as Dr. Halsted thought it one of two cases which he had seen in which the axillary glands were involved and removed before any tumour could be detected in the breast. I saw her, three months after the second operation, for an acute pneumonia, having nothing to do with the cancer. The subsequent history showed this to be the case. At the time of my visit the axilla had become inflamed and swollen, and there was evidently a recurrence. She improved, and went to Canada for the summer, but one day, at the dinner table, she had a convulsion. Not long after it was noticed that in walking the right leg was dragged. She gradually became completely paralysed on the right side and aphasic. There were intense headaches. She died in coma August 15th.

D.—Spinal.

The most common and the most serious, as entailing a maximum of suffering, are the lesions of the spine. Of the 29 cases in my series, 10 presented spinal symptoms. The anatomical lesions may be gathered from a brief statement of the autopsy in Case VIII—a man from whom the right breast was removed September 21st. For four months he had paroxysms of severe pains in the back, radiating in the course of the eighth and tenth ribs, with the gradual onset of a spastic paraplegia. Opposite the seventh dorsal body a saddle-shaped mass, 2 cm. by 1 cm., projected into the spinal canal, compressing the cord at this level. There were other small nodules projecting into the canal from the fifth to the seventh vertebrae. It is important to note the small size of the tumours which caused the paraplegia and the intense pains.

The frequency of metastases in the spine has been noted by all observers, and Billroth has somewhere remarked that they are more common in the atrophic form of scirrhus of the breast, and that the cases are frequently seen by physicians for spinal-cord disease without any suspicion of the true nature of the disease. It is rare to see kyphosis. The secondary growths may become sclerotic and shrink with the disappearance of the symptoms of pressure on the cord, as in Cases v and vi of my first series. Any part of the spine may be involved. One of my cases had for several months cervical neuralgia before the latent scirrhus of the breast was discovered. The sacrum or the sacro-iliac region of one side may be attacked. The literature is too rich in cases (as may be seen in the *Index Catalogue*, both series) to make any special references, but I may call the reader's attention to the writings of Charcot³ and to the monographs of T. W. Nunn and of A. Marmaduke Sheild.

The symptoms usually occur in two stages. In the first or neuralgic stage, following removal of the breast for cancer—it may be a few months or a couple of years—the patient begins to have pains in the back and side, indefinite in character, and often ill-defined, as to the position. She gets nervous and, as she may look very well and strong, the symptoms are not infrequently put down to neurasthenia or hysteria. There is a general

hyperaesthesia, an exalted sensibility to jarring movements, or in turning in bed the pain is much aggravated. In several patients the recumbent position at once gave relief, but any movement was followed by pain. For months these symptoms may persist without the slightest sign of organic change. It is a period of distressing doubt to the physician, and of great misery to the patient, who may be allowed to suffer in the belief that she is simply nervous or hysterical. Or the question may come up for a second operation for recurrence, or for tumour of the other breast. Such a case was referred to me by Dr. Moody, of Winnipeg—a woman, aged 37, had had the right breast removed, and a second operation for recurrence. Three months after the operation the other breast was attacked, and at the same time she began to have pains in the back and legs, and occasionally in the joints. At times they had been severe enough to require a hypodermic injection of morphine. The question was as to the existence of new growths elsewhere, as operation in the other breast had been advised. The examination was negative, and she looked a very healthy woman. She had had for many years neuralgic attacks, and on several occasions lumbago, so that I could not feel at all certain that the pains were due to metastases. The operation was performed, and she was for a time much better. I have not heard of the subsequent history.

A distressing and not very rare feature in this stage is an outbreak of shingles which occurred in Case vi. Romieu has collected a series of cases from the literature.⁴ Gradually there is an increase in the severity of the pains, which may come in crises of the most agonizing character, requiring large doses of morphine for relief. While as a rule the pains are thoracic or lumbar, they may at first be sciatic, shooting down one or both legs. For months, or even throughout the course, there may be no disturbances of motion or of sensation. The reflexes are often exaggerated in this stage, but not more than is often seen in neurasthenia.

In a majority of the cases the second or paralytic stage is reached—a pressure paraplegia, usually of the spastic type. The onset may be rapid, and within a few days the patient may be unable to walk. More often it is a slow affair, many months elapsing before there is complete paralysis. Disturbances of sensation, other than pain, are rare. Cramps in the muscles are common, and there are painful spasms in which the legs are drawn up forcibly. Finally, there is the well-known picture of paraplegia dolorosa. In rare cases only one leg is paralysed.

I saw a few weeks ago, with Dr. Brooks, a patient who had had a breast removed for cancer four years ago, and a second operation for recurrence this summer. For more than a year she had had pains in the right leg, believed to be sciatica, and a gradual wasting, with loss of power. She was a thin, delicate-looking woman. The right leg was wasted, particularly in the gluteal and upper parts. She could not lift it from the bed or stand upon it. The sensation was perfect. Nothing could be made out in the examination of the spine or the sacro-iliac regions. *Per rectum* some hard, nodular bodies could be felt above the fundus of the uterus, but their nature was doubtful. With such a history, and the recent recurrence of the cancer, there could be no question as to the cause of the right monoplegia.

One of the most remarkable features in the history of carcinoma is the spontaneous involution sometimes met with in the secondary tumours. Cases v and vi of my series, both with spinal symptoms, were still alive at the time of report, April, 1901. In Case v the primary tumour was removed in October, 1897. A year later the patient had a secondary growth in the right eye, pains in the back and legs, an extensive pleural effusion on the right side, and at the junction of the manubrium and the gladiolus a distinct tumour. She became greatly emaciated, was confined to bed, and had agonizing pains in the legs and the sides. For months she was in a desperate condition. Towards the autumn of 1899 the pains lessened, she was able to move her legs better. She could get out of bed and began to walk about the house and grounds. There was a distinct kyphosis of the fourth and fifth dorsal spines, and the back was stiff. The tumour of the manubrium had disappeared entirely. The vision of the right eye, which had been almost lost, improved. There was a local recurrence in the left breast, but it had not increased. In the summer of 1900 she improved still further, and was

able to be out, and even drove herself. During the winter of 1900-1 she was very comfortable. She still had pains in the back and side, for which she had to take morphine. In the summer of 1901 she began to have some shortness of breath. There were a few local skin recurrences. She gradually failed, and died on November 10th, 1901, three years after the first appearance of the secondary growths.

Case vi is in some respects even more remarkable. The primary operation was in February, 1898. In August, 1899, she began to have the usual nerve-root pain, and in November she had a severe attack of herpes on the left side. After a winter of great suffering she became completely paraplegic, and for weeks was desperately ill. In July she was moved to the country, and she began to get better. The paraplegia disappeared, and she regained control of the bladder and bowels. She walked stiffly, with the back bowed; but from this time on until her death in January, 1903, she had no further paralysis. She took about 3 gr. of morphine daily. When the paraplegia existed there were nodules about the scar, and the glands in the neck were enlarged, but they progressively diminished in size. One skin nodule ulcerated and never entirely healed, but gave her no trouble. Four months before her death she had anorexia with vomiting, and stiffness of the right arm, but there was no recurrence of the paraplegia, nor did the secondary tumours increase in size. The patient lived for between three and four years after the onset of a paraplegia, due, there can be no question, I think, to pressure of a secondary mass in the spine.

Even more remarkable cases are on record, in which multiple secondary tumours have gradually disappeared. The cases reported by Pearce Gould⁵ and Vulpian⁶ illustrate recovery from conditions apparently the most desperate, with a gradual subsidence of the secondary masses. In the cases the subsequent histories of which are here given, the morphine seemed to have had a very beneficial influence on the general condition, and it may have helped to keep in check the progress of the disease.

E.—Bones.

The frequency of metastasis to the bones has been noted by all writers. In a few rare instances there is widespread generalization in the bones, as in the cases reported by Brunon⁷ and Firket.⁸

In many of the cases with brain and spinal cord symptoms the lesion is in the bones, causing pressure. The long bones are not so often involved. In the following remarkable case spontaneous fracture of the thigh bone occurred at the seat of the secondary growth.

On December 1st, 1901, I saw at Mount Clemens, Michigan, Mrs. M., aged about 47. The patient was an exceedingly nervous woman, but otherwise had enjoyed fairly good health. In the spring of the year she had had rheumatic pains in different regions, but there had been nothing to call attention to the condition of her breast. She went to Cuba, where she remained for three months, returning in October. The pains had rather increased, but were still somewhat indefinite in character, and were thought to be rheumatic, and as some of her friends had received great benefit at Mount Clemens, she decided to go there for a course of the baths. A few days before leaving it was accidentally discovered that she had a tumour of the left breast, about which she had known for some time, but had never spoken. She had had some pains in the legs and in the back, but she was able to get about. The pains were, I believe, more marked in the left leg. On getting into the sleeping-car to go to Mount Clemens she had stepped up two steps, but on trying to get up the third she had an agonizing pain in the left leg, and had to be helped in, and throughout the night on the car her sufferings were excruciating. This was between two and three weeks before I saw her. From that time on she was confined to bed, could scarcely move the left leg without the most agonizing pain, and it was only with the greatest difficulty that she could be carried on a sheet to take the baths.

The condition was as follows: A healthy-looking woman, very neurotic and emotional, in an agony of apprehension lest her leg should be removed. She was not at all cachectic. There was a large carcinoma of the left breast, with secondary involvement of the glands of the axilla. The left leg was strongly flexed and everted. She could not voluntarily move it, but she could, with the other foot,

straighten the leg a little from the knee. The middle and upper part of the left thigh was visibly larger than the right. On palpation the lymph glands were not enlarged. There was no special tenderness, but there was evidently swelling and enlargement of the upper part of the thigh bone. Any attempt to straighten the thigh or to move it from its everted position caused the most agonizing pain.

It was suggested that she probably had a new growth in the upper part of the thigh, possibly about the neck of the thigh bone, and that she had had a fracture with dislocation at the time of getting into the sleeping car. She was taken back to New York, where she saw Dr. W. T. Bull, who concurred in the diagnosis of secondary carcinoma of the thigh bone. Nothing could be done, and the patient gradually failed in health and died a few months later.

In the following case the scapula was involved three years after removal of the breast: Mrs. N., aged 52, seen December 30th, 1901. She had had old valvular disease of the heart, and it was for this I was asked to see her. Incidentally it was mentioned that she had had her left breast removed three years previously by Dr. Tiffany for cancer.

She had been an energetic, active woman, and since the operation had apparently been in good health. Three weeks ago, while in Washington one evening, she had a sudden severe pain in the right side, of sufficient intensity to require morphine. She had not been well since, having a great deal of pain, chiefly in the right side of the chest. Last Thursday, five days ago, it lessened on the right side and became very intense on the left.

She was a well-nourished woman, a little pale, sweating profusely. The pulse was under 90, a little collapsing. She had signs of quite an extensive operation in the left breast. There was marked mitral insufficiency, and a loud, rough systolic murmur in the aortic area. There was impaired resonance at the base of the right lung, and numerous fine râles. There were no glands enlarged above the clavicle or in the axilla. Examining from behind, one was immediately struck by the difference in appearance between the two scapulae. The left was enlarged uniformly, chiefly in the upper half. It was not specially painful. There were no secondary masses in the ribs.

The bones of the hands and feet are not often involved—in not one of the 650 autopsies analysed by Stephen Paget. I was consulted in July, 1904, by Dr. Neagle about a patient who had had two recurrences within eighteen months after a primary operation. She then began to have pain and tenderness in the thumb of the right hand, the metacarpal bone of which enlarged, forming a solid fusiform tumour. The inner end of the right clavicle gradually became enlarged and tender, and at the last report the left knee and ankle had become involved—evidently a case of widespread generalization in the bones.

In many cases of internal metastases in cancer of the breast the symptoms are obscure or there are features which make the diagnosis doubtful. Scarcely enough stress is laid in works on surgery upon the terminal stages of cancer with the tragic events of which the general practitioner is left to battle alone. Amid the sad failures of our art these cases stand out in strong relief. An early diagnosis of the condition and an early recognition of its hopelessness may lessen the terrible ordeal of the poor victim, and mitigate not only her sufferings, but those of the near relatives. Morphine, enough morphine! given freely and without fear, in doses sufficient to keep the patient comfortable, affords the only possible relief. The radical operation as now performed, if performed early, should lessen enormously the proportion of these distressing cases with internal metastases.

NOTES AND REFERENCES.

¹ *American Medicine*, April, 1901. ² *Lancet*, 1889, i. ³ *Oeuvres Complètes*, Tome II, 116. ⁴ *Zona dans le Cancer du Sein*, Lyons, 1900. ⁵ *Clinical Society's Transactions*, vol. xxx. ⁶ *Gaz. des Hôp.*, 1885. ⁷ *Progrès Médical*, 1884. ⁸ *Bulletin Soc. Anat. de Paris*, 1885, lvi.

HEAT A MODE OF MOTION.—Sir William Gowers has unearthed in the *Medulla Medicinæ* of Professor J. A. Van der Linden, published in 1642, the following statement: "Calor est minutissimarum materiae partium motus in se reverberatus," and has written to *Nature* to ask whether there are any other contemporary anticipations of "heat a mode of motion."