bitten. A mixture of chloral and the bromides is given for the next few days. The most troublesome, and the least amenable to treatment, are those cases in which the attacks are of short duration and frequent. For these hot packs are often useful. Pilocarpin is an uncertain and, in some cases, a dangerous remedy ; though, no doubt, it sometimes is very valuable. But diaphoresis may readily be obtained by other means less depressing. A uræmic symptom quite as formidable as convulsions is vomiting, uncontrollable and incessant. Although central, it may be stopped by local treatment. All nourishment by the mouth should be stopped, and thirst quenched by ice or hot water alone. Bismuth and soda, and hydrocyanic acid, may be tried, or small doses of spirits of ether in water given every half hour ; but I have found washing out the stomach with an alkaline solution of soda and borax, which dissolves and removes the irritating bile-stained mucus, more effectual. Since adopting this plan, I have never had any difficulty in stopping the emesis. A hypodermic injection of morphin was valuable in a couple of cases.

Most of the important complications of scarlet fever have now been noticed ; and if the hints thus briefly and imperfectly thrown out may prove in any degree useful to a brother-practitioner in treating this omnipresent disease, I feel this paper has not been written in vain.

ART. XXIII.—*Non-Malignant Tumours of the Breast and their Treatment.* By O. JACOB, M.D. Translated by CHARLES GREENE CUMSTON, B.M.S.; Student-Associate of the Royal Academy of Medicine in Ireland; Assistant at the Butini Hospital, Geneva, Switzerland.

DEEP sutures, which were condemned with good reason a few years ago as being a cause of infection, are employed to-day by all surgeons. Prof. L. Tripier has had occasion to employ deep sutures in the mammary gland, in partial amputations of the breast. He found that, combined with the incisions, no matter how deceitful, they allowed at the same time to be completely fulfilled the indications in the special point of view for which they were intended, and at the same time they could give excellent results from the point of view of preservation and perfecting the shape of the breast. As they are applicable only to tumours obliging merely a partial amputation of the breast, I shall only speak of fibroma

and certain cysts, although sarcoma which obliges total removal is sometimes classed in the group of non-malignant tumours.

As this article is limited, I shall speak of certain points alone in the history of fibroma which have been almost completely left aside, and which, nevertheless, appear to play an important part in the pathogeny of these tumours. I particularly insist on the following points—(1). the relations of chronic mastitis with fibroma and cysts of the breast; (2), the pain in fibromata. I will then describe the methods of treatment employed in non-malignant tumours, and will finish with a description of the method employed by Dr. Tripier.

Fibromata are the most frequent tumours of the non-malignant type met with in the breast. Out of 34 cases Labbé and Coyne found 18 pure fibromata; 3 cysts, by retention of products produced by connective hyperplasia; 8 sarcomata, 4 of which had fibromata for a starting-point. According to these gentlemen, sarcoma is at its origin only a fibroma. The age at which fibroma appears corresponds to the sexual period of woman—that is to say, from twenty to forty years. Never, according to Billroth and Birkett, do these growths appear before puberty, and never after the age of forty; they develop most frequently between the age of sixteen to twenty-five. The fibrous tumours met with after twenty-five years of age may have formed during or after the first few years following puberty, but their origin passes more easily unnoticed when the nucleus of the tumour forms in the deep part of the mammary gland. Nélaton and Birkett maintain that unmarried life favours the development of these tumours; Labbé and Coyne believe the contrary. After Velpeau's statistics they are, above all, found in virgins and women who have never had children. Both breasts are rarely attacked at the same time; the right about as often as the left breast.

According to Labbé and Coyne^{1a} menstruation interferes only in certain cases, and only to explain the development of the growth. This ætiology appears to me to have a considerable importance; it is nearly always the only cause which can explain the development of multiple fibroma in women who have never had children or abscess of the breast. If these patients are carefully questioned as to the condition of their breasts during the menses, they state that they experience often a greater tension of the organ, with redness, heat, swelling, and pain—characteristics which testify

^a The numerals refer to the List of Works given at the end of this paper.

to a severe congestion, and even inflammation, of the gland. In fact, a veritable menstrual mastitis develops in the first stage, but later on it will leave in its stead fibrous nuclei. Under this influence of the genital reflex, the vessels so numerous in the mammary gland become dilated, and a more active diapedesis of the white globules takes place, or for those who do not admit Cohnheim's theory, a proliferation of connective cells in the connective tissue surrounding the acini. To this condition correspond the swelling, redness, &c., and a lobulated and indurated condition of the breast. A swelling of the axillary glands may also be observed, which must not be confounded with the aberrant portion of the gland, situated under the posterior border of the pectoralis major when this is congested. The phenomena of which I have just spoken disappear with the menses. But in time, under the influence of repeated congestion, nodosities persist in the breast, neoplastic elements are changed into connective and fibrous tissues, and a fibroma is formed. In the first few years one or both breasts are increased in volume in a diffused manner at the time of the menses; then after a certain time a solitary nodule is found by palpation; this grows, and it is the increase in size that brings the patient to the surgeon (Case IV.). I believe that menstruation has a great importance in the ætiology of fibroma, by producing a localised interstitial chronic mastitis. In fact, chronic mastitis is the first stage of fibroma.

According to Kennedy, a fibroma, even solitary, is nothing more or less than a circumscribed interstitial mastitis, in the highest degree of development, which in encysting ceased to communicate with the neighbouring parts, thus forming an isolated tumour, and developing as such. According to König³, fibroma represents the last degree of this form of mastitis, which is far from being known to surgeons as it ought to be.

If more attention were given to this form of interstitial inflammation, the appearance of a number of tumours—such as certain simple or multiple cysts, and fibroma in breasts apparently healthy—would be easily explained, to judge from analyses of the cases which have been published.⁴ At the onset of the disease (Case II.) there are found, in one or both breasts, round nodosities—more often quite hard or painful—which a proper treatment, well directed at this epoch, could cure. After a long insidious period, these attacks of chronic mastitis may follow a rapid course (Case I.), and the disease develops after a few succes-

sive attacks, often simultaneously in both breasts; the patient may, perhaps, not notice that the nodosities have developed, and it is only when they come to the surgeon that they are discovered (Case I.) It is, above all, at the time of the menses that new nodosities develop. The breast becomes painful, and quite often secretes a more or less watery liquid, sometimes resembling milk (Case V.). Often, also, there is tumefaction of the lymphatic glands.

If a histological examination of the nodosities is made, the morbid process in the connective tissue may be seen in all stages—the most recent degree is an infiltration of embryonic cells surrounding the acini, while the oldest degree consists of adult connective tissue. An examination of a section taken from Case I. showed a diffused lesion of sclerosis in the parts less attacked; the tissues surrounding the acini are healthy; there is an abundant infiltration of small cells, so marked in some points that the acini are compressed, atrophied, and the epithelium has undergone a granulo-fatty degenerescence. In the parts of the tumour removed by operation, corresponding to the tumours felt on the living subject, I found a pure histological formation of fibroma; on section the tissue was hard, and “cried” under the knife, of a pale yellow colour in some places, changing to rose. A few acini were dilated and more or less drawn out; the epithelium was more or less degenerated, and surrounded by a great number of connective tissue fibres placed concentrically to the acini, crossing each other, and in the spaces are seen connective tissue cells and a few vessels. This case shows well, it seems to me, the evolution of the morbid process in the connective tissue—in the first degree there is inflammation; in the second there is a metamorphosis of the cells into fibrous tissue compressing the acini; in the third all the cells are transformed into adult connective tissue and a veritable fibroma is organised.

Besides the preceding cases, in which the inflammatory morbid process ends in a fibroma, there are others in which cysts develop at the same time as the fibroma, varying in size, and sometimes quite numerous; sometimes the cysts alone form. In my second case, which, in the clinical point of view, resembles closely the cystic disease of Reclus, I found an example of an inflammatory morbid process ending at the same time in fibroma and cysts. After extirpation of the mamma I found numerous disseminated nodosities, and the gland presented sclerosis in parts. These nodosities offered the same characters as in the preceding patient—infiltration of embryonic cells, enveloping the acini and compressing them, and a

mass of compact connective tissue. Besides these nuclei of fibroma, I found tumours of various sizes—some the volume of a millet seed, while others were the size of a walnut, round, very hard, and in great quantity. When pricked with a needle these small tumours sent forth a jet of different coloured liquids with great force, and even in some places a noise was heard. These tumours were especially numerous on the posterior aspect of the glands. These small nodosities differ very much from the first, as they are cysts. Their formation has been well studied by Labbé and Coyne. These gentlemen have shown that cystic cavities, gaps, and spaces which are formed by means of the acini are to be found in the fibroma. The acini drawn and stretched in all directions by the development of peri-lobular connective tissue lengthen and broaden greatly. The excretory canals are effaced, in certain points obliterated and atrophied by the morbid process in the connective tissue; they dilate in the intermediary portions of their course.

The epithelium of the acini and that of the excretory canals does not generally remain indifferent to the continued irritation which exists in their neighbourhood, for they tumefy and proliferate. The acini are dilated by the liquid which they secrete, perhaps in greater quantity than normally, and which cannot be expelled. This liquid, by the pressure that it exerts at the periphery, may produce a degeneration of the epithelium, which falls into the liquid; and here it is found in the form of cells whose character is quite difficult to recognise, and which have undergone a granulo-fatty degeneration. This formation of cysts may remain localised in some spots, and is found especially in the excretory canals (Case V.), but it may be generalised, as well as in Case II. This morbid connective tissue formation ending in the organisation of cysts seems to me to apply to the formation of cystic cavities in certain cases of Reclus's disease. This idea seems to me justified by my second case. In this instance we find that the patient came into the hospital for the first time on the 4th of March, 1887, to be operated on for a tumour of the left breast, which had developed in three months. But from the epoch of her first menstruation the patient has always complained of pains in the left breast at the time of her menses, and the gland used to become enlarged and lumpy at that time.

The tumour which was found was about the size of a mandarin, hard, the surface nearly smooth, movable in its deep parts, and under the skin spontaneously painful, especially at the time of the menses,

and on pressure. The diagnosis was fibroma of the breast. Removal showed that it was a cyst with thick fibrous walls, filled with a reddish serous fluid. All around the cyst, and invading nearly the entire gland, are found numerous small cysts, some containing a butter-like matter, others a serous liquid. In the midst of these cysts are found numerous fibroma-nuclei composed of connective tissue.

The patient came back the following year to have the right breast, which is invaded in its turn, operated on. A hard, resistant movable tumour the size of a turkey's egg is seen, forming an appreciable projection exteriorly. Besides this tumour, others of variable size are discovered, and the breast feels as if it were full of grains of lead. A partial removal of the breast was performed, including in the part removed the largest of the tumours.

During the operation an accidental incision was made in the largest tumour, whence a pale yellow-coloured liquid squirted out. The piece removed was about the size of a fist, and the large cysts which had been incised had caused it to retreat. It was composed of a tissue comparable to that of a healthy gland. Only in the middle of this mass there was a great number of different sized cysts; the dimension of the one incised was that of a hen's egg. The small cysts appeared composed of a thin membrane, but which was very resistant when an attempt was made to break it.

Microscopical examination showed the connective tissue surrounding the acini to be normal, but nevertheless slightly thickened, and sclerosis was present about the clusters; great proliferation of the epithelium of the glands was noted. These are the lesions described by Malassez, Brissaud, and Cornil in the disease of Reclus. This patient, as I have already said, is a proof of the relations which exist between fibroma and cystic disease. This opinion was put forward by Trélat in a discussion which took place in February, 1888, at the Société de Chirurgie⁵, when he said, "if we take up the clinical point of view, between the cysts of the acini of Reclus and fibrous hypertrophy, vegetating fibroid cysts and true adenoma, the differences are not great, or at least the distinction is difficult; all these types are bound together, and even coincide." Kirmisson also does not make cystic disease a special entity. It presents itself, he says, sometimes as an original disease of the epithelium, at other times as a consequence of different alterations, such as adenoma, fibroma, senile degeneration. And lastly, Phocas, in

his thesis, and with him Tillaux, say that cystic disease is a chronic mammitis (*maladie noueuse de la mamelle*).

Without going further, I would only say that the development of fibrous tissue in the mammary gland can explain in certain cases the pathogeny of Reclus's cysts. If they are not large enough to choke the glandular acini, they at least irritate them, and can produce a proliferation of the epithelium, hypersecretion and formation of cysts. This importance of inflammation of the connective tissue in the pathogeny of Reclus's cysts is to be found in a great number of cases of this disease in which, as Quain remarks, a great frequency of abscess of the breast is noted. According to this author cystic disease is simply a neoplasm; it is caused by irritating lesions primarily acting on the epithelium. He calls it "epithelial cystic cirrhosis," for he says, "if the interlobular connective tissue is healthy, the same tissue surrounding the acini contains sclerosis." So from what has been said I think I am able to furnish some proofs as to the influence of inflammation of the breast in the development of fibroma, and of the near relations which, in certain cases, unite the fibrous morbid process with the cystic disease of Reclus. This influence of inflammation of the breast on the development of fibroma, I have shown in women who have never had an abscess of the breast. I have spoken only of chronic mastitis consecutive to the menstrual flux; but fibroma may still be the termination of infectious inflammation. In the examples that I have cited, the white globules passed by diapedesis into the connective tissue, favoured by the simple congestion; the metamorphosis of these cells into adult connective tissue was made with great slowness. In infectious mammitis an important element, the microbe, intervenes; it is by this organised body that a more considerable proliferation of connective cells is brought about, cells which are destroyed and produce pus; or, if they resist, they undergo a rapid metamorphosis into connective tissue. Now the difference between infectious and menstrual mastitis, in the point of view of the formation of fibroma, is that, in the first case, the fibrous nodosities rapidly appear. They are hard, multiple nuclei, occupying generally both breasts, as Phocas has described in his thesis. He wished to make a special disease of this condition under the name of "lumpy disease of the mamma," although without reason, it seems to me, for this is not a particular disease—it is only an intermediary condition between puerperal chronic mastitis and fibroma. As Cooper and Velpeau have described it—according

to the latter, traumatism has a great influence on the development of fibroma, by producing a localised spot of mammitis, which evolves in the direction of the fibrous tissue.

This ætiology, accepted by a great number of surgeons, is, above all, applicable to completely isolated fibroma, appearing in a breast which has been healthy up to that time. Chronic mastitis produces multiple fibroma in women whose breasts are painful at the time of their menses. From the relations existing between inflammation of the breast and fibroma, which I have tried to point out, I shall deduce certain consequences when speaking of the treatment.

The commencement of development of fibroma more frequently than not passes unnoticed, and ordinarily the patient does not seek the surgeon until the tumour is about the size of a walnut or more. The tumour is lumpy and hard, movable in the deep parts and under the skin; no pain on pressure. It is only when the nerve-endings are surrounded by fibrous tissue that the pain appears; this is very frequent in cases of multiple fibroma. In Cases I. and II. the pain was at the first quite mild, and coincided with the menses, disappearing with them; then it preceded and followed them. After a time they persisted, and the patient suffered constantly. The pain was shooting and violent, exaggerated by pressure on the tumours. It irradiated nearly always in the muscles of the shoulder and arm (Cases I. and II.).

In certain cases pain is precocious, even preceding the appearance of the tumours (Case I.); in others it appears at the same time as the tumours, while in some rare cases it is entirely wanting. There is a condition which greatly favours pain in fibroma of the breast—it is the soil in which these tumours develop. Nervous women are very subject to it; the patient in my first case is decidedly a neuro-pathic. In syphilitics, and, above all, subjects who have had malaria, it is well known how often neuralgia exists. Consequently, in patients who have painful fibroma, their antecedents should be carefully inquired into, and sometimes by applying a well-conducted treatment the pain may disappear.

A neuralgia of the third and fourth intercostal nerves, which are covered by the mammary gland, must not be confounded with a neuralgia of the breast, as has frequently occurred. The pain in the mammary gland may be of reflex origin, and it is not rare to observe patients who, having affections of the uterus or its appendages, complain of pain in the breast, which disappears when the genital affection is treated.

In Case II. the pain which had persisted after operation rapidly disappeared when the metritis from which she suffered had been treated. Consequently, pain in fibroma is not as rare as one might believe. When it exists, it is a sign of its non-malignant nature. In fact, the differential diagnosis between fibroma and scirrhus is very often so difficult that the question cannot be solved until a section of the growth has been made. Thus pain is a valuable symptom in the diagnosis. In fact, in fibroma I said that pain was precocious, that it preceded, or at least attended, in the great majority of cases, the tumour. In scirrhus, on the contrary, pain appears only at a relatively late period, when the glands are attacked, and compress the nerves. Patients are not alarmed by a painless tumour, which for the public is a sign of its being non-malignant, and the surgeon is consulted only when the pain appears—in other words, several months after the appearance of the tumour, when the chances of success are greatly diminished. Let me say, in conclusion, that fibromata can develop slowly, remain stationary for several years, and then suddenly enlarge; they can change into a malignant tumour, of which I have shown several examples. This possible termination of non-malignant tumours is an indication to surgically intervene when medical treatment is without effect.

Treatment.—This may be medical or surgical. The expectant treatment recommended by certain surgeons should not be the general practice. It should be tried only in timid patients, or when the tumour is too small to propose an operation to the person; at all events the case should be carefully watched.

Surgeons are of different opinions as to the value of medical treatment, and some discard it completely. Billroth says :—“ A veritable and complete resorption is never observed; the different salves and frictions only irritate the skin, and cause it to adhere to the tumour. Instead of a cure an ulceration and more considerable growth is obtained.” Others, on the contrary, as Lebert, Storck, Thierry, and Broca, attribute to medical treatment numerous and incontestable successes. These results, too apt to be forgotten to-day, should consequently not discredit a treatment which can render great service in certain cases. It has even been credited with possibly curing cancer. If it be true that it fails in a great number of cases, and many times because it is applied too late, there are other cases in which it may produce a cure.

I have shown that mastitis plays a considerable part in the development of fibroma of the breast, and it is, above all, against

this element that medical treatment fights; consequently it should be employed in all cases of multiple fibroma, when the gland is filled with hard nuclei, developed after repeated congestion of this organ. Under the influence of this treatment—especially if applied at the beginning, before the neoplastic connective tissue is transformed into fibrous tissue—congestion, chronic inflammation, &c., may be seen to disappear, and a partial absorption of the tumour to take place, and often even the entire growth to disappear completely. The cases in the thesis of Phocas show perfectly that medical treatment may be most useful in certain cases, for if it succeeds the patient avoids an operation which is not without danger, and if medical treatment fails the patient will more readily submit to an operation than if it were proposed immediately.

Medical treatment consists of iodide of potassium given internally, and mercurial and iodide frictions externally. The objection made to this treatment—that it produces mercurial salivation, and causes atrophy of the breast—do not appear to me to be serious, for this may be easily avoided by employing the frictions in a judicious and moderate way, in administering the iodide in small doses, and by not keeping up the treatment for too long a time.

The most important element for obtaining a cure is compression of the breast. Samuel Young was the first to employ it; Récamier, and especially Broca, made it popular in France. The latter invented numerous apparatus in order to perfect it. According to this author, this method gives excellent results in a short space of time; at the end of two or three days the improvement is marked, resolution continues quickly, and may be complete at the end of from two or three months.

Dr. D. Mollière, of Lyons, recommends us at the same time to employ sweating. This gentleman has by this means obtained rapidly-cured cases. "In cases of doubtful diagnosis," he says, "sweating should be provoked during several days, and chronic mastitis can be eliminated from the diagnosis, if the patient is not immediately cured."⁶ He covers the breast with a salve containing pilocarpin, and then envelops it with cotton, and the whole is covered with waterproof linen. Medical treatment is to be employed only in fibrous tumours of the breast; it should be continued for two or three months, and it is only after this time that a surgical operation should be performed, if this treatment is unsuccessful.

In speaking of pain as a symptom, I pointed out the importance as to the subject in which the tumour develops. Consequently it

is important to treat the general health, inquire into the antecedents, and look for diseases of the genital organs; thus sometimes a cure may be brought about and the pain diminished. Surgical treatment is that of choice in non-malignant tumours of the breast. Billroth⁷ says, "as a principle, never remove the entire tumour in a breast, no matter what may be its nature, if it has existed for some time and continues to grow. It should be removed, because it extends more and more," and may take the form of malignant medullary sarcoma—a carcinoma. Tumours have been, and are still, encountered which for many years were considered as non-malignant, and which take on a malignant character later on.

It is better to remove a tumour of the breast, because it deforms the organ. Besides, on account of the knowledge so widely spread among the public, there are many women who lose all repose and tranquillity because they are afraid that their "tumour" may change into cancer. The surgeon should for this reason advise removal, if the patient is confident as to his decision. Reclus⁸ is of the same opinion: "The surgical doctrine of to-day tends more and more to not allow neoplasms of the mammary gland to linger, even if regarded as non-malignant, for as the age of cancer approaches, that is to say, the menopause, all foci may give birth to a malignant tumour."

Among the surgical procedures formerly employed, I will only mention for memory's sake the subcutaneous breaking up of the tumour as performed by Marshall Hall; irritating interstitial injections practised by Luton, of Rheims, and compression, of which I have spoken. The only surgical treatment employed is removal of the tumour. Galien was the first to indicate the procedure for extirpating the breast, and recommended the knife. After him, in order to avoid loss of blood and the dangers of extensive wounds, surgeons preferred the slower procedures, such as cauterisation alone or employed with the knife.

Cauterisation was performed in two ways—either the neoplasm was directly attacked, or linear cauterisation was performed. For the first method Manec employed the salts of arsenic; Landolfi, of Naples, recommended a paste composed of chloride of zinc, bromine, chloride of antimony, and chloride of gold. Girouard, of Rheims, who brought to great perfection the method called linear cauterisation, enucleated the tumour by squeezing it between two steel blades, and then destroyed the pedicle with Vienna paste. This was nothing less than removal of the tumour—the caustic replacing

the knife. I will mention, while speaking of cauterisation, removal by means of Chassaignac's *ecraseur*, the elastic ligature which is due to Sylvestri, of Padua, and the galvano-cautery. All these procedures, which a few years ago were employed with good reason, are to-day left aside by nearly all surgeons, and the knife is the only instrument employed.

When the tumour is enveloped by a layer of cells in which it is encysted, or if it is adherent to the gland two procedures may be employed. One is enucleation, the other is partial amputation of the breast. Enucleation, when possible, seems to be the operation to perform, for it is of a remarkable simplicity and without danger. In fact, the skin only is incised, leaving the gland untouched; nevertheless, according to Labbé and Coyne, this operation "is in contradiction with what pathological physiology teaches us as to the so-called adenoid tumours and the recurrences which take place. In fact, this neoplasm forms around the glandular lobules, whose connective tissue surrounding the acini was the starting-point of the hyperplasia, following some irritating morbid process. By performing enucleation a mass of glandular tissue is left at the bottom of the wound, which runs a great chance of undergoing the same metamorphosis as the parts removed." Now, on the other hand, the operation of enucleation is not so serious, even as a partial amputation of the breast, and which, as to shape, gives a good result; on the other hand, the danger of a recurrence of fibroma is too little feared, although Labbé and Coyne mention a case, but nothing proves in this case that this was a new tumour more than a recurrence. Consequently, this operation deserved to be practised, and, when possible, should be preferred to partial amputation of the breast, especially in solitary fibroma slightly adherent to the gland. According to Billroth the operation should be performed as follows:—The patient placed on the table, with a pillow under the trunk; if the tumour is not larger than a big apple, and the skin normal and movable, the tumour is tightly seized with the left hand in such a manner as to cause it to project under the skin, and an incision is made, following its longest diameter. After section of the skin the tumour forms a hernia from the incision, and is then freed by little incisions. It is then seized by the left hand with a *Museux* forceps, or by an assistant, and then drawn out. Its extraction is completed with the knife or scissors, the wound drained, and the skin sutured. When the tumour is limited, and when it cannot be separated from the gland with which it forms a mass, as in cases of multiple fibroma,

the glandular portion must be removed. This is partial amputation of the mamma, although after the lesion has extended to different parts of the glands; for under the influence of this intervention other hard nuclei are often seen to slowly diminish in size, and after a longer or shorter period to disappear completely. This is what happened in Case I.

Partial amputation of the breast may be of use in certain cases of the cystic disease of Reclus, especially in those where there appear to be direct relations with fibrous products of the breast. Case II. was perfectly and completely cured by partial amputation of the organ, and the piece removed showed clearly on examination that we had to do with a case of Reclus's disease. It is better, therefore, from an æsthetic point of view as well as from the gravity of the intervention, to select partial amputation in preference to total. This incomplete removal may suffice to bring about absorption of the remaining diseased parts.

To perform partial amputation of the breast, if the skin is movable, an incision is made, following the greatest diameter of the tumour; if the skin is adherent a flap should be made, by making two curved incisions, corresponding to the transverse diameter of the growth. The tumour being brought into view, one to two centimetres of the gland itself are excised in order to remove all diseased glandular parts, the skin is sutured, and a drain inserted. By this method patients always bear a mark of the operation, for the breast no longer has its ordinary shape. In the spot corresponding to the portion of the gland removed a depression exists; all the more visible the greater has been the removal. The breast is sunken in, and the nipple may retract, while the skin adheres to the deep parts. Such are the inconveniences of great importance, especially in young women, which led Professor Tripier to make deep suture of the gland and suture of the skin, that is to say, two planes of sutures superposed upon one another.

I will now describe this operation. Having shaved the armpit, and all necessary antiseptic precautions having been taken, an incision is made over the tumour, directed from above downwards and from behind forwards, parallel to, and following the external border of the pectoralis major; the length of the incision varies, but should not be so long as to reach the areola. After incising the skin and subcutaneous cellular tissue, the tumour is cut down upon, and the incision deepened, so as to come to loose submammary tissue, which is situated over the pectoralis major; separating it

from the glands. Both halves of the tumour are now separately removed with the portions of the gland which contain sclerosis. The portion removed (see Fig. 1) has the shape of a triangle, with the base situated at the periphery of the gland and the apex near the nipple. The size of the segment removed depends upon the extent of the lesions; in one case Professor Tripier removed one quarter of the gland. When bleeding is staunched, the first drain destined to assure the flow of liquids which may exist in the submammary tissue is inserted. This drain is placed under the gland, and is commenced by a counter-opening made in the external furrow; the other end of the drain reaches the wound made in the gland. When this drain has been introduced the gland is sutured with three catgut sutures; the first and third are at the extremities of the wound, the second in the middle (Fig. 1); this forms the deep or supporting suture. The catgut is introduced from without inwards, entering the surface of section of the gland. When this has been accomplished, the second drain is introduced, which forms a right angle with the first; it is placed in the gland, with the upper extremity directed towards the armpit, while the lower end passes out by the upper end of the cutaneous wound. The operation is completed by suturing the skin. This I will call the superficial or perfected suture. Three catgut sutures are inserted, while the intermediate ones are made with metallic wire (Fig. 2), the wound is washed, the drains are examined, to be sure that they can fulfil their functions, and a bandage is applied. This procedure is employed very often by Professor Tripier, for it is the most suitable for tumours situated on the supero-external side of the breast (Cases I., II., III., and IV.), and which, as has already been said, adhere intimately to the gland.

The advantages of this method are that the woman has no trace of deformity, or of the operation—an end which should be all the more sought for, because, as I have shown, the affection in which this procedure is employed occurs especially in very young women. The most marked deformity, when the suture is not made, is a crater-like depression over the portion of the gland removed; the shape of the breast is destroyed, for the gland being removed the breast lengthens and sinks in. By suture of the gland the circumference of it is continuous; an æsthetic result is positively obtained. The breast, which before the operation may have been flabby and pendant, becomes prominent, firmer, and raised up, after the operation (Cases I., III., and V.) In Case III. the right breast

contained a fibroma, and hung down lower than the left. To-day it is on the same level and equal in size to its fellow. One patient told me that she was delighted with the operation, and two years after she said that it had given her the breasts of a young girl. No other deformity is to be seen excepting a rose-coloured line caused by the incision, and this disappears after four or five years. The line of incision is the only trace of the operation, and according to the situation of the tumour may be so arranged as to be completely hidden. In Case VI. the tumour was situated near the nipple. Prof. Tripier made a curved incision in the line of demarcation of the skin and areola. When the skin was incised the curved incision became transverse, and the tumour was easily enucleated; the walls of the cavity thus formed in the gland by removal of the fibroma were sutured in such a way as to re-establish the continuity of the gland; drainage and suture of the skin. There was not a trace of the operation; the line of incision was lost in the junction of the skin with the areola. In this case the gland was sutured; although no part of the gland had been removed, and only an enucleation performed.

Prof. Tripier leaves no cavity in the mammary gland, and whatever may be the portion removed—a segment of the gland, an enucleable fibroma, cysts, &c.—he always sutures the walls of the cavity thus formed in order to avoid, as I have already said, a depression which might form on account of adhesions of the skin with the cavity. Besides the incision of the skin on the supero-external side of the breast, and the periareolar incision, an incision of the skin under the breast may also be made in the furrow separating the organ from the thorax.

This incision, suggested beforehand by Gaillard Thomas, was practised for the first time—at least in Europe—by Rouge, of Lausanne. Dr. Mollière, of Lyons, has often employed it. The breast being raised, the sub-mammary serous bursa is opened, and the tumour is attacked on its deep surface. This incision may be more or less prolonged, but always following the sub-mammary fold, so as to allow the breast to be turned back and to remove the desired portion of the gland. Mollière says—"The gland, left to itself, falls, and the cicatrix is hidden in the sub-mammary fold to such a point that, after the operation, the gland operated on and the healthy gland cannot be distinguished. The operation is relatively easy; nevertheless, it demands a certain experience with the knife when the tumour is situated high up—as, for example, between the breast and clavicle, and it is then especially indicated in an æsthetical point of view" (9).

Prof. Tripier has perfected this procedure by adding the suture of the gland, and a better result is obtained. Not only is there no trace of the operation, but the shape of the breast is corrected—it cannot sink in, and is raised at the same time (Case V.). This operation is excellent in every way, and allows tumours situated high up to be removed. In Case V. one could reach 6 centimetres above the nipple. At the same time it hides the line of incision, and by suturing the gland the external aspect of the organ is happily modified; consequently, it should be performed whenever the opportunity offers.

CASE I.—Marie D., aged thirty-eight; admitted March 5, 1891. Patient is very nervous; menstruated at thirteen; has felt shooting pains in the left breast for one or two days. Married eight years ago; no children. In 1874 the patient received a violent blow on the left breast. From this time, at the epoch of her menses, the pain in the breast became violent; the left breast is larger than the right. Dr. Tripier was consulted in 1876, and prescribed a medical treatment, which greatly improved the patient for some months. But the pain returned; at first it was slight, and then increased in frequency and violence. Six months ago the patient again consulted Dr. Tripier, who found multiple tumours in both breasts, especially in the left, and of which the patient was not aware. Enlarged glands in both arm-pits; medical treatment produced no effect. The pain, which up to that time existed only in the left breast, appeared in the right as well. Four months ago the pain appeared in the muscles supplied by the brachial plexuses, more violent on the left side. The patient entered the hospital.

Present state.—Left breast more hypertrophied than the right; of normal appearance. On palpation in the supero-external region of both breasts, hard tumours are found. These cannot be isolated from the gland, with which they form masses of various sizes; the largest are the size of a walnut, and movable. The breasts, and especially the left one, are painful on pressure.

Operation performed on March 7th.—Partial amputation of the gland containing the largest tumours; deep suture of the gland, as has already been described. Histological examination of the portion removed, showed it to be a case of multiple fibroma, accompanied by chronic mastitis. The sequel of the operation was excellent; the bandage was removed the 17th of March. An effusion of blood was in the left breast, which slowly underwent absorption; it still existed the twenty-fifth day after the patient had left the hospital. Pain disappeared in the right breast, but was still quite sharp in the left, probably on account of the effusion.

The patient came back (May 20th) complaining of violent pains in

the left breast; the effusion had completely gone. As the patient was excessively nervous and a hypochondriac, an anti-nervous treatment was prescribed. The pains disappeared slowly; they were still slight on June 12th, when the patient left the hospital. The result of the operation from the æsthetic point of view, was excellent; the breasts were hard and well raised, and their shape is better than before the operation. The nodules have disappeared in the right breast; some still persist in the left.

CASE II.—Rose G., aged thirty-six; menstruated at thirteen. Married; has one child which she could not nurse; has had one accidental abortion. From the time that the patient had her first menstruation, she had experienced, at each period, quite sharp pains in both breasts, which became large and lumpy. Three months ago, without any appreciable reason, the patient found a tumour in the left breast the size of a walnut, attended with pain, and enlarging so rapidly that she was obliged to enter the hospital. The tumour was about the size of a mandarin, hard, movable, spontaneously painful—more so at the time of her menses, and also produced by pressure. No enlarged glands. In the other breast a tumour of the same nature was found. Removal of the tumour of the left breast, consisting of a cyst. All around this cyst, and invading the entire gland, small cysts and fibrous nuclei were found, so that we were obliged to entirely extirpate the left breast.

The patient returned the following year, suffering exceedingly from the right breast, in which multiple tumours of various sizes were discovered. The largest of these tumours—the size of a turkey's egg—was irregular in shape, resistant, and its surface was covered with lumps, one being much larger than the others. The tumour occupied the external side of the breast, and extended nearly to the nipple. In the rest of the gland small, indurated points are found, feeling like grains of lead.

Operation performed June 5th, 1888.—According to Tripiér's method, incision on the external side, removal of a quarter of the gland, deep suture, &c. The sequel of the operation was excellent; the examination of the tumour has already been given. The patient left cured. The hard nuclei, which existed in the other parts of the gland, were found to be slowly disappearing.

From time to time I saw the patient, who at the present time is undergoing treatment for metritis, as she suffered again from some pain in the right breast. This has completely disappeared since the treatment has been commenced.

CASE III.—Marie G., aged twenty-seven; entered the hospital Oct. 28th, 1889. Menstruated at fourteen. At the age of fifteen she noticed by chance that she had a small tumour the size of a walnut in the external side of the right breast; it was painless, movable, and underwent no

changes at the epoch of the menses. After ten years' duration the tumour is the same; as medical treatment had no effect, an operation was performed in Dec., 1886, according to Tripiér's procedure. The drains were removed on the eighth day, and the patient cured on the twelfth. She continued to come from time to time during two months, complaining of some slight pain in the shoulder and right breast, but this rapidly ceased. I saw the patient on April 26th, 1890. She was married in Aug., 1887; became a mother in June, 1888, and nursed her child for fifteen months on both breasts. The breast operated on furnished as much milk as the other one, and has given place to no painful or other symptoms. The breast operated on presents no difference from the other one. The skin is movable, and the only trace of the operation is a line two centimetres long, which is slowly diminishing; the shape of the breast is perfect, and absolutely resembles the other. The right breast, which before the operation descended more than the left one, is to-day on the same level with it.

CASE IV.—Claudine G., aged thirty; entered July 12, 1887. Menstruated at sixteen; irregularly up to the age of twenty. Married; one child, which she did not nurse. The *début* of the present affection dates back seven years; commenced by a painful gland in the armpit. Some time before this the patient received a blow on the breast. The pain in the armpit lasted until the spring; at this time the patient had attacks of shooting pains in the left breast several times during the day. At the same time she perceived that there was an indurated spot in the upper part of the breast; this tumour, not quite so large as a silver half dollar, was very sensitive on pressure. The patient used every possible and imaginable means to suppress it without obtaining any great relief. She entered the hospital for an operation. The tumour has remained stationary, and is movable under the skin.

Operation performed July 15.—Following Tripiér's procedure, the gland, which had, macroscopically, a normal appearance, was cut down upon; nevertheless, on section it has a sensation of resistance greater than the normal, and the glandular *cul-de-sacs* project; the connective tissue seems thickened.

July 20.—The pain is considerably better, and diminished progressively.

July 24.—It had ceased, and the patient was nearly cured, only the course of the drain is not yet closed. The shape of the breast is as perfect as possible.

CASE V.—Dauphiné N., aged thirty-two; entered April 30, 1890. Menstruated at thirteen regularly. At about the age of fifteen, at the epoch of the menses, the patient noticed that a few drops of bloody liquid flowed from the right breast, without there existing either tumour or pain; in the interval of the menses all disappeared. Married at twenty-

seven; first gestation twenty-eight, and a second one year later. The patient nursed her first child entirely, a little more with the left than with the right breast; because, she tells us, the nipple of the left organ was longer than the other. A year and a half ago she sustained a blow on the right breast; two weeks after this she noticed a tumour the size of a hazel-nut situated in the internal region of the areola; it was entirely painless, and slowly increased in size. Four months ago the discharge from the breast, which always appeared at the epoch of the menses, ceased, and the tumour rapidly enlarged. At the time of the examination at the hospital the left breast was a little larger than the right; the nipple was retracted a little, but on stretching the skin it was made to project. On palpation, a crescent-shaped tumour was found in the internal region of the breast, extending above and below the nipple, which was compressed in its concavity; it appears to surround the galactophorous canals. This large tumour is hard and lumpy; no adhesions. By pressure a drop of serous liquid was expelled from the nipple. No enlarged glands; no pain.

Operation performed the 6th of May.—A transverse incision 12 centimetres long is made in the submammary furrow. The tumour is laid open to view, and enucleation attempted, but is unsuccessful, and a careful dissection of the part becomes necessary; an accidental incision made in the tumour caused the escape of a brown-coloured liquid. This proved that we were in the presence of a cyst, and a slow and difficult dissection was made. It was formed by the galactophorous canals, which have sent forth ramifications in all directions. Under the nipple the cyst was so superficial that the knife was only a millimetre from the skin. We were obliged to go as far as 6 centimetres above the nipple. When the cyst was removed the wound was washed with carbolised water; a deep drain was introduced by a counter-opening made in the axillary line. Deep suture (with catgut) of the shell which had enveloped the cyst. Superficial drainage; section of the skin.

En résumé, this was the same procedure as for a removal of a segment of the gland. The patient left May 23, completely cured. No apparent trace of the operation; the breast operated on, which descended lower than the other organ, is now on the same level; the nipple is not retracted.

CASE VI.—Marie D., aged forty-five; hereditary tubercular antecedents. Married twice; has two children. The last labour was in 1880, followed by an abscess of the breast. In May, 1887, she found a tumour the size of a large walnut in her right breast, causing sharp pains extending down the arm of the affected side. On examination of the region a small tumour, quite movable in the deep parts and under the skin, was found. It was situated in the lower part of the breast; above quite an extensive and diffused induration of the gland was discovered.

In the corresponding arm-pit two or three large and indurated glands are found, and which escape from the finger when pressed. Nothing in the sub-clavicular region. The last-mentioned symptoms are all attributed to the abscess of the breast at the last labour.

Diagnosis.—Adenoid tumour of the breast. The treatment consisted of iodide of potassium internally, and a salve composed of the iodide and belladonna, *loco dolenti*; and as no result was obtained, an operation was decided upon. Prof. Tripier made an incision over the growth, and profited by the zone of the areola for hiding it. The incision was curved, followed in the boundary line between the skin and areola. When the cellular tissue had been cut through, the incision became nearly transverse; a layer of glandular tissue is divided, and the tumour was thus brought into view and easily enucleated. The cavity thus formed was drained, and the glandular tissue forming the anterior wall was sutured with catgut. The superficial tissues were sutured by means of metallic wire, after sub-cutaneous drainage had been established. Healed by first intention.

The patient left cured, with a perfectly-formed breast, and it is even less flabby and pendant than the healthy organ. The patient was seen last June. The cicatrix is hardly to be seen, and is reduced to the proportions of a simple scratch; both breasts are exactly the same in shape. The histological examination of the piece which was removed showed it to be a case of typical fibroma, containing numerous cystic dilatations and spaces.

Chronic inflammation of the breast, developing under the influence of menstruation or the puerperal condition, may end in fibroma or multiple cysts. Traumatism, by producing localised mastitis, can thus produce fibroma or solitary cysts; *à fortiori*, when the preceding causes exist. The affection, if taken at the outset, can be greatly improved and even cured by a local and general medical treatment, applied both at the same time. If it remains without effect, surgical treatment is necessary—by enucleation if it be possible, but more frequently, partial amputation of the breast. Prof. L. Tripier has improved the procedure by employing in every case two drainage-systems and two plans of sutures—a sub-mammary drainage and deep suture of the gland; a sub-cutaneous drainage, and a superficial or cutaneous suture. This method gives excellent results as to the shape of the breast—all the more so as in certain cases it is easy to hide the line of incision either in the sub-mammary fold, or in the line of junction of the areola with the skin.

WORKS REFERRED TO.

[The numbers correspond to those in the text.]

- ¹ "Tumeurs bénignes du Sein."
- ² G. B. Schmidt. "Beiträge zur klinischen Chirurgie."
- ³ "Pathologie Chirurgicale Speciale."
- ⁴ Idem.
- ⁵ "Comptes rendus de la Société de Chirurgie." 1888.
- ⁶ "Cliniques Chirurgicales."
- ⁷ "Die Geschwülste der Brustdrüsen."
- ⁸ "Cliniques Chirurgicales."
- ⁹ Mollière. Op. cit.

THE TREATMENT OF DIPHTHERIA BY THE INJECTION OF THE ERYSIPELAS ALBUMOSE.

DR. G. A. BANNATYNE (*Glasgow Medical Journal*, Sept. 1891), struck by a report of cases of diphtheria successfully treated by Dr. Babchinski, of Kieff, by the inoculation of erysipelas virus, has tried a short but important series of experiments on guinea-pigs and rabbits. He draws the following conclusions:—1. That even although the diphtheria had a good hold of the animal's system, yet by injecting the erysipelas albumose it could be arrested. This was true, either when the symptoms were only beginning to show themselves, as well as when they were well marked and severe. The albumose acted apparently by killing the bacilli—at least it rendered the surrounding ground unsuitable to their development, and thus prevented their elaboration of chemical poisons. 2. It produces immunity, of how long duration he cannot say, as far more elaborate experiments are required to determine this point. 3. The dose varies from a $\frac{1}{5000}$ to $\frac{1}{750}$. If one dose is not sufficient, and in a few cases it will be sufficient, a second should be given, slightly larger than the first, and so on until no reaction is got after the injection. The first dose, he held, should not be more than $\frac{1}{5000}$ at most.

DEATH FROM ETHER.

A DEATH from ether is recorded (*Medical News*, Philadelphia, LIX.-4, page 102) by Dr. Charlotte Brown. The patient suffered from fibroid tumours of the uterus, and was twice operated on with success under ether. After severe hæmorrhage, a third operation was recommended, and ether was again administered. Death occurred whilst the wire of the ecraseur was being slipped round the tumour. It is recorded that after the heart ceased beating there were a few weak efforts at respiration.