ON THE
DEVELOPMENT OF MAMMARY FUNCTIONS
BY THE
SKIN OF LYING-IN WOMEN.

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THE subject of numerical abnormalities of the breasts and nipples has from time to time received considerable attention under the titles of supernumerary mammae and nipples; it has been referred to by Sir James Simpson,¹ it has been treated by Dr. Mitchell Bruce² in an excellent paper, and, most exhaustively, by Professor Leichtenstern.³ Cases have also been recorded by Dr. Handyside,⁴ by Dr. Matthews Duncan,⁵ by Mr. Cameron,⁶ and by others.

The cases recorded by these observers have included numerical abnormalities of nipples, of nipples with mammary glands, and of mammary glands with pores and without nipples. With these we are now only indirectly

¹ 'Obstetric Works,' vol. ii, p. 325.

² 'Journal of Anatomy and Physiology,' vol. xiii, 1878-9, p. 425.

³ 'Virchow's Archiv,' Band 73, 1878, s. 222.

⁴ 'Journal of Anatomy and Physiology,' vol. vi, 1873, p. 56.

⁵ 'Obstetrical Journal,' vol. i, 1873, p. 516.

⁶ 'Journal of Anatomy and Physiology,' vol. xiii, 1878-9, p. 149.

concerned, indeed, only so far as to include certain specimens which have come under my personal observation, and which serve as a contrast to those cases which I propose to describe, cases which, so far as I know, are new.

These supernumerary structures, described by many authors, are in the great majority of cases situated below the normal mammæ and are a little nearer to the middle line ; when they are *above* the mammæ they are always (says Leichtenstern) *more external* than the normal mammæ. But this situation is so rare that out of 105 cases collected by him only 5 were situated in the axilla, while 2 were on the back and 1 on the acromion.

In the case of the five axillary mammæ (S. 254) they were all provided with nipples, often more or less rudimentary, from which milk or colostrum exuded. In 2 cases the side affected was the left ; in 3 both sides were affected. Thus, the left side was affected in all in 5 cases, the right in 3.

Mr. Cameron's case, which is not included in Leichtenstern's 5 cases, and, indeed, is somewhat different, is briefly as follows : A married woman, æt. 33, pregnant with her sixth child, observed a swelling under the left arm after over-exerting herself at a fire, when in her alarm she seized several buckets and carried them till she was exhausted. After her confinement milk could be squeezed from the tumour.

When examined a soft tumour was found in the left axilla behind the fold of the pectoralis major ; the mass was easily moveable and not connected with the breast of the same side. Its boundaries were difficult to define as the edges appeared to go under some structure and elude the fingers, reminding one somewhat of a hernia. This seemed to lead to the inference that there was originally a capsule or investing membrane which had burst on the occasion mentioned above as a result of over-exertion. This appeared all the more probable as no tumour was suspected before that occurrence, and from its size when examined, and the intelligence of the patient, this seemed

hardly credible, unless some change then took place in its condition or surroundings.

The length of the tumour may be roughly stated at about three inches by about one and a half in breadth. The skin over it was slightly darker in tint than that in the neighbourhood. The tumour was not painful or tender, nor had it given any trouble while suckling the last child. At the time the examination was made the patient was again pregnant, and milk could be drawn from the breast. A small orifice was found at the upper and anterior part of the tumour (but nothing like a nipple) ; from this a fluid could be squeezed which under the microscope proved to be milk, thus showing the true nature of the tumour.

Since the patient was under observation she has been confined, and it was observed during lactation that milk flowed freely from the tumour, and that whenever the breasts were allowed to become full the tumour swelled coincidently.

Cameron quotes a case related to him by Mr. Bickersteth, in which a somewhat similar tumour, as large as a cricket ball, was removed from the right axilla ; it had at first been as large as a walnut and had steadily increased in five years to the size of a cricket ball. It was removed from a distinct capsule and proved to be an adenoma, such as is found only in mammary tissue. The conclusion was, therefore, that the tumour was an adenomatous supernumerary mamma.

The value of this case lies in the microscopical examination, but the great increase of the tumour in size was pathological.

Mr. Bickersteth (says Cameron) had observed a somewhat similar case in an unmarried woman, æt. 33. The tumour was about the size of a fist ; it had developed with the development of the breast, but had not increased in size since puberty. It was not interfered with.

Leichtenstern found the left side much oftener affected with supernumerary mammæ and nipples than the right

side in the proportion of seven to two. He remarks that he cannot explain this, but that the left breast is usually the larger. Dr. Mitchell Bruce found them also more frequently on the left side.

The cases which I have to describe were observed in the General Lying-in Hospital and (not including cases like some of those above) number thirty, three of them during Dr. Williams's months of office. He has kindly allowed me to incorporate them.

The first included in the series concerned a patient admitted Oct. 9th, 1882, and the last concerned a patient admitted Nov. 27th, 1884. During this time the total number of patients observed in the hospital was 712. As will be seen by the table annexed, the appearances were observed far more frequently during some periods than others, they were not uniformly distributed in time, and no percentage represents the facts accurately. Indeed, the regular observations began Oct. 1st, 1883; this makes the total number of patients during this series 377, in 27 of whom these swellings were found.

As to the side affected—the right side was affected in 14, the left in 1, both in 15. Thus the total number of times in which the right side was affected was 29, the left 16. This is at variance with the proportion observed in supernumerary mammæ and nipples.

When bilaterally situated the lumps in the right side were the larger in 7; the left in 3; they were of equal size in 5. Thus the right side predominated both in frequency and in size.

It now remains to give—

I. A description of these bodies:

1. They are situated in the *skin* of the axilla, which cannot be pinched up freely over them. On attempting to raise the skin, it seems to be tied to the lumps by fibrous septa.

2. They can be raised and isolated from the deeper structures, and are not in the situation or of the shape and feeling of glands.

3. The skin over them is usually quite natural in appearance.

4. They are limited to the hair-covered surface.

5. They are usually soft, and somewhat elastic except when swollen.

6. They are usually somewhat flattened, their vertical diameter being the smallest.

7. They do not possess any nipple, pore, or duct.

8. Their size varies from the smallest perceptible, to that of an egg, or perhaps larger. (As to the comparative size of those in the right and left axilla, see above.)

II. As regards the *course* :

1. They are most commonly first noticed on the third or fourth day after delivery, at the time when the breasts fill. But they can very often be found, if looked for, at the time of labour, and the patient is sometimes conscious of their presence continuously from her first pregnancy.

2. They sometimes, when once established, become larger and occasionally painful at the beginning of pregnancy, sometimes at quickening, sometimes later in pregnancy, but most commonly not until after delivery.

3. Their course during lying-in usually coincides generally with that of the breasts, enlarging and becoming tense and sometimes tender about the third day, softening as the breasts soften, and becoming much smaller, or even almost imperceptible, by the end of a fortnight. As a rule, however, their size and tenseness does not coincide with the diurnal variations of the breasts in this respect.

III. As regards their *secretion* :

1. In the first 11 the mode of obtaining the secretion had not been discovered.

2. In the remaining 19 (with one exception) secretion of some kind was obtained.

3. In no case did secretion flow spontaneously, as described in some cases of axillary mammæ.

4. To obtain secretion it was necessary to firmly squeeze the lump between the fingers, from the deeper and towards the superficial aspect, as in evacuating a comedo.

5. The secretion was of three principal kinds:—(a) Granular débris, like the secretion of sebaceous follicles; (b) colostrum; (c) milk.

6. The above was usually the order in which the various secretions appeared.

7. Colostrum, milk, and granular débris might disappear and reappear within a few days.

8. At the same time various follicles would produce various secretions. The whole lump was not always uniform in its secretions at the same time.

9. The secretion was expressed from the situation of the sebaceous follicles as marked by the situation of the hairs. Before the secretion exuded for the first time from a follicle which was being squeezed, the follicle was usually seen to swell up, become prominent, whitish in colour, and often to discharge a fluid like thin gum, after which other secretions might follow.

10. The whole surface of the lump produced secretion; there was no centralisation.

In one case (No. 200, admitted August 25th, 1884) belladonna seemed to soften the lump and to promote escape of secretion, as in the case of the breast.

In order to reduce scepticism to a minimum, invitations were sent to many competent observers, and the appearances were seen by Drs. Braxton Hicks, Matthews Duncan, Gervis, John Williams, Herman, and Mr. Clutton, as well as by the author and by Drs. E. S. Tait and Boxall, who were successively house physicians, and from whose careful notes I quote below.

The following well-marked cases are described at length; the main facts of the others are set forth in the table.

Axillary Lumps without Nipples or Pores.

No. 200.—Admitted August 25th, 1884, æt. 30, 3-para. Lumps in both axillæ were noticed on admission.

On the second day the following note was taken:

“In the right axilla at the apex, extending in about

equal proportion on the inner and outer wall, is a lump in the skin three inches long, one and a half inches wide, and three quarters of an inch thick, thicker towards the chest than elsewhere; of even contour; firmly united to skin, and freely moveable on subjacent structures. Skin cannot be pinched up over it, but can be brought together under it, except where it is too thick to allow of it. Surface is covered by a few hairs; hair-covered surface is co-extensive with lump. Not painful, but a little tender on manipulation. No redness of surface, no duct to be seen. On squeezing, a little fluid exudes from a follicle with a hair in the centre, and others swell up, but do not rupture. In the opposite axilla is a similar lump, to which the above description equally applies, except that it is less defined and somewhat softer. Patient first noticed the lumps two or three months before her first confinement; smarting in the armpits drew her attention to them. They were smaller then than now; they got bigger and more painful till confinement and then went away, beginning to get smaller directly after labour, and had entirely gone at the end of a month. They were never then as large as now. The same series of events happened in the second pregnancy and after labour, but the lumps were larger than before and more painful. In this pregnancy they were noticed first about eight months ago, the aching pain drew attention to them, and she thought an abscess was forming. They have gradually got bigger and more tender up to the present time."

On the fourth day the lumps were noticed to be rather harder and more tender. Glycerine of belladonna applied.

On the fifth day the lumps were relieved by the belladonna. "On squeezing the lumps the follicles of the skin over them enlarge, and fluid oozes up around the hairs."

On the seventh day, "the lump under the right arm was squeezed, the follicles swelled up and fluid exuded around the hairs. This was collected from three different follicles; from one it came in great abundance and looked quite like milk both to the naked eye and under the

microscope ; it was perfectly typical, with a few colostrum corpuscles. Another specimen from another follicle showed many very well-formed colostrum corpuscles and milk globules, and a third specimen from another follicle showed a few colostrum corpuscles and a few globules like dilute milk. Of its character there can be no doubt."

On the ninth day the lumps were softer, smaller, and much less tender. "Milk from the other (left) lump was examined microscopically. It proved to be typical milk with excellent colostrum corpuscles."

On the tenth day, "the lumps keep much the same. When asked if they are still painful, patient volunteers the information, 'Only when the draught comes into the breast, they get hard at the same time, but subside with the breast.'"

On the fourteenth day, "says the lumps get hard at night when the child is put to the breast, but soon subside when the breast is emptied. Knows when she is in the family way by pain being felt in the lumps."

No. 239.—Admitted October 16th, 1884, æt. 33, 4-para.

On the second day the following note was made :

"In either axilla is a soft lump in the skin, so soft at present that it cannot well be defined. That on the left side is harder than that on the right ; they are limited to the hair-covered surface. The skin beneath them can be nearly, but not quite, pinched together, as the lump is of considerable thickness ; it cannot be pinched up upon it. No redness, throbbing, pain or tenderness. No duct can be seen. Not noticed before."

On the third day, "each lump is about the size of a large walnut, harder and more defined than yesterday."

On the fourth day, "the lumps rather larger, but not much harder. On squeezing them the follicles in the skin swell and exude fluid."

On the fifth day, "the breasts became hard in the night and so did the lumps. The breasts are now full, and the lumps are hard and well defined."

On the sixth day, "both lumps and breasts softer."

On the eighth day, "the breasts are soft and so are the lumps. The lump in the left axilla was squeezed firmly, and the hair-follicles swelled up as white points, looking something like small pustules with a hair in the summit of each. Some fluid begins to exude around the hairs in seven or eight places. This fluid collected on a cover-glass and examined under a microscope is seen to consist mainly of granular epithelial débris, much of which is freely floating with a few free oil-globules and a considerable number of colostrum corpuscles."

On the eleventh day, "lump in either axilla hardens whenever breast of same side gets hard and full."

On the twelfth day, "microscopic specimen made of fluid from lump in right axilla proves to be similar to that from the opposite side on eighth day. Both lumps are much softer to-day, and the breasts are soft too. Now says she noticed the lumps soon after first confinement, and they ran a similar course. The doctor in attendance also noticed them, and told her she had a small tumour in either armpit, and requested her to go to him again after she got about, but she did not do so."

No. 287.—Admitted November 29, 1884, under Dr. Williams, æt. 39, 8-para.

On admission very soft lumps were noticed in both axillæ, not easily defined at present, that in the right the larger.

On the second day, "at the apex of either axilla, is a lump in the skin, very soft at present, so that its area cannot well be defined. It is commensurate apparently with the hair-covered surface, and is three inches long by two inches broad, the long diameter running from the chest in the direction of the axis of the limb. It appears to be about half-an-inch thick, and is of barely firmer consistence than an accumulation of fat would be. There is no abnormal appearance on the skin, no redness, and no duct. The lump forms a visible fulness in the apex of the axilla. It is of fairly even contour, a little tender on manipulation; the skin can be pinched almost but not quite together under it owing to its extent and thick-

ness, but cannot be pinched up over it ; it is freely moveable on the subjacent structures. On squeezing the lump the follicles in the skin over it swell, and a small quantity of fluid exudes from several hair-follicles around the hairs. This effect is produced by very little squeezing. On collecting this fluid from several follicles for microscopical examination, it looks opalescent between glass, and on further examination it is seen to consist mainly of granular *débris* with a few oil globules of varying size floating freely in a clear liquid, and in another part of the specimen are many globules with several large, well-defined colostrum corpuscles. The lump on the left side is rather smaller and softer than on the right. These lumps were noticed on admission and have become rather larger, harder, and more defined since. She herself was unaware of their existence, and knew of none in her previous pregnancies or lyings-in, but the *axillæ* have, after each confinement, but not before, "become tender till the flow of milk came in, and I thought it was from throwing my arms about when I was confined."

On the third day, "lumps scarcely altered, perhaps that on right side a trifle harder, that on left side is rather larger and harder, so as to more nearly equal that on the opposite side. Fluid from left expressed and examined in same way as that from right, shows same characters in a much more marked degree. In one portion of the specimen is almost pure granular *débris*, with here and there a colostrum corpuscle ; in another is an innumerable colony of perfect colostrum corpuscles without any admixture ; and in another oil-globules of varying size with a few colostrum corpuscles and granular *débris* intermixed. Dr. Herman saw the lumps this evening, and fluid was expressed from the right and examined by him."

On the fourth day, "lumps the same ; it is difficult to separate the breast-gland from the lump on the left side, and on the right they become almost contiguous. The situation between the lumps and breasts on either side is tender."

On the fifth day, "Dr. Matthews Duncan saw the lumps last evening and also saw the same microscopical specimens as Dr. Herman. He thought the colostrum corpuscles were small, and had too defined an outline. A fresh specimen was made in his presence from the lump in the right axilla, and it proved to be milk with two or three of the same kind of corpuscles. Of the milk he had no doubt. The lumps are both rather larger in area and thicker than they were; they measure $3\frac{1}{2} \times 2\frac{3}{4}$ in. (right side); $3 \times 2\frac{1}{2}$ (left side). Their consistence remains unaltered. They are decidedly less tender than they were."

On the sixth day, "lumps same in size and feeling but not tender on manipulation. Dr. Gervis saw the lumps this afternoon. The fluid expressed from the outer portion of the left lump showed under the microscope mainly granular débris with a few oil globules and colostrum corpuscles."

On the tenth day, "lumps are getting decidedly softer. Dr. Braxton Hicks saw the lumps this afternoon. Very little fluid could be expressed, but sufficient for microscopical examination. It proved to consist mainly of granular débris and colostrum corpuscles."

On fourteenth day the patient was discharged, with "the lumps scarcely altered."

The following cases, which were observed concurrently with the others, are here inserted by way of contrast, and to show that the author was on the look-out for all varieties of mammary abnormalities.

A. *Extension of Mammæ into Axillæ.*

No. 16.—Admitted January 17th, 1884.

On third day a projection from the mammæ was observed to extend into the apex of each axilla; its greatest breadth was two inches. It was nodular and in all respects like the breast tissue. It joined the outer border of each breast at a tangent. It was fairly move-

able on subjacent structures, the skin over it was freely moveable and could be pinched up. There was no accessory nipple or unusual appearance in the axilla. No secretion could be expressed.

On the fifth day it was noted that the left breast had been sucked and was soft, and so was the axillary extension; that the right breast was harder, and so was the axillary extension.

No. 146.—Admitted July 6th, 1884.

On sixth day the following note was taken:

"In either axilla on the inner wall is an extension of the mamma as far as the apex, it is soft and feels like mammary substance, evidently connected with the breast, and freely moveable on the deep structures. The skin can be pinched up over it. No duct or nipple can be found." No secretion could be expressed.

No. 156.—Admitted July 11th, 1884 (see also "axillary lumps").

On second day it was noted that in each axilla, running up from the side of the breast along the inner wall towards the apex, was a prolongation of the breast, glandular and nodular in feeling, and softer than the "axillary lump" in the skin of the right axilla, which it met at an angle at the apex of the axilla. No duct or nipple could be found and no secretion expressed.

*B. Separate Axillary Mammæ with Axillary Nipples,
Pores, or Ducts.*

No. 136.—Admitted June 27th, 1884.

On the second day the following note was taken:

"In either axilla at the apex is a supernumerary mamma. That in the right is more distinct and as large as a pigeon's egg, at present soft and tender. A tail from this runs down the arm half an inch to an inch, and is a little harder than the rest. The skin can everywhere be pinched up over it, and it is fairly moveable on the subjacent structures. It opens by a duct in the anterior

axillary fold, the opening projects slightly, is perhaps faintly erectile, and out of it a bead of juice can be expressed. A similar lump is found in the opposite axilla with the following differences :—It is softer; has no tail, and out of the duct colostrum can be pressed. No colostrum can be obtained from either breast.”

On the third day colostrum could be squeezed from both axillary mammæ.

On the fourth day both were rather harder and distinctly nodulated like breast substance; milk could be squeezed from both.

On the sixth day the right axillary mamma was larger, and a second pore was found, from which milk could be squeezed.

No 152.—Admitted July 10th, 1884.

On the third day the following note was taken :

“In the right axilla is a lump which feels glandular, rather softer than the breast of the same side, nearly the size of a pigeon’s egg, but too soft to define. It runs from the apex towards the deep structures at the margin of the breast, its surface is covered by hair, it is freely moveable on the subjacent structures, the skin can be pinched up over it. At the anterior border, *i.e.* at the anterior axillary fold, a minute duct can be found, especially on pinching up the skin, when it becomes retracted in that spot; it projects slightly, and is of a little more pigmented colour than the surrounding skin. Scarcely any moisture can be expressed from it. It is not painful. In the opposite axilla is a similar body, but softer and half the size, with a less distinct duct in a corresponding situation. She had a painful lump in either axilla three days after her first confinement, it went away when the milk was dried up a week later.”

On the seventh day milk was expressed from the duct in the anterior fold of the right axilla.

No. 106.—Admitted May 24th, 1884, under Dr. Williams.

On the third day the following note was taken :

“In the left axilla, on the costal wall, close to the apex,

a lump can be felt just beneath the skin, which can be pinched up over it except at one spot where there is a minute hole, a little pinkish and pigmented, just visible to the naked eye, but its position is readily ascertainable by pinching up the skin over the lump, when a dimple is produced at the spot, showing it to be bound down to the deeper structures in that situation. There is no projection of the surface. The lump is about the size of half a nutmeg, round, freely moveable on the deeper structures, and apparently continuous with the glandular substance of the breasts, the connecting medium being an isthmus about one inch long, one third of an inch broad, and one third of an inch thick. The consistence of the isthmus and of the lump corresponds with that of the breast, undulating on the surface. None was found in the left axilla on examination yesterday, and none is apparent now in the right axilla. On squeezing the lump, out of the small pore a drop of fluid was expressed, which the microscope showed to be milk and colostrum."

On the fifth day, "in the right axilla is a small papilla corresponding in situation to that on the opposite side, and a little more distinct than it, standing up one sixteenth of an inch above the surface, and of a brownish-pink colour. In the centre is a duct, out of which milk can be squeezed. It is attached to something beneath, like that on the opposite side, but no lump can be felt. The margin of the breast is distant about one inch."

C. *Supernumerary nipples (without special gland substance).*

No. 301.—Admitted December 12th, 1884, under Dr. Williams.

On the third day the following note was taken :
"Immediately below the left nipple, one and a half inches from the lower margin of the breast, is a nipple-like wart, as large as a pea, with a small pedicle, quite short, and surrounded by a bronzed areola one sixteenth of an inch

wide. No opening can be found in it, there appears to be no gland tissue beneath."

No. 317.—Admitted November 28th, 1883.

On the fourth day the following note was taken :

"Below each breast is a pigmented wart suggestive of a supernumerary nipple. That on the left side is vertically below the nipple and situated on the costal arch ; its diameter is about an eighth of an inch ; it projects about a sixteenth of an inch from the surface, has a central depression and is surrounded by a pigmented area. It is distinctly erectile on irritation, but no moisture exudes on pressure. On the right side is a similar body midway between the nipple and costal arch, that is, lying over about the seventh rib, two and a half inches from the costal margin, and one and a half inches from the circumference of the breast. It is like the other in all respects, but is about twice as large, and a serous moisture exudes on pressure. No gland substance can be felt, nor any elevation of the skin. Says her sister has similar bodies. Thinks they are a little darker than they used to be."

Copy of a letter from patient's sister :

"I have only one small, round place about the size of a small pea, smooth and a brown colour, a small hole in the middle and just below the left breast. I believe I have had it from my birth ; not like a nipple."

No. 181.—Admitted August 8th, 1884.

On the second day the following note was taken :

"At the lower margin of each breast, almost vertically below the nipples but one inch towards the middle line, is a rudimentary nipple projecting about one sixteenth of an inch, consisting of distinctly erectile tissue, of brownish-pink colour and faintly pigmented around for a quarter of an inch. Each has a depression in the centre and looks exactly like a diminutive nipple. That on the left side is a little the more pronounced. There is no swelling beneath to indicate gland substance. On drawing up the skin, the depression in the centre becomes very evident."

No. 186.—Admitted August 10th, 1884.

This was a remarkable case, having a typical "axillary lump" (see Table) in the skin of the right axilla, and *also three small axillary lumps on the right side, and three rudimentary nipples, two on the right side and one on the left.*

On admission the following note was taken :

"At the circumference of the right breast, vertically above the nipple is a small rudimentary nipple of pinkish-brown colour, apparently erectile, with a dimple in the centre, made most distinct by pinching up the skin ; at the side and at the lower border is a still smaller but similar structure. Three axillary lumps close together in the right axilla, none in the left, each the size of a cherry stone, on the outer wall, close to the apex. The skin over them is red (says it feels tender when washed) ; the follicles on the surface are distended, and become more so when squeezed, and ultimately give way in several places, exuding slightly opalescent fluid, which under the microscope is seen to consist of granular and fatty epithelial detritus."

On the second day an indistinct axillary lump was felt in the right axilla in addition to those described above (see Table).

On the 9th day the following note was taken :

"Lumps in axillæ gone. At the circumference of the left breast also (see condition on admission) is a still more marked rudimentary nipple, situated vertically below the nipple, of a brownish-red colour, decidedly erectile, with a depression in the centre, out of which milk readily exudes (confirmed by microscope). None obtained from the others described on the right breast."

No 196.—Admitted August 23rd, 1884.

On the second day the following note was taken :

"Three inches and three quarters vertically below the right nipple is a rudimentary nipple of brownish colour with a faint areola round, and slightly erectile, with a depression in the centre. None on the opposite side. No secretion."

No. 198.—Admitted August 25th, 1885.

On admission a rudimentary nipple was found at the upper margin of the right breast.

No. 200.—Admitted August 25th, 1885.

On admission a doubtful rudimentary nipple was found at the lower margin of the right breast.

The cases which I have described, and which I believe have not been hitherto recognised, seem to prove that in lying-in women the sebaceous follicles of the skin are capable of producing true mammary secretions. The transition from granular material, through colostrum to true milk, is distinct and unmistakeable. They confirm the opinion that the breast is a highly specialised aggregation of highly specialised sebaceous follicles. The least specialised form (1) is that here described, where the skin is merely thickened, and the sebaceous glands may produce true mammary secretions. The next form is (2) that where there is an aggregation of the ducts, which is open by one or more external pores. The highest rudimentary form (3) is where a nipple, or more, is super-added to the last variety. It is also well known that nipples may be developed independently.

I have not yet had an opportunity of making a microscopical examination, but these structures are so far from rare that, when attention is once directed to them, opportunities are sure to arise sooner or later. The secretions were too scanty for chemical analysis. It is far from improbable that they may share the pathological affections of the breast, and even be the seat of abscess.

Verneuil has described lumps in the skin of various parts of the body, which he concludes to be situated in the sweat-glands. One of the favourite places is the axilla, another the mammary areola. Other situations, such as the region of the anus, are not like those which I have described. Not a word is said of any secretion, nor of their connection with pregnancy and lying in. Some parts of their characteristics are never-

theless so much like those above that they are given below. It will be seen, however, that the details are comparatively scanty, and that their situation remained a matter of opinion.

Verneuil's papers are to be found in the 'Arch. gén. de Méd.,' v série, tome 4, 1854, p. 447. ("Études sur les tumeurs de la peau; de quelques maladies des glandes sudoripares.")

(*Ibidem*, *ibidem*, p. 693.)

(*Ibidem*, vi série, tome 4, p. 537.) Sudoriparous abscesses are common in the mammary areola, in the axilla, and round the anus. They were called "abcès tubériformes ou tuberculeux" first by Velpeau, but their seat was unknown to him. Verneuil calls them "Hidros-adénite."

(*Ibidem*, *ibidem*, p. 542.) These abscesses are rarely idiopathic, and are nearly always secondary to local or general causes. Predisposing conditions are to be found in the acrid and profuse sweats of the axilla, anus, scrotum, &c., especially in hot weather.

(*Ibidem*, *ibidem*, p. 544.) In the absence of local causes the affection may be due to general causes, such as scrofula. It is equally common in the two sexes; it is common in adult life.

(*Ibidem*, *ibidem*, p. 545.) The affection may be situated anywhere except on the palms of the hands and soles of the feet, where the thickest part of the epidermis seems antagonistic to it.

(*Ibidem*, *ibidem*, p. 546.) In the axilla, where the sudoriparous glands are most developed, their size may equal that of a pigeon's egg.

(*Ibidem*, *ibidem*, p. 547.) They are isolated from the deep parts of the axilla by fascia, whereas the skin is distensible.

(*Ibidem*, *ibidem*, p. 548.) Septa pass from the skin to the fascia.

(*Ibidem*, vi série, tome 5, p. 327 and p. 437.)

P. 442. If the skin be loose, thin, and movable, the

induration can be raised in a fold between the finger and thumb . . . ; if the induration be somewhat extended the skin can be pinched up in front of it ; it is painless or only causes very slight prickling. Direct pressure, or pressure between the fingers on the other hand, is painful.

The following case, for which I am indebted to Dr. John Williams, suggests that these axillary lumps may be subject to the same sympathetic affections as the breasts.

E. C—, æt. 22, married, had one child twenty months before she was seen on September 14th, 1885, at University College Hospital, complaining of pain and a discharge apparently the result of inflammation after her confinement.

She spontaneously complains of a little pain in the left axilla. When she was between nineteen and twenty she thinks she had a small swelling there during a menstrual period.

In the last month or two of her pregnancy she had pain in the left axilla and felt a lump there ; it went away soon after her confinement. At the present time her attention has been again attracted to the same spot, but she has been unable to find any lump. She is now near the end of a menstrual period, and a little thickening of the skin covered by the hairs can be felt.

During her pregnancy she had pain in the left breast, but not in the right, and during the present menstrual period she has had it again. As a rule she has had no pain in the breast except at the menstrual period.

(For report of the discussion on this paper, see 'Proceedings of the Royal Medical and Chirurgical Society,' New Series, vol. ii, p. 106.)

No. of case	Hospital No.	Date of admission.	One or both sides.	Dimensions (inches).	First noticed.	Largest which day.	State when last seen.	Secretion.	Remarks.
1	253	Oct. 9, 1882	Both	Right bilobed, size of a walnut; left much smaller	About time of quickening	—	16th day nearly disappeared	—	7-pars; lumps first noticed about time of quickening; grew till delivery, and became tender; size and tenderness diminished since. The state of repletion of the breasts produced no effect on their size.
2	255	Oct. 11, 1882	Both	Right size of half a pigeon's egg; left half that size	3rd day	—	Much smaller on 7th day	None	2-pars; first noticed at 7 months; increased till delivery, decreased since; same in last pregnancy, disappearing three months after delivery. State of repletion of breasts does not affect lumps.
3	289	Nov. 21, 1882	Both	Right 3 × 1; left same	3rd day	3rd day	14th day fast; disappearing	None	Small mole in left axilla, from which nothing can be squeezed; 7-pars; similar lumps in all former confinements, beginning about 3rd day, lasting a few days, varying according to repletion of breasts; this variation not distinctly observed while in hospital.
4	278	Oct. 18, 1883	Both	Left = chest-nut; right = bean	5th day	5th day	10th day nearly gone	—	—

5	293	Nov. 4, 1883	Both	Right $2 \times \frac{5}{8} \times \frac{3}{8}$; left $1 \frac{1}{2} \times \frac{2}{3}$ Billiard ball	3rd day	5th day	14th day still distinct	—	Both lumps bilobed; upper lobe larger.
6	301	Nov. 8, 1883	Right	Billiard ball	2nd day	3rd to 10th day	16th day slightly smaller	—	—
7	306	Nov. 14, 1883	Right	$1 \frac{1}{2} \times 1 \times \frac{1}{2}$	4th day	4th to 5th day	14th day somewhat smaller	—	—
8	311	Dec. 4, 1883	Right	$2 \times \frac{2}{3} \times \frac{1}{3}$	2nd day	3rd day	14th day a little smaller	—	—
9	2	Jan. 1, 1884	Right	Rabbit's kidney	2nd day	2nd to 3rd day	4th day half size	—	—
10	36	Feb. 21, 1884	Right	Bean	1st day	1st day	14th day small nut	—	—
11	134	June 23, 1884	Both	Small, ill- defined, especially in left	2nd day	3rd and 4th days	13th day right nearly gone; 5th day left gone	—	3-pars; same in 2nd con- finement. 8-pars; same after 4th and 5th confinement.
12	147	July 6, 1884	Right	Coffee bean	10th day	10th day	Gone on 12th day	Milk on 10th day from the root of a hair.	—
13	149	July 8, 1884	Right	Nut	Before delivery	3rd to 5th day	13th day much smaller	8th day epithelial débris on pressure from roots of hairs	—
14	151	July 10, 1884	Both	$2 \times \frac{2}{3}$	2nd day	7th day	14th day considerable size	Epithelial débris with a few doubtful colostrum corpus- cles exudes on pressure from roots of hairs	Wart in right axilla; right lump larger than left.
15	156	July 11, 1884	Right	$1 \frac{1}{2} \times \frac{2}{3}$	2nd day	3rd day	6th day a little softer	6th day milk with few colostrum corpuscles ex- udes from roots of hairs on pressure	4-pars; the same after last confinement. Extension of mamme into each axilla separate from lump.
16	158	July 13, 1884	Right	Large almond	1st day	3rd and 4th days	10th day disappeared	3rd day granular débris from roots of hairs on pressure	—

No. of case	Hospital No.	Date of admission.	One or both sides.	Dimensions.	First noticed.	Largest which day.	State when last seen.	Secretion.	Remarks.
17	175	Aug. 5, 1884	Both	Right $1 \times \frac{3}{8}$; left cherry-stone	1st day	3rd day	14th day, both disappeared	1st day fluid exudes from roots of hairs, on pressure; from some epithelial débris with few oil-globules, from others oil-globules as large as the largest in milk, a few apparently fused, a few small oil-globules, others just like small milk-globules 5th day milk, small globules, no colostrum	2-para.; lump in right axilla noticed one month after confinement, never quite disappeared.
18	179	Aug. 7, 1884	Right	Cherry-stone	5th day	No change	14th day no change		
19	186	Aug. 10, 1884	Right	Small, ill-defined (3 others size of cherry-stone, 4 in all)	2nd day (3 small ones on admission)	3rd day	Gone on 9th day	Sebaceous matter squeezed from roots of hairs on 3rd day (from 3 small lumps on admission)	3 rudimentary nipples, 2 right, 1 left; 4 axillary lumps right.
20	191	Aug. 13, 1884	Both	Right $2\frac{5}{8} \times 1\frac{3}{8}$; left $3\frac{1}{4} \times 1\frac{1}{8}$	2nd day	5th day	On 14th day much smaller	Opalescent fluid squeezed from roots of hairs, consisting of granular and epithelial débris, with oil-globules of various sizes	6-para.; noticed since 2nd or 3rd day after 3rd confinement, always present since. During 1st lactation left lump as large as an egg, hard, and tender, larger during lactation and during great perspiration
21	200	Aug. 25, 1884	Both	$3 \times 1\frac{1}{4} \times \frac{1}{2}$	1st day	4th day	14th day still distinct	Typical milk, with colostrum corpuscles from roots of hairs over both lumps	3-para.; lumps first noticed by smarting 2 or 3 months before 1st confinement, increased till confinement and diminished directly after; the same in 2nd pregnancy, but larger and more painful than before. In this pregnancy noticed

22	206	Aug. 30, 1884	Right	Soft and ill-defined	3rd day	Always ill-defined	8th day no change	Milk-like fluid squeezed from roots of hairs consists of granular and epithelial debris, with a few oil-globules of varying size	in second month by aching, have grown bigger till now. Pain in lumps let sign of pregnancy. Belladonna removed hardness and promoted secretion.
23	230	Sept. 19, 1884	Left	Size of Bar-celona nut	On admission	2nd day	13th day still distinct	Fluid squeezed from roots of hairs consists of epithelial debris, with many oil-globules of varying size	5-para; never noticed till found by physician.
24	234	Sept. 24, 1884	Both	Right $2\frac{1}{4} \times 1\frac{1}{4}$, left smaller	2nd day	3rd and 4th day	14th day still distinct	On 4th day clear. 7th day granular debris, many oil-globules of varying size, and a few small but typical colostrum corpuscles. 14th day granular debris, typical milk, and a few colostrum corpuscles squeezed from roots of hair. From a separate follicle on 14th day granular debris, with few oil-globules	13-para; lump in right side since last confinement, 2 or 3 days after delivery; got harder and softer as breasts did.
25	239	Oct. 1, 1884	Both	Size of large walnut	2nd day	5th day	12th day still distinct	Fluid pressed from roots of hairs consists of granular debris, a few free oil-globules, and many colostrum corpuscles	4-para; noticed after first confinement by patient and doctor; their course was similar.
26	248	Oct. 9, 1884	Both	Right, size of almond, left 3 or 4 times as large	3rd day	Not much change	13th day still distinct	None, but follicles swell up on squeezing	3-para; first noticed a few days after first confinement, became painful and then subsided, the same in the next confinement.

No. of case	Hospital No.	Date of admission.	One or both sides.	Dimensions.	First noticed.	Largest which day.	State when last seen.	Secretion.	Remarks.
27	252	Oct. 13, 1884	Right	Size of cherry-stone	2nd day	4th day	8th day still distinct	A little fluid squeezed from roots of hairs	—
28	287	Nov. 16, 1884	Both	Right $3\frac{1}{4} \times 2\frac{1}{2} \times \frac{1}{2}$ left $3 \times 2\frac{1}{4} \times \frac{1}{2}$	On admission	5th to 10th day	14th day plainly palpable	Fluid squeezed from roots of hairs on 2nd day, granular debris, few oil-globules of varying size and large distinct colostrum corpuscles. 3rd day many colostrum corpuscles. 5th day milk and colostrum. 10th day chiefly granular debris and colostrum corpuscles	8-para; never noticed before, but after each confinement tenderness in axillae. Lumps and secretion seen by Drs. Braxton Hicks, Matthews Duncan, Gervis and Herman.
29	296	Nov. 27, 1884	Right	Half an nutmeg	2nd day	4th to 6th day	14th day half original size	7th day pure milk from roots of hairs, a few large colostrum corpuscles	7-para; noticed since first confinement; gets larger before confinement, large till about third day after confinement, and smaller when child sucks properly. Between pregnancies size of cherry-stone, but never disappears. Seen by Mr. Clutton.
30	297	Nov. 27, 1884	Both	Right $1\frac{1}{2} \times 1 \times \frac{1}{2}$; left $1\frac{1}{2} \times \frac{3}{4}$	1st day	Left 3rd day; right 4th day	14th day half original size	Fluid squeezed from roots of hairs; third day granular and epithelial debris, few oil-globules and colostrum corpuscles; same on 14th day	9-para; never noticed by patient, but tenderness in axilla always when breasts got full soon after labour and at other times. Had to wean 7th child, and had a painful lump under left arm. Seen by Mr. Clutton.