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Peddie, Alexander, 1810-1907.
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Publication/Creation

Edinburgh : Sutherland & Knox, 1848.

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ON

THE MAMMARY SECRETION;

AND

ITS PATHOLOGICAL CHANGES.

BY

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FROM THE MONTHLY JOURNAL OF MEDICAL SCIENCE, AUGUST 1848.

EDINBURGH :

SUTHERLAND & KNOX, GEORGE STREET.

MDCCCXLVIII.

ON
THE MAMMARY SECRETION;

ITS
CHARACTER, CHEMICAL & STRUCTURAL; THE VALUE OF THE
MICROSCOPE IN THE STUDY OF IT; ITS EXISTENCE AN IMPORTANT
SIGN OF EARLY PREGNANCY; & ITS PATHOLOGICAL CHANGES;

WITH
HINTS REGARDING LACTATION AND THE CHOICE OF NURSES.

THE chief design of this paper is to show, that the existence of milk in the breasts is an important sign or evidence of pregnancy, more especially of a first gestation, and in the earlier months; and to enforce attention to the practical value of the microscope, with the view of detecting the pathological changes of milk, and discerning cases where the propriety or impropriety of lactation, on account of the health of mother or child, may be under consideration. To render my remarks, however, more intelligible to those who may not have given particular attention to the subject of the lacteal secretion, it seems necessary that I should make a few preliminary statements regarding the function of the mammary glands, and the character, chemical and structural, of the fluid formed by them; and, to make this communication more complete and generally useful, I shall in its latter part introduce some general remarks on nursing, the choice of nurses, and the evils of unduly prolonged lactation.

I.—*The Functions of the Mammary Glands, and the Characters of the Lacteal Secretion in its Normal State.*

Providence, kind and wise in every arrangement, has in all respects perfectly adapted these glands, with their peculiar form and

distribution of tubes, blood-vessels, absorbents, glandules, follicles, and epithelial cells, to the purpose of elaborating from the blood a fluid admirably suited for animal nourishment; and while the apparatus and its products are thus so well fitted for supplying physical wants, connected with them are generated sympathies, organic and emotional, which likewise assist in the conservation and growth, first of the embryo, and then of the infant, and draw forth those keen and strong affections which contribute to the mother's health and happiness.

To the accomplishment of those ends, as womanhood is approached the mammary glands are gradually developed, and feelings and desires are excited, and uterine sympathies established, which prepare them for the exercise of their destined functions. Whenever, therefore, conception occurs, these organs and sympathies receive an impulse to activity; so that, on the arrival of the period when the child must maintain a separate existence, the mother is enabled to furnish a supply of food of all others best fitted in quantity and quality for its sustenance.

Human milk, when perfectly healthy, is, to external appearance, thin, turbid, and white, with a slightly bluish tinge. It has a sweet taste, acquires a cream when allowed to settle, will afford butter if churned, will precipitate curd from the serum or whey if mixed with the mineral, acetic, or lactic acids, and finally cheese, if this curd is submitted to pressure. The oily part forms the cream and the butter,—the former by the ascension to the surface of the larger globules, and the latter by the union or incorporation of these with each other; while the casein or albumen—for they appear, according to Liebig, to be identical¹—gives the cheese. The specific gravity is from 1.030 to 1.035. It is decidedly alkaline when fresh, but becomes acid when kept for any time. Its chemical analysis has been stated by Simon to be

88.06	water.
3.70	casein.
4.54	sugar.
3.40	butter.
0.30	saline matters, &c.

100.00.

Its similarity, therefore, to the constitution of the blood itself is evident;² and reflection on the combination of the saccharine with the oleaginous and albuminous elements, will render apparent its life-sustaining and nutrient properties.

From the above analysis it will also be seen, that the fluid or

¹ Mulder has demonstrated that casein and albumen have the same bases, namely, protein.

² The chemical relations of blood and milk are exceedingly well stated by Dr Rees in the *Cyclopædia of Anatomy and Physiology*, Article *Milk*, p. 363.

serous portion of the milk is much larger than the solid. This part holds in solution the sugar, various saline ingredients, and the largest amount of the caseous element; while the oleaginous or buttery globules, with their thin, caseous pellicles, are suspended and float in it. Under the microscope the milk is seen to consist of a serous fluid in which innumerable globules are suspended. These, when viewed immediately, are seen to have active molecular movements, rolling past or over one another in their own independent courses. They vary in size, according to Donné,¹ from 1-500th to 1-50th of a millimètre. This admeasurement is differently stated by various observers, and the medium size is given as 1-4000th or 1-4500th of an inch in diameter;² but I should suppose that definiteness must be next to impossible. They appear—as Fig. I. of the annexed plate, drawn with the aid of a fine achromatic microscope magnifying 206 diameters will show—to range from minute molecular spots to pretty large globules. The smallest seem to be wholly or mostly caseous, while the largest are those described as cream globules. They are perfectly spherical and pearl-like, have clear dark margins, and bright, light-refracting centres. The surrounding margin has a distinct film or pellicle, which, however, the best observers do not recognise as a true organized cell, such as the envelope of the pus or blood corpuscle, but simply as a coating of caseous or albuminous matter, as pointed out by Mandl;³ and Dr Ascherson of Berlin⁴ has shown, that a drop of oil and a drop of the white of egg, dexterously mixed, produces an appearance identical with that of the milk globule. Ether dissolves the oil of the globules.

These, then, are the characters of the lacteal secretion, as found in its normal condition when the mother has quite recovered from child-bed, and is suckling her child. But until the process of secretion is fairly established, the milk is marked by other features which it is of importance to notice, namely, the presence of what is called colostrum. The colostric fluid—popularly termed “green milk”—serves an important purpose in the infant economy, being nature’s aperient for purging off the meconium which has accumulated in the large intestines during foetal existence. When present in great quantity, it gives to the milk, seen by the naked eye, a yellowish colour; and, on examination under the microscope, it is found to differ most essentially from the secretion already described. In examining a single drop two or three days after parturition, within the field of the microscope, while numerous proper milk globules may be seen moving independently here and there, they are agglomerated into masses, adhering together by a viscid mucoid fluid; and at the same time there will be seen from one to four, or even more, colostric bodies. These,

¹ Cours de Microscopie.

² Hassall’s Microscopic Anatomy of the Human Body.

³ Anat. Microscopie, p. 53.

⁴ As quoted by Dr Bennett, in his paper on the Structural Relations of Oil and Albumen.—*Monthly Journal of Medical Science* for 1847, p. 167.

described by Donn ¹ as the "*corps granuleux*," vary much in form and size,—a few resembling large oily globules, evidently butter ill elaborated, forming a yellow bed, in which lie a multitude of dusty looking granules, and among which is generally imprisoned one or more true milk globules. The envelope to these masses is at first firm and transparent, but breaks down as the secretion becomes older, and the globules become individually more independent of each other.²

I have given a representation of these appearances in Fig. VI., which will answer the purpose of a lengthened demonstration; and as this specimen was taken from a patient in the best of health three days after delivery, and promising to become a most excellent nurse, the same delineation will show the various stages towards the disappearance of these bodies, namely, the breaking down of the firm envelope or binding membrane, the shedding of its contents, and the last cloudy streak or patch which is visible. These changes go on in general until about the tenth day after delivery, though certainly in many good nurses for about three weeks; and then the milk ought to possess the normal characters (Fig. I.) already described. The granular portion of these masses is soluble in ether; the membranous portion in acetic acid; and treated with ammonia the mass becomes glairy and tenacious.

Here I may notice, although having no practical bearing upon the present inquiry, that I have examined microscopically many specimens of the milk which is well known to exist in the breasts of young infants. I have found it almost invariably present, seldom obtainable until the second day after birth, generally most abundant about the fifth day, and usually gone by the tenth day. It presents all the characters of the mother's milk at the same period, with colostric bodies as well as milk globules,—only the latter are in sparing

¹ P. 400.

² There is an evident similarity between colostric and compound granular bodies,—those formations which Gluge denominates *inflammation globules*, which Vogel calls *granular cells*, Henle, *exudation corpuscles*, and Bennett, *exudation masses*. These structures are seen in cerebral softenings, and inflammatory products of various organs; but M. Reinhardt has shown that they are not necessarily characteristic of inflammatory action. In the digest of his opinions given in the *Monthly Retrospect* for Feb. 1848, published along with the *Monthly Journal*, it appears that M. Reinhardt considers the colostric granules as transformations of the epithelial cells of the mammary ducts—as the result of disintegration, or a retrogressive metamorphosis. During pregnancy, when there is an increased action going on in all the tissues of the mammary glands, and a greater determination of blood to them, the epithelial cells are thrown off in greater numbers than usual, distending the milk tubes. "This superfluous epithelium, therefore," the editor says, "is converted into granular cells or colostric corpuscles, and thence into masses of agglomerated fatty granules, which are then broken up and absorbed. During the first days after delivery, those bodies continue to be developed, and are washed out with the first formations of milk which constitute the colostrum." The colostrum generally exists in greatest quantity after first deliveries.

number, and generally of larger size. I find also that it is as often present in male as in female children, and may be got most readily by a gentle pinching or pressure on each side of the tiny nipple. I have given representations of this infantile milk in Fig. XI. Nos. 1 and 2.

After these details, I now go on to consider the existence of the mammary secretion *during* gravidity; and to enforce the practical importance of a knowledge of this fact in the diagnosis of that condition.

II.—*The Mammary Secretion prior to Parturition; and its Existence a Sign of Pregnancy.*

In common with others in the profession, when considering the differential diagnosis of obstructed menstruation and pregnancy in the earlier months, with all due attention to the ordinarily recognised signs, I have often experienced serious difficulty as to the opinion to be given, or the treatment to be pursued; and I believe that I have been misled in some instances by those whose object was, if possible, deception and concealment. The dilemma is most apt to occur in the discharge of hospital and dispensary duties, when required to give advice to young females whose characters are unknown. Under all circumstances, the responsibility which rests upon the physician is great. To convict an applicant of an immoral act, and of present imposture, and avoid the risk of prescribing means which might blight a human existence; or to allay a mother's fears of a daughter's virtue, and silence the tattle and cruel suspicions of a neighbourhood, are assuredly important objects. The determination may concern the health, happiness, and prosperity of individuals and families, and greatly affect the practitioner's peace of mind and prospects in life. Indeed, in every point of view, as well as from regard to moral and medico-legal ends, it is an imperative duty in any doubtful case, to submit to a searching scrutiny every sign, symptom, and circumstance which can throw light upon it.

From the experience of upwards of two years, during which my attention has been directed to the subject, I feel convinced that *the most invariable sign of gestation prior to quickening, is to be found in the presence of fluid in the breasts*,—with the limitations that shall hereafter be noticed; and, consequently, that the absence of the secretion will afford the surest evidence that the suspension of the catamenial flux is an abnormal deviation from nature's course. The sign is indeed, to some extent, an old and popular one, but not to be despised or overlooked on that account, nor to be set aside without consideration. Although some eminent writers on obstetric medicine have passed it by without any notice, and others have pronounced it "an evidence scarcely of any value at all,"¹ I would earnestly invite an unprejudiced attention and scrutiny of the subject; for my own experience

¹ Churchill, Theory and Practice of Midwifery, p. 107.

in judging from the sign, when there was an opportunity of watching the course of events, warrants in me stating, that I have never found it fail in regard to those *who were gravid for the FIRST time*, or in regard to those who were not pregnant at all. And although the greater number of cases of pregnancy in which I have had an opportunity of applying the test, have been advancing in the fourth month, yet so early as the end of the second and the beginning of the third months the sign has held good. It is not, however, until about the termination of the third, and more generally in the currency of the fourth months, that the medical man is consulted, when the repeated non-appearance of the menses attract the notice, and excite the interest or fear of the individual, according as the moral feelings may be affected. And as the value of the sign is not insisted upon in its application to other than first pregnancies, within this limitation is included the class of cases, which, above all others, are of most frequent occurrence and importance, and which occasion most trouble and anxiety to the practitioner.

Perhaps the value of this sign in the early months, has been doubted or under-estimated, in consequence of not observing fluid trickle from the nipples, as it frequently does in the last month of pregnancy. I believe that this will rarely happen in the commencement of a first gestation. The fluid must be brought; and the method of obtaining it, under doubtful circumstances, is to press the finger and the thumb firmly on the mammary gland, a little beyond the margin of the areola, and then draw them to the point of the nipple with a stripping and expressing movement. This repeated three or four times, will certainly bring fluid if any be present; and a single drop will suffice to prove the nature of the case. A little moisture from the sebaceous follicles of the areola, which is sometimes produced during these efforts, must not be mistaken for a lactic secretion. I believe that this kind of exudation, which may occur in ordinary circumstances, has actually led, in some instances, to the rejection of the sign which I am now advocating. It is recommended also, that if a drop of fluid is not obtained from one nipple, the other ought to be tried, as the orifices of the lactiferous tubes are sometimes more narrow or glued up in the one than in the other breast, and in *primiparæ* this is more particularly the case.

In the early months of a first pregnancy the secretion has seldom the external appearance of milk, but is serous-looking, and often very viscid and syrupy. When submitted, however, to the microscope, the characteristic milk globules (described p. 3) will at once be detected; and these will be seen agglomerated *en masse*, the solid portion being at this period in a large ratio to the fluid, which latter is also peculiarly glutinous. Mixed with these groups will be perceived an abundance of large oil globules and colostrum granules, as in the green milk of recent parturition. There are sometimes found also a few epithelial lamellæ, which have been separated from the lining

membrane of the excretory ducts, and which have either not been transformed into colostric masses, or, if this has been so, they have already parted with their mucoid and granular contents.

Of the annexed plates, II. and III. are exact copies of the secretion taken in the third and fourth months of gestation; the first, from a young unmarried woman, who attempted to conceal her pregnancy; and the second, from a young unmarried lady, who was not aware of her own condition, and whose station in life, education, and previous good conduct, was a protection against an early suspicion of her state. Both were convicted by the milk test, when the ordinary signs excited only a vague suspicion; both soon confessed their transgression; and both were, on the strength of the opinion given, immediately placed in the bonds of lawful wedlock.

The value of the lactic secretion as a sign of pregnancy has apparently been disregarded by some, in consequence of the very exceptional cases recorded, more especially the example given by Baudeloque, of a girl eight years old who was able at pleasure to milk her own breasts, and another somewhat similar mentioned by Belloc; and this under-valuation may also be ascribed to the statements of other writers regarding the exudation of milk, even from the breasts of adult males.¹ Such cases, however, even if well authenticated, are worthy only of being ranked among other physical monstrosities occasionally met with; and even instances less wonderful, as the appearance of fluid in the breasts of those who are not, and never were pregnant, ought, I think, to be viewed as rare examples of nature's freaks—her exceptions, and not her rule.² While I do not doubt that such cases have occurred—though I think some of them are not unlikely to have been the follicular exudations already noticed—in the very numerous examinations which I have made with a view to detect, if possible, the existence of fluid in the *mammæ* of the non-pregnant, I have not as yet met with an instance of the kind. In many instances of unmarried women of unblemished character, who were suffering from menstrual obstructions, and of married women under similar circumstances, who never were gravid, I have not been able by expression to obtain a single drop of fluid; and in many instances also of both classes where there was perfect uterine health, I have been equally unsuccessful.

Beyond the limitation of first pregnancies, I would not desire to

¹ Carpenter in his *Treatise on Physiology*, p. 626, refers to an instance of this kind, as described in the *Phil. Trans.*, vol. xli. p. 813; another by Captain Franklin, in his *Narrative of a Journey to the Polar Sea*, p. 157; one by Humboldt, in his *Personal Narrative*, vol. iii. p. 58; and a fourth by Dr Dunglison, in his *Physiology*, vol. ii. p. 417. In the last-mentioned case, the subject, a man of colour, is said to have actually officiated as a wet nurse!

² In this light I would regard the single instance which M. Donné has noticed, of a little fluid found by him in the breast of a young woman said never to have been pregnant, and which presented the microscopic character of milk, p. 144.

urge the application of the milk test ; for when a woman has once suckled, the fluid is apt to linger in the breasts a considerable time after weaning, and the mammæ continue performing a partial function,—in many instances, doubtless, owing to the daily operation of maternal sympathies. In general, I have found the fluid easily obtainable from three to six months after weaning, and the restoration of the catamenia,—although in one instance which occurred lately, it had completely vanished before the expiration of two months. On the other hand, I found it present in one case after the lapse of two years ; and I believe that it may exist at a still later period, although in several women still within a child-bearing age, I have been unable to procure a single drop of fluid at the distance of four years from the date of last weaning. It may, however, readily return at a much later period in the case of those who have once given suck, when the uterus becomes distended with any false conception or hydatid accumulation ; and very probably it may do so under similar circumstances, in those who never were pregnant. An instance of the former kind came lately under my own observation. The patient had not had a child for nine years, and while the uterus gradually enlarged, and the abdomen became distended, so as to simulate pregnancy, and lead to the necessary preparations, imposing on myself at an early, and on another physician at a later period, the secretion was most abundant. The time of expected confinement, however, passed by to the extent of several weeks, and the mystery was solved by a sudden and large discharge of water.

When milk is procurable a few months subsequent to weaning, and the woman not again gravid, I have found it existing only in small quantity, one or two drops, viscous and cream-like to the unaided eye ; and to the microscope it presents milk globules in sparing number, often ill formed, adhering together, or to large oily drops (the creamy part), or to the epithelial scales, mucoid, and other foreign matters, which are generally present in abundance—as is seen in Fig. VII. 1 and 2. The secretion in such circumstances affords, I think, some good diagnostic marks, by which it may be readily distinguishable from fluid obtained in the early months of a new gestation. The latter is comparatively rich in milk globules of normal appearance, and of better medium size, having abundant colostrum, and few if any membranous scales, or debris of disintegrated textures—(Figs. II. and III.) ; and, as the full term of gestation is approached, the secretion increases in quantity, and becomes better in quality, more evidently suited for the important object in prospect.—(Figs. IV. and V.)

From the above notices, I think it may be admitted that the sign now advanced, although of most value in the diagnosis of a first pregnancy, is not without a certain amount of importance in the recognition even of a subsequent gestation ; and I should decidedly affirm, that in general it is more certain in its information as a corroborative evidence of pregnancy than the popular

areolæ, which, when once darkened, seldom lose much of their colour, or of the follicular glands, which retain in a great measure their size after they are once developed.

Compared with any of the ordinarily recognised signs for distinguishing a first pregnancy from a simple suppression of the menses, before any bulk or impaction in the iliac and hypogastric regions can be detected by the eye or hand, or before the ear can discover the unmistakeable sounds of placental and foetal circulation, there will be found, I think, far fewer exceptions to the milk test. As regards the sign of *morning sickness*, I have had under advice many cases of obstructed menstruation from causes unconnected with gravidity, yet attended with disturbance of the digestive organs to a great extent, of which daily recurring sickness—most frequently in the morning, formed a part; while, on the other hand, in very frequent instances this symptom has been entirely wanting in those really pregnant. Then, again, the signs taken from *the aspect of the mammae*, are most variable and contradictory. While I have often observed women with fair complexions who had large breasts, well marked areolæ, numerous and large follicular glands, and prominent nipples, suffering merely from suppression of the catamenia, I have seen not a few with dark or sallow complexions, who, although undoubtedly pregnant, had small breasts, small nipples, areolæ scarcely distinguishable from the surrounding skin, and few or no sebaceous glands.¹ Were it not to extend this communication to too great a length, I might give notes of many cases illustrating the variability and uncertainty of these signs. I shall, however, content myself with noticing only one example—which is interesting in several other respects. The patient was brought before the Obstetrical Society in December last² by Dr Simpson, chiefly to show the impossibility of diagnosing pregnancy in her case, in so far as the appearance of the mammae were concerned. The woman had dark brown hair and a sallowish complexion; she had been four years married, and was then, although presenting no traces of areolæ or glandular follicles, decidedly in the seventh month of her first pregnancy, complicated with large fibrous tumours projecting from the anterior wall of the uterus. Now, it is an interesting fact, that before the fourth month was complete, counting from the last menstrual period, I had carefully examined this patient, who called on me on account of the tumour

¹ In so far as the appearances of the breasts are concerned, it may be curious to notice here, that I had under my care lately an adult male of fair and ruddy complexion, afflicted with disease of the heart, whose breasts were full, slightly pendulous, surrounded with exceedingly dark areolæ, numerous follicles, and whose nipples were large and prominent. On several previous occasions I have met with cases somewhat similar; and in fact the variety in the colour of the male areola, the development of its follicles, and the size of the nipple, is a matter of daily observation.

² Monthly Journal of Medical Science, March 1848, p. 693.

of the abdomen; and, in consequence of being able to extract a little fluid from the nipples, I expressed my conviction that she was pregnant, though I was then at a loss to say whether the tumour was a growth from the uterus or an extra-uterine conception. On a second examination, about one month subsequently, I was able by the stethoscope to verify the opinion formerly given as to the fact of gravidity, and I know that she has been since confined at the proper term of gestation.

As regards the evidences of pregnancy from *abdominal exploration* previous to the commencement of the fifth month, there is always ground for much doubt and fallacy. For it is not till then that quickening occurs; and in cases requiring a special scrutiny, this is a symptom which will in all probability be concealed. It is not until then also, that the iliac and hypogastric regions assume a visible fullness, and give to touch a feeling of firmness and impaction; and, although this enlargement was then apparent, it might be owing to causes very different from gravidity. Auscultation, too, comes after this period only to be of any avail,—and perhaps not even until a considerable time subsequently, to the ears of many; and did delicacy oppose no obstacle to uterine examination, until now the finger or the speculum of the most experienced obstetrician, may be unable to detect the true nature of the case.

The presence in the urine of what has been called—but absurdly so—*Kiestein*, is a very important evidence of the existence of pregnancy. It has been found by Dr Golding Bird¹ as early as the second and third months after conception; but as it appears to exist only in small quantities in the early months, as the urine must be allowed to settle for a number of days before the peculiar greasy, cheese-odoured pellicle can be obtained, it is evident that this is not a test which can be often or conveniently employed, especially in the most important class of cases in which the physician is consulted. The fact of the unvarying existence of this substance, however, may I think be assumed as strongly corroborative of the value of the milk test, as it shows the presence of the secretion at an early period; for without doubt, as Dr Bird expresses it, “the imperfectly formed secretion of milk, not having a ready exit by the mammæ, is taken up into the circulating mass, is separated by the kidneys, and eventually escapes from the body in the urine.”² With the aid of the microscope, I have fully satisfied myself that this product contains some of the elements of milk—the largest amount of which is probably caseous matter, mixed with crystals of the triple phosphate of magnesia—(Fig. XII. No. 1.) That the milk should be thus changed in appearance—if the theory given above is correct—is not surprising, on account of the process which it must go through before its elimination can take place. As a contrast to this, I have given a representation also of the change produced on milk after absorp-

¹ Guy's Hospital Reports, Vol. V. p. 16 and 25.

² Ibid. p. 22.

tion from the alimentary canal, and excretion by the urinary apparatus—(Fig. XII. No. 2.) It is the greasy pellicle of an infant's urine allowed to settle for fifty-eight hours, and observed by the microscope. The child was deriving its sole nourishment from the breast, and was in the possession of perfect health. A few pretty well-formed globules are apparent, but most of them have lost the roundness of the original milk globule—are flatter, and present a much thinner investing membrane. One ounce of the fluid was sufficient to yield a well-marked scum; no crystalline matter was present. The delineation of the kiestein which I have given, closely resembles the aspect of caseine when precipitated from the serum of milk by the action of acetic acid,—as is depicted in Hassall's *Microscopic Anatomy of the Human Body*, Plate XV. Fig. 5.

III.—*The Pathological Changes of Milk; the Value of the Microscope in the Observation of such; and Hints regarding Lactation and the Choice of Nurses.*

I now proceed to remark on the deviations from the normal condition of the milk—in other words, *its Pathological Changes*—which are detectable by the use of the microscope only; and to point out the importance of a knowledge of these, and the circumstances connected with them in practice. For many interesting and instructive remarks on this branch of the subject, I would again refer to the excellent treatise of M. Donné. Having made the greater part of my observations before becoming acquainted with his researches—while much trouble was unnecessarily occasioned, I have had the satisfaction of verifying all that he advances; and if I am not able to bring forward much that is new regarding the microscopical aspects of the mammary secretion in health and disease, I may perhaps succeed in drawing more attention to a subject which has been much neglected, and placing in a clearer light facts which appear to be little understood, and which are high and wide in practical import.

M. Donné makes no allusion to the existence of the mammary secretion previous to the last month of pregnancy, and consequently has given no account of its microscopic characters at an earlier date. This defect I have been able to supply, as will be seen in the description given at pp. 6 and 8. The Figures II. and III. show the peculiarities during the third and fourth months, and IV. and V. during the seventh and ninth months of gravidity. Drawings illustrative of appearances at intervening periods might easily have been multiplied from the numerous observations made; but those given will suffice to show the chief phases of the secretion during the progress of gestation; and that, while in the earlier months the elements of good milk are apparent, as the term of pregnancy approaches towards completion, there is a manifest improvement in the quantity and quality secreted—gradually becoming better adapted for the purpose for which it is so admirably designed. It may

especially be remarked, that the foreign matters, such as the epithelial scales, are less likely to be met with; that there are fewer large butyraceous globules present; and that, from the lessened viscosity of the serous part of the secretion, there is a smaller tendency to aggregation among the milk globules. The colostric bodies, which are present from the very first, continue so, as I have already stated at p. 4, until perfect convalescence from child-bed. It sometimes happens, however, that the milk is not so soon, or is sometimes never, freed from its colostric characters in one form or another, or that these return again at some period during lactation, after the secretion has been perfectly pure. When this occurs, as M. Donné has had the merit of showing, the health of the mother in affording such unwholesome supplies, and the child in receiving them, are placed in equal jeopardy. Of the truth of this opinion, I have found ample proof. M. Donné goes the length of expressing his belief, that from microscopic examination of the secretion alone in the last month of pregnancy, we may ascertain whether a woman is likely to prove a good nurse or not.¹ This I consider to be extremely probable; but be it so or not, there is no doubt that, while certain information cannot possibly be obtained from the external characters of milk during suckling, such as colour, consistence, and taste, or by the application of chemical tests, the microscope enables us at once to detect deviations from its normal condition. Assuming, therefore, the appearances described at p. 3, and depicted in Fig. I., as the standard purity of the secretion, it is surely rational to employ this means—while other considerations are not neglected—in determining those momentous questions which so often occur in regard to the propriety of a mother suckling her own offspring, as the strong ties of nature and the suggestions of duty would dictate, the length of time lactation may be continued with safety to herself and benefit to her child, or the choice of a nurse as a substitute, by whom the future health and happiness of the infant may be so materially affected.

During lactation, the nurse cannot be indisposed without an immediate change occurring in the properties of the milk; and to such vitiation is evidently attributable many of the alarming illnesses of infants. Every nursing mother knows, how apt a purge taken by herself is to affect the child, while she obtains perhaps little benefit from its use; and how speedily some articles of diet excite flatulent distension and colic pains in the infant. It is also a well-known fact, that when a nurse is caught in a shower and gets damp, or is exposed to any sudden danger, or hears any painful intelligence, and becomes violently agitated,—the child is apt to be rapidly and forcibly affected. This latter cause has been known to produce convulsions, and even death.² Hence, it is the duty of those who have the charge of young and inexperienced

¹ P. 406.

² Eberle on Diseases of Children, p. 35.

mothers, to give wholesome advice regarding the diet and regimen, the care of the breasts, the subjugation of the desires and passions, the cultivation of equanimity of temper and cheerfulness, and the avoidance of unsuitable medicinal agents; and hence, also, the need of keeping a strict look-out on the condition and conduct of the hireling nurse, who has not such strong natural incitements to caution, or motives to self-denial. Now as it is evident that it is through the channel of the breast that many disorders are conveyed to the child, it is equally clear that, in the elaboration from the blood of the milk in such instances, some alteration must take place in its nature, whether perceptible to our senses or not, imparting to it an injurious tendency. As it is in the atmosphere, however, which we breathe, and which may convey to us some severe or pestilential disease, and yet the utmost efforts of science for detection and analysis may be baffled; so perhaps the most skilful histologist, with the best optical instruments, and the most patient attention, may never be able to discover minute deviations from the normal state of the mammary secretion corresponding to the various diseased conditions of the mother, or the disorders produced in the child. Thus, there has nothing hitherto been ascertained peculiar or specific in the milk of a syphilitic nurse, although the virulence of the taint communicated is obvious enough; thus, too, nothing distinctive has been observed in the secretion of the nurse who may be communicating strumous disease to the child of another individual free from all hereditary taint, which in after life exhibits itself in one or other of the dreadful forms of diseased glands and joints, phthisis, or insanity. Even in the secretion from the breast of a patient extensively affected with cancer, which I lately had an opportunity of examining,¹ I could detect nothing essentially different from the appearances of fluid taken from an engorged breast, or in the cases hereafter to be mentioned. The only pathological changes of the milk which have as yet been observed, are the colostric condition already described, and admixture with pus. Associated with the more severe ailments of the mother, which seriously affect the child if not withdrawn from the breast, I have observed that the granular bodies are larger or more numerous, and more frequently of a rich amber colour than of the yellowish or greyish tints observed prior to delivery, and during child-bed. There seems also to be a much greater tendency to aggregation of the real milk globules from the amount of mucoid fluid present, which is turned into a most tenacious mass with ammonia; and there is often seen on the field of the microscope thick patches of grey, yellow, or deep amber-coloured matter, floating raft-like, with milk globules resting on

¹ The tumour in the breast of this individual was first observed about three months previously, and had since grown with great rapidity, involving a large portion of skin, and implicating a gland in the axilla. The child, now sixteen months old, although only partially fed from the breasts, was sickly-looking, and troubled with bowel complaint.

them or clinging to their edges. These characteristics vary in degree in relative correspondence to the deranged health of the nurse and nursing.

In instances of returning catamenia,¹ a single day is sufficient to occasion a considerable change in the milk; and in this affection, as is well known, the infant often immediately refuses the breast, and if not so, vomits severely, and is pained or purged. This abnormal change is seen to a still greater extent in cases of fever, of which Fig. VIII. No. 1, is an example. The patient from whom this fluid was taken, was in the fifth day of the fever. She had made an excellent nurse during two months, but had not suckled for the last two days. There was no engorgement of the breasts, but, on the contrary, they were pendulous and almost empty. The infant in this case did not suffer, as it was withdrawn early from the breast, and suitable nourishment substituted; and as the fever was of short duration, and not very severe, the secretion was kept up by a little being artificially drawn off from time to time, until the child could be reapplied with safety. The same appearances of the milk are observed in cases of severe dyspepsia and general debility, such as is depicted in Fig. VIII. No. 2. This patient nursed nearly eight months, during the two last of which she had gradually been losing strength and flesh, and complained of violent headaches, vertigo, disrelish for food, and other symptoms of indigestion. The child during the same period was much affected, although perhaps dentition may have had a share in its ailments. It was pale, soft, fretful, and had occasional attacks of violent abdominal pain, vomiting, and diarrhoea. Weaning was in this instance recommended to save both mother and child from certain ruin; and the step was followed by the best consequences, more especially to the health of the child.²

Many similar cases have occurred to me, which it is unnecessary to particularize,—cases happening at various stages of nursing, some of which required its immediate and entire abandonment, some a temporary cessation from it until the general health was restored to its normal condition, and others where only a partial performance of the function was permitted. The treatment applicable to those various cases, such as the choice of a substitute nurse, the kind of

¹ As yet no blood globules have been detected in such cases; and it appears that blood is never secreted from the lactiferous tubes during suckling. When blood is drawn, it is from rupture of a capillary vessel by too strong suction.

² It appears that in cow's milk granular bodies and agglomerations of globules are present for some time after calving, and that when the animal falls into bad health there is a reappearance of the same characters; and M. Donné has shown that in the disease called *la cocote*, characterised by fever, pustules in the mouth, udder, and hoof—a malady apparently analogous to our "murrain,"—the milk exhibits the same abnormal aspect. Hence the value of a microscopical examination of an article so important in domestic economy, when it is suspected to be rendered impure by the disease of cattle. And great use may also be made at times of optical help and chemical reagents in detecting the adulterations of milk by various substances.

supplementary food proper at different ages of infancy, &c., shall be briefly noticed at subsequent parts of this paper, in so far as is consistent with its special object.

When nurses are affected with returns of the catamenia, I do not think it necessary to put a complete stop to suckling, unless they recur frequently, and are evidently impairing the mother's health. For the security of the child, it is enough to withdraw it from the breast during the continuance of the flux, and otherwise supply suitable nourishment, while the secretion is drawn off several times a-day at regular intervals, either by the lips of an attendant or a suction apparatus:—the first of which modes is preferable, if done slowly and tenderly. I have followed the same practice in other short illnesses of the nurse, occurring prior to the proper time for weaning, until the constitutional disturbance subsides. An engorgement is thus avoided which would produce a bad effect on the glands, and prove certainly hurtful to the child when suckling is resumed. This is known to happen in simple engorgement even of one breast, while the other is performing its proper function, for the milk in it becomes viscid and colostrous. It is of obvious consequence, therefore, to impress upon the inexperienced, from the moment of delivery, the necessity of managing the breasts so as to avoid any cause which might favour over-retention of milk in the mammæ, or a determination of blood to the organs, and thus occasion engorgement, febrile excitement, and perhaps even inflammation and suppuration. It is always expedient during lactation to have the breasts regularly and alternately drawn at intervals of from one hour and a half to five or six hours, according to the age of the child, generally oftener in the case of young children, and less seldom by those who are further advanced, and who are the length of obtaining other kinds of nourishment; and when an engorgement has been permitted to occur, the first drawing off should, if possible, be done otherwise than by the child. It is bad for the health both of mother and child, and materially affects the condition of the mammary gland and the quality of the milk, to deny the breast long after birth;¹ and it is equally bad practice at a subsequent period to give it too frequently,—whenever, in fact, the infant exhibits the slightest uneasiness or pain. To discuss such topics, however, would extend this communication to too great a length, and moreover they do not strictly belong to the subject of our inquiry.

Should an inflammation of the breast be established, the best practice is to remove the child from it at once, and permit it to drink only from the healthy one; while a little of the secretion, if pain will allow, is drawn off from time to time as tenderly as possible. For before suppuration has begun, in consequence of the

¹ The first trial ought to be made within a few hours after delivery, and repeated at intervals of from three to four hours, until the secretion is fairly established, which is generally in from three to five days.

congested and inflamed state of the glands, the quality of the milk becomes much changed, as already noticed; and after an abscess is formed, according to M. Donné, pus corpuscles may mix with the milk in the lactiferous ducts, and pass through their orifices in the nipples, consequently becoming unwholesome and unsafe for the child if still at that breast. That this morbid admixture always takes place I am not prepared to admit; for although I have often seen pus and milk mingling and flowing out at the openings of abscesses and sinuses, the milk from the nipple in these cases appeared, from its thin consistence and bluish-white colour, to be genuine and unpolluted. Microscopic examination, however, will of course be the certain means of detecting the presence of pus; and although in the only two cases I have had an opportunity of making use of the microscope—cases of extensive suppuration—I was unable to find a single pus corpuscle, I do not doubt the correctness of the statement made by so accurate an observer as M. Donné. I think it not unlikely, however, that the delineation given in Mr Hassall's work¹ represents small grey-coloured colostric bodies in tight envelopes, rather than pus corpuscles. I infer this from the large size of the latter compared with the former bodies, and from the granular appearance given to them. The appearances of some of the colostric granular bodies in No. 2 of Fig. IX., are illustrative of this conjecture; and the fluid depicted in this case was taken from a breast which had been suppurating and healing up alternately for three months, but had closed finally only ten days before, leaving the gland hard and knotted. The less regular margin, the spotted and opaque appearance of the pus corpuscles, compared with the clear border, spherical form, and translucent aspect of the real milk globules, ought to be good diagnostic marks in such cases. Should there, however, at any time be difficulty in deciding as to the admixture of pus with milk, the use of two chemical tests under the microscope will settle the point; for while real milk globules are readily soluble in ether, and are unaffected by a caustic alkali, the latter at once dissolves the pus corpuscles, leaving the milk globules untouched. Should any blood globules happen to be present, they may be disposed of by the addition of acetic acid, without interfering either with the pus or the milk.

In the milk of all women who nurse beyond what may be called the natural time, namely, nine months, I believe that the colostric characters will soon be assumed. Such has been the case in all the specimens I have examined microscopically. This, however, may happen some months earlier to women of a particular constitution, and in such instances lactation persisted in must be attended with bad consequences. Hence the utility of the microscope in enabling us to decide when the child should be taken away from the

¹ Microscopic Anatomy of the Human Body. Plate XV. Fig. 1.

breast, and to guard against the choice of a substitute who may not herself be better qualified to furnish a healthful supply.

The case already mentioned, accompanied with the delineation of the milk, Fig. VIII. No. 2, is an instance of early unfitness for nursing, and of the imminent danger from continuing it. Another example I have given in Fig. IX. No. 7. The patient from whom this specimen was taken had only nursed for six months. It was her first child; and about two months after delivery she was disabled from suckling with one breast in consequence of suppuration, although the abscess healed up in four weeks. She was much emaciated, dyspeptic, and presented on different parts of the body cutaneous cysts, known by the name of the *molluscum contagiosum*, of various sizes, from that of a pea to a large bean. Her child had the same affection to a considerable extent, eczema behind the ears, constant diarrhoea, and a weakly ill-nourished body. From the breast not suckled I could easily obtain a little fluid; and it presented characters identical with those in the case referred to at p. 16, and depicted in No. 2. of Fig. IX. The colostric bodies were seen to the number of from five to twenty in every drop placed in the field of the microscope; and these were also of small size, mostly ovoid in shape, and girt with a tight envelope. Were it requisite, I could quote many other cases in which microscopic examination satisfied me, that suckling at different periods prior to the termination of the ninth month could not be carried on without danger both to mother and child, or to either; and in several instances I have also been enabled to prove, when otherwise I could not have done so, that the illness of a child was in no way attributable to the milk of the mother. Thus the most tender and important objects and interests may be secured. The attention is at once directed to other causes of ill health; and the proper course of treatment is made more apparent. While in one instance violence is not done to the feelings of an affectionate parent, in depriving her unnecessarily of the pleasure and privilege bestowed upon her by nature, and by the transference of her little one to the breast of a stranger; in another instance, pain is not given to the hired nurse by an uncalled-for interdict on her future services. Thus both may be permitted to exercise a function which, from physical changes and mental sympathies, may prove most salutary to future health; and the child has continued to it the supplies of food best adapted to its tender age, and is not hazarded either by a change of milk, or by an artificial substitute, at a time when ill health makes the success of such an experiment more uncertain and unsafe. Thus too, by the help of the microscope, we may be able to distinguish between instances of real inability to nurse and of sheer disinclination to do so. In this age of luxury and refinement it is to be regretted that there are so many who belong to

the latter class,—individuals who seek to escape the trouble connected with the rearing of offspring, and the trammels which may interfere with a free indulgence in the pleasures and gaieties of the world.¹

Having now seen that the milk sometimes becomes impure, and consequently injurious, before the completion of the ninth month—the usual period for weaning, I go on to state the morbid changes which are apt to occur in it when that term is exceeded.

In a very few weeks after this period, and I should say almost invariably at the conclusion of one year from the birth of the child, the secretion is found colostric even in the healthiest women. To this I have met with no exception; and, seeing that such is the case, I believe that lactation continued beyond the ninth month is decidedly improper. When mother and child escape injury from such a practice, it is not in consequence of the ability to give, and the suitableness of the supply to the wants of the infant economy, but from the strength of the constitution of both to resist the evil effects which it tends to produce.

The impropriety of such prolonged lactation may appear evident to any one who reflects that the child is now being endowed with teeth, and its organism in all respects so far advanced in development as to require a much more nutritious fare than the mother can supply. Mothers, however, are often found continuing the child at the breast from personal considerations, without particular reference to its wants. What I allude to is, the supposition that during nursing protection is afforded against the occurrence of a new pregnancy. This idea I think is an erroneous one; and it is to be regretted that medical men have not set themselves more against the practice founded upon it. While it is admitted that those who do not nurse at all are apt to bear children in quicker succession than those who do; yet that those who delay weaning beyond nine months are less likely to conceive soon than those who do not, is opposed to all the experience I have had in practice. When fertile power is very strong, a new gestation will commence a few months after the last child-birth, even although the lactic function is in operation;—hence the frequency of pregnancy in the sixth month of suckling; when it is strong, conception is sure to take place about the termination of the ninth month of

¹ The best artificial nourishment is cows' milk, but diluted from one-third to one-half, slightly sweetened, according to the age of the child, as it is richer than human milk. The milk of the goat and sheep are nearly similar in strength, and that of the ass is lighter; but were the taste and smell of all these agreeable to every child, they are not generally and regularly procurable. The "*pan and spoon*" system is unquestionably pernicious to newly-born children; but when the fourth month is attained, then supplies of rusk, arrow-root, barley-meal, and other light farinaceous food, may be begun in small quantities, and varied as they are found to agree with the infant.

suckling; when it is ordinary, conception generally occurs about one year after the last delivery; and when it is feeble, many months more, or years may elapse, ere the woman becomes again pregnant. On the whole, therefore, it appears that there is no certain relation between periods of lactation and gravidity, and that the latter condition is dependent on constitutional peculiarities. But even did certain data establish the supposed protective influence of prolonged suckling, the end desired would not justify the means adopted, if it is found to endanger seriously the constitution of mother and child. On the other hand, supposing pregnancy should occur while a child is at the breast, as often happens, unknown for a considerable time to the individual herself, the effects on both are still more hurtful; or if, as is also very commonly the case, the mother goes on nursing for twelve, eighteen, or twenty months, or even longer, in the vain hope of averting a future evil, she is not only periling her infant's life, but as she may become pregnant immediately after the weaning, between alternate long-continued suckling and gravidity, her vital energies are so exhausted as to entail a train of the most disastrous consequences on her own constitution and on that of her offspring.

When a woman becomes pregnant during lactation, if other symptoms do not enable us to give an opinion, the microscope is a most important diagnostic guide; for then the colostric characters of the milk are apparent, and thus we can, without hesitation, advise an immediate abandonment of suckling.

The consequences of unduly prolonged lactation are sufficiently well known to render a lengthened statement unnecessary. The generality of women are in the possession of the best of health, and in the enjoyment of the greatest amount of earthly happiness while nursing, unless they are oppressed with much fatigue, or harassed with anxiety or other ills of life. It is a natural function, in the performance of which the warmest sympathies and liveliest emotions are excited, and a tone thus imparted to the physical constitution as well as to the mind. Nor should the good effect of lactation, properly performed, cease with weaning. It is permanent, and tends to the prolongation of female existence; but when continued beyond the term which nature has pointed out, it exhausts her strength, and, according to the character of her constitution, so are the evils resulting more complicated, severe, or lasting. From a consideration of this, it is easy to perceive that an offspring reared from an exhausted body, must, like the plants of a worn-out soil, pine away a sickly and delicate existence. The most common evils entailed on a nurse by this practice are severe headaches, giddinesses, blindnesses, inordinate and irregular action of the heart, loss of appetite, general debility, lowness of spirits and hysterical affections, sinking feelings, pain in back and loins with dragging sensations, leucorrhœal discharges, and menorrhagia. Such symptoms variously combined, and many others, may exist during suckling,

and may continue long after weaning, inducing severe functional disorders, or incurable lesions of the most important organs, more especially of the brain and uterus. Then as regards the child, during the first nine months of its existence, no kind of food answers so well for the purposes of growth, nutrition, and the support of life, as that provided by the mother's breasts; but so soon as the fountain becomes impure, from being overdrawn, the most deleterious effects are produced, where formerly there was apparently the best of health. If children thus exposed are not sustained by a great deal of nourishment otherwise, the consequences are soon displayed in their meagre bodies, pale countenances, in the vomitings, purgings, cryings, spasms, or convulsions; and subsequently these victims drag out a miserable life, or fall before the first accidental illness or epidemic malady with which they are assailed. I am quite convinced that a rigid inquiry into the proximate, as well as ultimate causes of infantile and maternal death, would afford a melancholy return in regard to the consequences resulting from ignorance and culpable imprudence in the matter of lactation.

The milk of those who overnurse presents the diseased characters already described, varying in different cases, not in kind, so far as I can discover, but only in degree. These are well depicted in Fig. X. 1 and 2; and it will be seen that, in addition to the colostric granules, the most important morbid change is in the reappearance of large oleaginous globules, and in the excessive agglutination of all the bodies together. When specimens are first placed on the glass under the microscope, there are scarcely ever any independent motions seen among the globules. Example No. 1, was taken from a patient who had nursed one year, and who, during the last three months, had become pale, thin, feeble, dyspeptic, and affected with psoriasis. Her child, on the other hand, was evidently ill-nourished, was latterly much troubled with diarrhoea, and had had several convulsions. Example No. 2, is the milk of a patient who was in the twenty-second month of lactation. She had been weakly for upwards of two years in consequence of repeated attacks of ague when in Canada West, and was now much emaciated, troubled with cephalalgia, palpitations, pains in the back, downbearing sensations, and was menstruating every three weeks. Her child, although obtaining a good deal of supplementary nourishment, had had much bowel complaint, was pale and flabby, and had not been as yet able to walk. Fig. VII. 1 and 2, although designed to illustrate the bad quality of the secretion obtained after weaning, in contradistinction to the character of the fluid found in the breasts in the early months of pregnancy (*Vide* p. 8), it may be worth while to notice here, that the individuals from whom the specimens were taken, may be adduced as proofs of the evils resulting from prolonged lactation. The former had been confined one year and a half previously, and nursed for fifteen months. She menstruated

once prior to weaning, and had done so every two weeks since. She suffered chiefly from pain in the back and debility, and is yet in very infirm health. The latter had been confined two years and a half previously, nursed for fourteen months, and ever since had been losing flesh and strength, had an abortion six months ago, since then almost constant menorrhagia, and is now undoubtedly affected with phthisis. The children of both parents, I may also notice, have been extremely weakly. Many such examples might be added to these; but I think enough has been brought forward in evidence of the bad consequences of prolonged suckling. The physician cannot too decidedly set his face against a practice so disastrous, or be too careful in his warnings to young and inexperienced mothers.

It has been supposed that the milk, which in its normal state is distinctly alkaline, may become acid in the breast, and consequently injurious to infant health. No data, however, have been given for this opinion; and I am inclined to think that acidity can only occur when the milk is removed from the breasts, and allowed to stand for some time before it is examined. I would thus also explain the appearance of the beautiful confervoid vegetation, the *penicillium glaucum*, which springs from the milk globule. M. Turpin has imaginatively conjectured this growth to be the cause of the knotted condition of an engorged breast, germination having taken place in the lacteal ducts from undischarged milk. The idea cannot, however, for a moment be entertained. The milk newly drawn is invariably alkaline, it soon becomes neutral, it ere long is found distinctly acid, ferments, is decomposed, and then readily gives origin to confervæ and vegetable infusoriæ.

By the microscope we are enabled with certainty to distinguish poverty from richness of milk;—the former by the sparing number and small size of the globules, compared with the quantity of the serum in which they swim; and the latter, by the large size and number of the globules. The naked eye cannot inform us satisfactorily whether, in a particular instance, the secretion is too thin to afford sufficient nourishment to the infant, or too rich for easy and healthful digestion. Nor can the healthful or unhealthful aspect of the nurse in every instance warrant more than a guess as to the quality of her milk, or her ability to furnish adequate supplies. Microscopic examination, however, will give decision to our impressions, and qualify or corroborate the opinion which we may have been inclined to form of the capacity of a mother to suckle, wholly or partly, or of the qualifications of a nurse as a substitute, and thus solve occasionally very great difficulties, and protect most important interests. The general considerations which ought to guide us in the choice of a nurse are of course not to be overlooked. If the mother has a good constitution, but is from any cause disqualified from suckling her own child, then we should look for a nurse as nearly re-

sembling her in constitution and physical appearance¹ as possible; but if, on the other hand, she is delicate or impaired in health, and if there is any occasion to suspect that she or the child's father have a hereditarily defective or tainted constitution, then it is imperative to choose a nurse of an entirely opposite mould. Hence it is that a change of milk is often called for, and a sickly child, or one in an almost hopeless condition, may be quickly restored to health by a timely transference. A nurse, too, should be chosen as nearly of age to the mother as possible, avoiding the extremes of maternal prematurity, or the period when a woman generally ceases to bear children. That the age of the milk also should be especially attended to, may be gathered from the preceding pages, as it has been shown that the qualities of milk vary materially at different periods, in its adaptation to or unfitness for the wants of the child. It is always improper to give a newly-born infant to a nurse when her milk is several months old. When such is the case, the child seldom thrives, and is apt to become afflicted with rachitis, or some other ailment of imperfect nutrition. Dr Combe, in his excellent treatise on the management of infancy,² states the general qualities which are indispensable to constitute the good nurse, as "sound health, a robust constitution, freedom from any hereditary taint, cheerfulness of mind, orderly, neat, and temperate habits, patient kindness and good-humour, and above all, spontaneous activity, and a strong and innate liking for children." He also mentions that the external appearances should be "moderate plumpness, fresh and clear complexion,³ clear cheerful eyes, with well-conditioned eyelids, deep red-coloured lips without cracks or scurf, sound white teeth, and well-formed moderately firm breasts, with nipples free from soreness or eruption."

External appearances are, however, often deceptive; and as the main requisite in a good nurse is the supply of the life-supporting element, a microscopical examination of it is recommended as the surest and easiest method of testing its suitability, especially when there is any ground for doubt. Our treatment of particular cases also, is thus more rationally guided. If a particular specimen of milk is found to be poor in quality, a consideration of the chemical and structural constitution of the secretion in its normal state suggests, that aliment which will supply the fatty and albuminous principles in abundance, will be best fitted to secure in the nurse the elaboration of a good secretion. This will be best accomplished by a mild vegetable and farinaceous diet, and of soups in which are suspended a considerable amount of oleaginous matter. As a proof of the capa-

¹ Children of tall spare women are said never to thrive on the milk of those who are short and stout.

² Edition 1847, pp. 74 and 76.

³ Too much weight, I believe, has been attached to the complexion of nurses, as to whether dark or fair women are preferable. Those who present a medium aspect are the best, always keeping in view the other qualifications desirable.

bility of the former articles to afford good milk, I may instance the dainty food which the cow and the sheep can furnish to their young ; and of the fitness when both are combined, I may instance the success with which the countrywoman can perform the function of suckling. All experience demonstrates that strong meats and drinks taken during lactation, beget a heat and irritability of the system, if not feverishness, and thus lessen rather than increase the amount and suitableness of the secretion. In these remarks, I do not mean to aver that solid animal food and stimuli should never be taken by nursing women. Habit, and many other considerations, must render a considerable allowance necessary ; but I mean to caution against the immoderate use of a highly nutritive and exciting diet, and a dependence on such from mistaken ideas of expediency. The benefit derived from stimuli in general, I very much question. They induce an unnatural excitation of the nervous and circulating systems, and communicate only a forced strength to the constitution, which ere long leads to increased supplies to maintain it, and ultimately to great physical, mental, and moral evils.

When the milk is found too rich for the digestion of the infant, and is creating disorder of its stomach and bowels, it is of importance to give diluents freely, such as barley water, or thin gruel prepared from groats ; the latter of which is particularly beneficial, especially in the earlier days of suckling. It is of great consequence also, to attend to the state of the breasts in all instances of faulty secretion. In cases of too great richness of the milk, it has been observed by M. Péligré,¹ that allowing it to remain longer than usual in the breasts, tends to an increase of its serous or watery part, and therefore the child should not be applied in such cases very frequently. Regarding the general management of the breasts, I have already, in the foregoing pages, thrown out a good many hints, more especially as to the prevention and treatment of engorgements. In the case of weakly and unproductive nurses, a great deal may be done to improve the quantity and quality of the milk, by due attention to the regularity and frequency with which the breasts are given, and the amount of supplementary supplies which may be necessary for the infant at different stages during lactation. Although many interesting topics connected with the above subjects, and the influence of exercise, mode of life, &c., on successful lactation, yet remain for discussion, these must be set aside for the present, as I have already exceeded the limits permitted me.

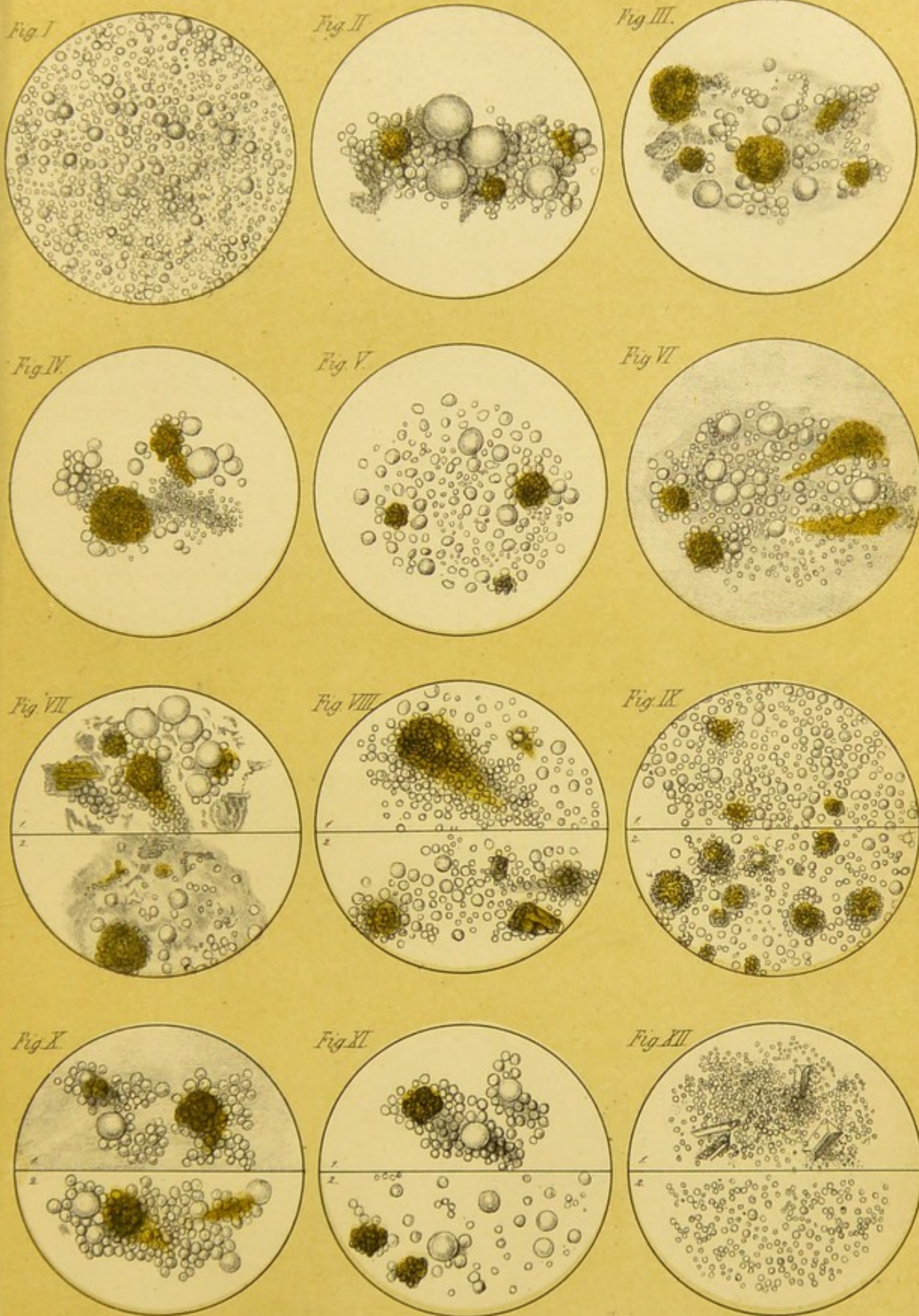
EXPLANATION OF THE PLATE.

Figures magnified 206 diameters.

- I.—Example of healthy milk at the best period of nursing—mother and child being in good health.
- II.—Fluid taken in the third month of pregnancy.

¹ Quoted by M. Donné.

- III.—Fluid taken in the fourth month of pregnancy.
IV.—Fluid taken in the seventh month of pregnancy.
V.—Fluid taken in the ninth month of pregnancy.
VI.—Milk three days after parturition, showing the characters of the colostrum, the appearance of the granular bodies in their perfect state, and the stages through which they pass in disappearing.
VII.—No. 1. Fluid taken five months after weaning ; patient not pregnant.
No. 2. Fluid taken one year after weaning ; patient not pregnant.
VIII.—No. 1. Milk of a patient in the fifth day of fever ; the secretion formerly healthy.
No. 2. Milk of a patient in the eighth month of suckling, labouring under severe dyspepsia and general debility ; child affected with vomiting and diarrhœa.
IX.—No. 1. Milk of a patient in the sixth month of lactation ; her symptoms being emaciation, dyspepsia, an eruption of the *molluscum contagiosum*, and ability to suckle only with one breast, the other having been early destroyed by suppuration. The child was affected with the same eruption, and presented the general appearance of being ill nourished.
No. 2. Milk from a breast which had suppurated repeatedly, and finally closed up ten days previously. Mother ceased to suckle at same period, after having nursed fourteen months,—but not constantly with the diseased breast :—child weakly.
X.—No. 1. Milk of a patient who was in the twelfth month of suckling. She was thin and debilitated, while the child was affected with diarrhœa and convulsions.
No. 2. Milk of a patient who had nursed for twenty-two months ; herself extremely weak, affected with cephalalgia, loss of appetite, &c. ; and the child pale, flabby, and unable to walk.
XI.—No. 1. Examples of fluid taken from the breast of a *female* child three days old.
No. 2. Example of fluid taken from the breast of a *male* child six days old.
XII.—No. 1. Example of *Kiestein*, with crystals of the triple phosphate of magnesia.
No. 2. Appearance of the greasy scum from the urine of an infant nourished solely from the breast.
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A. Peddie del.

P. Schenck lithogr. Edinburgh.

ILLUSTRATIONS OF DR PEDDIE'S PAPER ON THE MAMMARY SECRETION.
FIGURES MAGNIFIED 206 DIAMETERS.

(To face page 65)





