A THESIS

ON

"A CLINICAL STUDY OF BREAST FEEDING
IN THE FIRST TEN DAYS OF LIFE."

Submitted as part of the qualifications for the degree of Doctor of Medicine of the University of Edinburgh, by

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Southport (Lancs.)
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The work for this thesis, "A Clinical Study of Breast-feeding in the first ten days of life", was done at The Simpson Royal Maternity Hospital in Edinburgh during the summer of 1939. Active Service duties have delayed the writing of it till now - the autumn of 1942.

The fact that I intended writing a thesis on breast-feeding amazed my many medical acquaintances - former fellow students. They could scarcely imagine that any one of us should have learnt enough to be able to write a thesis on this subject. One of my more facetious and accomplished friends - he qualified in our year with honours - dubbed me "The only human breast pump north of the Tweed". Such had been their experience of breast-feeding that the mention of it immediately conjured up the picture of a breast pump.

Yet I possessed no special qualifications for writing on this subject. I had been a house physician at the Sick Children's Hospital in Edinburgh and had seen the ravages wrought by the artificial feed. It was this which finally made me decide to make the closer acquaintance of breast-feeding. Why had so many of the mothers of my former patients failed to breast-feed? "The milk failed" or "The milk did not suit the baby" seemed inadequate reasons. I was determined to find out.

So/
So it was in a pure spirit of quest that I approached this subject. I had no axe to grind, no point to prove. I looked not for my answer at the bottom of a test tube, but remembered the words of one of my former Chiefs "The Wards are the greatest of all research laboratories". (1.).

Whether I have found the true answer to my question is for the reader to decide. I am convinced I have discovered - that is the wrong word, I should have said, brought to light again - one of the main reasons. It is with these words that I close my thesis "Look after the teaching of nurses and medical students, and breast-feeding will look after itself."
"But since it is an act worthy of public detestation and general abhorrence, to destroy a human being in its inception, while it is being fashioned and given life and is still in the hands of Dame Nature, how far does it differ from this to deprive a child, already perfect, already brought into the world, already a son, of its own familiar blood?"

The Philosopher Favorinus.

We know that Cain and Abel were the first two children to be successfully breast fed. Although they quarrelled it was not about the way in which they were fed; in fact, if they thought about it at all, they most likely considered it all perfectly natural. Not even the idea of a wet nurse can have crossed their minds; for if Eve had failed, all would have failed. But as the centuries passed women appeared on the scene who were unable, for one reason or another, to breast-feed their children; and doubtless a wet nurse stepped in to save these children from the fate which would have befallen Cain or Abel in similar circumstances. At first the wet nurse would only be called upon in cases of dire necessity. But as the world grew older life became easier and people ceased to imitate the "lilies of the field", and began to take thought for the morrow. So some woman must have considered/
considered herself extremely clever, when she struck on the idea of obtaining a wet nurse to carry out the duties which she was perfectly able to perform herself. The idea must have caught on and spread; because, although Egyptian culture was matriarchal in type and breast-feeding generally the rule, Pharoah's daughter had no difficulty in finding a wet nurse for Moses, which suggests the possibility of a well organised wet nurse service. By the time of the Ptolemaic Age the service was definitely well organised and it was rare for the cultured and well-to-do mother to nurse her own child. Instead she entered into a contract with the local wet nurse, who must have followed hard on the heels of the local midwife, to breast-feed her child for the first six months and then to feed it with cow's milk until the end of the second year. So too with the patrician mother of Rome. Alone of the ancient peoples the Jews remained faithful to natural breast-feeding. The Jewish mother got away to a flying start by putting her baby to the breast before the cord was cut. The Greeks and Romans have had their day, but the Jews still remain one of the greatest forces in the world.

Many doctors appear to have accepted the view that wet nursing had come to stay. We find Soranus of Ephesus, at the beginning of the second century A.D., Oribasius in the fourth century, and Paul of Aegina/
Aegina in the seventh, more concerned with keeping up the standard of wet nursing than preaching the gospel of natural breast-feeding. Of a similar turn of mind was Paolo Bagellardo, who was responsible for the first medical treatise to make its original appearance in print. In this book ("Bagellardus Libellus de Egritudinibus Infantium") printed in Padua in 1472, he orders that a wet nurse be procured for the feeding of the new born infant; then weakly goes on to say "If the infant is a child of the poorer class let it be fed on its mother's milk". No mention that all mothers should breast-feed their children. But Petrus Toletus, who wrote a commentary on the Latin edition of this book, published in 1538, was made of sterner stuff. In no uncertain manner does he say "I would have a mother to be the one and only feeder of her child...... For this reason, when the time of the birth arrives, does nature, the worker of all hidden mysteries, drive to the breasts that fluid and blood, which was previously in the womb, and this is whitened by much heat and complicated elaboration so that it may cherish the beginnings of light and life, and afford a known and familiar food...... Let the child love thee as a mother because of all that gentle nurture and suckling; that he, your own child, may regard you for ever as his mother, and not sink, as he often does, into the child of a stranger". Doubtless/
Doubtless other voices were raised to point out the advantages of natural breast-feeding. But it was not the inability to resist the teaching of the preachers of wisdom, that caused a decline in the percentage of children fed by wet nurses. It was a failure of the wet nurses to meet the demand made upon them, which occurred in the eighteenth century. Nor was there the hoped for reversion to natural breast-feeding. Mothers, failing a wet nurse, chose artificial feeding rather than feed their children themselves. William Cadogan in "An Essay upon Nursing and the Management of Children from their birth to three years of age" written in 1768, gives us a picture of this terrible process, when of these mothers he says, that immediately at birth they "cram a Dab of Butter and Sugar down its throat, a little oil, Panada, Caudle or some such unwholesome Mess.... It is the custom of some to give a little roast Pig to an Infant which it seems is to cure it of all the Mother's longings." At this time one-third of the total mortality at all ages occurred under the age of two years, yet many mothers persisted in artificially feeding their children.

With the nineteenth century came the first really successful bottle, the first proprietary foods and an illuminating example of the value of breast-feeding. During the siege of Paris, 1870-71, while the general mortality rate doubled, the infant mortality rate fell from 330 to 170 per 1,000 deaths, the reason being/
being that the women having no other food to give their babies, had to nurse them. The twentieth century sees proprietary foods brought to a high degree of safety and cheapness, and backed by such a mass of propaganda, in which only one sentence per pamphlet pays lip service to the advantages of breast-feeding, that a prospective mother once said to me in all sincerity "Of course I shall bottle feed my baby. It is just as safe as breast-feeding. I shall have a nurse and it will be much easier for me."

Thus voicing the belief and attitude of mind of hundreds of thousands, if not millions, of present day women. Had Petrus Toletus been alive, I feel sure, he would not have been acquiescent. He would have been as strong an advocate of natural breast-feeding in this twentieth century, as he was in his own sixteenth, when wet nurses called forth his scorn upon those mothers who being able to feed their own children did not do so.

To-day we have many like Soranus, Oribasius and Paul of Aegina, too few like Petrus Toletus. (2) (3) (4.) (5.) (6.) (7.)
"I believe that few medical men appreciate the difficulties attendant on the commencement of lactation, and that a mother without the intelligent and sympathetic help, which comes from such appreciation often lapses into a course of feeding which would be otherwise avoidable."

Lucy Naish M.B., Lancet (1913) I 1657 - 1699.

We have seen how in the past the well-to-do woman tended to avoid her maternal responsibilities. She handed over her baby to a wet nurse, and later, when the supply of wet nurses could not meet the demand, resorted to an atrocious form of artificial feeding. The poor, of necessity, had to breast-feed their own children. What is the position regarding breast-feeding to-day, when cow's milk, in many forms, is easily available to rich and poor alike? It is the popular belief in many quarters that the upper class mother bottle feeds her baby, so that there may be no interference with her leisure; and that the lower class mother, as ever, breast-feeds her child. In actual practice the majority of mothers of all classes breast-feed their children to begin with, but soon turn over to artificial feeding. This practice is most noticeable amongst the hospital or clinic type of patient. (9) (10) (11). Spence has stated that, in England, 80% of mothers suckle their infants for a few weeks; that not more than $\frac{1}{3}$ in big towns are/
are breast-feeding at the sixth month; and that 20% to 30% give artificial feeds from birth. (9.).

A German writer states that, in Nürnberg, 98% of babies were breast-fed from birth in 1937, compared with 56% in the period 1905-7; but that 69% were breast-fed for less than six months, as compared with 43.5% in the former period. (12.). Italian figures show that amongst 770 infants studied from birth to weening, 55% were artificially fed from birth and 43.5% breast-fed to the second to fourth month. (13.). An American study of 20,061 babies from birth to nine months, during the period 1924-29, showed that 48.5% were entirely breast-fed; that 43% were partially breast-fed; while 8.5% were artificially fed. (14.). From these figures we see that roughly 90% of babies are breast-fed at birth, but that these figures rapidly fall till by the end of three months only about 40% are being breast-fed. The numbers breast-fed from birth could be higher, and every effort should be made to raise this figure. The failure of over 50% of this number to breast-feed beyond the third month indicates that something is radically wrong.

Before going on to consider what is wrong, it will not be out of place to stress the advantages of breast-feeding by showing the effects of breast-feeding and artificial feeding on later development, as/
as shown by Hoefer and Hardy. A picture which ought to stimulate those concerned to devote all their energies to making breast-feeding successful and universally practised. An analysis of 383 elementary school children of Chicago, between the ages of 7 and 13 years, has shown that:-

A. Artificially fed children were, on the whole, inferior physically and mentally to breast-fed.

i. Except for height, they rank the lowest in all physical traits measured.

ii. From the standpoint of nutritional indices they were the poorest nourished group.

iii. On the average, they were the most susceptible to diseases of childhood.

iv. In learning to talk and walk, they were the slowest of all groups.

v. In mental development, the artificially fed ranked next to the lowest; the lowest were those breast-fed between 10 and 18 months.

vi. Of the children with superior intelligence, the smallest percentage was in the artificially fed group.

vii. Of the artificially fed, not a child was classified as being exceptionally bright.

B. Those breast-fed from four to nine months were definitely superior, physically and mentally, to all other groups. (15.).

These/
These facts, and others on morbidity and mortality amongst breast-fed and artificially fed children would, if they were more universally known, go far to make the advantages of breast-feeding more fully realised than the bald statement that it helps the involution of the uterus - see any text book dealing with breast-feeding.

The tendency for the milk supply to fail when the mother gets up; the fact that many mothers give up breast-feeding when they go to work; the safety and cheapness of artificial foods; and, occasionally, the lack of a sense of responsibility on the part of the modern mother towards her child are given as explanations for the failure to persevere with breast-feeding. Personally, while admitting the truth of these explanations, I believe that there is a much simpler one. One which, if acted upon, would bring about a surprising change for the better in a comparatively short period of time. It is as follows. The great majority of doctors and nurses are not sufficiently acquainted with the minor difficulties that arise during the first few days of breast-feeding. They are incapable of correcting these difficulties, which are often as alarming to them as they are to the mother. Even more important, they are not sufficiently well instructed to be able to give the mother sound advice on the correct way to breast-feed her child. While gathering the/
the material for this thesis, I was present during the day-time whenever the babies were fed, for a period of three months. Yet I could count on the fingers of one hand the number of nurses, training for their midwifery examinations, who took an interest in instructing the mothers to breast-feed their babies. The fault was not entirely the nurses. Their time was fully taken up in undressing, washing, weighing, and dressing the babies; seeing that they were put out to feed and taken in again at the right time; preparing and giving bottle feeds to babies not on the breast; and attending to premature babies who needed special nursing. The interest in the struggle to rear a premature baby successfully is second only to the drama of the labour ward in the student nurse's mind. They were so overworked that when the normal babies were being fed, they were catching up on some other part of their work - such as attending to the bottle-fed babies. I am sure that the most important time in breast-feeding is the first ten days or so. If the mother was well instructed in how to breast-feed her baby at that time, we would find the figure for those still breast-feeding their children at six months would be far higher. Also the number who bottle fed their babies from birth would be lower, because often it is an unfortunate previous experience which decides a mother to bottle feed her baby from the start.

Suggestions/
Suggestions for the better training of medical students and nurses in the art of breast-feeding will be made in a later chapter. Sufficient to mention here that our object should be to train medical students and nurses so that it will no longer be possible to say "... "In the vast majority of cases improper management during the first few days or weeks of the child's life is the cause of failure in the attempt at breast-feeding." (16.). Only when our medical students and nurses see, before qualifying, as many babies being normally breast-fed, as they now see "abnormal cases" being delivered, will the future position of breast-feeding be assured.
ANATOMY AND PHYSIOLOGY OF THE MAMMARY GLANDS.

Anatomy:

Each Mammary Gland, in the female, lies in the superficial fascia over the pectoralis major and serratus anterior muscles, from the second to the sixth rib and from the lateral border of the sternum almost to the mid-axillary line. A "tail" extends from the lower border of the pectoralis major up into the axilla at the level of the third rib. The glandular tissue forms a flattened conical mass - the smooth contour being due to the invasion of its substance by fatty tissue - and the apex corresponds to the nipple, which forms a conical elevation a little below the middle of the gland. A pigmented area called the areola surrounds the nipple; the subjacent tissue and the nipple itself are devoid of fat. Each Mammary Gland is a large compound racemose gland, not enclosed in a capsule, and made up of 15 to 20 groups of glands; these are embedded between the strands of fibrous tissue, which pass through the superficial fascia from the skin to the deep fascia. Each group opens by means of a duct upon the apex of the nipple, around which the groups radiate. The essential units of these groups are the alveoli, which, in the virgin mamma, are few, and scattered in small groups amongst the abundant thick connective tissue. Their walls are composed of a delicate basement membrane, invested by/
by capillary blood vessels, and lined by a simple layer of columnar epithelium. The alveoli are drained by ducts which unite to form a lobular duct; contiguous lobular ducts unite to form the duct of a small lobe, which unites with similar ducts to form the duct of a large lobe. These are 15 to 20 in number and as they lie beneath the areola, each duct expands into a spindle shaped dilatation called a lacteal sinus, which serves as a milk reservoir. Terminally each duct narrows, traverses the nipple, which contains a considerable amount of plain muscle, and opens on its summit at the bottom of a small depression. The duct walls are composed of areola and elastic tissue, the latter being arranged in both a longitudinal and circular manner, and are lined with columnar epithelium. The Mammary Glands, like the sebaceous and sweat glands, are developed from ectoderm; but the lumen of the branching duct system is formed only at birth and is associated with the secretion of a fluid resembling milk, which often takes place at that time. (17.). (18.). (19.).

Physiology:

Mammary development, in the female, begins at puberty; and the preparation for lactation in the first month of pregnancy, when the glands swell as a result of the exaggeration of normal growth. During the remaining months of pregnancy there is production of/
of new secreting alveoli and proliferation of duct epithelium. But even in the lactating gland there are large areas of fatty tissue and the alveoli can be seen in all stages of development. The ovarian hormones are chiefly responsible for the mammary development, and prolactin, an anterior pituitary hormone, for lactation; although our knowledge of these mechanisms is not complete. A certain amount of secretory activity takes place during pregnancy, as can be demonstrated clinically. Starling states "In certain mammals this watery secretion gives place to a secretion of true milk at the end of gestation or during the process of parturition itself. In the woman the secretion does not begin as a rule until the second or third day after birth, though the formation of milk may be anticipated if a child has been put to the breasts during the latter part of pregnancy."

Breast milk is a specific secretion, although some of its constituents, such as the vitamins and urea, are considered to be dialysed from the blood plasma. It is formed by the columnar cells lining the alveoli, and milk globules can be seen, not only lying in the alveoli, but also within the columnar cells themselves. Large fat containing cells (colostrum corpuscles), which are believed to be either leucocytes or disintegrated portions of the secreting cells, are seen in the early flow.

Secreted/
Secreted milk collects in the lacteal sinuses. As the amount contained within the gland increases, the columnar cells lining the alveoli become flattened. On reaching a certain tension secretion ceases, unless the tension is relieved by free escape to the exterior. This can occur as a result of overflow, manual massage of the gland, the action of a suction pump, or the sucking of the baby - although the plain muscle lying just inside the basement membrane of the alveolus is thought to play a part in the emptying of the gland. With the lowering of tension, the activity of the columnar cells recommences and more milk is secreted. The production of milk is absolutely dependent on the removal of milk from the gland. If this removal does not take place a process of involution follows. Thus, other things being equal, where manual or mechanical means are not used, the amount of milk secreted by the active glandular tissue is dependent on the ability of the baby to remove it. (19.). (20.).(21.). (22.).
ANTE-NATAL PREPARATION FOR BREAST-FEEDING.

There are many books written for the expectant mother, and in many clinics they are often given a printed copy of instructions. But the printed word is not enough and is frequently misunderstood. I well remember, as a locum in general practice, going to see a moderately well-to-do woman in the last month of her pregnancy. She was very distressed, because her ankles became swollen towards the end of the day. She became breathless on reaching the top of the stairs. Although she did no heavy work, most of the day was spent supervising the maid and doing lots of little odd jobs. She said that she felt pleasantly tired by the end of the day and it was rather a nuisance having to go for a four mile walk in the evening. I asked why she did this. She replied that it said in her baby book, that to keep herself as fit as possible in pregnancy, she should walk at least four miles a day. She had not realised that she walked a considerably greater distance while doing her house work. She was greatly relieved, and benefitted, by the advice given. I was particularly impressed, in the series of cases studied, by the number of mothers who had received no verbal instruction as to the preparation of the nipples, even in cases where the nipples were flat. Some of them had been/
been given printed slips of instructions, but often they thought their nipples did not need any special treatment. One mother informed me that she had bathed her nipples with spirit, as advised, but had had to give up as they had become cracked. She was rather worried about this as she thought, that as her nipples would not stand up to spirit bathing, she would not be able to breast-feed her baby successfully. Unfortunately she had not realised that this cessation was a blessing in disguise.

I am convinced that the hospital paediatrician can play a very useful role as the link between the ante-natal and post-natal periods. At present the expectant mother first of all sees a junior obstetrician and the sister in charge of the ante-natal department. At the time of her delivery she is most likely attended to by another doctor and the labour ward sister. Finally she meets the ward sister and another doctor. This, in the larger hospitals. The nurses of course are constantly changing. She has most likely passed through the hands of 4 or 5 nurses during her attendance at the ante-natal department and meets completely new nurses in the ward. How much better if she saw the paediatrician during her pregnancy. At the first visit he would explain to her about the advantages of breast-feeding and about the care of her nipples and breasts during pregnancy/
pregnancy. At the second visit, during the last month of pregnancy, he would explain any little points that had occurred to her. Then he would point out how, although the milk did not come in for the first two or three days, it was very important to get the baby to suckle during this time, although it was often difficult as the baby might be sleepy; but that on her success then would depend the ease with which the milk would flow when it did come in; a word or two on how to hold the baby, get up the wind, and anything else that might occur to the mother. Then finally an assurance that although it might all sound very bewildering, and would be rather strange at first, she would soon get into the way of it, and he would be there to give her a hand. As I shall stress later on, it would be a great advantage if the primipara could visit the lying-in ward at this time and actually watch a mother breast-feeding her baby. Then after childbirth the paediatrician, who had seen her in pregnancy, would see her once each day while she was actually feeding her baby. He would give her advice and encouragement and at the same time explain any points which might be worrying the nurse who supervised the feeding. As I watched the obstetrician doing his round of the mothers, or the paediatrician his round of the babies, I was often struck with the thought that each saw part of the machine but neither of/
of them saw the machine in action. Too often the ward sister is not keen on the doctor doing his ward round during feeding time, but that is the time when it would be most beneficial. I am sure that with a little thought and arrangement the above scheme could be put into practice.

The hospital type of mother has at her disposal a very good antenatal service. However, only too often, little advice is given regarding the preparation of the nipples and no advice regarding preparation for the breast-feeding of her baby. Naturally her thoughts, and those of the obstetrician are centred on seeing that her general health is satisfactory; on the coming labour; and on the birth of a healthy baby. With these very estimable thoughts there can be no quarrel. Still, there are a few points in the ante-natal preparation of the mother for breast-feeding that call for comment. As regards preparation of the nipples, I believe the best advice is that of general cleanliness and the gentle pulling out of the nipples if they are not sufficiently prominent in the last month of pregnancy. The advice about the use of a scrubbing brush has now fortunately been relegated to the historical scrapheap. I have always been against the use of spirit in the preparation for prolonged trauma, whether for the buttocks or the nipples. It is not physiological and by drying the skin decreases/
decreases its suppleness and increases the tendency to cracking. The skin is usually moist, but if it tends to be dry, I should imagine the use of a mild antiseptic ointment would be beneficial. When secretion from the nipple has dried and become adherent, Waller (23.) advises the application of a series of moist dressings wrung out of 1 in 4,000 biniodide of mercury and covered with oil silk. This allows the dry secretions to be freed without injury and the dried up secretion to escape; but with general cleanliness this need should not occur.

It is, however, with the preparation of the breasts in pregnancy that I am more concerned. Waller in his stimulating book "Clinical Studies in Lactation" discusses engorgement in some detail. This, he considers, to be an expression of interference to the free outflow of milk. As he so aptly puts it "The fact is that far more often than not the milk 'comes in' with almost automatic precision. The abiding nuisance is that so often it does not get out."

He suggests three causes of this interference with outflow. 1. The anatomical structure of the ducts. 2. Previous mild infection of the breasts, distorting or obliterating the ducts. 3. The type of early secretion. Text books of anatomy and physiology state, and implement with drawings, that the lactiferous ducts run straight from the lacteal sinuses and open on/
on the summit of a conical nipple. While this is so in the majority of cases, there is frequently a different state of affairs, as was seen in 45 cases of my own where complete records were kept. There were three women in each of whom one nipple was of the "crater type" - i.e. there was a depression of the summit of the nipple and into this depression the ducts opened, so that the milk appeared to flow from the bottom of a well. Both nipples in one woman were "pitted" - i.e. a duct or ducts appeared to open at the bottom of small pits. In another the ducts of one nipple opened on the summit, but there were only two openings. In another, in addition to the duct openings on the normal type of nipple, there were ducts which opened in the area of the areola. There were seven women with flat nipples and one in whom they were definitely retracted. Thus it is not hard to imagine ducts which are so tortuous that the milk has great difficulty in getting out; and others which have no external opening, so that the milk from the segment of the gland which it drains has no escape at all. The latter possibility was suggested in two women, in whom an area of one breast was hard and tense and could not be emptied by massage. This obstruction may have been caused by sticky secretion in a normal duct, or by obliteration of a once anatomically sound duct as a result of previous inflammation/
inflammation. Waller does not suggest that the original structure of the lacteal ducts, or interference with that structure by later mild inflammatory processes, are the most important causes of interference with the outflow of milk; this he attributes to the early type of secretion, particularly that in primiparae.

It was my practice in this study, at the first opportunity, to examine the nipples and breast and to express a little of the colostrum - or as I prefer to call it, the early secretion. The fluids expressed differed in appearance. There was a sticky, almost colourless fluid, like the white of an uncooked egg, which formed a greater part of that expressed in primiparae. A bright yellow and less viscid fluid formed the preponderance in multiparae. Then there was a thin type of fluid which looked like water, after it has been poured into an empty glass from which milk has just been drunk - this was seen almost exclusively in multiparae. Finally there were those in whom all three types were present in equal amounts. I was definitely struck with the preponderance of the clear sticky fluid in primiparae and the difficulty with which it was expressed. Waller attributes the chief cause of obstruction, - to the outflow of milk at the beginning of lactation - to the difficulty in removal of this early secretion. If I interpret him correctly,
correctly, he does not attribute a great deal of importance to the vigour of the baby in the removal of this early secretion, but more to the massage of the breasts in pregnancy. He states "The baby may set about its task with the greatest energy and yet be quite frustrated and unable to obtain milk in the presence of an abundant secretion." Lowenfeld and Widdows (24). express the view that the rate and character of the development of lactation falls into two main types. The first was found mainly in multiparae whose breasts were usually active during the later weeks of pregnancy. Here there was an early production of homogenous milk, ample in quantity, the colour being never deeper than primrose yellow. This type was illustrated by a mother with a good sucking infant in whom the fluid had the bluish appearance of normal milk. In the second type, found mainly in primiparae, whose breasts were usually not active during the later weeks of pregnancy, the milk was not homogeneous, was very viscid, scanty in quantity, and often had a deep yellow colour. This type was illustrated by a mother with a poor sucking infant, in whose breasts there was no fluid, even by expression, in the first 24 hours. It was at first very viscid and, after 36 hours, deep yellow. Later they say "It does occasionally happen that a primiparae if young and full breasted and possessed of a vigourously/
vigourously sucking infant, will show a development approximating to the multiparous type."

In my series of cases I have attempted to correlate the discharge of breast secretion in pregnancy, the sucking ability of the baby, and excessive engorgement of the breasts when the milk comes in - engorgement that was really painful and in which the breasts were so full that the baby was unable to obtain a grip on the areola till some breast milk had been expressed by hand. It seemed to me that if a woman's breasts discharged secretion in pregnancy, one might be justified in supposing that the baby would have less difficulty in removing the early secretion than if there had been no discharge of secretion; and that the chances of excessive engorgement would be less, and more so in a baby who sucked strongly, than in one who sucked feebly.

The following table sets out my observations:-
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<th>Power of Suction</th>
<th>Discharge from breasts in pregnancy</th>
<th>Excessive engorgement occurred when milk came in</th>
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| TOTALS          | /                                  | 6 6 12                                        | 19 12 31                         |
I fully realise that these figures are too small for satisfactory conclusions to be drawn, but I believe they show one or two interesting points. The first of these is that discharge of breast secretion in pregnancy occurred in 6 multiparae and 7 primiparae. Thus, when it did occur, it occurred equally in previously active and inactive breasts, which is at variance with the views of Lowenfeld and Widdows. It is, however, what one might expect to find from one's knowledge of the histology of breasts in pregnancy. One never sees in histology books different descriptions of the breast changes in primiparae and multiparae; for as Dawson puts it "As normal post-lactation involution implies the more or less complete degeneration and removal of the new secreting tissue formed during pregnancy, subsequent pregnancy involves a repetition of glandular proliferation and differentiation for a new lactation". (25.). If discharge of secretion is going to take place in pregnancy there is no apparent reason why it should not occur equally in primiparae and multiparae, except for one fact. This is that the lumen of the ducts leading from the lacteal sinuses to the surface of the nipple might be comparatively larger in multiparae, and so less predisposed to clogging. After the gland has ceased to secrete, not only do the alveolae atrophy but the calibre of the ducts also diminishes (19.). Whether they revert to the same diameter as they previously possessed I do not know. The second is that in one/
one multipara and three primiparae, in whom both good suction and previous discharge were present, there were no cases of excessive engorgement; yet, where there was good suction but no previous discharge, 5 out of 18 multiparae developed excessively engorged breasts and 1 out of 8 primiparae. Although the figures are not really large enough for comparison, it would seem that previous discharge plays a part. Also, where there was poor suction and no previous discharge 3 out of 3 primiparae developed excessive engorgement and the only multipara escaped; yet where poor suction was present with previous discharge only 1 out of 5 multiparae developed excessive engorgement, and 2 out of 4 primiparae. This also shows the part played by previous discharge.

If we look at these figures again, from the point of view of the part played by the suction of the baby and that played by previous discharge - which I maintain should mean easier removal of the sticky secretion and less chance of excessive engorgement - we find that in primiparae and multiparae, the chances of excessive engorgement are as follows:

<table>
<thead>
<tr>
<th>Suction</th>
<th>Discharge of secretion in pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
</tr>
<tr>
<td>All types</td>
<td>1 in 5</td>
</tr>
<tr>
<td>Multiparae</td>
<td>1 in 4</td>
</tr>
<tr>
<td>Primiparae</td>
<td>1 in 11</td>
</tr>
</tbody>
</table>
Here we see, that in both types of women taken together, good suction is the most important factor, but previous secretion also plays its part; that in multiparae previous discharge, or ease of removal, is if anything slightly more important than the power of suction; while in primiparae good suction is all important and will be doubly useful where there has been no previous discharge. We know that the babies of primiparae are bad suckers - the reason for which I shall discuss later - and we can see here that in a primipara with a badly sucking baby, previous discharge, which points to easier removal, will play an important part.

The point I am trying to make is this. The more easily the breast secretion is removed by the baby, the less will be the chance of excessive engorgement. Now this secretion will be more easily removed by the baby - particularly in primiparae, where the early secretion is more viscid and the effects of a badly sucking infant far more disastrous - if massage of the breasts and manual expression has been practised in the last weeks of pregnancy. Why this early secretion should be more viscid in primiparae, I do not know, unless the supposedly narrower lacteal ducts lead to clogging of the secretion and stasis leads to greater concentration. But I do know that excessive engorgement is to be avoided at all costs, not/
not only because of the cracked nipples and mastitis which may follow - through the struggles of the baby to take the nipple - but because of the time that will be wasted in getting the mother and baby initiated into the art of breast-feeding; time which is extremely important when the mother has to go back to her home on the 10th to 14th day; lost time which may result in the mother's milk "failing" when she gets up. This failure is, to my mind, another way of saying that the mother has not learnt how to see that the baby makes the best use of the time at the breast. Thus when she goes home, and is not under supervision, the baby takes less from the breast, secretion falls off, a vicious circle is instituted and the bottle finally takes the place of the breast, because the breast is supposed to have failed.

I believe that the pregnant woman should be taught to massage her breasts in the last month of pregnancy, so that the early secretion may be removed; so that the suction of the baby may not be wasted on unnecessary hard work; so that he may thereby the more easily remove the less viscid secretion which remains, and ensure an uninterrupted outflow of milk when it arrives.

The massage of the breasts in pregnancy to prepare for the easy escape of the milk was practised by the Maoris of Old as was related to Penniman (26.).
by "Makereti" sometime Chieftainess of the Arawa tribe, known in New Zealand as Maggie Papakura. Here is the description. "Her u (breasts) which had received special attention during the months of her pregnancy would have the waiu (milk) flowing easily, and so the child is fed from the breast soon after it is born. In the old days the u were mirimiri, massaged, and also the matamata, nipples, and a Maori mother never had the difficulty of the women who have come in contact with civilization. When a woman became happu" - I take this to mean pregnant - "her breasts were attended to from three months after right up to the birth of the child."
Points to be considered before putting the baby to the breast for the first time.

After the stress and strain of labour, both the mother and her baby are in need of a well earned rest. Once the mother has had a good sleep, her first desire will be to see her baby and fondle him. What the baby's desires are we can only guess. By all appearances they are to sleep, which is natural enough, for he has undergone, and is undergoing, momentous changes, and the only other momentous change that he will experience will be death. Between the two there is no more comparison than there is between the first gigantic leap of flame when a petrol dump is sabotaged, and the last flicker of the resultant fire. It is with a similar suddenness that the new type of existence descends on the baby. For here we see the effects of the moulding of labour, the first use of the lungs, the shutting off of an old and the starting of a new circulation, the destruction of blood cells, the cessation of a constant supply of nutriment, the playing of light on the eyes and of air upon a body, which has previously seen accustomed to a constant and equally distributed warmth. No wonder the baby wishes to sleep.

But how long is he to be allowed to sleep?
A new system of feeding has to be initiated and full use/
use must be made of the first few days in learning the new art, so that when the breasts fill with milk he will be able to take what is offered, else his future supply will be jeopardized. For the baby who has not suffered birth injury and whose mother has not experienced a long and trying labour, most authorities suggest that the baby should be put to the breast about 8 to 12 hours after birth (27.)(28.).(29.).(30). Heiprich (31.) put 200 infants to the breast for the first time from 12 to 20 hours after delivery, and another 200 between 24 and 30 hours. The second group (24 to 30 hours) took four times as much at the first feed, and twice as much during the first day of breast-feeding, as the first group; also their total intake over the first three days was 50% greater; the initial loss of weight was practically the same in both groups; but 33% of the second group regained their birth weight by the tenth day, as compared with 25% of the first group. In a similar type of experiment Oeljan and Scherer (32.). with the same number of babies, but divided into different time groups, namely 12 to 14 hours, and 24 to 36 hours, noted the following facts. The later group (24 to 36 hours) showed a smaller initial loss of weight; obtained less breast milk for the first three days, but made up this deficiency and took larger amounts before the end of their stay in hospital; and the greater percentage of them regained or/
<table>
<thead>
<tr>
<th>Average time put to the breast in hours.</th>
<th>No. of Cases</th>
<th>Average amount taken per day in ozs.</th>
<th>Number + or - birthweight on tenth day.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 feeds measured.</td>
<td>(6 1/2)</td>
<td>(9) 1/2 2 1/3 6</td>
<td>(6- 3+)</td>
</tr>
<tr>
<td></td>
<td>(13 1/2)</td>
<td>(8) 1/2 2 1/3 8</td>
<td>(6- 2+)</td>
</tr>
<tr>
<td>4 feeds during day time measured i.e.</td>
<td>(7 3/4)</td>
<td>(10) 2/3 2 1/10 4 1/3</td>
<td>(6- 4+)</td>
</tr>
<tr>
<td>last and first feeds not measured.</td>
<td>(13)</td>
<td>(8) 1/2 2 4</td>
<td>(6- 2+)</td>
</tr>
</tbody>
</table>
or exceeded their birth-weight on discharge from hospital.

In the wards where the present series of cases were studied, the babies were put out first at varying times after birth, but the average of all normal cases works out at 12½ hours. Splitting up these cases into two groups, namely those put to the breast for the first time between 5 and 10 hours after delivery, and those put to the breast for the first time between 11 and 16 hours, we obtain the following facts:

(See Table)

From these figures it would appear that it makes little difference when the baby is first put to the breast between 5 and 16 hours after delivery, except that in the later group (11 to 16 hours) there seems to be a greater intake of milk at the first and last feeds on the third day. But the most striking fact is that only one-third of all the babies had regained their birth-weight by the tenth day. This regain of birth-weight I will consider later.

I have had little experience of first putting babies to the breast later than the times mentioned. Naturally, one wants to put the baby to the breast at the earliest moment, in order to facilitate the removal of the early secretions, and in this way the baby/
baby will achieve as much experience in sucking as he can before the milk comes in. If the breast becomes over-filled at that time, he will find his task difficult and may become discouraged. In my opinion there should be no definite time after delivery for first putting the normal baby to the breast, but this should be done when two conditions are satisfied. These are that the mother should have had a good sleep and reasonable rest after her labour, and be keenly looking forward to seeing her baby; and the baby should be "looking for its feed". In fact both mother and baby should be looking for, and in need of, each other. I have seen babies that have been sleeping soundly since delivery, woken up to be fed for the first time, refuse all offers of the breast, and go off to sleep again. This usually to the distress of the nurse, when she is informed; but not of the mother, who feels that the baby is in as much need of a sleep as she is herself. Far better that the baby be awake and shouting for his food, for then, not only will he make a good attempt to obtain something from the breast, but the mother will be more painstaking in her attempts to feed him, as she will be convinced that he is crying because he is starving. In the normal course of events both these conditions will be present in the first 24 hours after delivery. I think that it is extremely important that the baby should/
should have a good and uninterrupted sleep, and that he should be given no fluid till after he has been put to the breast for the first time. After this he should be given fluid as often as possible, till the milk comes in. It might be argued that the longer the interval between delivery and the first feed, the greater the loss of weight; but I maintain that it is more important to have a baby which is awake at his first feed, so that both he and his mother make a good attempt at feeding from the very beginning.

In the case illustrated here, the baby was born in a police box. This occurred when the mother was telephoning the hospital to see if there was a bed for/
for her. She was admitted to hospital at 1 a.m. It was decided not to put the baby to the breast that day, but to give the mother and the baby a good rest to get over their experience. The first feed was at 9 a.m. the next day, when the baby needed no encouragement to "go to it". I asked the night nurse, a few nights later, how the baby was sleeping. She told me that he never stirred, but on the first night he had cried from midnight on, and, if it had not been for her instructions, she would have given him to the mother to feed at 6 a.m. Certainly this baby took all that was offered to him, there was no suggestion of engorgement, and the birth weight was more than regained by the sixth day.

Having decided when first to put the baby to the breast, the next thing to consider is how often the baby is to be fed. Some authorities suggest that the baby should be put to the breast twice on the first day, four times daily on the second and third days, and six times daily when the milk comes in. (33.) Others, that the baby should be fed three-hourly till he reaches 10 lbs. in weight, and then four-hourly. (34.)(35.) And some, that he should be fed four-hourly from the start (36.). In the wards where these cases were studied, it was the custom to put the babies out to feed every three hours during the day (at 0600, 0900, 1200, 1500, 1800 and 2100), leaving/
leaving an interval of nine hours at night, so that I have had no opportunity to study four-hourly feeding from the start. I have, however, one or two reasons for thinking that this method would be preferable. It was very noticeable how sleepy most of the babies were at the time of their feeds, and how often it was necessary to wake them up before they were put to the breast. It was my habit to weigh them before and after a feed, and to help the nurses to "put them out" and "take them in" again. Often as many as 12 babies would be wheeled into a ward on one trolley and, as often as not, not one of them would be even whimpering. So, many of these babies which were fed three-hourly were not looking for their feeds and this is a "bad thing". It is argued on behalf of three-hourly feeding that by this means the baby is put to the breast more often than in the four-hourly regime, and that this is beneficial, because the best stimulant for the secretion of milk is the actively sucking baby. But it is not the number of times the baby is put to the breast that is the important factor, but the efficiency with which the breast is taken. Surely a baby that is fed four-hourly will be more likely to be "looking for" his feed, and therefore suck more vigorously, than one that is fed three-hourly, and the increased vigour will more than make up for the feed that is lost. On the other hand, babies/
babies who are awake and ready for their feeds at three-hourly intervals are often overfed with unfortunate effects on their weight, as can be seen from the following example.

This baby on three-hourly feeds was awake at every feed and sucked well. He lost 5% of his birthweight in the first two days, and then for the next two days put on weight. But the breasts were being over-stimulated and he was taking more milk at each feed than he could adequately deal with. This was shown by a further loss of weight. A regain in weight was obtained.
obtained by allowing ten minutes at each feed instead of 20. The mother was told to put the baby to the breast four-hourly after she had been home for two days. This pleased her as she had fed her last baby four-hourly and it had done well.

Now this brings me to another point, which I think is in favour of four-hourly feeding. In trying to establish the art of breast-feeding before the mother leaves hospital, we are trying to establish a conditioned reflex. We are teaching the mother to feed her baby at definite set intervals, and we impress on her most firmly the importance of feeding her baby exactly at these times. We need not mention here the reasons, for they are proven and generally accepted. But in feeding the baby three-hourly, are we not increasing the chances of the mother going over to bottle-feeding in the not too distant future? Most mothers, I think, turn over to four-hourly breast-feeding sooner or later because they find that it interferes less with their housework, and takes less out of them. Now suppose a baby has been fed three-hourly and with some difficulty breast-feeding has been established. The mother goes home and decides to change over to four-hourly feeding - despite the doctor's instructions to feed three-hourly till the baby weighs 10 lbs. - because her neighbour tells her how much easier it is, and how well her own baby has done.
done on four-hourly feeding. The old reflex, which has with difficulty been established, is broken and a new one has to be conditioned. The baby cries; the mother, who has had some difficulty already, becomes apprehensive; she thinks the baby is not getting enough and after a few days puts it back to three-hourly feeds. The baby, who has got used to making more vigorous demands on the breasts, obtains too much, vomits, has diarrhoea, or loses weight. The mother becomes convinced that the milk is not agreeing with the baby and on to a bottle it goes. Suppose on the other hand that this changeover is done under skilled guidance and all goes well. Will there not have been rather a waste of time and effort? Later on we train the baby to move his bowels after his 10 a.m. feed. Having got this reflex firmly conditioned we would not dream of breaking it and teaching the baby to move his bowels after the 6 p.m. feed. So why should we not do the same for his stomach at an earlier age? It may be thought necessary to feed a baby three-hourly at first because he is weak or under weight. But surely even here it would be better to feed four-hourly and complement if necessary. A reflex cannot be broken with impunity, and I feel that the breaking of a three-hourly reflex by a mother not receiving skilled supervision, is one of the explanations why a mother’s milk is said to “go” when she gets up.
As to whether one or both breasts should be used at one feed, I am in favour of using both breasts until lactation is established. As pointed out earlier on, our aim is to remove as much of the early secretion as possible, in order that there may be no impediment to the outflow of the milk when it comes in. If this was the only consideration, it would be advisable to use only one breast at each feed, so that the baby could expend the whole of its energy thoroughly clearing out the ducts. However, the nipples and areola have also to be considered. They are, particularly in the case of a primipara, being subjected to a set of conditions to which they are not accustomed. If the baby was allowed to suck the whole of the time at one breast, it might harm the nipple and areola - and cracked nipples are to be avoided at all costs, for not only do they give the mother unnecessary pain, but loss of valuable time in teaching the art of breast-feeding results, through the breast or breasts affected being out of action, and mastitis with complete cessation of breast-feeding may follow. Better then to use both breasts at each feed - the left breast being given first at one feed, the right at the next, and so on. At the first feed the time at each breast should be short, preferably one minute, i.e. a total feeding time of two minutes. This should be increased by a minute at each breast, every other feed, till a total time of 10 minutes at each breast is reached, as follows :-
<table>
<thead>
<tr>
<th>DAY</th>
<th>1st day</th>
<th>2nd day</th>
<th>3rd day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>1 min.</td>
<td>2 mins.</td>
<td>3 mins.</td>
</tr>
<tr>
<td>at</td>
<td>R.L., L.R.</td>
<td>R.L., L.R.</td>
<td>R.L., L.R.</td>
</tr>
<tr>
<td>each</td>
<td>Order of giving</td>
<td>Order of giving</td>
<td>Order of giving</td>
</tr>
<tr>
<td>breast</td>
<td>breasts.</td>
<td>breasts.</td>
<td>breasts.</td>
</tr>
<tr>
<td></td>
<td>Born 0100.</td>
<td>0800</td>
<td>1800</td>
</tr>
<tr>
<td>Time</td>
<td>of feed.</td>
<td>1000</td>
<td>1400</td>
</tr>
</tbody>
</table>
I think this gradual and regular stepping up is advantageous. As the strength of the baby increases, so does the time spent at the breast increase; as the strength of the mother returns, so do the demands on her energy become greater; but most important of all, the tissues of the nipple and areola are gradually exposed to a new set of conditions. The time spent at each breast is long enough for the baby to remove all the secretion he is likely to remove, and not long enough for him to be discouraged by sucking at an empty breast. Should the milk "come in" 48 hours after birth, the baby will by that time be sucking at each breast for 4 to 5 minutes, which is long enough, particularly at this stage, when we do not want the baby to throw too great a strain on his digestive apparatus, which is being "run in" for the first time. A state of affairs which frequently happens in a vigorously sucking baby, as we shall see in the later chapter.

There is one more point I wish to discuss before going on to the actual art of feeding; and that is the importance of environment, and careful and sympathetic instruction of the mother by the nurse in the first few days. This is best illustrated by drawing two word pictures. The first is of a primipara who "has her baby" at home. She goes through her labour, which is not as bad as some of her relations had assured her it would be. "Still", she muses, admiring the/
the elegant stems of the red tulips on the bedside table, "it has all been worth while, because I have a boy, which is what I and Fred" (her husband) "wanted, and the Doctor told me that I was very good." Then just before she drops off to sleep her husband comes into her room and tells her how thankful he is everything has gone off so well, and how marvellous she is. Next day she feeds her baby for the first time, and although it is all rather strange and queer, she does quite well and nurse is very pleased with her and baby. For the next day or so the baby cries after he is fed and once actually vomits up the milk he has taken, but he is getting better with each feed, and both the Nurse and the Doctor are very pleased. People had actually told her that breast-feeding was difficult. "Why" she wonders "it is too easy". And sitting there in bed, feeding her baby she feels queen of all she surveys.

The other picture is of a slightly nervous primipara, the wife of a stoker serving in a Destroyer on the Atlantic. She is in a large ward with 11 other women, waiting for her baby to be brought to her for the first time. As she lies there she thinks "Thank goodness that is all over; it was terrible. I wish the doctor who delivered me was here. I would like to thank him for all he did - but maybe I will see him again before I leave; he seems to be the only person/
person I know here. I have never seen any of these women before, but the one with the blue shawl in the far corner looks quite nice. The nurses are all new and the woman in the next bed says the Sister is an absolute tartar. I suppose the night nurse can't be so bad as the sour-looking woman by the door says she is. But what does it matter?; all I have to think about now is feeding my baby, and that won't be difficult, the doctor told me I would manage all right." Then the babies are brought in. Her baby cries and refuses to take the breast. The woman in the next bed says "That's nothing - wait till he cracks your nipples, I know." The baby of the woman in the blue shawl is not crying, and the woman by the door looks as if feeding a baby was so easy it is a waste of time. But her baby won't take the breast and goes away, as he came, crying. She knows he is hungry and blames herself for being unable to feed him. The next day is a little better, but he only takes the breast for a minute and then falls asleep, to wake up and cry when he is taken away. "He is tired out and hungry, things are going from bad to worse. Oh, why can't I feed him?" she asks herself. The nurse assures her that often babies are sleepy to begin with, but it will be all right in a day or two. "But the woman by the window, who came in this morning, is having no difficulty." The/
The next day the milk "comes in", her breasts become painfully engorged and are so tense that the baby cannot obtain a grip. He mouths violently at the breast and screams but gets nothing. The Sister comes over to see what is wrong. She scolds the nurse for allowing the baby to be put to the breast and shows her how to exhaust the breast, so that the baby can obtain a grip. Things are a little better after that, but she has no confidence in the nurse, who she feels should have helped her more and prevented this terrible state of affairs happening. The next day is better still; she is quite pleased with the success of her feeding efforts and her breasts are less painful. Then the night nurse tells her that her baby is not putting on weight as fast as he should, and that she must take more interest in feeding her baby. She cries. She thought she had been doing so well but apparently she is not able to give the baby enough milk. The woman in the next bed tells her not to worry, for everything will be all right when she gets home, where there will be no-one to stop her giving him a good bottle. "But I want to breast-feed by baby; you are doing all right, why shouldn't I?" she says. "We can't all be the same, dear, and don't think I won't give mine a bottle when I get home; he's got a lot to make up; they let them cry so much at night that they are exhausted by feeding time."
I put my last one on the bottle when I got home and you should have seen the difference." If this woman continues to breast-feed her baby, when she gets home, she will do well.

Possibly the contrast is a little overdone, but the remarks of the woman in the next bed are taken from life, and the lack of attention by the nurses I have seen too often. Only the Sister saved a disaster by stopping the baby from feeding at an overloaded breast. But the Sister is an overworked woman, dashing here and there wherever the red light of danger glows. It is impossible for her to instruct every woman under her care, from the start.

When I started this study I noticed after a few days that everything was going well in one ward (A) and everything badly in the other (B). In the latter ward my presence was resented. One woman remarked that she wished there would be a war and then we could get rid of some of the men; another felt she knew everything there was to know about breast-feeding and resented any help. Unfortunately when one grumbler left, there was another on whose shoulders her mantle had fallen. The primiparae were nervous and agitated. Never will I forget those anxious, half terrified glances, which struggling primiparae cast at those who were feeding successfully, and the way they sank back in their pillows exhausted at the end of feeding time/
time. There seemed to be nothing but engorged breasts and a failure to regain birthweight by the tenth day. There was much talk of bottle feeding. Everything seemed hopeless. In the other ward (A) it was different. The mothers were grateful for what help I could give them; there seemed to be less engorgement, and often the birthweight was regained, or almost regained, by the tenth day. The primiparae did well; there were no tears or agitated expressions; there was no talk of bottle feeding; there was reason to hope for the best.

These experiences set me thinking. I decided that the all-important point was a happy atmosphere and more attention to the first few days. To achieve this, I waited till the last of the grumblers had taken her departure. Then, by arrangement with an understanding ward sister, all primiparae went into side wards till they were over the difficult first few days. Only when I felt reasonably sure that they were into the way of breast-feeding did I transfer them to the main ward. Multiparae went straight into the main wards. Both primiparae and multiparae were given help and instruction at every day feed for the first few days. After this, when I felt that they were into the swing of breast-feeding, I only gave them what time I had left over from attending to those who were starting to breast-feed. My impression at the time was that this policy paid. It was only/
<table>
<thead>
<tr>
<th></th>
<th>No. of Cases</th>
<th>Average weight</th>
<th>% of birthweight lost</th>
<th>% who had excessive engorgement</th>
<th>% who regained birthweight by 10th day</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bad Environment (B)</strong></td>
<td>12</td>
<td>7 lb. 3 oz.</td>
<td>9.0%</td>
<td>50%</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Good Environment (A)</strong></td>
<td>10</td>
<td>7 lb. 6 oz.</td>
<td>7.6%</td>
<td>30%</td>
<td>50%</td>
</tr>
<tr>
<td><strong>New Methods</strong></td>
<td>22</td>
<td>7 lb. 8 oz.</td>
<td>6.7%</td>
<td>13.6%</td>
<td>41%</td>
</tr>
</tbody>
</table>
only an impression, but it was a forceful impression. It is only since starting to write up these cases that I have analysed the figures. Although small, they would appear to bear out my impression, that help and attention in the first few days, with a pleasant atmosphere, makes for a successful initiation into the art of breast-feeding. The figures are as follows:

(See Table)

It can be seen that both the percentage of birth-weight lost, and the percentage of cases who had excessively engorged breasts were reduced. Had I been able to give each mother the same attention throughout her stay in hospital, that I had been able to give her in the first few days, I am convinced that the number, who regained their birthweight by the tenth day, would have been very considerably increased. Now why didn't they receive this attention throughout their stay in hospital, and why hadn't they been receiving this attention before? The answer is lack of staff, and, I believe, improper training of nurses in the art of breast-feeding.

A consideration of a few of the salient points in the staffing arrangements of the nursery where I was working will give a slight idea of the lack of staff. When I started there were three nurses for 36 babies, towards the end there were 4 nurses for 24 babies; this in addition to the Staff nurse and
the Sister. The babies were fed at 0600, 0900, 1200, 1500, 1800 and 2100. Below are set out a few facts about the day staff.

0715 : Day Nurses come on Duty.

2 nurses start bathing and weighing babies, assisted by Staff nurse.
1 nurse makes up artificial feeds; when finished attends to sick babies.
1 nurse attends to premature babies.

0900 : Babies out to Mothers.

2 nurses go to breakfast.
1 nurse feeds premature babies.
1 nurse watches babies breast-feeding.
(Often she gives the other a hand, or does jobs not done previously. This of course is unofficial.)

0920 : Babies brought in again.

2 nurses go to breakfast. (1 is off till 1300; the other returns at 1015).
2 nurses return from breakfast.
1 nurse attends to premature babies.
1 gives complementary feeds.
The one returning at 1015 looks after sick babies.

1130 : As at 0715, but 3 nurses instead of 4.

On four afternoons a week: -
1 nurse off half a day.
1 nurse off for the afternoon from 1320 to 1700.

On two afternoons a week: -
A lecture from 5 till 6, when Staff nurse relieves the 3 nurses on duty.

1500 : 1 nurse changes nappies, etc. (plus Staff nurse if on), puts out babies and takes them in again.
1 nurse attends to premature babies - complementary feeds, feeding of sick babies, etc. have also to be done by these 2 nurses.

1700 - 1800 :
3 nurses on duty, except on two afternoons a week, when they attend a lecture and the Staff nurse does their work - often one would "skip" the lecture to give the Staff nurse a hand.
After 1800: 2 nurses on duty, as I has her evening off.

It is not difficult to see that these 4 nurses, who were being trained in the care and management of new born infants, had little opportunity of studying breast-feeding at the breast. They learnt a lot by practice about premature infants, sick infants, the making up of artificial feeds and complementary feeds, but little about normal breast-feeding. Much of the supervision of the normal breast-feeding was done by the Sister and the Staff nurse, so that the ill-effects of this system were not immediately apparent in the work of the nursery. But, and it is a very big but, some of these nurses are going out into the world to be midwives. Doubtless they will deliver their cases successfully, but how will they shape in teaching the mothers, especially the primiparae, to breast-feed successfully? Will they not at first be as much at a loss as the mothers? Won't they wish they had learnt more about breast-feeding in hospital? Will not many mothers bottle feed their babies as a result of the inexperience of these nurses? And won't there be many tragedies, many unnecessary failures, before they finally pick up, in the hard school of experience, an art in which they might have been successfully instructed as students?

This, of course, was only my experience in one hospital.
hospital, a teaching hospital, but I do not doubt that a similar state of affairs existed in many other hospitals. As a result of the war, conditions must have deteriorated. At the moment planning for after the war is in the air, so let us think ahead and plan for then.

In the first place, I would advocate that in maternity hospitals there should be no big wards; there should be only two or four bedded rooms, and whenever possible primiparæ should be put into the two bedded rooms and never with multiparæ. Secondly, great attention should be paid to the type of women. As soon as a grouser or grumbler is discovered, she should be isolated like an infectious case. Alternatively, she could be put into a two bedded room with another grumbler, where the two of them would be able to grumble and grouse to their hearts content, and probably do each other a lot of good, as they would be in what is to them a congenial atmosphere; and so would breast-feed satisfactorily without upsetting others. Thirdly, I would allot, at a minimum, 1 nurse to every four breast-feeding mothers. It would be her responsibility to see that they breast-fed successfully. She would consult the Sister or the Staff nurse on any difficulty, and one of them would instruct her regarding this difficulty at the next feed. In this way the mothers would receive better supervision and the nurses more experience and practical/
practical training. Fourthly, I would have the nurses spend longer over their training in the nurseries and lying-in wards. While I was studying these cases I was informed that there was a long waiting list of nurses wishing to undergo training for the Midwife's Exam.; but that there were many empty rooms in the nurses hostel. Apparently the reason for this was that there were not enough cases booked for delivery "on district" to enable a greater number of nurses to be dealt with at one time. Surely many nurses would be willing to wait for their cases in the nurseries and lying-in ward, once they realised that the extra time spent there would not be wasted, but would tend to make them more efficient at their job after the baby was born. Fifthly, I would have the doctor do his rounds, at least twice in the week, at feeding times, so that mothers could see that he was as interested in their babies as he was in the mothers themselves; so they could ask questions which they felt had not been fully or satisfactorily answered by the nurse or Sister; and so that the doctor would have more opportunity to give time to the practical training of the nurses, and impress on them the importance of what they were doing.

Of the training of medical students I will write in a later chapter.
BEFORE THE MILK COMES IN.

From the time the baby is first put to the breast till the time the milk comes in, is one of the most important periods in breast-feeding. During this period we have to accustom the mother, particularly a primipara, to feeding her baby; the baby to taking the breast; and the baby’s digestive system to a set of conditions that it has never previously experienced.

The time at our disposal is usually about three days, but may be four or five, and on the other hand may be only one or two. Fortunately there is little at this time in the healthy mother and baby, whom we are considering here, to distract our attention from the job in hand. Loss of weight during the first few days we have come to accept as physiological, and it passes unnoticed unless excessive; a point I shall mention later. Over-feeding does not occur and excessively engorged breasts will only claim our attention when the milk comes in. Diarrhoea, constipation, vomiting and septic skin conditions in the baby, and mastitis in the mother, are troubles spared us in the first few days; though the chances of their occurring later will depend on our skill at this time.

At the first feed of all, the great thing is to show the mother how to hold her baby and offer it the breast; but before this is done the mother must be given/
given plenty of time to have a good look at her baby. This is the moment for which she has been waiting, and she is not going to take too kindly to the business-like nurse, who turns the first time at the breast into a high powered efficiency lesson. She should be allowed plenty of time to fondle her baby, decide who he looks like, remark on the colour of his eyes and hair, and the many other points which are of absorbing interest to the mother, though possibly not to the nurse. On the sympathetic interest and understanding of the nurse at this first occasion will the successful co-operation of the mother largely depend. The way in which the mother should hold her baby and offer it the breast is too well known to be set out here, but there are one or two points which call for observation, and they are chiefly applicable to the primipara and her nurse.

Many primiparae have never seen a baby feed at the breast, so what they are called on to do for the first time is not only something new to themselves, but also a completely new experience. For example, if you give a golf ball and a driver to a person who has never before seen golf played, and tell them to have a shot, that person will probably take a flat sweep at the ball as it lies on the ground, and miss completely. Give a golf ball and driver to a person who has seen the game played, and he will probably tee/
tee up the ball, adapt his stance with great deliberation, take an extremely exaggerated swing, which has however more resemblance to the orthodox than in the first case and, although it is not relative to the argument, send a beautiful shot right down the middle of the fairway and spend the next few years trying to do the same thing again! Now a multipara who has previously breast-fed is like a person whose second home is the golf links. The primipara who has never seen a baby breast-fed is like the person who has never seen anyone drive a golf ball. Our aim should be to make her like the person who has previously seen a golf ball driven. This is possible in the case of a woman attending a hospital antenatal clinic. It is my opinion that she should be taken to a side ward, once or twice during the last month of her pregnancy, and allowed to watch a mother feeding her baby. Her attention should be drawn to the attitude of the mother and the baby, as well as to the way in which the breast is supported, and she should be allowed to hold the baby herself. In this way, when she comes to feed her own baby, she would be attempting to do something with which she was familiar; and also be able to understand better what the nurse meant when she attempted to correct any faults being made.

Another point, that cannot be too firmly impressed on the mother (and the nurse) during the first few/
few days, is the importance of seeing that the baby
is really awake before his feed and of keeping him
awake. It is a point that often can only be brought
home to mothers with a great deal of difficulty.
It is a common belief that if the baby is sleeping at
feeding time he is not hungry, and it is quite useless
to tell some mothers of this type that even an under-
fed baby will sleep at the breast. I remember one
mother whose baby was not getting enough, due to her
not waking him up properly and allowing him to sleep
at the breast. Reasoning was of no avail. So before
one feed I weighed the baby at the bedside and allowed
her to go her own way. At the end of the feed re-
weighing showed that the baby had taken half an ounce
of breast milk. Then, to the mother's great annoyance,
I woke the baby up thoroughly and repeated the same
performance. The taking of three ounces of breast
milk by the baby absolutely amazed the mother and
turned her into a model baby-waker.

The importance of "getting up the wind" has also
to be impressed on the mother. This point is usually
quickly appreciated by most of them once it has been
explained how the wind finds its way into the baby's
stomach, and the colic it may produce. One mother was
very grateful for this explanation, because she thought
that as she was constipated and troubled with "wind
in the bowel", the wind must be getting into the milk
and the milk would continue to be windy till she cured
her/
her constipation. Strangely enough, they never seem to appreciate that by getting up the wind the baby will be able to hold more milk in his stomach, till they have heard a really good "windy-pop".

The usual advice is that the mother should help her baby to get up the wind at the end of a feed. This is satisfactory advice in the prelacteal period, when the baby obtains very little from the breast and the mother is easily tired. But in my opinion, once the milk has come in, the wind should be got up every five minutes. Suppose a baby is being fed at both breasts at each feed; it is often stated that the right breast should be given first at one feed and the left breast at the next, as the baby will be found to take more from the first breast than the second; and unless this alternation is practised, the yield from the second breast will be less than from the first due to inadequate removal of milk. But I have found that if the baby feeds for ten minutes from each breast, and the wind is got up at the end of each five minute period, almost as much milk is taken from the second breast as from the first. Similarly, if only one breast is used at each feed, and this method is practised, it will result in more milk being taken as was repeatedly shown by test weighing in the series of cases studied.

The importance of getting up the wind every five minutes was particularly well illustrated in the case of/
of my own baby. I first saw him when he was five months old. He was healthy and active, but rather thin and tended to wake up ½ to ⅔ of an hour before feeding time and make himself heard in no uncertain manner. He was slowly and steadily putting on weight, but this gain only amounted to 3 ozs. a week, and there seemed little chance of his birthweight being doubled at 6 months. Both breasts were used at each feed and the wind was got up at the end of the feed. It was noticed that he fed well for the first few minutes at each breast, but then took less, and it was difficult to make him feed during the last 5 minutes at the second breast. I suggested getting up the wind at the end of every 5 minutes. This resulted in his feeding equally well at each breast, no more crying before feeds, a gain in weight of 6 ozs. each week and a doubling of his birthweight with a week to spare.

The mother must have impressed upon her, from the beginning, the importance of watching her baby during the whole time at the breast, and of seeing that as soon as he stops sucking he is started off again. Many mothers are at a loss how to do this. Some take the nipple out of the baby's mouth and then put it back again. This is not a good practice, as particularly during the first few days, it might easily cause trauma to the nipple. Some nurses have the habit of flicking the soles of the baby's feet, which/
which is not always effective and is a quite unnecessary chastisement. The most efficacious and effective method is for the mother, as soon as the baby stops sucking, to lift the lower jaw with the index finger of the hand supporting the breast, by placing it just in front of the angle of the jaw, and then to release the pressure quickly. This action is much the same as that used in tapping the patella, when synovial effusion into the knee joint is suspected, though of course the movement is up instead of down. So that the index finger may be free to carry out this movement, the breast must be supported and the flow of milk controlled by the thumb and third finger. The lightness of the pressure needed and the quick release take a little getting into, but, once mastered, the method will be found to be extremely efficacious.

The mother and doctor must carefully watch the baby at the breast for any faults that there may be in the sucking mechanism, so that they may be corrected before the milk comes in. The baby takes the nipple and a considerable proportion of the surrounding areola into his mouth, and obtains milk from the breast by the upward and downward movement of his lower jaw. Some authorities maintain that the milk is obtained chiefly by suction and others by the pressure of the jaws on the lacteal sinuses. (37.). (38). Actually the closing of the jaws compresses the/
the lacteal sinuses and drives milk into the mouth (a method which can be easily demonstrated by compressing the lacteal sinuses between the index finger and thumb) and the opening of the jaws creates a negative pressure in the mouth, which draws in the milk (as can be demonstrated with the aid of a suction pump). These two methods of obtaining milk from the breast are complementary and there is little point in differentiating between them. The usual causes of failure to suck properly, such as maldevelopment of the baby, birth trauma, infection, nasal obstruction, sleepiness, and retracted nipples, are well known, but the importance of studying the act of feeding at the breast in the first few days, and correcting faults, is well illustrated by two cases in this series.

In the first case, that of a primipara, with a 7 lb. 10 oz. baby, it was noticed at the 0900 feed on the second day, that although the baby fixed well at the left breast, he would not take the right breast. Careful inspection, after the feed, revealed that there was a very fine long light hair growing from the areola about ½ inch above the right nipple, which could only be seen when looking at the breast from the side. At the 1200 feed the baby would not fix at the right breast, even though the hair was kept out of the way, as it was attached to a part of the areola/
areola which the baby took into his mouth. He was put to the left breast and fixed well. He was immediately taken off and put on to the right breast, and again refused. The hair was cut off, and when the baby was put to the same breast again, he fixed well and continued to feed until taken off.

In the second case, that of a multipara with a 5 lb. 11 oz. male baby, suction had not been carefully watched in the first few days, as the mother, who had breast-fed her previous children, said the baby was sucking well, which at a quick glance appeared to be the case. However, when the milk came in, test weighing revealed that the baby was getting practically nothing at all. This the mother attributed to the fact that he could not swallow properly, as sometimes he let go of the nipple and milk ran out of his mouth. The next feed was closely watched. It was noticed that while the baby took the nipple into his mouth, he sometimes took very little of the surrounding areola, and on these occasions there was not a proper biting action of the jaws, but more of an up and down movement of the lips. It was at these times that the milk ran from the mouth when he let go the nipple. I gave him my little finger to suck and there appeared to be no fault in the act of suction. I gave him my finger to suck again and this time he took less of it into his/
his mouth, and the up and down movement of the lips was noticed. I was unable to push my finger further into his mouth, as it came up against the under-surface of the tongue, which was dorsi-flexed so that the tip of the tongue was in contact with the palate. The mother was shown how to guide the nipple into the baby's mouth, so that it lay over the upper surface of the tongue. A rapid gain in weight followed and this unfortunate habit appeared to have been corrected by the time the mother left hospital, as the baby was then taking the breast without any special guidance. It is interesting to note that the mother attributed this peculiarity on the part of her offspring to the fact that during the whole of her pregnancy her husband had made clicking noises with his tongue, which necessitated the apposition of tongue and palate. Truly husbands have a lot to answer for!

The necessity of watching the nipples for abrasions and cracks during these first few days, and also when the milk comes in, still needs emphasis. The great importance of immediately taking the baby off the infected breast, instituting suitable treatment and resting the breast for a few feeds, as soon as the mother complains of a painful nipple or, even more important, appears to be suffering pain when feeding her baby, cannot be too often repeated. Even Sisters are guilty of trying to make the mother persevere with a painful nipple after a few dabs of Friars/
Friars Balsam.

A firm but sympathetic attitude, with explanatory reasons for each piece of advice given, on the part of the doctor and nurse at this time, goes a long way to establishing satisfactory breast-feeding. It was my experience that mothers were more ready to do what they were told, if the reason for doing so was explained to them — for example getting up the wind. Not that they always appeared to understand the reasons given, but they appeared to sense that the advice was given for their own good and not out of sheer cussedness. This certainly appears to be common sense, but I have repeatedly noticed resentment on the part of mothers when told to do something different from what they are doing, without any explanatory reason being given by the Staff nurse or Sister. It must never be forgotten that what may be obvious and straightforward to the doctor and nurse or even annoying, because they have seen the fault committed so often, is new and bewildering to the primipara. Unless explanations are given and sympathy shown, she will tend to feel that her efforts are not being appreciated and so a needless hostility will be borne towards her attendant and the chances of easily establishing breast-feeding thereby decreased.

During the first day or two, before the milk comes in, the baby loses weight. Many attempts at interpretation and prevention of this were made in the/
the past. This loss of weight was correlated with the time of ligation of the umbilical cord (39), icterus neonatorum (40.), and the development of the mammary glands. It has, however, been demonstrated (41.), and is now universally accepted, that this loss of weight is nothing more or less than the difference between intake and output. All that is obtained from the breast at this time is the scanty early secretion or colostrum. This has attributed to it certain beneficial qualities, such as being a concentrated food containing immune bodies. It allows for an easy period of peristaltic initiation of the alimentary system, and is said to act as a mild purgative. As the infant obtains only about \( \frac{1}{2} \) oz. the first day and 2 ozs. the second day it is easily seen that, whatever else it does, this early secretion does not supply the baby with enough fluid. It is for this reason that extra fluids are given to the baby for the first few days. In the wards where these cases were studied it was the habit to give glucose saline every 3 hours, yet the loss of weight, as we have seen (page 48a), varied between 7.6% and 9.0%. Closer supervision of the mothers at feeding time reduced this figure to 6.7%. It is the habit to look on this loss of weight as inevitable. Yet a certain amount of effort has been made to discover whether any more suitable fluid could be given at this time to reduce the loss of weight.

Drossel/
Drossel (42.), by pushing the intake of water in the first few days, obtained a reduction in the average initial loss of weight from 8.8% to 7.5%, and a diminution in the deficit of regained birthweight from 3.6% to 2.5%. The administration of Ringer's solution reduced the figure to 6.8% and complementary feeding to 5.9%. Eder (43.) gave a 5% solution of dextrin and maltose, containing 1 gr. of sodium chloride and 5 gr. sodium citrate in each 2 ozs. of the mixture, to 800 babies every 2 hours in the first 24 hours, and every 3 hours afterwards; this in addition to the usual routine breast-feeding. The initial loss of weight was reduced to 3.6%, and of 100 consecutive cases 66% regained their birthweight by the eighth day, 77% by the tenth day and 87% by the fourteenth day. Kugelmass and his co-workers (44.) gave a solution consisting of 6% gelatin, 3% dextrose and 0.5% sodium chloride at 2-hourly intervals for the first 24 hours after birth and for the next 3 days. This reduced the loss of weight to 1.7%, compared with 7% of controls; also a rapid disappearance of the usual apathy, somnolence, and stupor secondary to birth shock is claimed.

Krost and Epstein (45.) experimented with various solutions and showed that dextrimaltose was more hydrating than other sugars, but that the use of these prelacteal solutions upsets the delicate balance of the water metabolism of the baby, causing tremendous water/
water retention. They record two cases of cerebral oedema. So it would appear that the use of these solutions is as unphysiological as they claim the loss of birthweight to be. On the other side of the picture Schorer and Laffoon (46.), who tried out 7 pre-lacteal procedures in 972 consecutive new born infants, found that neither foster mother's milk, gelatin-dextrose-salt mixture, nor a cow's milk mixture had any influence on the initial weight lost, but that plain water or a simple sugar solution were effective, and a solution of beta lactose with sodium citrate even more so. In no case did the calorific value of the various mixtures appear to exert any influence.

For my own part I cannot help feeling, that amongst other things, the accuracy of these figures depends on the conscientiousness with which the various mixtures were given. I could not but notice, while studying the present series, that the giving of glucose saline in the prelacteal period was more often than not skimmed by the nurses, due to the rush of work and the smallness of the staff. It is my opinion that with (1) thorough attention to the instruction of mothers in the art of breast-feeding, particularly during the first few days, (2) the regular provision after feeds of glucose saline till the milk comes in, and (3) regular massage of the breasts, both in the last month of pregnancy and also in the prelacteal period/
period, we will be doing all that is necessary to minimise the initial loss of weight, prevent excessive engorgement when the milk comes in, achieve a regain of birthweight at the earliest possible moment, and assure a healthy infant troubled neither with dehydration fever nor superhydration catastrophes.

In concluding this chapter on the prelacteal period, I wish to stress once more that I consider it one of the most important periods in the whole of breast-feeding. Too little attention is at present paid to it, and the impression is gained that the nursing staff are reserving all their energies for dealing with the excessive engorgement that so often arises with the onset of lactation. During this time so much that is simple but essential to ensuring the success of breast-feeding can be done. The mother can be taught how to hold her baby properly, how to make sure that her baby is awake before he is put to the breast, how to see that he makes full use of the time at the breast, and how to get up the wind and prepare for the incoming of the milk. Also the nurse, by her understanding and sympathetic help, will be able to gain the confidence of the mother at the earliest possible moment and together they will be able to deal with any difficulties that may occur when lactation commences.
THE MILK COMES IN.

So far I have not mentioned test weighing, for the reason that there is no point in test weighing until the milk comes in. In the prelacteal period there is not the remotest chance of the baby obtaining too much from the breast. The greatest intake in the first three days, in the present series, occurred in a 7 lb. 4 oz. baby, a second child, put to the breast for the first time 4 hours after birth, who obtained 2½ ozs. the first day, 5½ ozs. the second day and 9½ ozs. the third day.

So, far better to concentrate our energies in the prelacteal period, on teaching the mother and her baby how to make full use of the time at the breast and to supplying the necessary extra fluids. But once the milk comes in there is not only the danger of underfeeding, but, what is often not fully realised, the equally great danger of overfeeding, as I shall show later. A comparison of the daily weights of the baby is no indication as to whether he is being overfed or underfed; for a baby may be slowly gaining weight and yet not be receiving enough breast milk; on the other hand, he may be losing weight and yet be receiving too much. The only sure guide as to whether underfeeding or overfeeding is taking place is test weighing, which must be done before and after every feed by the same person and in the same manner, till breast-feeding/
breast-feeding is satisfactorily established. But before going on to speak of under and overfeeding, it is necessary to decide what are the normal requirements of a baby in the first 10 days of life.

The stomach of the foetus lies in the left hypochondrium, except for the pylorus, which is in the median line, and is almost vertical in position but in the newborn baby is more oblique. Pisek and Lewald (47.), as a result of X-ray examinations, concluded that the shape of the stomach is dependent on the amount of gas present; but three main types are usually seen, namely, the ovoid or Scotch bagpipe, the tobacco pouch and the pear shape. As would be expected, the physiological capacity of the stomach in life is greater than the anatomical capacity found post-mortem; for soon after ingestion of milk the stomach shows signs of motor activity, the pylorus opens and the stomach contents begin to pass almost at once into the intestines. The findings of Mosenthal (48.), in 24 cases are shown below:

Amount of milk offered at each nursing 4 ozs.
Amount of milk ingested at each nursing 3.6 ozs.
Post-mortem gastric capacity ... ... 2.6 ozs.

It is interesting to note in this connection the amounts of breast milk taken by a male baby in this series, who weighed 8 lbs. 11 ozs. at birth on the 4th, 5th and 6th days of life.
<table>
<thead>
<tr>
<th>Day</th>
<th>0600</th>
<th>0900</th>
<th>1200</th>
<th>1500</th>
<th>1800</th>
<th>2100</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th</td>
<td>5oz.</td>
<td>4½oz.</td>
<td>4½oz.</td>
<td>2¾oz.</td>
<td>4¾oz.</td>
<td>5oz.</td>
<td>25½oz.</td>
</tr>
<tr>
<td>5th</td>
<td>6½oz.</td>
<td>2⁴/₈oz.</td>
<td>4oz.</td>
<td>4½oz.</td>
<td>4¾oz.</td>
<td>26¼oz.</td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td>5¾oz.</td>
<td>3 oz.</td>
<td>4½oz.</td>
<td>4¾oz.</td>
<td>2⁵/₈oz.</td>
<td>5oz.</td>
<td>25¼oz.</td>
</tr>
</tbody>
</table>

No vomiting or regurgitation of any large quantity of milk took place, yet, on every occasion except one, more than the anatomical capacity of the stomach as found by Mosenthal was ingested, and on one occasion almost 2½ times this amount was taken.

It is to be remembered that the alimentary canal is being tried out for the first time, and that all the factors in the adult digestion are present but in a weaker form. In the prelacteal period the concentrated food (colostrum) and the extra fluids provided are usually satisfactorily dealt with; the alimentary canal is in fact having a trial run and its digestive, absorbtive, and peristaltic abilities are being tested. With the commencement of lactation the less concentrated food has to be dealt with, but in greater bulk, and an increased strain will be thrown on the alimentary canal’s peristaltic ability, which if impaired, will interfere with the digestion and absorption of the food. Our aim is to find the most suitable amount of breast milk that the baby can take, consistent with the/
the normal peristaltic action of the alimentary canal.

Opinions as to the calorific requirements of the baby vary, and this is doubtless due to the fact that the various authorities refer to different ages. For instance, a League of Nations' report on "The Nutritive Requirements during the First Year of Life" states that the average calorific requirement per kilo body weight per day, for the first and second quarters, are 110 and 100, i.e. 50 and 45 calories per pound body weight per day. Most text books recommend 45 to 50 calories per pound body weight per day or, what is the same thing, $2\frac{1}{2}$ to $2\frac{3}{4}$ ozs. of breast milk. Tallerman (50.) is, however, more specific and he states that "During the first year of life the infant needs approximately 45 calories per pound body weight in order to gain weight and develop normally. It should be noted however that for the first week of life an intake of only 22 calories per pound per day is necessary. Observation of breast fed infants and calculation based on their food intake during the first week of life confirm the lower food requirements at this time." In another publication (51.) he writes "During the first two weeks a calorific intake of 25 to 30 calories per pound of body weight per day usually suffices, instead of the 45 calories subsequently required by the infant. As regards fluid intake, a total of 2 ozs. per pound of body weight per day is enough, during the first six weeks of life, to/
to provide adequately for the infant's needs. The larger amount sometimes recommended for older infants are generally not necessary or advisable for the newborn child."

I now propose to set out the charts of 11 typical cases, from the series studied, with a commentary on each one. Afterwards, I shall discuss what I believe to be the most suitable intake during the first 10 days of life, as well as under and over feeding.

Key to Charts:

Figures on left side of chart = total daily intake of breast milk in ozs.
Figures on right side of chart = baby's weight in lbs. and ozs.
Shaded areas = total daily intake.
Continuous black line = weight curve.
Percentage figure on weight curve = percentage of initial birthweight lost.
Horizontal red line = expected total daily intake of 2⅛ ozs. per lb. body weight per day at birth.
Horizontal green line = expected total daily intake of 2⅞ ozs. per lb. body weight per day at birth.
Horizontal blue line = expected total daily intake of 2 ozs. per lb. body weight per day at birth.
Figures in first line below base line = age of baby in days.
" second " = No. of stools per day. * Not recorded.
M = meconium.

Letters in third line below base line = Colour & type of stools. G = green.
Y = yellow.
L = large and loose.

Signs in fourth line below base line = Clinical notes regarding baby.
J = jaundice. V = vomit.
D = coated tongue.
%= septic skin condition.
10 = minutes at breast.
E = mother's breasts excessively engorged.
CASE 1.


Commentary: This baby was obviously jaundiced. If it were to be said that every baby who failed to take, in the first 10 days of life, 2 oz. of breast milk per pound body weight per day was underfed, then all but one of the babies in this series who had clinical jaundice (as judged by the appearance of the conjunctivae) would be underfed; for in the series of cases where particular attention was paid to the mother in the first few days and in which test weighing was done at every feed in the 24 hours, only 8 cases failed to take this amount of breast milk by the tenth day and 6 had obvious clinical jaundice. There/
There were only 2 other cases of clinical jaundice in the whole series. From the fifth day onwards this baby took about \(1^{\frac{1}{2}}\) ozs. (25 calories) of breast milk per pound body weight per day, calculated on the birthweight, and although the birthweight had not been regained by the tenth day, there was a slow but steady increase in weight. The baby was in good health and there was every reason to suppose that the intake of breast milk would be increased and the gain in weight accelerated. This case certainly bears out Tallerman's contention that a calorific intake of 25 to 30 calories per pound body weight per day suffices in the first two weeks of life. It would have been interesting to see the effect on the weight of giving normal saline to raise the total fluid intake to 2 ozs. per pound body weight per day.
CASE 2.

**Facts:** Para. 2. 29 yrs. Normal pregnancy. Well developed breasts and nipples. Slight discharge from breasts in last month of pregnancy. ?1½ hours in labour. Spontaneous. Female baby in good condition. Fixed and sucked well.

**Commentary:** Here it will be noticed that on the fourth day there is a quick step-up in the daily intake, to which the alimentary canal had difficulty in adapting itself, as is reflected in the increase in the number of stools on that day and the slight loss of weight which was noticed next day. As the 2 oz. level was reached the tongue became coated, indicating a mild dyspepsia, and the weight almost stationary as an attempt at adaptation to the increased intake took place. But the daily intake increased/
increased and there was a loss in weight. Adaptation had failed to take place. It is not unreasonable to suppose (a) that if the total daily intake had remained for a little longer at the 2 oz. level adaptation would have taken place, and a gain instead of a loss in weight would have been recorded; (b) that had the alimentary system been able to adapt itself to the increase in intake on the fourth day, it would have been able to deal with the larger amounts in the last few days and the birthweight might have been regained by the tenth day. As it is, we cannot say that breast-feeding has been established. It has not. This case is not so satisfactory as the first one, although the daily intake is proportionately greater.

Commentary: In this case there was a steady increase in the amount of the daily intake in the first few days, which was successfully dealt with and the birth-weight regained by the eighth day. But as the 2\frac{1}{2} oz. level was reached the tongue became coated, the number of stools increased, and the weight remained stationary. However, adaptation was successful and a further gain in weight was registered. Had there been any difficulty in adaptation in the first few days, it is probable that there would have been a loss, instead of a gain of weight on the last day. This case may be considered as satisfactory.
CASE 4.


Commentary: Here we see the failure of a lively alimentary canal to adapt itself to the increased demands made upon it in the first few days, so that there is a loss in weight on the fourth day. As the intake increased the stools became large and loose, although not so numerous, and the tongue coated. An attempt at self-adaptation by a decrease in the amount taken is seen in the last two days and only ½ an ounce in weight was lost. Had the intake increased instead of decreased on the last two days, it is probable that there would have been a greater loss of weight. This case will probably do all right, but one would have felt happier had a further stay of 3 days in hospital been possible.
CASE 5.


Commentary: The baby appeared to deal satisfactorily with the rapid increase of intake on the third, fourth and fifth days. There was no increase in the number of stools and the birthweight was regained. But on the sixth day when more than 2½ ozs. per pound body weight was taken, a small amount of the midday feed was vomited. However, an increase in weight was registered. On the seventh day the 2½ oz. level was greatly/
greatly exceeded and the weight became stationary. On the eighth day the stomach reacted violently to the strain put upon it and the whole of the afternoon feed was vomited, despite the fact that the wind had been got up successfully at five minutes intervals. The next day the intake was still above the 2½ oz. level and the loss of weight, first noticed the day before, continued. On the last day the tongue was coated. It was unfortunate that this mother had to leave hospital on the tenth day. However, both this baby and the next would do well on four-hourly feeds at home.
CASE 6.


Commentary: This is a particularly interesting case because the mother was a primipara. The milk was felt to come in on the early morning of the third day. There were two slight vomits on the fourth day due to the baby sucking fairly quickly and the inexperience of the mother in getting up the wind. The daily intake was small for the first four days and the alimentary canal was run-in slowly, so that when a sudden increased demand was made upon it, it was able to cope with the new situation satisfactorily and there was a rapid increase in weight, the birth-weight/
birthweight being regained by the eighth day. For the last five days the daily amounts taken were well over the 2½ oz. level and no ill effects appeared for the first three of these five days; but then the inevitable happened, the tongue became coated and the weight, after a momentary hesitation, fell. Had the alimentary canal not received a quiet period of initiation it is probable that the loss in weight would have occurred sooner and been greater.

It may be pointed out here that in only 5 of the 22 cases, where special care was taken over the instruction of the mothers in the first few days, did vomiting occur. 3 of these were due to overfeeding in multiparae; the other 2 occurred in primiparae who were slow to learn the knack of getting up the wind.
CASE 7.


Commentary: In this case we see no gradual initiation but a sudden and very rapid increase in the daily total intake. This was certainly reflected in the increased number of stools, but not the weight, which rapidly increased, the birthweight being regained by the sixth day. On that day the intake was well over the 2½ oz. level and the weight fell sharply. Only when the total daily intake fell below the 2½ oz. level did a gain in weight take place. It is to be noted that this baby had a number of septic spots on the face and body, and to this might be attributed the loss of weight and the decrease in intake. While this was certainly a factor, in my opinion, it was only a contributory fact to the loss of weight seen.
CASE 8


Commentary: Once again the absence of a quiet period of initiation is noted with, at first, no apparent ill effects. But as the total daily intake remained well above the 2½ oz. level there was an increase in the number of stools and a loss in weight. It had been previously decided that should the 2½ oz. level be passed the length of the feeds should be shortened. This was done here, the length of the feeds being shortened.
shortened to 10 minutes. The effects of this procedure were at first not apparent, due to the failure of the night nurses to co-operate; but once the daily intake was reduced to the 2½ oz. level the lost weight was quickly regained. Incidentally this mother was told to feed her baby for 20 minutes four-hourly when she went home. She was seen again 9 days after leaving hospital; she had carried out the routine advised and the baby had gained 7 ozs., the weight being 9 lbs.

Commentary: This mother was not very good at feeding her baby and there was definite engorgement of the breasts on the fourth and fifth days. It is probable that if there had not been a watery discharge from the nipples in pregnancy and a subsequent easy flow of milk, the state of the breasts would have been much!
much worse as the baby was a poor sucker. There was a drop in weight on the seventh day which is difficult to explain. The baby was in good health and, apart from the loss referred to, was putting on weight, although the increase was slower than what we have been led to expect from a study of previous cases. This baby had less in reserve than previous cases, would be more likely to react badly to adverse circumstances, and we cannot say that breast-feeding had been established by the tenth day. The 2 oz. level was never reached.

Commentary: The milk here came in on the third day and the breasts were full but not excessively engorged. The baby, however, failed to avail himself of what was offered, and his mother was not much help, the result being a second loss of weight after the initial fall. However, as they became more proficient the daily intake approached to the 2 oz. level and a gain of 1 oz. and then 2 ozs. in weight was recorded on the last two days. We cannot say that breast-feeding has/
has been established in this case, but intake and weight were moving in the right direction, and if a further three days in hospital had been possible one would have felt happier about the future of breast-feeding in this case. As it was the baby was in good health.
CASE 11.


Commentary: This is a good case in which breast-feeding has been well established by the ninth day and we need have no qualms about this mother leaving hospital. There was a steady step-up in the intake on the second, third, fourth and fifth days, and on the latter the 2½ oz. level was reached. Although one would have liked to have seen a further day taken over this stepping-up process, the baby dealt with it satisfactorily. Then, when a further increase would...
would have taken us above the 2½ oz. level and possibly to minor digestive disorders and a loss of weight, the daily intake remained in the region of the 2½ oz. level for three days, and no undue strain was thrown on what appeared to be a fairly sound alimentary system. Plenty of time had been given for the adaptation of the alimentary system to the new set of conditions and the baby left hospital on the ninth day, 4 ozs. over its birthweight. Without doubt the most promising case amongst those set out here.
It has been truly said that "The individual infant . . . must be studied and there is no rule, nor can there ever be any rule, applicable to all infants." (52.). It is this great truth that must always be kept in mind when considering breast-feeding. For instance, in the cases set out above, it has been noticed that while one baby rapidly increases its daily intake over the first four days with no immediately apparently ill-effects (Case 7. page 83 ), another will react adversely with an increase in the number of stools, coated tongue and a temporary halt in the weight curve (Case 4. page 78 ).

For my part I would say, as a general guide, that the "motor" of the alimentary system is "run-in" most satisfactorily if the following points are noted. The total daily intake should reach the 2 oz. per pound body weight per day level by the fifth or sixth day and the climb to this level should be smooth, that is a gradual and regular increase in the total daily intake. Once this level has been reached the total daily intake should remain between 2 and $2\frac{1}{2}$ ozs. per pound body weight for the next 3 to 4 days, and only after the ninth day should a larger daily intake be allowed. Of course if difficulty is experienced in coping with the increase in the first four days, the/
the rate of climb will have to be slower and the time spent at the 2 oz. level increased. As regards underfeeding, it has been my experience that, apart from babies with easily recognisable jaundice, it is most likely to occur in the babies of primiparae and those of multiparae who are easy-going.

In the case of primiparae, underfeeding is usually confined to the first few days and is due to the inexperience of the mother and the accompanying nervousness which communicates itself to the baby. As pointed out in a previous chapter all is new, and it is in this type of case that a sympathetic, encouraging and understanding nurse can be of the greatest value. Faults must be corrected, not by telling the mother that she is, for example, holding the baby the wrong way, but by pointing out that, while she is doing quite well, she would find it more comfortable and it would be easier for the baby if she held it such and such a way (the correct way). Similarly, the importance of attending to these faults must be impressed upon the mother from the point of view of the benefit that will accrue to the baby. At the same time the mother must be told that when her baby cries it does not mean that he is in pain, as so many primiparae think, but, that the baby should cry occasionally, is quite a good thing as it exercises the muscles of respiration and others as well. No mention should/
should be made of the loss of weight in the first few days, unless this is unavoidable, when great stress should be laid on the fact that it is quite natural. If there should be a temporary halt for a day or two, once weight is being regained, the advantage of this in allowing the baby to adapt itself to the increased intake should be pointed out.

Everything must be done to allay the fears of the mother and to dispel them with readily understood explanations. It must not be forgotten that this type of mother will judge everything by adult standards. Crying to her means abdominal pain, the loss of weight she associates with starvation and disease.

During the first few days manual exhaustion of the breasts should be continued after each feed till the 2 oz. level is reached. This is necessary because, due to the inexperience of the mother, the breasts are often inadequately emptied, and there is the danger of excessive engorgement. Should the breasts become full and tense, milk must be manually expressed till the areola is slack enough for the baby to be able to take it into his mouth. On no account should the baby be put to the breast to see if he can obtain a grip, for in this way great damage can be done. If there is any doubt the milk should be manually expressed/
expressed - till there is no doubt. This expression should always be done by hand. A nurse learns nothing by using a hand or electric pump except possibly the damage that may be inflicted. The difficulties encountered in a primipara are well illustrated in the following case.


Commentary: The mother was keen to breast-feed her baby but was very worried as to whether she would be able to do so. Her nervousness was further increased because she was in a ward where the environment was bad, there being one woman who resented anything/
anything that was done for her and a number of multi-
paraes who were feeding successfully. The mother's
nervousness communicated itself to the baby, which was
reflected not only in its lively behaviour at the
breast, but also in the number of stools passed each
day. The breast became excessively engorged on the
third day and enough milk was exhausted before each
feed to allow the baby to take an adequate amount of
the breast into her mouth. The engorgement period
was successfully surmounted and the baby's daily
intake increased, and on the last two days weight was
gained. The mother left hospital on the eleventh day
extremely grateful for everything that had been done
for her, and fully convinced that she would be able
to breast-feed successfully. In this she was not
wrong. When the baby left hospital she was definitely
under-nourished. When seen 14 days later, this baby
was healthy and weighed 7 lb. 14 oz., a gain of 22
ozs. The mother was advised to change over to four-
hourly feeding.

With multiparous mothers, underfeeding is due
usually, in my experience, to slackness on the mother's
part. In such cases, the mother puts the baby to the
breast and either watches other mothers feeding their
babies, or else carries on a conversation with another
mother of a similar disposition. The baby sucks
avidly/
avidly for five minutes and then falls into a doze, which there is no chance of the mother disturbing. Suggestions regarding the getting up of the wind are pooh-poohed and if the word "underfeeding" is mentioned it is usually turned aside with the remark that the mother has previously breast-fed. Enquiry will usually reveal that in the case of her last baby breast-feeding had to be given up at the second month due to the milk failing. The most satisfactory way of dealing with these mothers is to wait until the baby slips into a doze, then take him off the breast, get up the wind, and after weighing him in front of the mother thoroughly wake him up. Then back to the breast. When feeding ceases, once more take him off the breast, get up the wind and re-weigh him. A gain of at least 1 oz. will be usually recorded. This will convince most mothers of this type that their baby is not obtaining enough and they will then listen to advice.

Underfeeding at the start has been my experience with babies who have obvious clinical jaundice. The initial loss of weight is usually greater than the average. In the series of cases where test weighing was carried out at all feeds, and particular attention was paid to the art of feeding during the first few days, the initial loss of weight was 6.7% of the birthweight/
birthweight. In the six cases of jaundice the figures were 13%, 12.5%, 8.7%, 10.1%, 5.8% and 7.1%. The total daily intake may resemble that in the case illustrated (Case 1. page 73) or it may be less. The weight curve may be lower or even, after the initial loss, flat. But as long as care is taken to see that the mother is paying proper attention to the feeding of her baby and is exhausting her breasts after each feed, there is no need to worry. Once the jaundice subsides the total daily intake will increase and weight will be gained.

In no case amongst the 70 which I saw during the course of this study was underfeeding due to inability of the breast to yield the necessary amount of milk.

It is my opinion that overfeeding on three-hourly feeds in the first few days, when care is taken to see that the mother feeds her baby properly, is far more prevalent than is generally realised. In this connection the following figures are of interest:-
<table>
<thead>
<tr>
<th>Group of Cases</th>
<th>No. of cases</th>
<th>Average birthweight</th>
<th>Took 2 ozs. per lb. bdy. wt. per day by 9th day</th>
<th>Took 2½ ozs. per lb. bdy. wt. per day by 9th day</th>
<th>Failed to take 2 ozs. wt. by 9th day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particular attention paid to first few days</td>
<td>22</td>
<td>7 lb. 8 oz.</td>
<td>13 (4)</td>
<td>12 (6)</td>
<td>9 (6 jaundiced)</td>
</tr>
<tr>
<td>No particular attention paid</td>
<td>23</td>
<td>7 lb. 5 oz.</td>
<td>15 (6)</td>
<td>4 (7)</td>
<td>8 (2 jaundiced)</td>
</tr>
</tbody>
</table>

Figures in brackets in columns 3 and 4 represent the average day on which the totals in these columns were reached.
Now it may be pointed out here that I gave on an earlier page (No. 92) a general guide for satisfactory breast-feeding in the first ten days of life, and I said that an attempt should be made to "reach the 2 oz. per pound body weight per day level by the 5th to 6th day" and that "only after the ninth day should a larger daily intake be allowed."

It would seem, from the above figures, that these conditions were more nearly complied with in the series of cases where no special attention was paid to the art of breast-feeding during the first few days. But in the wards where these cases were studied, it was the practice to make all mothers exhaust their breasts after feeds. In the first series of cases, where special care was taken to see that the mothers fed their babies properly, this resulted in many of the babies being overfed. In the second series of cases the baby quickly obtained its 2 oz. of breast milk and then fell asleep.

Few mothers will continue to exhaust their breasts after they leave hospital - because of the extra time involved. As a result in the second series, where the mothers had not been properly trained to see that their babies were awake before feeds,
feeds, to get up the wind, and to keep their babies feeding, the daily total intake will fall when they go home and finally resort may be had to the feeding bottle, because the breast milk is supposed to have failed. In the first series of cases the fall that will result from ceasing to exhaust the breasts will be beneficial. It may be said, that mothers who do not feed their babies properly in hospital will not be able to exhaust their breasts very efficiently in hospital either. But it so happens that this is one of the points on which the nurses are particularly good at keeping the mothers up to the mark, because they need breast milk for the premature babies; and the struggle to feed a premature baby successfully is the drama of the nursery in which every nurse likes to feel she is playing a part.

Thus we see, that although at present overfeeding is far more common than is generally realised in the hospital type of case in the first ten days of life, where special care has been taken to instruct the mothers how to feed their babies, this would not be so if the excessive amounts of milk secreted by the breasts and taken by the baby were not kept up by unnecessary manual breast exhaustion; and also that four-hourly feeding could be instituted from the start with benefit. Also we see that what is apparently a satisfactory state of affairs, from the point
of view of intake, in mothers to whom no special attention has been paid, is really most unsatisfactory; because the ill effects of the failure to practise the art of breast-feeding properly are masked by the maintenance of secretion at a satisfactory level; a procedure which the majority of mothers of this type will cease to practise on their return home, when the full effects of their incompetence will become apparent.

It is my contention that the chance of a mother successfully feeding her baby after she leaves hospital would be greatly increased if (1) more attention was paid to seeing that the art of breast-feeding was properly practised by the mothers, especially in the first few days, (2) four-hourly feeding was instituted from the start, (3) exhaustion of the breasts was only carried out till the danger of excessive engorgement was past.

In conclusion let it be said once more that "the individual infant....must be studied and there is no rule, nor can there ever be any rule, applicable to all infants." But guiding principles there can be; and what these guiding principles should be I have attempted to set out above to the best of my ability.
THE MOTHER AND HER BABY GO HOME.

On the last day in hospital of the mother and her child we should decide whether breast-feeding has so far been successful, and also give instructions to the mother as to how she is to carry on when she returns home.

In our assessment of the success of breast-feeding in the first ten days of life we must not attach too much importance - as is so often done - to a regain of the birthweight. The adaptation of the alimentary canal to the new mechanical conditions is more important. The birthweight may be regained by the end of the first week; the baby on the day of his leaving hospital may be over his birthweight, and yet, due to an undue strain having been thrown on the alimentary canal in the first few days, there may be six large loose green stools per day, a furred tongue and occasional vomits. This baby cannot be said to have done as well as one in whom a further gain of 4 ozs. is needed to reach the birthweight, but whose stools are four in number and yellow in colour, whose tongue is clean, where posseting is the nearest approach to vomiting and a slow but steady gain in weight is taking place.

If the mother has learnt to see that her baby is/
is properly awake before putting him to the breast; if she keeps him to it while at the breast without damaging her nipples and does not allow him to fall asleep; if she holds him properly, and successfully gets up the wind at five minute intervals; if she does all this and does it without any anxiety, then she may be said to have successfully learnt the art of breast-feeding. If the baby is "looking for" each feed and takes the breast quietly and steadily; if his stools are three to four in number and yellow in colour; if there is no vomiting and his tongue is not furred but is clean and moist like his lips; if his skin is clear and supple and not pasty, dry or spotted; if his eye is clear and his muscular tone is good; if he sleeps well and is placid but not apathetic; and if he is showing a steady gain in weight, however small be the daily rise, then he may be said to have adapted himself successfully to the new conditions and to be in good health.

How are we to instruct the mother who has learnt this art so that she may successfully continue to feed her baby? Here we come up against the question of whether the milk will fail when the mother goes home; and if it does, why it does. I have not studied this question in individual cases, but the matter was often brought to my notice when I questioned mothers as/
as to their previous breast-feeding experiences, and frequently received the answer, "The milk failed after I got home."

Now it appears obvious to me that in the hospital type of mother there will be a diminution in the amount of milk which the baby will obtain in the first few days after his return home. The mother goes from an atmosphere where she has enjoyed complete bodily rest to one where she experiences all the exertions of a mother and a housewife. She may not have had complete mental rest in hospital, for doubtless she will have been worrying whether everything has been going along all right in her absence, but she will have had mental relaxation. When she returns home she is beset with worries; worries about getting Johnnie to school in time; worries about making the housekeeping money spin out, as her husband's wages have dropped while she has been in hospital; worries about things that have gone wrong in her absence, and things that look like going wrong in the future if she doesn't have a care; and finally the worry of fitting in her household duties with the feeding times. But although this diminution may occur in the first few days after her return, it should not continue till the milk fails completely, or is insufficient to nourish the baby, as we are led/
led to believe by the mother's remarks, but should cease as the mother adapts herself to the new conditions. It should therefore be our object to give her advice which will help in this adaptation.

On her last day in hospital it must be made perfectly clear to the mother that if she feeds her baby regularly, practises the art which she has learnt in hospital, takes plenty of milk, and has a rest in the afternoon, the baby will come to no harm as a result of any diminution in the amount of milk which may occur in the first few days; and that this diminution will be made good as she and her baby adapt themselves to the new conditions. Finally she must be told that if she has any difficulties, she must not try to rectify them herself but should seek advice from her family doctor or the clinic.

The two commonest causes for mothers giving up breast-feeding after their return home are, on their own admission, either that the milk fails or that it does not agree with the baby, which usually means vomiting. I fully realise that there are many other reasons why mothers give up breast-feeding after their return home, but they do not enter into the scope of this thesis. Of the many reasons that I have seen given, improper instruction in the art of breast-feeding during the period of hospitalisation has not been given the prominence which it deserves, and is, in fact, rarely considered.
THE NURSE, THE DOCTOR AND THE FUTURE OF BREAST-FEEDING.

This thesis has so far been confined to the initiation of successful breast-feeding in the hospital type of mother. It has been pointed out how the expectant mother may, during the last month of her pregnancy, better prepare herself for breast-feeding by massaging her breasts; by frank talks with the paediatrician, in which the mother does as much talking as the paediatrician; and by one or two visits to a lying-in ward, when she is shown a baby feeding at the breast and is shown how a baby is handled. Most of this is chiefly applicable to the primipara, and the particular importance of environment in her case has also been stressed. The supreme need of sympathetic and careful instruction of the mother in the art of breast-feeding in the first ten days of life has been pointed out again and again. Many hard words have been written concerning the failure of the student nurse to master this art, often through no fault of her own.

Now I wish to leave the world of the hospital and pass to another aspect of breast-feeding.

The nurse on passing her Midwifery Examination may launch out as a full blown midwife, and it has already been pointed out how, excellent as she may be in handling the obstetrical side of her cases, she will/
be pitifully equipped for dealing with breast-feeding.

"But surely she has the family doctor, the general practitioner, to fall back on?"

"Ah! The general practitioner, the salt of the profession!"

"He will be able to put everything right. Is he not the backbone of the medical profession?"

"He may have been once upon a time, but the backbone has become rather wobbly of late as, due to the midwifery services and the infant welfare clinics, the general practitioner's experience of health and disease in the first years of his patients' lives has become less and less".

"It is a common fault for the Specialist to criticise the general practitioner".

"As I am a general practitioner myself in peace-time, I think I may be justifiably allowed to indulge in self-criticism".

"But surely he still sees enough cases to practise the art of breast-feeding which he learnt as a medical student?"

"Yes, he still has to give advice about breast-feeding, but unfortunately, while he may have learnt the theoretical side of breast-feeding from books and learnt enough to pass his medical examination, it is possible for him to graduate as a doctor without ever having seen a baby at the breast, or at the most having/
having seen only two or three babies breast-fed".

"It is impossible!"

"It is not. The medical course is so designed, that the main opportunity for studying the practical side of breast-feeding occurs when the medical student is enthralled with the drama of obstetrics and has learnt nothing of breast-feeding; and the theory is taught at a time when his attention is fully riveted on the final examinations, with their three great divisions of surgery, medicine and midwifery".

"But surely breast-feeding, being a normal physiological process will have been taught early in the curriculum, and must be one of the links between the medical school on the one hand and the hospital on the other".

"So one would imagine, but I will tell you of my experience as a medical student.

"There were over 200 of us who started medicine together, but some fell by the wayside and others dropped back into the year behind. Of those who stayed the course I think I may truly say that I was a good example of the average. I never did brilliantly in anything, nor did I ever just scrape through examinations. To be Irish, I always knew what I didn't know before I went into an examination, and my marks were usually between the 55% and 65% mark. I possibly had an advantage in that my father was a doctor in general/
general practice, and I was, so to speak, born and brought up in a surgery and, although it is beside the point, will most likely die in a surgery (or a Sick Bay).

"My first year in medicine consisted of chemistry and physics, which I utterly detested, and botany and zoology which I enjoyed for themselves and by contrast with chemistry and physics. I learnt all about the frog, the skate, the amoeba and the tape-worm; how they fed, breathed, protected themselves, and propagated their species. But I don't ever remember learning anything about how the pig, the cow and the ape suckled their young, which was a pity, for I was a townsman. In my second year I studied anatomy and physiology. The bodies which I dissected were exclusively male. I remember taking a decided interest in the contents of somebody else's female pelvis, but I never remember seeing a dissected mammary gland. In physiology, I rather skipped lactation, for like many others, I felt that I could safely leave that till fourth year; and we would have thought ourselves the victims of a very shabby trick, if we had been asked any questions about it in our examinations.

"In my third year I studied medicine, surgery, materia medica, pathology and bacteriology. It was a/
hard year but an interesting one. Then the fourth year. The year of calm between two storms. The year devoted chiefly to midwifery. I like others enjoyed midwifery and never missed one of those lectures which occupied the winter and spring sessions. We were well taught – but not breast-feeding. At the end of the Spring term I did my normal cases with several others in Dublin. It was necessary to do 12 normal cases out in the town on our own, but we did more than that number. Possibly you may think that here was plenty of opportunity to study breast-feeding. Certainly there was, but somehow we didn't seem to grasp that opportunity. Somehow we were more interested in the involution of the uterus, the temperature chart, the type of lochia and the general health of the mother. Our visits never seemed to coincide with feeding time, and on the one occasion that the two did coincide, the mother of three children was less embarrassed than the three medical students who had never seen a baby breast-fed before in their lives. Not that she was having any difficulty, which was a fortunate thing, for no one of us would have had any knowledge on which to draw to help her in her difficulty.

"Then the final year. In the Winter term we had lectures on "kids". At the first lecture we were shown healthy babies. It was a revelation. For two years/
years we had been studying the diseased human body and had almost forgotten what health looked like. The healthy development of the child was dealt with and then breast-feeding, and so on. How I wished that I had had these lectures earlier. I decided to take particular notice of the next child I saw breast-fed; for one point that clearly emerged from the maze of artificial feeding was that breast-feeding was a comparatively easy process, and if practised successfully would by-pass most of the early pitfalls of life. But I did not again see a baby at the breast till the last term of my final year, when we were shown a mother breast-feeding her baby during one of our ward visits at the Sick Children's Hospital. It was then, if never before, that we fully realised the value of health and the full significance of disease. Before us was a fine healthy baby with a smooth skin and a clear eye, watched over by a loving mother; in the cots around us were wizened wrecks, who had been artificially fed, left by their parents for repair; repair which one felt might put the machine into running order once more, but could never make good the damage that had been done.

"So I qualified, having seen two babies at the breast during the whole of my medical course, with some/
some knowledge of disease but little of health. I was far from being alone in my ignorance. As I said before I was the average. Many of us were to become general practitioners and it was to us that the midwife would turn with her breast-feeding difficulties. Is it to be wondered that with the nurse and doctor, trained as I have shown, to help her, the average mother turns to the bottle feed on the first check to breast-feeding? For which of these two, at least in their early days, is qualified to help her to persevere with breast-feeding? Neither, I maintain".

Lord Elton reviewing a number of books on religion, concerned with the world after the war, in the Observer of Sunday, 23rd August, 1942, wrote: "The trouble with these blue prints of a Christian new order is that they all start from the wrong end... The greatest revolution of all, from which all else would follow would be to make Christian men and women". In the case of breast-feeding we hear everyone exclaiming in a loud voice that breast-feeding is best, but that modern civilisation is responsible for its decline. Few seem to realise that a breast-feeding new order will not come about until a change takes place in the teaching of the art of breast-feeding to our nurses and medical students, who will then be able to instruct the mother and her child successfully and from this all else will follow.

This/
This obvious truth that you can't build a house without bricks has been forgotten in all walks of life. The common belief is that a plan has only to be drawn up and executed by the State, for a Utopia to result without any exertion on the part of the beneficiaries. As I write a plan is being drawn up for a medical service for the nation. It would appear that general practitioners will work group surgeries and do far more infant and child welfare work than they are at present doing. This is in itself a good thing, but, as far as the continuance of breast-feeding is concerned, it will be a disaster unless doctors are trained, as medical students, to be able to undertake these duties.

The mother and her child successfully practising breast-feeding are the bricks with which the future health, physical and mental, of the nation will be built. But you can no more make bricks without straw than you can build a house without bricks. Now if the breast-feeding mother and her child are the bricks, the general practitioner is the straw; and on that straw will the strength of the brick depend. All doctors are united in saying that breast-milk is the finest of all foods for the baby and that breast-feeding should be practised by all mothers. Yet it is generally acknowledged that the average general practitioner, when confronted with a breast-feeding difficulty will be as ready to switch over to artificial feeding as the mother. The quantity of good straw/
straw is small and the chance of making a good brick slight. The quantity of good straw can only be improved by changing the instruction of the medical student.

In the final term of the second year it was in my time, and I believe still is, the practice to go over to the Infirmary from the Medical School, for an hour or so each morning, to attend lecture demonstrations in elementary medicine. This was a bridge between the teaching school and the hospital. It is this that I would do away with, and in its place I would put instruction in the wards of the children's Hospital. The time would be spent in ward rounds, in which the teacher using simple language would paint a broad picture of health and disease on the background of anatomy and physiology. First a demonstration of the growth of the human being from birth to early youth; the development of speech, hearing, sight, the mental faculties and growth. Then the anatomical injuries that may result at birth and their effect on development. After that demonstrations of the baby being fed at the breast, pointing out the physiological processes involved. Test weighing to show the amounts taken and how these may be increased and decreased. The effects of over and under feeding. Then, in very general terms, bottle feeding and the danger of the introduction of disease as a result of carelessness. The effects of nutritional defects (e.g. rickets) and disease (e.g. tuberculosis) on the development of the child.
child. The ill effects of faulty posture, and so on and so forth. And last but not least the effects of treatment; for where are the results of treatment seen to better effect than in the wards of a children's hospital?

In this way, the student at the end of his detailed study of the body in health, and before his detailed study of the ills of the body, would have laid before him a broad panorama of the purpose of medicine. In this way, as he moved from one speciality to another, he would be able to constantly look back and see how it fitted into the picture as a whole.

The teaching of medicine has become split into water-tight compartments and the necessary stress on the abnormal has become too great. As I said before we did 12 normal midwifery cases out on district, but we saw more than 100 abnormal midwifery cases in hospital. It was after seeing one of the more mutilating of these procedures, as far as the baby was concerned, that a fellow student said to me "You know the way they show us one abnormal case after another, you would almost think that the point they are trying to make is that it is a sin to be a father".

The point I am trying to make, particularly as regards breast-feeding, is that if this period of instruction was instituted at the end of the second year, the medical student would be able to benefit very much better from his later instruction. The importance/
importance of breast-feeding would be appreciated from the very start, and when the medical student came to do his cases on district he would see to it that he paid as much attention to the breast-feeding of the baby as he now pays to the involution of the uterus of the mother. He would obtain more benefit from the paediatric lectures and the final year clinical instruction in the wards of the children's hospital than he does at present. He should be shown far more examples of normal breast-feeding; and if the "Finals", instead of consisting of the three great divisions of surgery, medicine and midwifery, comprised surgery, medicine, midwifery and paediatrics, it would be to the benefit of all.

Thus if more attention was paid to the teaching of the art of breast-feeding to nurses and medical students, the exhortations of the few to the many, to see that breast-feeding is persevered with, would not fall on ears which were deaf. To quote Lord Elton once again "A Christian country it certainly is not, if judged by its arrangements for religious teaching in the elementary schools" Similarly we might say "A breast feeding country it certainly is not, if judged by its arrangements for the teaching of the art of breast-feeding to its nurses and medical students". In fact - look after the teaching of nurses and medical students and breast-feeding will look after itself.
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