A HISTORY OF INFANT FEEDING

PART V.—NINETEENTH CENTURY CONCLUDED AND TWENTIETH CENTURY

BY

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(RECEIVED FOR PUBLICATION OCTOBER 19, 1953)

The Study of Scurvy in the Nineteenth Century

In spite of the fact that scurvy has been known to medical writers since the days of Hippocrates, there is remarkably little reference in the literature to this disease as it occurs in infants. Sea-scurvy, of course, was for centuries the disease dreaded by all mariners, and opinion seems to have been more or less evenly divided in the eighteenth century as to whether sea-salt and salted foods or the lack of fresh fruit and vegetables was the causative factor. There is good evidence also that scurvy was prevalent amongst the poor in the towns for it was described by Gideon Harvey, physician to Charles II, as 'Scorvey, the Disease of London' in 1675. Harvey's account is almost entirely confined to the disease in adults, but he believed that it was contagious and that infants contracted it from kissing. Glisson, as we have seen, was clearly aware of the separate identities of scurvy and rickets, but for the next 200 years and more the few references to the disease in the paediatric literature were disguised under the title of 'acute rickets'.

In 1878, however, W. B. Cheadle reported in the *Lancet* three cases of scurvy supervening upon rickets, preceded by a lengthy and learned discussion on the probable aetiology of the disease, that marked a great advance in medical thought. Cheadle summarized the previous views, all of which had rated scurvy as a deficiency disease. Thus Baly had suggested that it was due to a lack of certain organic acids, Garrod to a lack of potash, and Buzzard to a combination of both, whereas Rolfe had resurrected the ever-popular acidity theory expressed in terms of diminished alkalinity. Cheadle discarded the current belief in cold and lack of sunlight as causative factors because the disease was as well known in the tropics as amongst arctic explorers, and he emphatically stated that 'the essential factor is the absence of certain elements in the food'. Furthermore he knew that these elements existed in fruit, fresh milk and potatoes. Incidentally, potatoes were

first introduced into this country by Sir Walter Raleigh in 1585 but they did not become popular for at least a century to follow, but thereafter their increasing use in the feeding of infants probably considerably reduced the incidence of frank scurvy amongst the children of the poor until the production of condensed milk and patent foods once more accounted for an increase during the nineteenth century.

Cheadle's three cases were aged from 14 months to 3 years and all were well cared for apart from the diet. The first was breast fed with supplementary feeds of condensed milk for six months and then weaned on to oatmeal, rusks and broth without any milk at all until the advent of frank scurvy with fungating gums at 14 months. On this Cheadle made the classic comment: 'The diet was more than a rickety diet—it was a *scurvy* diet'. For treatment he recommended two pints of 'new' milk daily, half an ounce of raw meat juice, steel wine, potassium bromide and cold sponging. His second case was hand reared on milk alone for 10 months and then on bread and patent foods until scurvy became pronounced at 16 months, and the third case, aged 3, had received no milk, meat or vegetables since weaning at the age of 2. Cheadle wondered, just as many medical men subsequently did at the beginning of World War II, whether the many cases of gingivitis he saw were really suffering from a mild degree of the scorbutic state.

In 1883 Barlow collected 20 cases of 'acute rickets' from the literature, added 11 of his own, and fully described the disease which subsequently became known as Barlow's disease, but he fully acknowledged the earlier recognition of infantile scurvy by Ingerslev and Cheadle. He pointed out that the disease mainly affected children under 2, that it was more prevalent in winter, and that active rickets was often present concomitantly. His main contribution, how ever, was to describe fully the pathological findings, including the characteristic

sub-periosteal haemorrhages. Like Cheadle, he was fully aware of the importance of diet and one of his cases, a boy aged 15 months, had been fed on Robinson's groats, Swiss milk, baked flour, condensed milk, Robb's biscuits, Liebig's extract and saccharated lime water in turn since being weaned at the age of 6 weeks. He concluded by observing that 'infant foods cannot be trusted as the sole aliment for any lengthened period'.

In spite of these enlightened contributions from Cheadle and Barlow, it was some time before the disease was generally recognized in infancy. Samuel Gee, their colleague, described cases in 1880 under the heading 'Osteal and Periosteal Cachexia', and for many years 'scurvy-rickets' was a popular clinical hotch-potch diagnosis. The aetiology of scurvy was finally put on a sound scientific basis by the discovery of vitamin C by Hopkins and later the synthesis of ascorbic acid by Györgyi in 1928 made specific therapy a practical possibility.

During the twentieth century the incidence of infantile scurvy has steadily declined, yet in 1935 Still had collected 155 personal cases with a mortality of 5.5% compared with Barlow's 22%. There was naturally a rise in incidence in World War I but the provision by the Government of cheap bottled orange juice and the free use of ascorbic acid tablets in the infant welfare clinics in the second World War prevented a similar occurrence and the condition is now a rarity.

The Incidence of Rickets in the Nineteenth Century

A summary of the early history of rickets up to Glisson's account in the seventeenth century has already been made. As the Industrial Revolution progressed the employment of women and children, and the popularity of starchy foods for infants, taken in conjunction with the overcrowded and squalid slum conditions, inevitably resulted in a rise in the incidence of the disease in the towns. Even by the middle of the eighteenth century, however, James Nelson (1753) wrote that 'Rickets is a Distemper extremely common in London', and a century later Gee (1868) computed that 30% of the children admitted to The Hospital for Sick Children, Great Ormond Street, under the age of 2 were rickety; nor was this disease solely confined to the children of the poor. Gee attempted to stimulate medical interest in the condition for it seems that rickets were still largely accepted as the normal state in late infancy at this time. Cheadle had observed that in 1865 the winner of a baby show was obviously markedly rachitic.

The high incidence of rickets was continued into the twentieth century, for in 1902 in Leeds 50% of

the babies were stated to show well-marked signs of the disease, and a further rise in the rate took place during and after World War I, particularly in Vienna where, in 1919, Dr. Harriette Chick led an expedition of research workers. They succeeded in convincing Professor von Pirquet, who was previously of the opinion that rickets was an infection, of its true nature as a deficiency disease. In war time, unfortified margarine had been a potent cause of the epidemic.

Speculation as to the cause of rickets has naturally been widespread. At the outset of the nineteenth century William Buchan expressed the opinion that the recent increase in the manufacturing towns was due to lack of exercise but later in the century Routh deprecated starch as a food for infants because it interfered with the absorption of calcium and phosphorus from the gut and hence predisposed to rickets. Magendie had shown that dogs die if fed on white bread whereas they thrive on brown, and Liebig had stated that the alum used for bleaching causing a precipitation of the phosphorus and hence the development of rickets. In this respect it is interesting to recall Mellanby's recent work on the development of canine hysteria due to the agene process for bleaching flour.

In 1886 Bland-Sutton observed at the London Zoo that lion whelps and other young animals fed exclusively on raw meat always died of rickets, whereas by feeding them upon milk, pounded bones and cod liver oil instead, without making any alteration in the hygiene or ventilation of their cages, he was able to rear successfully the first lion cubs born in captivity. This work led Cheadle to appreciate the importance of diet in this disease as well as in scurvy, and he initiated the view, which held supremacy for many years, that rickets was a fat-deficiency disease, indeed until Edward Mellanby in 1919 showed by experimental work on puppies that the dietary rachitogenic factor could be narrowed down to a fat-soluble substance separate from vitamin A. The final challenge to this view came from Leonard Findlay, writing in the *Lancet* in 1922, who revived the old theory of lack of exercise. He observed that although Indians of all castes notoriously lived on a low fat intake, rickets was seldom seen except amongst the wealthy, from which he concluded that the physical restrictions of purdah were responsible. In fact of course, lack of sunlight rather than of exercise was responsible, as it was also in Findlay's puppies who became rickety on a low-fat diet in the towns but not in the country. Nowadays there is no serious challenge to the view that rickets is due to a deficiency of the fat-soluble vitamin D.

Curiously enough cod liver oil has been used empirically for the prophylaxis and treatment of rickets for well over a century. J. H. Bennett (1841) recorded that *oleum jecoris aselli* was first used in 1766 in the Manchester Infirmary for the treatment of rheumatism and allied conditions, and that it had been used traditionally in Scotland for the prevention and cure of rickets. Early in the nineteenth century it had been used extensively in Holland and Germany where Dr. Schenk had recorded several cures by the administration of one or two ounces daily. By 1840 a few London physicians were obtaining good results with it and Bennett believed that the combination of rickets and scrofula responded particularly well due, he thought, to the trace of iodine contained in the oil. This marked the addition of a most useful weapon to the average physician's armamentarium, for Nelson had had to be content in 1753 with recommending a cold bath as 'the great and noble Remedy for this Disease' together with bleeding and purging if fever was also present, but by 1868 Gee had accepted cod liver oil as a 'noble remedy' and thereafter it became increasingly popular, aided by the manufacture of more purified, and therefore more palatable, preparations. Nevertheless even such an authority as Eric Pritchard (1904, 1916) failed to make any mention of its use and value in either of his two books on infant feeding. However, the provision of free cod liver oil by the Government during and after World War II has convinced even the most sceptical lay opinion of its value and hence florid rickets is nowadays rarely seen.

The Contribution of the Nineteenth Century

As the seventeenth century unfolded, the old scholastic conservatism, with its ancient humoral pathology, was gradually superseded by the steady advance of a more practical and experimental approach to scientific problems in general, and medical problems in particular. During the eighteenth century the dawn of modern medicine, with its central conception of disease entities, began to break and grow but at first medicine lagged behind the physical sciences and the art of infant feeding scarcely felt the new scientific influence at all.

The first impact, however, was made when the 'chymical' analysis of milk at the outset of the nineteenth century became a practical proposition though the advantage gained was not, for many years, very great. It was helpful, of course, to know that ass's milk was the nearest approach to breast milk, and that cow's milk required modification in order to be 'humanized', but this in fact had been deduced empirically some years previously. In spite

of this advance infants were all too frequently reared, or killed, on a diet of flour and water in the first half of the century. During this period the supervision of infant feeding, when indeed it was supervised at all, was in the hands of midwives and obstetricians who were reluctant, to say the least, to abandon the folklore approach which had been traditional for so long. Liebig seems to have been the only true scientist of note to enter the field of infant nutrition but his food for infants was by no means an unqualified success.

The rapid fall in infant mortality which took place during the latter half of the eighteenth century was carried over for a time into the nineteenth, but for the major part of the century it remained static about the 150 mark, and even sustained a slight rise in the 1890s though the general death rate for the whole population fell steadily from 1850 onwards. It is generally agreed that the high rate was largely dependent upon the prevalence of gastro-enteritis, which in its turn was a product of faulty feeding, bad hygiene and poor management. The advent and elaboration of dried and evaporated milks and the mass production of teats and feeding bottles apparently did little or nothing to bring about an improvement, for the apparent increase in rickets and scurvy was probably mainly due to their increasing use. This was disappointing, for John Clarke (1815) had hoped that society would benefit if wet nurses could be dispensed with; he had argued that the nurse's own child was left at home to be hand reared under bad conditions whereas the employer's child, who would have stood a better chance of survival on artificial feeding, was reared on the breast.

The knowledge of the composition of cow's milk resulted in the publication of numerous formulae and complicated systems such as that introduced by T. M. Rotch of Boston who believed that minute variations in the composition of a feed, even 0.1% variation in a single food element, would make the difference between its being digested or not (Morse, 1935). The percentage system of feeding insisted upon the very careful graduation of the size and composition of the feeds from week to week with a result that milk was prescribed with the same accuracy and precision as a dangerous drug! But perhaps the acme of complexity is to be found in Tuley's book of 1904 (Levinson, 1926) which contained two and a half pages of algebraic formulae for calculating a healthy baby's feed.

Perhaps the greatest benefit to the safety of infant feeding accrued from the public health movement under the auspices of Simon and Chadwick which lessened the danger of the transmission of diseases by milk and water and gradually raised the general

standard of living conditions. Towards the end of the century the work of Pasteur and Koch drew attention to the danger of micro-organisms in milk and for this reason Budin scorned the elaborate humanizing formulae and instead relied entirely upon the use of sterilized undiluted cow's milk when breast milk was not available.

The paediatric literature was mainly concerned with the rapid advance in the knowledge of children's diseases, and for a while infant feeding remained in the doldrums. Thus the sixth edition of William Buchan's text-book (1769) attributed the high infant mortality to 'improper management and neglect' and to the 'absurd and ridiculous practices' which were so different from the natural methods of animals who were 'guided by instinct, while man, trusting solely to art, is seldom right'. Yet the twenty-second edition (1832) showed no notable advance over the 50 year period in the section on infant feeding, though there was a remarkable expansion of the rest of the book which was concerned with diseases and their treatment.

Since Armstrong's dispensary closed in 1781 there was no organized medical care for children until Davis founded his dispensary in 1816, but paediatrics as a real and separate specialty scarcely existed before the middle of the century when The Hospital for Sick Children was founded at Great Ormond Street. Thereafter Samuel Gee, Charles West, Eustace Smith, Goodhart and Cheadle greatly added to our knowledge of the subject though they were mainly concerned with diseases and only Budin, the obstetrician, notably influenced medical thought on infant feeding. Edmund Cautley, in the preface to the second edition of his comprehensive text-book on the subject at the end of the nineteenth century, noted the recent advance in bacteriology and the percentage feeding system, but he objected to treating the infant's stomach as if it were a test-tube for the reception of alarmingly complicated formulae, and he summed up the general state of affairs at this time when he wrote that 'although the feeding of infants is free from the taint of empiricism, and every year rests on a more scientific basis, it still remains largely an art which gives ample scope for judgment and resource'.

Infant Welfare Movement in the Twentieth Century

The steady reduction in infant mortality during the last 50 years has occurred *pari passu* with the gradual development of the infant welfare movement, and although the child welfare clinics are by no means solely a beneficial influence, yet there can be no doubt that the education of the mothers with regard to the value of breast feeding and the proper

use of dried milks, together with the distribution of vitamins and cheap powdered milk, have been a major factor in the general improvement.

In 1892 Pierre Budin founded the first welfare clinic, the *Consultation de Nourissons*, where breast feeding was ardently encouraged and sterilized cow's milk was issued in sealed bottles, one per feed. The babies were examined and each mother was provided with a card showing the date of birth, weekly weight chart and the mode and quantity of feeding. Two years later at Fécamp Dr. Dufour independently founded the *Goutte de Lait* from which was issued diluted milk with cream and sugar added. Thereafter this movement spread rapidly throughout France.

In 1899 Dr. Drew Harris, inspired by Dufour's work, set up the first English milk depot where, in addition to the issue of milk at a financial loss, weekly weighings were carried out. The first real consultation clinic was set up at the Battersea Milk Depot by Dr. McCleary in 1905 (Pritchard, 1916, and McCleary, 1933), and thereafter the movement rapidly developed in this country also so that about 200 largely voluntary societies were functioning by 1913, which was increased to 650 by 1915, and 1,278 at the end of World War I, a remarkable growth for war time. Statutory powers were given to the local authorities to establish clinics in 1909 and these were extended by the Maternity and Child Welfare Act of 1918.

The first international congress on *Gouttes de Lait* took place in Paris in 1903 when the rival interests of obstetricians and paediatricians were publicly displayed, the former asserting that the clinics were encouraging artificial feeding at the expense of breast feeding. A national conference on infant mortality in London in 1906 further stimulated medical interest in this pressing problem and in 1928 the founding of the National Council for Maternity and Child Welfare under the chairmanship of Dr. Pritchard marked a further step forward in the organized attack to improve the standard of infant care and management.

Health visitors first began to be employed at the beginning of this century (Craig, 1946) and by 1905 50 authorities were using them to establish a liaison between the homes and clinics, a much needed task for in Liverpool the infant mortality in the centre of the town was more than twice that in the suburbs. Their work was greatly simplified by the Notification of Births Acts of 1907 and 1915 which made early visiting at first a practical possibility and later the universal custom. The problem of illegitimacy was also tackled by the foundation of the National Council for the Unmarried Mother and Her Child in

1918, though the Scottish Committee was not set up until 1940.

Thus it will be seen that the infant welfare movement, which was originally instituted by the zeal and funds of voluntary workers, has been gradually extended by legislation and public grants until the vast organization, which now reaches every hamlet in the United Kingdom, was built up. A very high proportion of working and middle class mothers now avail themselves of the facilities offered and the standard of mothercraft has greatly improved. However, since the advent of the National Health Service the justification for the separate existence of the movement no longer exists. The poor mother no longer has to think of the cost when she consults her general practitioner, who now, for the first time, has the opportunity of becoming a true family doctor. Logically, therefore, as Moncrieff (1950) has said, the family doctor should be carrying out the work in the homes and in the infant welfare clinics, assisted by the health visitors. This merger with the general medical services will probably be the final stage in the evolution of the infant welfare movement.

Frederick Truby King (1858-1938). This outstanding and remarkable man was for many years Superintendent of the Seaclyff Lunatic Asylum near Dunedin, New Zealand, an enlightened institution whose inmates enjoyed occupational therapy in the surrounding gardens and adjoining farms. Truby King was a keen student of plant and animal life and he became particularly interested in the scientific feeding of calves and the reduction of the incidence of scouring amongst them. He himself suffered from phthisis and while on sick leave in Japan in 1904 he became impressed by the popularity of breast feeding there as compared with New Zealand, and by the good physique of the general population. On his return home in the following year he and his wife adopted a daughter, Mary, who in 1948 published his biography. They resolved to improve the practice of infant feeding first by encouraging breast feeding and failing that by educating mothers and nurses in the use of suitable substitutes.

In 1907, at the age of 49, he started the Truby King movement earnest and the Plunket Society, named after the Governor of New Zealand, was formed. At the same time King installed at his week-end cottage at Karitane 13 of the worst cases of unwanted babies he could find, and there, by skilled care and attention to feeding, he proved that they could be reared and brought up to become normal useful citizens. The Mothercraft Movement rapidly developed in New Zealand so that quite soon

80% of the mothers were attended by Plunket nurses and the infant mortality, which in 1900 was already only half that in England, was halved again by 1912. The nurses were taught to encourage breast feeding, to guard against overfeeding at all costs, to use a modified form of percentage feeding with cow's milk, to learn how to collect representative samples of breast milk and to estimate the fat content, in addition to all the other aspects of mothercraft.

In 1913 Truby King visited England as the New Zealand representative to the Infant Welfare Conference. It seems that he regarded himself rather as a crusader or missionary to a primitive land and, not unnaturally, this attitude resulted in him being variously regarded as a crank, quack, enthusiast or rival, but a few became his most earnest and faithful disciples. He was determined to prove that apparently weak babies were well worth saving (infant life was still valued much lower than it is today) and that slum mothers were not necessarily slut mothers. To do this he set up a clinic in Bethnal Green where he found that feeding problems were much the same as they were in New Zealand. Later he visited von Pirquet in Vienna who impressed upon him the great danger of overfeeding, and Finkelstein in Berlin who was treating infantile infections dietetically.

In 1917, on his way to Europe again, he visited New York where he was royally received—in marked contrast to his cold reception here. On this visit he founded the Mothercraft School which existed until recently at Cromwell House, Highgate, and he first became acquainted with Marylebone cream (50% emulsion of linseed oil) which Pritchard was adding to sweetened diluted cow's milk. On returning to New Zealand, where he became Director of Child Welfare, he set up factories for the production of 'kariol' (50% fat, 40% sugar and 10% water) and 'karilac' (60% lactose, 35% dextri-dextrose and 5% gelatine) which were subsequently distributed in this country from Cromwell House.

On his third visit to England in 1928 Truby King had become rambling, senile and dogmatic so that the cause he had founded suffered some discredit. It has aptly been written of him:

'He was of course a genius. . . . What he gained in pure mental intellect he lost in emotional balance, and, as the normal dissolution of old age came on, the imbalance was accentuated.'

Considerable space has been devoted to the life of Truby King because he was such an outstanding personality of world-wide renown in the first quarter of the present century. At that time his encouragement of breast feeding, with the use of such slogans

as 'breast fed is best fed', was a welcome reminder to all that the recent advances in the production of artificial milks and patent foods in no way superseded the tremendous value of the natural method. His work was marred by his gross over-emphasis of the dangers of overfeeding, which he described as more common and more dangerous than under-feeding in the breast-fed infant, and his influence in this direction is still plainly discernible in England and New Zealand today. It is curious that a man so interested in nature should have insisted on such a rigid restriction of quantity and such a strict adherence to feeding by the clock when it is so plain for all to see that nature obeys no such man-made laws.

Most twentieth century writers have ignored Truby King though his disciples have continued to put his principles into practice and to use his products almost without alteration to this day. His methods have been openly challenged by Pritchard, and Burgess (1925) was at pains to expose the defects and limitations of his system in the treatment of difficult feeding problems. In summary, we find that the Truby King movement has many of the characteristics of a religious revival. The first enthusiasm, inspired by the magnetic personality of one man, was undoubtedly responsible for a great re-awakening of interest in breast feeding and a general raising of the standard of mothercraft as a whole. Unfortunately, as is so liable to happen, his followers have been more concerned with perpetuating his teaching than with making further progress forward. In fact it is sad but true that very little remains of the movement in England today apart from strict enforcement of feeding times and habit training and a morbid fear of overfeeding; when executed with ardour, these precepts are prone to produce a hungry and frustrated baby.

Eric Pritchard (1864-1943). Pritchard, who was medical director of the Infants' Hospital, Vincent Square, was actively engaged in developing the infant welfare movement when Truby King first visited England. He initiated the first infant welfare clinic in London at Marylebone and was the first paediatrician appointed to Queen Charlotte's Hospital.

Although probably a difficult man to work with, comparison of his two books on infant feeding, written in 1904 and 1916, shows that Pritchard was very ready and willing to change his views should they prove to be incorrect. Thus, in the earlier work he wrote: 'there is no sort of coordination between the supply on the part of the mother and the demand on the part of the child', but in 1907 Budin's work was published in England which caused him to

revoke entirely the above statement in his later lectures. At the time when he wrote, Rotch's elaborate scheme was in vogue and although he fully acknowledged the excellent work carried out by the Walker-Gordon Laboratories in the production of clean, standardized milk, he also realized that a much more simple and less expensive scheme was necessary and desirable. He therefore devised a 'physiological nursery chart' incorporating weight tables, formula changes at monthly intervals (instead of weekly), total quantities and time intervals between feeds. However, in the later work, he had realized he had been guilty of producing too rigid a scheme for he wrote:

'Although in the past I have been guilty of drawing up many a table for the feeding of infants of various ages, I now fully admit that such tables are worthless, unless other important considerations, such as those of clothing, housing, and airing, are simultaneously taken into consideration.'

It is notable that in neither case was Pritchard particularly concerned with the infant's weight as a basis for calculating a feed, being more influenced by the age, but it is encouraging to find a physician at that time attempting to make the feeding schedule fit the baby instead of the reverse. He made a special study of 'test feeds', a term he coined himself, and he noted the great variation which was liable to occur from feed to feed. He accepted the figure of 99 cal. per kg. body weight for the daily food requirements of infants under 3 months, and on this basis he considered that such a baby would require about 2 oz. of milk per lb. weight daily—'hedging myself in with all possible reservations' as he put it (1916). The modern teaching of infant feeding in England today, including its good and bad points, owes a great deal to the foundations laid down by Eric Pritchard who, for a quarter of a century, was actively engaged in teaching and lecturing nurses and students.

Conclusion

In some ways this historical review might be regarded as a chronicle of man-made errors, for many of the ideas in the writings that have been quoted were intended to be an improvement upon nature though few have succeeded. Those who have heeded nature any way, namely the nursing mothers, have seldom found it necessary to put pen to paper. To some extent, however, lactational failure is to blame, for it has been in the search for a suitable substitute for breast milk that so much artificiality has been unnecessarily introduced and this has even spread to engulf the simple act of successful breast feeding itself.

Overfeeding has been repeatedly cited as the main

source of feeding troubles whereas in reality improper feeding (e.g., too early introduction of starch, lack of vitamins, bacterial contamination etc.) has been the chief cause. This attitude reached a peak at the end of the nineteenth century when Budin, Czerny, Finkelstein, von Pirquet, Rotch and Truby King were preaching about the dangers of overfeeding all over the world. In France Budin's influence was so widespread that Cran (1913) reported in 1913 that the weighing machine had become an instrument of torture as much to the mother with plenty of milk as to the one whose lactation is poor. A recent investigation (Wickes, 1952) showed that in London today similar conditions prevail. In this respect we are still fighting a battle that has already been won.

It is, perhaps, in the study of feeding times that the changes in infant feeding habits can best be followed through the ages. In the natural state the infant is fed as often as he is hungry and until his hunger is satisfied, but even in the most primitive civilizations this method may have to be modified by circumstances. Thus, in some parts of China the mothers refer to their offspring as 'one', 'two' or 'three furrow babies' meaning that whereas one will require feeding after the mother has had time to hoe only one furrow, another will be content to sleep at the edge of the paddy field until three have been worked.*

In Tudor times and after no mention was made of a regular feeding schedule. Indeed in the sixteenth century Guillemeau specifically wrote that 'it is fit he should have the teat as often as he crieth'. Cadogan in 1748 seems to have been the first writer of importance to extol the virtues of regular feeding, advising that for the breast-fed infant 'four times in four and twenty hours will be often enough to give it suck' at stated times, the same every day. For hand fed infants 'little and often' became the rule, so well exemplified by the following extract from the *Monthly Repository* (1810):

Nursery Clock

In the year 1760, Lady Arabella Denny presented a clock to the Dublin Workhouse, to be put up at her expense, in the nursery for foundling children, with the following inscription, viz. "For the benefit of infants protected by this hospital, Lady Arabella Denny presents this clock, to mark, that as children reared by the spoon must have a small quantity of food at a time, it must be offered frequently; for which purpose this clock strikes every twenty minutes, at which notice, all the infants that are not asleep, must be discreetly fed".

During the nineteenth century writers became increasingly anxious to limit and regulate feeds,

frightened as they were by the appalling mortality from gastro-enteritis. Thus, Eustace Smith (1878) recommended 10 two-hourly feeds daily for the first six weeks of life! At the beginning of the present century the pendulum began to swing the other way, Truby King pointing out in 1915 that these frequent feeds resulted in the one thing they were designed to obviate, namely overfeeding. Rigidity, however, was not relaxed. The twelfth edition of Goodhart and Still's text book (1925) recommended a change from two to three-hourly feeding when practicable but insisted that 'whatever interval suits the infant best is to be strictly enforced.'

Between the world wars the first signs of the emancipation of medical writers from the strict regime of the past began to be apparent in the papers of Weinfeld and Floore (1930), Clara Davis (1935) and Gesell and Ilg (1937). Later the work of Aldrich and Hewitt (1947) did much to popularize the self-demand or self-regulatory method. When this regime becomes universally adopted, as it surely will, so the last chapter on the history of infant feeding will be concluded. Indeed, such a history would never have been written if Sainte-Marthe's sound advice in his poem *Paedotrophia* (1584) had been heeded:

And I, for suckling, no fix'd hour prescribe;
This Nature teaches best the nursing tribe:
Let her your mistress be; and when, with cries
The hungry child demands his due supplies,
Forbear not you the wish'd relief to bring,
But, for his use, unlock the sacred spring;
Nor then be loath your snowy breast to bare,
That he may suck, and streaming fragrance share.'

This history formed part of an M.D. thesis at the University of Cambridge in 1951. It could not have been written without making full use of the excellent facilities so freely available at the Wellcome Historical Medical Library, and I am greatly indebted to the Director and the librarians for their help.

The photographs for Figs. 1-4 were kindly supplied by the Wellcome Historical Medical Museum, and for Figs. 5-11 by the Photographic Department of St. Bartholomew's Hospital to which I am most grateful.

Finally, I should like to thank my wife for preparing the typescript.

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* I am indebted to Dr. Waller for this information.

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