THE UNIVERSITY OF HULL

FEEDING AND MORTALITY IN THE EARLY MONTHS OF LIFE; CHANGES IN MEDICAL OPINION AND POPULAR FEEDING PRACTICE, 1850-1900

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Abstract

This thesis is concerned with the artificial feeding of very young children during the second half of the nineteenth century, and its implications for infant health and survival. The decline of breastfeeding which occurred in England between the years 1850 and 1900 was regarded by contemporary critics as largely responsible for the high rate of infant mortality which persisted throughout the half century, at a time when premature deaths in other age-groups were declining in number. This thesis examines, in the light both of contemporary judgements and of modern knowledge, the artificial feeding methods which were adopted in place of breastfeeding. Changes in medical attitudes and opinion during this period in relation to artificial feeding are described, and their influence on popular feeding practice in different social contexts discussed. Rival influences, such as shortcomings in the supply of certain foods and the pressure of commercial advertising, are also examined, and the influence of social factors in general on the development of effective methods of artificial feeding assessed. Finally, the state of health of handfed infants as described in contemporary sources is considered in relation to their diet. Contemporary assumptions about the relationship between artificial feeding and high infant mortality and morbidity are largely found to be justified; it is argued that the period 1850 to 1900 was, nevertheless, one of notable advance both in attitudes towards handfeeding and in the technical skill and understanding which was brought to bear on the problems it involved. Although this period itself saw no reduction in the infant mortality rate, it is seen as a time of adjustment to new ideas and practices, forming a necessary prelude to subsequent and more effective attempts at reform.

PREFACE

The second half of the nineteenth century witnessed an upheaval in infant feeding patterns, associated with high rates of disease and death in the early months of life. In an increasingly urban and industrial society the needs and expectations of mothers of young babies were changing, and the traditional methods of infant feeding which had formerly fulfilled these needs and expectations were failing to do so. The adaptation of feeding patterns to changing requirements, however, presented serious problems. Pressures on mothers to abandon traditional practices were matched neither by the expertise required for the development of satisfactory alternatives nor, in the majority of cases, by the wherewithal to carry them out had they existed. The compromises which emerged were widely criticised by contemporary observers, who believed that they represented a substantial decline in standards of maternal care. This thesis examines the new feeding patterns. It describes and attempts to account for their growth and development during this period, and assesses their significance in relation to infant mortality and morbidity.

This is a study which deals with the influence on infant health of the growth of handfeeding; the term 'infant' is used in this context to refer to the child in the pre-weaning stage, since it is only before weaning that alternatives to handfeeding exist. The pre-weaning stage cannot for the purposes of this study, however, be defined in

terms of the actual time of weaning, since this differed widely in different contexts during the period. With regard both to historical medical opinion and to modern views on this subject, the pre-weaning period has been defined as the first six months of life, and the infant as the child from birth to the end of that period. The feeding of the infant covers all aspects of his diet except the supervised use of drugs and medicines in the course of specific medical treatment, any discussion of which falls outside the scope of a non-technical study. The general domestic use of drugs and medicines is discussed, since the quantity of these substances regularly consumed by infants during this period is too large to allow them to be classed other than as part of the normal intake of nourishment. Recourse to drugs and medicines on this scale has been considered significant both for its own influence on infant health and for the indication it gives of existing ill-health resulting from other factors.

This study covers infant feeding both in a middle and upper class, and in a working class, context. A broad framework was adopted in the belief that it was from its own broad base, as a movement occurring throughout the community, that the decline of breastfeeding derived its significance. To have described the growth of handfeeding in the middle and upper classes alone would have been to deprive it of much of its meaning, by restricting it to an environment in which its most important implications were lost. To have described the growth of handfeeding solely among working people, on the

other hand, would have been to ignore the origins of the institution among the leisured classes, and to lose what may be important insights into its development.

The relationship between feeding and mortality has been discussed in two stages. The first part of the study describes the feeding practices which existed during this period in different social groups and indicates the effect these practices were likely to have had on infant health. The concluding chapter describes the state of health of young infants as it was recorded by contemporaries and relates this in more detail to the feeding practices described earlier. In assessing the state of health of infants reference has been made to recorded causes of death, but these have not formed the basis of the discussion. The diagnosis of infantile disease during this period was frequently imprecise through lack of knowledge and, for other reasons, not always accurate and the usefulness of the registered causes of death in the early months of life is therefore limited. Furthermore, information relating to immediate cause of death may be misleading as an indication of the role of dietary factors, which seldom in themselves precipitate death though they may have a profound influence in predisposing the individual to infectious and other diseases and in retarding or preventing his recovery from them. The recorded causes of death in infancy are not irrelevant, but they must be looked at in conjunction with information about morbidity in general, obtained from other sources.

The approach adopted in this investigation is not that of the nutritionist or the physician, but that of the social historian. What is attempted is not a detailed analysis of the relationship between diet and mortality and morbidity - whether that would be possible on the basis of existing statistical evidence is anyway arguable - but an examination of changing feeding patterns in their historical context, and an assessment of their influence on infant health in terms of a limited number of uncontroversial nutritional indices. The assessment of dietary factors in disease or death is rarely a simple matter, and its difficulties are greatly increased when the population involved is an historical one, for which relevant statistics are unreliable and difficult to interpret. The conclusions drawn in this study are restricted, therefore, to a well-defined field and do not relate to areas of current medical controversy or those in which precise technical knowledge is required for the interpretation of data.

The interest felt by ordinary observers and, increasingly, by government during this period in changes which were taking place in infant feeding has ensured for posterity a large quantity of contemporary material. The official sources fall into three main categories: the annual reports of government departments, with any special reports, decennial supplements and other material which may be attached to them, the reports of parliamentary committees, and the reports of local officials and authorities, such as

medical officers of health and parish vestries. These sources contain a quantity of material relating directly to infant feeding, as well as much that has relevance for it. In each case the impetus for the provision of information was anxiety over high rates of infant mortality, either generally or in a particular population, and the information given relates in the main to the poorer sections of the working class community, in which infant mortality was highest.

The private sources fall into various categories. Private individuals wrote prolifically on infant feeding and related subjects throughout this period, and a large amount of material was published by professional, learned and philanthropic societies. Much of this is descriptive in nature, and supplements the information supplied in the official sources, providing valuable details of feeding practices and conditions in all classes of society. Other material from private sources is of a mainly prescriptive character, and includes not only articles, instructive manuals and tracts produced by individuals and miscellaneous bodies, but also advertising matter dispensed by a growing number of baby food and feeding utensil manufacturers and suppliers. These sources yield information relating in the earlier part of the period chiefly to feeding practices among the middle and upper classes, but in the later decades of the century aimed increasingly at working class mothers as well. This prescriptive material, though unsuitable as the sole index of feeding behaviour, nevertheless provides

useful insights into contemporary assumptions and beliefs and frequently also affords an intermittent commentary on actual practices and conditions, whether stated or inferred.

Historical research published in recent years has dealt with aspects of infant feeding and infant mortality. Social historians have shown a growing interest in dietary questions, and studies of food consumption such as that carried out by Dr John Burnett[1] refer to the feeding of infants and children among other groups. Research into other areas of social and economic life in this period, in particular Dr Margaret Hewitt's survey of the conditions of working women[2], is also relevant, Dr Hewitt's study discussing the feeding patterns of one section of the population in some detail. An investigation into certain aspects of infant mortality and morbidity during this period by A.H.Gale[3] again has a bearing on questions considered here. Finally, there is a small number of histories of infant feeding techniques; these, though very general in their coverage, shed some light on the crucial developments of the later nineteenth century. There exists, however, no detailed study of infant feeding and its influence on infant mortality and morbidity during this period, other than those published by contemporary authorities.

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1 J. Burnett, Plenty and Want: a social history of diet in England from 1815 to the present day (1966).

2 M. Hewitt, Wives and Mothers in Victorian Industry (1958).

3 A.H. Gale, 'A Century of Changes in the Mortality and Incidence of the Principal Infections of Childhood', Archives of Disease in Childhood XX 101 (1945) 2-21.

A great deal of the material on which this study is based, both private and official, is to be found in the library of the British Museum, and I am grateful to the staff of the Reading Room for the help I have received while working there. The staff of the Wellcome Institute of the History of Medicine and the staff of the libraries of the University of London and the University of Hull have also given advice and assistance on many occasions, for which I should like to express my appreciation.

CONTENTS

CHAPTER 1

Infant feeding and infant mortality, 1850-1900: an introduction.

The second half of the nineteenth century is a time of particular interest for the study of infant feeding and its relationship with infant mortality. Not only were there significant changes during this period[1] in the nature and structure of infant feeding patterns themselves, but against a background of increasing interest in the prevention of disease and the reduction of premature death, the diet and feeding habits of infants, as of other age-groups, came to be a matter of growing concern to contemporaries. The reduction of rates of premature mortality in all age-groups except that of infants during this period attracted attention to this group as one with special problems, while changes in diet and feeding practices among very young children suggested themselves as their source.

The dates 1850 and 1900 are taken roughly to mark the beginning and end of a period of adjustment in the history of infant feeding. Feeding patterns in infancy were undergoing stress in a situation in which technological advance was making new methods possible and in which

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[1] For a discussion of demographic change during this period see E.M. Hubback, The Population of Britain (1947) 17-32; A.H. Gale, 'A Century of Changes in the Mortality and Incidence of the Principal Infections of Childhood', Archives of Disease in Childhood XX 101 (1945) 2-21.

changing needs and expectations were making these methods attractive. While some groups welcomed changes in feeding practices they were resisted by others, and throughout the period they were the subject of controversy. The emergence, acceptance and partial solution of the problems engendered by these changes and the resolution of the conflict to which they gave rise were all part of the adjustment process of this half century. It was a period which bridged the gulf between the old system of infant feeding patterns, which had evolved to serve traditional needs and expectations, and a new system, evolving in response to new and different needs.

The history of infant feeding in the second half of the nineteenth century is dominated by the rise and development of bottle-feeding. Commercial activity and contemporary comment indicate a steady trend away from breastfeeding throughout this period in favour of the feeding bottle and artificial foods.[1] The abandonment of maternal breastfeeding was not in itself a new development; for centuries richer mothers had avoided the chore of feeding their infants themselves by hiring wetnurses to perform the task for them.[2] The departure from tradition represented by the developments of the mid-

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[1] See Chapter 2 below, 24-52.

[2] For the history of infant feeding before 1850 see D. Forsyth, 'The History of Infant Feeding from Elizabethan Times', Proceedings of the Royal Society of Medicine 4 (1911) 110-141; G.F. Still, The History of Paediatrics (1931); I.G.Wickes, 'A History of Infant Feeding', Archives of Disease in Childhood XXVIII (1953) 151-8;232-240; 332-340; 416-422.

nineteenth century and subsequent years lies rather in the use, for the first time on such a scale, of an artificial substitute for human milk. In the earlier part of the period doctors continued to recommend wetnursing[1], and it was not unknown even in later decades; during the second half of the century, however, its use declined as mothers began to prefer the greatly improved artificial alternatives which were appearing on the market. Bottle-feeding had earlier been regarded as a dangerous last resort in child care, only to be employed where no other means of rearing an infant was available. It was now looked upon to an increasing extent as a genuine alternative, rather than an inferior substitute, for the breast, whether that of the mother or the wetnurse, and regarded as a method which, for mothers if not for children, was frequently both more agreeable and more convenient. It was, moreover, a method which was open to the poor as well as to the rich. Many working class mothers had earlier been compelled to resort to some extent to handfeeding, but in so far as they were able they had combined it with breastfeeding; the complete abandonment of breastfeeding became during this period increasingly common among such women.

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[1] T. Bull, Hints to Mothers for the Management of Health during the Period of Pregnancy and in the Lying-in Room (7th ed. 1851) 297; T.H. Barker, 'On the Management of Infancy and Childhood', The British Mothers' Magazine VIII (1852) 217; P.H. Chavasse, Advice to a Mother on the Management of her Offspring (5th ed. 1860) 22.

The trend away from breastfeeding and towards bottle-feeding significantly altered the nature of the infant feeding task. Breastfeeding was a specialised task, demanding particular physical qualifications of those who undertook it. If a mother did not wish to feed her baby herself, the only possible substitute was another woman who had recently given birth to a child. Bottle-feeding, in contrast, required no special qualifications, but could be carried out by anyone. If the mother herself did not wish to feed the baby, any servant, or even a child, could act as her deputy. The transformation of infant feeding from a specialised into a general task is shown in another way, in a reduction in the influence of the medical profession and a corresponding increase in the influence of commercial interests.[1] The rise of bottle feeding created an extensive market for infant foods and feeding utensils, and the opportunities of manufacturers to influence infant feeding practices were enhanced by the growth in advertising, which enabled them to reach a receptive public which the medical profession was unable to influence in the same way. These changes combined to render the infant feeding task in 1900 quite different from that task in 1850.

The effect of the spread of artificial substitutes for the breast was to increase the demands made by infant

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[1] F.H. Alderson, Diet and Hygiene for Infants (1906) 1.

feeding upon knowledge and its communication and upon services such as the supply of food. Breastfeeding could be carried out successfully with little, if any, precise theoretical knowledge of the infant's nutritional requirements, because these were allowed for in normal circumstances by the body's own arrangements. The knowledge required to produce an artificial substitute for the infant's natural food was, in contrast, extensive, demanding an understanding not only of nutrition but of hygiene. This knowledge, moreover, could not be confined to the medical profession, but needed to be shared by, or readily available to, the ordinary lay mother. This presupposed a reliable form of communication between the two, which became increasingly important where rival influences were competing for the mother's attention. Finally, the necessary conditions had to exist to enable the mother to put the knowledge she acquired into practice. This presupposed food supply arrangements, either existing in the normal course of events or artificially imposed, which ensured that the recommended foods were readily available to all mothers, and living conditions which were such that food could be prepared adequately in the home.

Between 1850 and 1900 society could not meet these demands, and its inability to do so was reflected in a persistently high infant mortality rate. Statistics for those under one year old show a mortality rate which remained virtually stable, at or about 150 per thousand

live births, throughout the second half of the nineteenth century.[1] Only after 1900 did this figure decline significantly.[2] In contrast, the mortality rate among children aged from one to five years declined steadily from the 1870s,[3] and adult mortality rates showed a similar trend.[4] For the last thirty years of the nineteenth century, therefore, the infant mortality rate, while remaining stable in absolute terms, rose in relation to the mortality rates of other age-groups, including that of only slightly older children.

The disparity between the mortality trend in the infant population and that characteristic of other groups revealed infants as a group facing particular problems. These resulted from the fact that infants were subject to a different pattern of fatal disease from that characteristic of older children and adults. The diseases which were most commonly fatal to children over one year old and to adults during this period were those which the town cleansing programmes of the 'sanitary revolution' and the

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1 Registrar-General of Births, Deaths and Marriages in England and Wales, Annual Reports to the Home Secretary, BPP 1852-1899, see Bibliography for individual references to these; A.H. Gale, loc. cit., 3.

2 A.H. Gale, loc.cit., 19.

3 Ibid., 4.

4 E.M. Hubback, op.cit., 21.

increasing use of preventive measures such as vaccination were able significantly to reduce during the later decades of the nineteenth century.[1] The diseases of infants, however, were less susceptible to control by these means. In the case of many of the common infections, such as diarrhoea, infants were very much more at risk than adults or older children, and required more stringent precautions to protect them than were sufficient to reduce infection among older persons. The removal of the grosser sources of infection in the environment were less likely, therefore, to result in a reduction in infant death rates comparable with that which occurred elsewhere. More significantly, infants were susceptible to a number of diseases and conditions which were not wholly infectious and which were not affected by the environmental improvements made during this period.

While infants were breastfed, they were protected from many of the hazards to which as a group they were exposed, but the development of handfeeding removed this protection.[2] Prominent among causes of death in the first six months, and exemplifying that aspect of infantile morbidity which proved hardest to control, was what were known as the 'wasting diseases'.[3] Some wasting in infancy probably occurred in the course of diseases not directly

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1 R.H. Shryock, The Development of Modern Medicine (1948) 267.

2 A.M. Brown, Practical Nutrition for Nurses (1966) 81; R.S. Illingworth, The Normal Child. Some problems of the first five years and their treatment (4th ed. 1968) 1.

3 See Eustace Smith, On the Wasting Diseases of Infants and Children (1868).

connected with diet, some was associated with premature birth and thus originally with pre-natal causes, some, again, was associated by contemporaries with drugging[1]; a great deal of wasting, however, as of numerous other diseases of infancy, was recognised as deriving directly from malnutrition.[2] Malnutrition, furthermore, both increased the risk of infants succumbing to non-dietary diseases and reduced the likelihood of their recovering from such diseases. The high level of malnutrition among infants which was the principal obstacle to the reduction of infant mortality and morbidity during this period must, as contemporaries acknowledged, be attributed chiefly to the prevalence of handfeeding.

That infant mortality fell most heavily on the artificially fed was not questioned. This was asserted from their own experience by members of the medical profession, of whom a number had made special studies of the problem.[3] Official enquiries carried out during the 1850s and 1860s into conditions in a number of areas in different parts of the country in which infant mortality was particularly high corroborated the evidence of the doctors.[4] In every area investigated there was a high

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1 See Chapter 8 below, 207-8.

2 Eustace Smith, op.cit., 1.

3 See C.H.F. Routh, Infant Feeding and its Influence on Life (1st ed. 1860; 2nd ed. 1863; 3rd ed. 1876).

4 E.H. Greenhow, Report on the Circumstances under which there is an excessive Mortality of Young Children among Certain Manufacturing Populations, Appendix V, Fourth Report of the Medical Officer of the Privy Council, BPP 1862 XXII 187-196; H.J.Hunter, Report on the Excessive Mortality of Infants in some Rural Districts of England, Appendix to Sixth Report of the Medical Officer of the Privy Council, BPP 1864 XXVIII 458-464.

incidence of artificial feeding. Later reports continued to link infant mortality with handfeeding.[1] This link was most clearly demonstrated in the eyes of many contemporary observers by the marked decline in infant deaths which was reported during several periods of unemployment in industrial areas in the 1860s. During the Preston strike[2], the Lancashire 'cotton famine' caused by the cessation of cotton supplies during the American civil war[3], and the prostration of the Coventry ribbon trade[4] it was reported that although the unemployed workers were generally in a pitiful state and the adult death rate was adversely affected, the number of infant deaths was unusually small. This was attributed by local observers to the unusually high incidence of breastfeeding among unemployed women workers, who at other times were obliged to put their children out to nurse to be handfed.[5] In the previous decade the local registrar of Deansgate, Manchester, observed that the diminution of industrial employment

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1 W. Farr, Letter to the Registrar-General on the Causes of Death in England in 1872, Appendix to Thirty-Fourth Annual Report of the Registrar-General, BPP 1873 XX 217.

2 M.A. Baines, On the Prevention of Excessive Infant Mortality (Manchester Statistical Society 1868) Appendix, note II, 19.

3 Ibid.; 25th Annual Report of the Registrar-General, BPP 1864 XVII 28.

4 M.A. Baines, op.cit., appendix, note II, 19; 23rd Annual Report of the Registrar-General, BPP 1862 XVII 36.

5 M.A. Baines, op.cit., appendix, note II, 19; 25th Annual Report of the Registrar-General, BPP 1864 XVII xxxii; P. Birch, 'The Food of the Household: its Bearing on Health and Disease', Manchester and Salford Sanitary Association Health Lectures for the People, 6th series 4 (1881-2) 28.

resulting from the Crimean war had had a similar effect on infant mortality.[1]

The significance of the second half of the nineteenth century for the development of infant feeding lies, however, not in the acknowledgement of the relationship between handfeeding and infant mortality, but in the adjustment to the implications of this relationship. In 1850 bottle-feeding was a technically premature course of action. Medical knowledge was not sufficient to sustain it; public opinion deplored it. But it had somehow to be accommodated. The process by which knowledge increased and attitudes altered to the point at which some degree of accommodation was attained was a lengthy one, and was not complete by the end of the century. By 1900, however, the first and most crucial stage of adjustment had been reached. It had been accepted that bottle-feeding was necessary, and it had been recognised that if it were not to be detrimental to infant health and survival a new approach and new provisions were essential. Furthermore, significant advances towards meeting these requirements had been made.

Acceptance of the irreversibility of the changes taking place in infant feeding practices was the first stage in adjustment to them. In the early years of this period informed opinion both inside and outside the medical

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[1] 19th Annual Report of the Registrar-General, BPP 1857-8 XXIII 24.

profession showed resistance to artificial feeding, and tended to seek a solution to the problems resulting from it not in new provisions but in a return to former practices.[1] The possibility that there might be a genuine need for artificial feeding was discounted. Neither physical difficulty in breastfeeding nor the employment of mothers outside their homes were regarded as sound reasons for the abandonment of breastfeeding.[2] It was assumed that, with the exception of a small number of women genuinely incapacitated, the cause of mothers resorting to alternative means of rearing their children was irresponsibility and laziness.[3] In this situation infant deaths resulting from artificial feeding were regarded as just retribution; both the blame and the responsibility for a solution were laid upon mothers, and the responsibility of the medical profession and other authorities was confined to reminding them of their maternal duties.

The attempt of critics to deal with the problems of artificial feeding by urging its abandonment became less common as handfeeding gained general acceptance. There had already in 1850 been some who had believed in

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[1] M.A. Baines, op.cit., 11.

[2] Ibid.

[3] H. Martineau, 'On Infant Mortality', Medical Times and Gazette XIX (June-December 1859) 273; L.M. Child, The Mother's Best Book or Nursery Companion (1859) 6; M.A. Baines, op.cit., 6-11.

the need for an artificial substitute for breastfeeding, and support for this view increased. Attempts to solve the problem of infant mortality by appealing to mothers to revert to infant feeding practices which they had already shown to be obsolete were unlikely to be effective. Neither the arguments of the doctors nor the exhortations of those articulate middle class women who took up the cause of breastfeeding[1] could be successful in the face of the inability of some mothers to breastfeed and the firm desire of others to avoid this task, and it became clear to the majority of observers that there was no other course than to accept the decline of breastfeeding as a fait accompli. It came to be recognised that it was not artificial feeding itself but incompetent artificial feeding which was damaging to infant health and survival.[2] Thus Routh wrote in 1863, the 'great mortality of infants is now no longer attributed so much to handfeeding, as to the injudicious manner in which it is generally conducted'.[3]

The realisation that there was scope for material improvement in artificial feeding methods and the belief that such improvement would bring about a reduction in

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[1] Among these were Miss Harriet Martineau (see above), Mrs Bakewell, Editor of the British Mothers' Magazine (see above), and Mrs A.M. Baines (see above).

[2] C.H.F. Routh, op.cit., x; Anon., Rules for the General Management of Infants (Obstetrical Society of London, 1871) 5.

[3] C.H.F. Routh, op.cit., x.

infant mortality marked an important stage in the adjustment of contemporary observers to the existence and the problems of handfeeding. The possibility of improvement clearly implied the need for greater research into handfeeding methods and thereby shifted the responsibility for finding a solution to the infant mortality problem from the mothers who employed artificial feeding methods to the doctors who were critical of them. The more active involvement of members of the medical profession in infant feeding and the new seriousness with which artificial feeding was investigated gradually had their effect on the understanding of this subject. In 1850 the attitude of doctors towards handfeeding had been sceptical[1]; by the 1870s and 1880s there was a greater confidence, and it was frequently stated both within the medical profession and outside it that artificial feeding was in theory no longer dangerous.[2] The failings which continued to make it a source of danger in practice resulted from the conditions of life in the mass of the population, which rendered the implementation of approved artificial feeding theory impossible.

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[1] R.T. Evanson and H. Maunsell, A Practical Treatise on the Management and Diseases of Children (5th ed. 1847) 51; R. Ellis, Disease in Childhood, its Common Causes, and Directions for its Practical Management (1852) 53.

[2] Anon. On Handfeeding (Ladies' Sanitary Association 1872) 3; M. Lonsdale, The Care and Nursing of Children (1885) 12.

Recognition of the importance of social factors in the successful handfeeding of infants[1] encouraged a more practical approach to the problems of artificial feeding than had been evident in previous years. At least until the 1870s there had been a tendency for writers on the subject of infant feeding to concentrate on ideal methods, and to ignore the facts that these could only be carried out in wealthier homes. Thus doctors advising on handfeeding recommended expensive foods such as asses' milk, which were unobtainable by the poor[2], and laid down complicated procedures for preparing food[3] which were inappropriate in view of the equipment and the time available for carrying out food preparation in poorer homes. The limitations of this approach in the evolution of a practicable system of artificial infant feeding likely to reduce the mortality from that cause are clear, and the increased awareness of practical problems in the last decades of the century[4] shows that such limitations were coming to be appreciated.

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1 For the classic exposition of this principle see G.Newman, Infant Mortality: a Social Problem (1906).

2 T. Bull, op.cit., 298; T.H. Tanner, A Practical Treatise on the Diseases of Infancy and Childhood (1858) 84.

3 P.H. Chavasse, op.cit. (3rd ed. 1843) 38.

4 J. Tatham, 'Special Dangers to Health in Large Towns', Manchester and Salford Sanitary Association Health Lectures for the People, 3rd series 6 (1879-80) 109; E. Cautley, The Natural and Artificial Methods of Feeding Infants and Young Children (1897) Appendix B, 259.

It was understandable that at a time when no certain basis for artificial feeding had been established doctors should be primarily concerned in studying the subject from a theoretical standpoint. With the emergence of a more precise theoretical framework, however, came greater readiness to look beyond theory itself to its practical application. It had long been recognised that some foods were better for very young children than others, and that cleanliness in their preparation was desirable. By the 1880s particular foods could be specified as essential in infant diet[1], and specific hygienic precautions as necessary[2], if infants were not to suffer unduly as a result of artificial feeding. A comparison of the conditions under which infants were fed in working class homes with those in which the correct foods could be obtained and the necessary hygienic precautions observed made it clear that infant mortality resulting from handfeeding had a practical and social aspect.

A factor which encouraged investigation of the social aspect of artificial feeding during the latter decades of the nineteenth century was the allegedly increasing involvement in it of working class mothers.[3] From the very beginning of this period women separated from

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[1] See Chapter 4 below, 107-110.

[2] See Chapter 3 below, 87.

[3] See Chapter 2 below, 47-49.

their babies by employment outside their homes had been obliged to resort to artificial feeding and contemporary observers were very conscious of the effect that the employment of married women had on the infant mortality rate. Working class women were believed, however, to be able to breastfeed with ease, unaffected by the lactation problems which appeared to beset mothers in the higher income groups.[1] This belief encouraged critics to explain inability to breastfeed as the result of luxurious living and laziness, and doctors to concentrate their attention on finding methods of artificial feeding suitable for the middle and upper class household. A solution to the infant feeding difficulties of the working class mother were sought, meanwhile, not in improved facilities for artificial feeding, but in the cessation of married women's employment or in better arrangements for the access of mothers to their babies for the purpose of breastfeeding during the working day.[2] When a desire to avoid breast-feeding began to become evident in working class mothers,

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[1] L.M. Barwell, Infant Treatment under Two Years of Age (1859) 15; Report of the Infant Mortality Committee of the Obstetrical Society of London, Transactions of the Obstetrical Society of London, XI (1870) 135.

[2] W.N. Maccall, 'Health and Recreation in Childhood', Manchester and Salford Sanitary Association Health Lectures for the People, 3rd Series 3 (1879-80) 48.

coupled with physical difficulty in performing this task such as had long been claimed for middle and upper class mothers[1], this approach, already a negative one, was no longer relevant. A need for artificial feeding among the poor as well as among the rich had to be accepted, and with a new emphasis on the difficulties of such feeding in a working class context inevitably came a new emphasis on social problems.

The social conditions which prejudiced the success of artificial infant feeding in working class families were tackled throughout this period by voluntary effort. Professional and charitable bodies such as the Obstetrical Society of London[2] and the Manchester and Salford Sanitary Society[3] were particularly active in the educational field, but other forms of aid were given, including visits to mothers in their homes[4] and the provision of day-nurseries.[5]

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1 See Chapter 2 below, 47.

2 See Bibliography; for the Infant Mortality Committee of the Obstetrical Society, see Transactions of the Obstetrical Society of London XI (1869).

3 See Bibliography.

4 J. Lane Claypon, The Child Welfare Movement (1920) 8; G.F. McCleary, The Early History of the Infant Welfare Movement (1933) 84-88.

5 For a discussion of nursery provision see J.M. Sutton, 'Day Nurseries and their Bearing on Public Health', Manchester and Salford Sanitary Association Health Lectures for the People, 3rd series 8 (1879-80).

Voluntary agencies could not, however, offer a comprehensive service; there were many parts of the country where no organisations of this kind existed, and where they were in existence their work was hampered by lack of resources, lack of information, and lack of power. Local authorities gave limited support in some instances[1], but they themselves were not empowered, or not compelled, to provide the services which were required. Voluntary effort showed the kind of work which needed to be done, but the difficulties faced by voluntary workers and by those local authorities which shared their aims indicated clearly the need for legislation to establish a national system of welfare services.

Radical changes in attitudes to infant welfare were necessary if government, central or local, were to take up the active role which the situation increasingly required of it during the later years of the century. The contribution of government to the lowering of infant mortality had been seen as being confined to the collection and interpretation of information and to the promotion of legislation designed to control or eradicate positive evils such as baby farming[2] and the adulteration of food.[3] This was a limited role; and in regard to adulteration,

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[1] J. Lane-Claypon, op.cit., 9.

[2] J.L. Brand, 'The British Medical Profession and State Intervention in Public Health, 1870-1911' (London Ph.D., 1953) 510-11.

[3] Ibid., 371-75.

at least, it had not been an efficient one.[1] What the situation came to demand of the state was both more effective and more positive action. It could not be left to the sporadic and largely unassisted efforts of voluntary bodies to carry out the work which was shown to be necessary. Action was required on a national scale to raise the standard of infant feeding among poorer mothers not only by teaching and advising them, but also by ensuring that they were able to carry out the advice they were given. The provision of such services by official bodies required a new approach to the question of welfare services as a whole, particularly in regard to government intervention in family affairs, long assumed to be unjustified where no illegal action was being committed.[2]

A change in attitudes to government intervention was rendered the more necessary by the intensification of the infant mortality problem during the latter part of the period. During the 1850s and 1860s infant mortality, as government concern indicates, was a recognised problem; at the same time, however, disease and premature death were serious problems throughout society. Occurrences such as epidemics of cholera so frequently monopolised the attention of Government departments[3], and schemes for sanitary

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1 Ibid., 372.

2 Anon. Infant Mortality: its Causes and Remedies, The Committee for Amending the Law in Points wherein it is Injurious to Women (1871) 6-9.

3 See Report of the Medical Officer of the Privy Council and Local Government Board, new series V, BPP 1875 XL 143-393.

improvement took up so much of the time of local health authorities that mortality among infants received only intermittent attention. There was, moreover, a high birth rate - 35 per 1000 in the 1870s[1] - which to some extent lessened the impact of the high loss of infant life. Subsequent decades were to see important changes in this situation; by the 1870s premature mortality among those over one year of age was declining[2], leaving infants as the only group whose death rate was persistently high, and in the last quarter of the century there was a noticeable fall in the birth rate.[3] The continuing high level of the infant mortality rate affected the perception of the infant mortality problem by revealing infant death as a phenomenon distinct from premature death in other age-groups. It also had implications for the health of the population as a whole. It had been suggested in the 1850s that the death rate of young children was a measure of the salubrity of the environment generally.[4] Its failure to respond when the declining death rates of other groups seemed to show that the environment was becoming healthier was disquieting. It was increasingly believed that infant mortality, far from resulting in the survival

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[1] E.M. Hubback, op.cit., 21.

[2] A.H. Gale, loc. cit., 19.

[3] E.M. Hubback, op.cit., 21; R.H. Shryock, op.cit., 267.

[4] General Board of Health, 'Papers Relating to the Sanitary State of the People of England,' BPP 1857-8 XXIII 293.

of the fittest and thus strengthening the population, as had been suggested earlier, weakened it, being accompanied by the severe impairment of health among survivors, which affected them throughout their later life and even influenced the health of future generations.[1]

Government action to reduce infant mortality by improving standards of infant feeding had little effect before 1900, but considerable advances in this direction had been made by the end of the century. The contribution of government action was to set the seal on more positive involvement in this field, and to provide an indication of the trend of future policy, rather than to produce a solution to the infant mortality problem in this period. The most notable activity of the state in connection with infant feeding before 1900 was the establishment of the first municipal milk depot[2], where mothers handfeeding their babies and unable to obtain suitable milk for this purpose on the open market could be provided with a reliable and cheap supply. This was a notable innovation. The inaccessibility of good milk for infant feeding at a price which all families could afford was, by common consent, the most glaring deficiency of the infant feeding situation during this period.[3] Legislation against adulteration had

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[1] J.M. Sutton, loc. cit., 124; W.N. Maccall, loc.cit., 45.

[2] J. Lane-Claypon, op.cit., 3; G.F.McCleary, op. cit.70.

[3] For a discussion of animal milk in infant feeding see Chapter 3 below, 53-88.

improved the quality of fresh milk to some extent, but even in the later decades of the nineteenth century the supply available to poorer mothers was unsuitable for the feeding of young children.[1] The establishment of the municipal milk depots, even without the advisory functions which they were later to assume[2], was of crucial significance in determining the shape of future welfare provision. The initial steps in this direction were scarcely great enough to affect the infant mortality rate, but a principle had been laid down which represented a most important advance towards that end.[3]

The degree of adjustment to artificial infant feeding and its problems which was achieved between 1850 and 1900 is clearly shown by a comparison of attitudes and beliefs in each of those years. The most influential factors in this adjustment were the advance in understanding of the physical relationship between infant feeding and infant mortality, and the recognition of infant mortality resulting from malnutrition as a social problem requiring the intervention of the state for its solution. In neither sphere was every difficulty resolved, as the continuing high rate of infant mortality shows. In 1900, medical

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[1] Ibid.

[2] I.G. Wickes, loc.cit., 498; J. Lane-Claypon, op.cit.,3.

[3] G.F. McCleary, op.cit., 73.

discoveries remained to be made, notably that of vitamins[1], which would have a great impact on artificial feeding, and the bulk of state provisions in infant welfare remained to be pressed for and obtained. The degree of adjustment to the nature and requirements of the infant feeding situation which had been achieved, however, paved the way for the campaign against infant mortality whose achievement was to be that framework of legislative provisions, laid down in the early decades of the twentieth century[2], which was finally to reduce infant mortality to a more acceptable level.

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[1] Though valuable work had already been done by W.B. Cheadle and others which led up to this. See G.F. Still, 'Infantile Scurvy: its History', Archives of Disease in Childhood X (1935) 211-218; F.J. Poynton, 'Dr Cheadle and Infantile Scurvy', Archives of Disease in Childhood X (1935) 219-222.

[2] J.L. Brand, op.cit., 523; see G.F. McCleary, op.cit.

CHAPTER 2

The decline of breastfeeding

Between 1850 and 1900, the breastfeeding of babies as their principal means of nourishment declined progressively in favour of feeding with the 'sucking-bottle' and artificial foods. In 1850, artificial foods were frequently given in conjunction with the breast, but the rearing of babies solely by hand was regarded by the medical profession as ill-advised, and by the majority of mothers as either undesirable or unnecessary. Although the existence of some patent feeding bottles and infant foods gave an indication of possible future developments, such articles were still few in number and not widely used. By 1900, the position was reversed; the use of the feeding bottle had become so widespread in all classes of society that it was feared 'the human species was becoming effete and unable to provide breast-milk'.[1] The medical profession had been compelled to modify its former hostility towards handfeeding, while the manufacture and sale of proprietary foods and bottles for infants, insignificant half a century before, had become 'an enormous trade'.[2] Advertisements for increasingly sophisticated products stared from hoardings, were liberally displayed on

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[1] J. Lane-Claypon, The Child Welfare Movement (1920) 56.

[2] D. Forsyth, 'The History of Infant Feeding from Elizabethan Times', Proceedings of the Royal Society of Medicine 4 (1911) 110-141.

the sides of omnibuses and filled the newspapers and magazines. In fifty years, the concept, nature and extent of artificial feeding, and thus the nature of infant feeding as a whole, had entirely altered.

The decline of breastfeeding was in part a decline in wetnursing. At the mid-nineteenth century, the employment of wetnurses as a substitute for maternal breastfeeding was still common in middle and upper class families, and its incidence was even claimed to have increased during the 1850s.[1] Wetnurses, newly-delivered women whose own children had usually either died or been found homes away from their mothers, were often engaged through accoucheurs, who reported a brisk demand. In a letter to the Lancet in 1859, Mr Acton stated that as an accoucheur with a large practice he was obliged to meet requests for such nurses daily, and that no member of the profession who practised extensively could afford to shut his eyes to this need.[2] Mrs M.A. Baines, in a pamphlet published in the same year, advised anyone who doubted that wetnursing was widespread to visit lying-in hospitals, another common source of supply, where large numbers of women could be found waiting to be engaged.[3] Wetnursing had for some years, however, been attracting criticism as a

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[1] Anon., 'Extract from a Lecture delivered at Brighton, by Dr Pettigrew', The Mothers' Friend X (1857) 65.

[2] W. Acton, 'Unmarried Wet-nurses', Lancet I (1859) 175.

[3] M.A. Baines, The Practice of Hiring Wet Nurses (1859) 13.

practice conducive neither to the physical nor to the moral health of society. Described by Dr Webster in a report published in the Lancet in 1850, as an 'objectionable' institution[1], wetnursing became the subject of a further attack in the same journal in 1858, in an article advocating its restriction by law.[2] This suggestion was not taken up, but the public debate continued and Dr Routh observed a few years later that the evil effects of wetnursing were 'becoming daily more appreciated'.[3] Addressing the Manchester Statistical Society in 1868, Mrs Baines, still an active campaigner, claimed that the employment of wetnurses as a social convenience alone was still common[4], but by the following decade interest was largely centred on other issues. Wetnurses continued to be recommended in certain circumstances as late as the 1880s and 1890s[5], but in the seventies they were already becoming the exception rather than the rule in that class of society which could afford them.

One objection to wetnursing which helped fire moral opposition lay in its contribution to infant mortality. At a time when such mortality was causing increasing concern,

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1 Dr Webster, 'Remarks on the Health of London', Lancet I (1850) 513.

2 Anon., 'The Murder of the Innocents', Lancet I (1858) 346.

3 C.H.F. Routh, Infant Feeding and its Influence on Life, introduction to 2nd edition (1863).

4 M.A. Baines, On the Prevention of Excessive Infant Mortality (Manchester Statistical Society 1868) 6.

5 S. Jex-Blake, The Care of Infants (1884) 13; J.F.Goodhart, The Diseases of Children (3rd ed. 1888) 28.

it was an uncomfortable reflection that infants who were wetnursed too often survived only through the sacrifice of the nurse's own child. In some case this child had been stillborn or had died soon after birth, and in a few instances where it had lived it was arranged for it to share the mother's milk with the 'interloper'; in most cases, however, the child of the wetnurse was entirely deprived of its natural food. It was commonly believed that 'no one woman can nourish at the same time two children'[1], and although there were doctors who ignored this belief and encouraged the suckling of two children by the same nurse, among others the celebrated Manchester accoucheur, Mr Roberton[2], such a practice was unusual. The child of the wetnurse was generally farmed out to a hired nurse to be handfed, and was thereby exposed to the risk of death from malnutrition and general neglect. The condition of infants put out to nurse in this way, many of them the children of wetnurses, was the subject of an enquiry carried out by a Parliamentary committee which reported in 1871.[3] Nurse-children, it was found, were frequently given for 'adoption' on the understanding that they would be allowed to die, or with the evident intention on the part of those accepting them that this should happen.[4]

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1 C.H.F. Routh, 'On the Mortality of Infants in Foundling Institutions, and generally, as influenced by the Absence of Breastmilk', British Medical Journal (1858) 145.

2 Ibid.

3 See Report from the Select Committee on the Protection of Infant Life, BPP 1871 VII 607-954.

4 Select Committee on Infant Life, Minutes of Evidence, Q.30, loc.cit., 629.

Such children were reported to be severely neglected, especially in the matter of feeding, and it was stated that 'scarcely any of them are known to live long'.[1]

It was suggested by observers that those responsible for employing wetnurses to feed their offspring at the cost of the lives of the nurses' own children were little better than murderers.[2] Though it was conceded that nurses themselves often wanted to be rid of their babies, the argument was put forward that this was the necessary outcome of a situation in which employers did not usually welcome children accompanying their mothers into service, and seldom made adequate arrangements for their care. The firm belief of critics of wetnursing that the misery and slaughter which resulted were occasioned in order that children might be breastfed whose mothers could easily have breastfed them themselves only increased their desire to limit or abolish the 'tyrant custom'.

The fact that the majority of wetnurses were recruited from among 'fallen women' was a further source of indignation and anxiety to those who opposed the practice. Unmarried women were especially attracted to wetnursing. This was not only, it was suggested, because their circumstances tended to debar them from other

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[1] Select Committee on Infant Life, Draft Report, loc.cit., 619.

[2] See Anon., 'Murder of Innocents', loc.cit.

employment, but also because the position of wetnurse offered them wages and a degree of comfort far greater than they would have received in any other form of domestic service. Acton observed with asperity that 'the most vehement objector will not venture to say that any girl submits to be seduced on the faith of getting /such/ employment'[1], but the conviction that the advantages to be gained did, in fact, encourage illegitimate births was expressed both by contemporary[2] and by later commentators.[3] Wetnursing was not only a well-paid occupation, in which a girl might receive as much as a guinea a week in 1870[4], but one which, according to Routh, 'may place /the wetnurse/ in a household in the highest possible position in which she can be, albeit nominally a servant'.[5] The overriding need for a good and plentiful supply of milk led to other benefits, many of them considered by doctors to be unwisely generous. The nurse's diet, they warned, was often so lavish in comparison with the food to which she was accustomed that it disordered her system[6], while rest was

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1 W. Acton, loc.cit., 175.

2 C.H.F. Routh, op.cit., introduction.

3 D. Forsyth, loc.cit., 124.

4 Select Committee on Infant Life, Minutes of Evidence, Q.1334, loc.cit., 689.

5 C.H.F. Routh, 'On the Selection of Wet Nurses from among Fallen Women', Lancet I (1859) 582.

6 P.H. Chavasse, Advice to Mothers (1843) 48; T. Barrett, Advice on the Management of Children in Early Infancy (1851) 23.

considered so necessary by employers that the nurse took scarcely any exercise, but was frequently allowed to remain in bed until a late hour and to 'continue in the house during the day as if she were a fixture'.[1] A generous allowance of porter and other alcoholic drink was often permitted the nurse[2], although doctors' views on the necessity for such provision differed. The belief that alcohol helped the production of milk was widespread among the general public and persisted throughout this period. In contrast with its advantages, the employment of the wetnurse was uncertain and could be terminated at any stage, often for reasons beyond her control, and for many, despite the cynical assumptions of commentators, the good pay and the luxuries it afforded can have compensated but poorly for enforced separation from their own children. Nevertheless, their situation compared well enough with that of contemporaries like the country girls in ordinary service described by Mr Merivale, who set out for their first posts 'the flower of our female youth' and returned 'in the course of a year or two years, in broken health'.[3]

It was argued by those in favour of wetnursing that the services of unmarried mothers were both indispensable, and generally beneficial. 'For years past and every

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[1] Ibid., 50.

[2] J.G. Beaney, Children: their Treatment in Health and Disease (1873) 127; P.H. Chavasse, op.cit., 48.

[3] Rev. C. Merivale, 'Some Remarks on the Physique of the Rural Population', Contemporary Review X (January-April 1869) 260.

year more and more largely', wrote Mr Acton, the need for wetnurses 'has been supplied...by single women',[1] for the sole reason that insufficient numbers of suitable married women came forward to perform that task. 'Every accoucheur will bear me out in this', Acton declared, 'that no wages can procure married women of any pretence to respectability to raise one-half the children whose mothers cannot and will not'.[2] Unmarried wetnurses, furthermore, had certain other advantages. Routh, in an article in the British Medical Journal in the previous year, admitted that it was usual in the medical profession to recommend the unmarried mother as wetnurse, adding 'the reason assigned is, that her milk is less likely to suffer, because she has no husband or children to fret after; or, if she has fallen more than once, she is less likely to fret after a child left behind, her habits having inured her to this separation'.[3] Married wetnurses, Acton complained, were too often

> of a kind that make the anxious doctor long after the unmarried... It is not well to enquire what they were before they married. It is not safe to look too closely into their present life and habits.../ or / to be too acute in your enquiries about the husband, and the nature of the conjugal solicitude that keeps him eternally hanging about your area steps or lounging in the back kitchen. [4]

As his model of the unmarried wetnurse, Acton took not the professional prostitute, but rather the 'young housemaid

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[1] W. Acton, loc.cit., 175.

[2] Ibid.

[3] C.H.F. Routh, loc.cit., 105.

[4] W. Acton, loc.cit., 175.

or pretty parlour maid', who, with 'shame and horror... bears a child to the butler, or the policeman, or her master's son'[1], losing her post in consequence of her seduction. Such women, he suggested, were not only preferable to the married wetnurses he described; they also constituted 'the very class that most needs help'.[2] Young women who had once 'fallen' must be saved from being seduced a second time, and from the necessity of embarking on a life of prostitution as the only means of earning their livelihood. For a young servant dismissed from her post in the circumstances outlined, honest employment as a wetnurse was, it was declared, the sole means of salvation from the 'pit of harlotry' into which, when her savings were spent, she would otherwise descend.[3]

The desire to rehabilitate unmarried mothers was not lacking[4], but the advantages of doing so through the medium of wetnursing were outweighed in the minds of its opponents by the dangers to which they believed this exposed both society and the individual. And the apparent necessity of employing unmarried women in this capacity only served to increase the argument against wetnursing as a whole. A pamphlet published by the National Association for the Promotion of Social Science in 1859 listed three evils which were believed to result from the

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[1] Ibid.

[2] Ibid.

[3] Ibid.

[4] M.A. Baines, Wetnurses (1859) op.cit., 5.

employment of unmarried wetnurses, namely

> 1st. The sanction and encouragement to immorality /resulting from mothers and doctors/ preferring unmarried women for the duties of that delicate office.
> 2nd. The risk of contaminating other members of the household, by associating them under the same roof with persons of that description.
> 3rd. The bad moral tone that may be disseminated very widely by countenancing vice in any form; but especially /the injury to/ society /from allowing/ the fallen to be lifted to the highest position in the household, and to have bestowed on them such privileges and such favour as should only be enjoyed by the virtuous and pure, but /are/ rarely to be obtained by them. [1]

In addition to these social evils, there were dangers for the individual. There was always a fear that children would suffer moral or physical harm from contact with the wetnurse, and this was particularly acute where there was evidence in the nurse of 'a natural tendency to a fornicating course of life'.[2] As to physical dangers, the main fear was that the child would contract syphilis, scrofula[3], or some other disease suffered by the nurse herself. This risk, it was felt, could be reduced if the nurse and her own child both received a thorough medical examination before she was engaged, as most advisers on infant care recommended.[4] The moral danger, that undesirable

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[1] Ibid.

[2] C.H.F. Routh, 'Wetnurses' (1859) loc.cit., 580.

[3] A morbid constitutional condition with glandular swellings and a tendency to consumption.

[4] P.H. Chavasse, op.cit. (6th ed. 1861) 26.

mental states or tendencies might be transmitted from the same source, was felt to be less easily guarded against. The traditional belief that mental characteristics and moral tendencies could be transmitted through the milk in the same way as physical disease[1] had suffered some decline by the 1850s, but it was still influential among both doctors and laymen. While the authors of The Mother's Best Book confidently declared in 1859 that 'it would be affectation to assert...that disposition and passions are constantly communicated to the child from its foster-mother'[2], Routh had given as his opinion only the previous year that 'if a nurse of confirmed vicious and passionate habits suckles a child, that child is in danger of having its own morality tainted likewise'.[3] And'Mater', writing to the Lancet in 1859, felt it to have been demonstrated 'by undoubted authorities' that intangible moral qualities could be conveyed to a child through human milk.[4] Routh explained this theory by stating that the inheritance of mental conditions,as well as of physical diseases, was through the blood, and that the nurse 'undoubtedly communicates... the distillation, as it were, of the vital essences of her

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1 P.H. Chavasse, Advice to Wives (1843) 78; G.F. Still, The History of Paediatrics (1931) 331.

2 L.M. Child, The Mother's Best Book (1859) 6.

3 C.H.F. Routh, 'Wetnurses' (1859) loc.cit. 580.

4 'Mater', 'Wetnurses from the Fallen', Lancet I (1859) 201.

own blood' to the child when suckling.[1] This notion had implications both for the individual and for society; one of the more serious of these was raised by Routh himself, when he observed that it was 'a very curious question... how far crime is or is not hereditary'.[2]

To the influence of the various moral and physical arguments advanced against wetnursing was added that of the practical inconveniences associated with the system. Among these was expense. The middle class household was expected to have to face some degree of financial strain as a result of employing a wetnurse.[3] Even among families prepared to bear the cost it is probable that any otherwise acceptable and less expensive alternative would gladly have been adopted. It has been suggested that another problem was the tendency of the nurse to make herself a nuisance in the house through intemperance and other faults.[4] The possibility that she might abuse her privileged position was always a potential source of difficulty to her employer. A child was completely dependant on his nurse. Not only was it likely to be a serious matter for his health if she failed him; it could also result in a great deal of annoyance for his mother. Nurses might conceal illness, or the failure of their milk, in order to keep their jobs, might starve foster children

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1 C.H.F. Routh, 'Wetnurses' (1859) loc.cit., 580.

2 Ibid.

3 L.M. Barwell, Infant Treatment, under Two Years of Age (1859) 71.

4 D. Forsyth, loc.cit., 125.

in order secretly to feed their own infants, or simply abandon their charges at crucial stages in their development. For such reasons, or because a baby did not thrive, some families were obliged to try as many as six or seven nurses before one could be found 'to suit'.[1] For employers, wetnursing was liable to be a tiresome business.

Handfeeding began to appear attractive not merely in comparison with wetnursing, but as a substitute for maternal breastfeeding. The range of costly babyfoods and feeding utensils appearing on the market in the 1850s, when wetnursing may actually have been increasing in popularity, suggests that breastfeeding was becoming less frequent among women who would otherwise have fed their children themselves. The moral and social ill effects attributed to wetnursing clearly deterred some women from employing wetnurses who were financially able to have done so; it cannot be assumed, however, that those deterred actively wanted to breastfeed, nor that all were really fit enough to carry out this task. For such women, as well as for those who breastfed solely because they could not afford to employ a wetnurse, handfeeding had an obvious potential attraction. Growing feeling against wetnursing and advances in handfeeding techniques during this period both played a part in ensuring that that potential was realised among middle and upper class families. For it was here rather than among the poor that manufacturers found a

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[1] C.H.F. Routh, loc.cit., 105.

market for seven-and-sixpenny feeding bottles and patent babyfoods at six shillings a canister.

The opposition to wetnursing evident in the 1850s and 1860s appears, ironically, to have played a part in the decline of maternal breastfeeding. The aim of the opponents of wetnursing was to increase, rather than to decrease, maternal breastfeeding, and they emphasised the need for mothers to carry out that 'first and dearest duty to their babes'.[1] It is perhaps not surprising, however, that their efforts should have achieved the opposite result. Those who advocated the limitation of wetnursing faced a logical dilemma: although they deplored handfeeding, they were forced to recommend it as an alternative to wetnursing. Maternal breastfeeding was clearly not possible for all mothers, and if only for the sake of genuinely incapacitated mothers and their babies, it was necessary to make the best of handfeeding. Many recognised that this was also made necessary by the refusal of many women to breastfeed who were able to do so. It was evidently fruitless to urge such women to breastfeed their children themselves, and the best that could be hoped for was that they could be discouraged from employing wetnurses. To countenance handfeeding even in this limited context, however, was to run the risk of encouraging it to spread generally.

The reasons for which women abandoned breastfeeding, whether in favour of the employment of wetnurses or in favour of bottle feeding, were a matter of controversy.

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[1] 'Mater', loc.cit. 201.

Those who opposed wetnursing were unanimous in their belief that middle and upper class women failed to breastfeed largely as a matter of choice.[1] This was denied by women themselves and by their accoucheurs. 'Hundreds of mothers', it was asserted, were physically unable to breastfeed their children themselves, while 'hundreds more ought not, on account of disease or debility'.[2] Many women claimed that they had attempted breastfeeding, but had been forced to adopt an alternative as they had been unable to carry it out successfully. Their opponents responded by arguing that the number of women genuinely incapable of breastfeeding was very small, and that the real cause of failure was the desire of mothers not to interrupt their social life, not to be 'laughed at by their former companions and votaries of fashion'[3], and to preserve their figures.[4] In these desires, it was stated, women were supported by irresponsible medical attendants who wished only to ingratiate themselves with their wealthy patients.[5]

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1 Anon., 'Murder of Innocents', loc.cit., 346.

2 W. Acton, loc.cit., 175.

3 M.A. Baines, A Few Friendly Words to Young Mothers (1856) 2.

4 Anon., 'Murder of Innocents', loc.cit., 346.

5 Accoucheurs showed reluctance to press mothers to breastfeed, both at this time and later in the period. See T.K. Chambers, A Manual of Diet in Health and Disease (1st ed. 1875) 130.

Of the lactation difficulties which were claimed to be so common, critics dismissed a proportion as sheer pretence. The remainder they attributed to the 'artificial mode of living'[1] common in wealthy households, and to incompetent nursing. It was frequently observed that the influence of the monthly nurses employed in middle and upper class families to assist during the first weeks after the birth was an important factor in the abandonment of breastfeeding for handfeeding.[2] Mrs Baines divided monthly nurses into two classes: one composed of 'the wives of tradesmen in a small way of business, who think the good pay belonging to the office a welcome help'[3], the other a smaller group of women

> who have served their best days as superintendant of a nursery...have become unequal to that occupation from increasing years, and...think the other easy and lucrative. [4]

The ignorance of such nurses may well have led to the bad management of breastfeeding which frequently resulted in the failure of the milk; it was also suggested, however, that the failure of breastfeeding was often deliberately brought about. Not only were unwilling mothers encouraged in their desire to avoid breastfeeding, but willing mothers dissuaded from doing so by monthly nurses, because they themselves found it more convenient if children were handfed.

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1 W. Davidson, A Treatise on Diet (1843) 261.

2 M.A.B., 'Deficiency of Milk in Suckling Women - The Causes and the Cure', Lancet II (1858) 388.

3 M.A. Baines, Friendly Words, op.cit., 15.

4 Ibid.

Sophia Jex-Blake dealt severely with such nurses. 'I never', she declared, 'accept excuses on this point, but make it clearly understood that I shall consider any nurse simply incompetent who cannot get the baby to suck'.[1] Under these circumstances, she reported, the ultimate failures of breastfeeding were 'very few and far between'.[2] Dr Thorne, looking back in 1911 on forty years experience of infant care, made more serious allegations as to the conduct of monthly nurses in attempting to encourage handfeeding. Difficulty in breastfeeding, he found, rested very largely on the nurse, rather than on the mother. The nurse, he alleged,

> strongly objected to bringing the child to the mother, and...the drugging of infants... was an extremely common practice;...the young mother was persuaded over and over again that the milk was disagreeing with the child, whereas it was really the drugging...which was doing the harm; thus the confiding mother was persuaded to give up the natural mode of feeding. 3

The belief that failure to breastfeed among middle and upper class mothers was the product of laziness and irresponsibility rested very largely on the observation that the poor generally breastfed with ease. Thus Chavasse, noting in 1868 that 'rich people...are either too grand, or, from luxury, too delicate to perform such duties'[4], stated that poor married women, in contrast, usually nursed their own children.[5] Other commentators

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[1] S. Jex-Blake, op.cit., 10.

[2] Ibid.

[3] D. Forsyth, loc.cit., 140.

[4] Chavasse, op.cit. (9th ed. 1868) 26.

[5] Ibid., 27.

remarked on the good supply of milk provided by working class mothers and many doctors issued frequent warnings about the dangers of protracted suckling[1], a custom particularly prevalent among the poor, who believed that women did not conceive while they had a child at the breast.[2]

Working class women who failed to breastfeed their children were generally recognised, in the earlier part of this period at least, to do so not through choice, but through force of circumstances. Financial necessity, and the fact that the workplace to which that necessity drove women was, to an increasing extent, outside the home[3], gave rise to problems for the mothers of young babies. The conditions of such a mother's employment necessarily separated her from her children during a part of the day, and many were separated during the whole of it. That these children were often still young enough to need frequent feeds is clear from the short time many women stayed away from work following a confinement; in 1861

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1 T.W. Cooke, Hydrocephalus Reconsidered (1850) 48; P.M. Braidwood, The Domestic Management of Children (1874) 32.

2 Report of the Infant Mortality Committee of the Obstetrical Society of London, Transactions of the Obstetrical Society of London XI (1870) 135.

3 M. Hewitt, Wives and Mothers in Victorian Industry (1958) 30.

E.H. Greenhow reported that few factory workers in Birmingham, Coventry and other manufacturing districts investigated by him, returned later than a month after giving birth, and many returned sooner.[1] Not till the Factory Act of 1891 was there any legal obligation placed upon employers to ensure that their women workers took any particular length of time off work after their children were born, and even then the wording of the Act was too weak to ensure that its provisions were properly enforced.[2] Even those who took the statutory month's leave were returning to employment away from their homes when their children still needed feeding every few hours during the day, and when to feed them solely on the breast was normally impossible. Dr Margaret Hewitt points out that during the third quarter of the nineteenth century, the married textile operative, representative of a large proportion of married women industrial workers during this period, was absent from her home

> from before six o'clock in the morning till after six o'clock at night - sometimes later if she was working for an unscrupulous employer. The longest break in the day was at dinner-time - usually 12.30 to 1.30: occasionally, in the larger mill towns, she was able to go home during her dinner hour; but on the whole it seems that the proportion

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[1] E.H. Greenhow, 'Report on the Circumstances under which there is an Excessive Mortality of Young Children among Certain Manufacturing Populations', Appendix V, Fourth Report of the Medical Officer of the Privy Council, BPP 1862 XXII 655.

[2] G. Newman, Infant Mortality. A Social Problem (1906) 123.

> of women who lived near enough to the mill to be able to do this and thought it worthwhile was not very large. [1]

Even those infants who were breastfed in the middle of the day still had to be fed by hand during the greater part of it. Where breastfeeding was not abandoned completely, it seems likely that many children were the victims of premature weaning. It was recommended that the French example should be followed and crèches set up near the factories, where mothers could have access to their babies for the purpose of breastfeeding.[2] Few employers, however, showed interest in such proposals.

The problems of women employed in agriculture were similar to those of women working in factories. In 1864, Dr Hunter reported to the Medical Officer of the Privy Council that the feeding of infants was adversely affected by the conditions under which female agricultural workers were employed.[3] In those parts of eastern England in which Hunter collected his information - the Fens, part of East Yorkshire and eastern Kent - mothers suckled their children before leaving them with hired nurses in the

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[1] M. Hewitt, op.cit., 29.

[2] W.N. Maccall, 'Health and Recreation in Childhood', Manchester and Salford Sanitary Association Health Lectures for the People, 3rd series 3 (1879-80) 48.

[3] H.J. Hunter, Report on the Excessive Mortality of Infants in some Rural Districts of England, Appendix to Sixth Report of the Medical Officer of the Privy Council, BPP 1864 XXVIII 458-465.

morning, and again on their return home in the evening.[1] During the day, however, they might be many miles away from their own villages. Gangs of women agricultural workers in the fens customarily travelled long distances to their work, and were unable to return home at midday. Dr Hunter does not say how soon after a confinement women returned to agricultural work, but he gives some indication of when this may have been by suggesting that children still required feeding at night. Thomas Graham, whose manual for mothers on the feeding and general care of infants was published in the same year as Hunter's report, thought that night feeds might be dispensed with after the first month[2], and few authorities seem to have expected that they would continue for longer than two months; the implication of Hunter's suggestion is thus that many women probably returned after their confinements having taken little more time off work than did mothers in industry.

It is unlikely that breastfeeding among mothers employed in domestic industry was much more widespread than breastfeeding among those working outside their homes. A woman whose home was her factory often worked such long hours and had such a burden of work that breastfeeding was liable to be as difficult for her as if she had been physically separated from her baby. Mrs Neff's statement

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[1] Ibid., 461.

[2] T. Graham, On the Management and Disorders of Infancy and Childhood (1864) 203.

that 'homes and babies were...liable to neglect long before women went to the factories to work'[1] is supported by the findings of E.H. Greenhow, who reported in the early 1860s on infant mortality in seven industrial centres in England and Wales.[2] Of women in domestic manufactures he noted, 'they are obliged to neglect their offspring, more or less, and cannot bestow on them the time and attention given by mothers who are engaged in no special kind of industry'.[3] Comments on the lives of workers in different parts of the country confirm this. Of the wives of Bradford woolcombers, Mr Scruton remarked that they often had to 'stand at the pad-posts and work from six o'clock in the morning till ten at night'.[4] Dr Hewitt cites as another example Lancashire handloom weavers, who commonly hired young children to deputize for them while they were at work. She concluded, with Mrs Neff, that the delegation of domestic duties was 'no...innovation in the working class home'.[5]

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1 W.F. Neff, Victorian Working Women (1929) 23.

2 E.H. Greenhow, loc.cit., 651-660.

3 Ibid.

4 W. Scruton, Bradford Fifty Years Ago (1897), quoted in E.P. Thompson, The Making of the English Working Classes (Penguin 1968) 313.

5 M. Hewitt, op.cit., 65.

Sir George Newman showed how little progress had been made in improving the conditions of women workers in domestic workshops when he stated in 1906 that 'hours, meal-times, holidays, and overtime are all entirely unregulated, and depend upon pressure, need, and physical endurance'.[1] Of the 'immense number' of women in this type of employment, 'a high percentage' was married.[2] Newman believed, on the basis of evidence given by women in London and the Potteries, that the resumption of work after a confinement tended to take place much earlier among women in domestic industry than among those in outside employment. He described how women might wait six weeks or more after the birth of a child before they returned to factory jobs, but expected to do housework and other jobs at home after no more than two weeks. This implied that workers in domestic industry, where even the Act of 1891 did not in any case apply, might start paid work again after about the same length of time. This supposition was supported by evidence from a number of women, of whom one was sufficiently poverty-stricken to have begun work again only a few hours after the birth of a stillborn child.[3] It is unlikely that women working under pressure at home would have felt able to breastfeed a child. According to standard practice at the time, young babies required frequent feeds, and where feeding on demand was practised, some children were given the breast at

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[1] G. Newman, op.cit., 121.

[2] Ibid., 124.

[3] Ibid., 125.

intervals of less than half an hour. Such a regime could scarcely have been maintained by women with a quantity of work to complete, and in consequence many probably allowed their children to be fed by hand from a very early age.

In the late nineteenth century, the neglect of breastfeeding among working class women, formerly believed to be due primarily to economic factors, began to assume characteristics similar to those observed in the decline of maternal breastfeeding in the middle and upper classes. The division between rich and poor, expressed in the belief that richer mothers handfed for convenience, while most working class women did so from necessity, was being erased. Breastfeeding was seen to be declining even among non-employed working class mothers, and among their employed contemporaries for reasons other than absence from their homes.[1] There is evidence both of a deliberate changeover to handfeeding for reasons of convenience, which made the active encouragement of breastfeeding a major priority[2], and of the development of inability to breastfeed successfully among the poor, as well as among the rich.[3] Several factors account for the desire to handfeed, among them pressure of advertising and

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[1] E.M. Bunting et al., A School for Mothers (1907) 82; Anon., The Present Conditions of Infant Life (Infants' Health Society 1905) 3, 11.

[2] Sir T. Barlow, introduction to E.M. Bunting et al., op. cit., 3.

[3] Anon., Present Conditions, op.cit., 4, 11.

the production of cheaper foods and utensils. An additional influence was to appear in the form of the municipal milk depots. The provision of milk for infant feeding had by the end of the century begun to be undertaken by local authorities to meet the needs of poor mothers in the large towns who were neither able to breastfeed nor able to obtain a reliable supply of animal milk. It was later suggested, however, that this reform had resulted in some quarters in a move to handfeeding in the belief that 'depot milk' was superior to breastmilk and intended by the authorities to be used in preference to it.[1] This mistake could to some extent be rectified but its existence is significant as an indication of a desire to avoid breastfeeding which was earlier thought to be characteristic only of those living in luxury.

The development of apparent physical difficulty in breastfeeding among the poor similar to that which had long been claimed for the middle and upper classes, was a more intractable problem. The appearance of such difficulties was widely noted by contemporary authorities[2] and encouraged them to regard lactation problems, previously found only among richer women, as more important than they had earlier believed. A greater acceptance of the movement towards handfeeding did not, however, invariably lead to a more accurate appraisal of its causes. Both in their earlier attempts to reverse the tide of handfeeding by finding

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[1] J. Lane-Claypon, op.cit., 57.

[2] Anon., Present Conditions, op.cit., 11.

remedies for lactation difficulties and later in their fear that such difficulties represented a permanent loss of the ability to breastfeed[1], contemporary critics failed to recognise in these difficulties a psychological significance. In rejecting breastfeeding, women were reacting to something more than their physical environment, making more than a petulent protest against fatigue and boredom, more even than an involuntary protest against their own virtual starvation. They were releasing themselves from a role which they felt to dominate and restrict their lives, and which they now believed was becoming obsolete. The burden of breastfeeding had been bearable while the sole alternative was the death of their children; once it came to be believed that handfeeding was no longer dangerous, only mothers in whom breastfeeding satisfied either a physical or a psychological need were prepared to continue it. The instinct of the majority was to take advantage of the emergence of handfeeding as a viable alternative to the breast, just as their wealthier contemporaries had for centuries taken advantage of wet-nursing. What was unfortunate was that the assumption that handfeeding had become a generally viable alternative to breastfeeding was premature.

The pressures on mothers of every class to believe handfeeding to be a viable alternative to the breast were strong. The enthusiasm of the advertisers led to the extravagant claim that artificial feeding was superior to

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[1] J. Lane-Claypon, op.cit., 56.

feeding by natural means, and members of the medical profession, while in principle disputing this, added to the general impression that artificial feeding was reputable by patenting their own feeding bottles[1] and publishing their own recipes for infant foods.[2] Some doctors did not hesitate to put their names to warmly phrased testimonials for both foods and utensils, while others wrote books and pamphlets on infant feeding which amounted to lengthy advertisements for particular products.[3] Lack of knowledge among mothers and nurses encouraged their belief that they could improve on nature, and a desire to save time and inconvenience encouraged them to look for easily prepared foods. These factors combined to make them deaf to the advice of knowledgeable and experienced doctors and easy prey for manufacturers.

One of the influences which helped to promote artificial feeding was the attraction of the ingenious and the mechanical. The appearance at the Great Exhibition of an early feeding bottle from France, the 'biberon Darbo', aroused the interest of the British public, and a similar bottle produced by an English manufacturer, Mr Elam, provoked an admiring notice in the Lancet which illustrates this attitude.[4] If, as he asserted, the author had 'seldom seen anything more beautiful or better adapted for its use'[5],

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1 C.H.F. Routh, loc. cit., 287.

2 Ibid.; P.H. Chavasse, op.cit. (12th ed. 1875) 29.

3 See H.A. Allbutt, The Young Mother's Handbook (1897)

4 Anon., 'The Biberon, a New Feeding-Bottle', Lancet I (1851) 184.

5 Ibid.

how much more susceptible to its excellence was the mother, who not only saw and admired, but also benefitted by, the machine? It was a time in which machines of all kinds were dominating many fields of human activity, and in which man's success in inventing and employing devices for the relief of drudgery was an established criterion of progress. Breastfeeding was just such drudgery to many mothers, or came to seem so to them as soon as there appeared a way to escape it, and a machine capable of performing the task for them found a logical place among the exhibits of 1851. Only much later was it recognised that nature was 'an exacting customer and a hard taskmaster'[1]; for the time being, her ingenuity was overshadowed by the inventiveness of man, whose devices continued to endanger the health of infants.

By the end of this period, the decline of breast-feeding had been accepted by critics. The maxim that the mother's milk should be the child's only food for the first months of life remained the 'choice stock in trade'[2] of medical advisers, but it was recognised that whatever the views of doctors on this subject, mother's milk would in many cases give way to a substitute. Arguments in favour of breastfeeding were unavailing against increased commercial pressures supported by the underlying needs and desires of mothers themselves. While artificial feeding among wealthy families presented few serious problems by the

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[1] J.F. Goodhart, op.cit., 26.

[2] Ibid., 18.

end of the period, the matter continued to be one of life and death in poorer homes, and the high rate of infant mortality made it clear to the medical profession and to others concerned that some remedy was necessary. It was equally clear, however, that the path could no longer seriously be believed to lie in the abolition or limitation of artificial feeding.

CHAPTER 3

Animal milk in artificial infant feeding.

The effort to encourage and perfect the use of animal milk in the artificial feeding of infants was a dominant theme in the development of bottle-feeding during the second half of the nineteenth century. In 1850, most doctors, if not yet all, recognised in animal milk the only viable substitute for human milk; they recognised, too, that the use of animal milk for babies presented serious problems. Many mothers, particularly in the poorer classes, could not obtain milk at all, or were unable to secure a product suitable for infant feeding; of those who were able to obtain it, many reacted to the difficulty of preparing and employing milk by distrusting it as a food for infants, turning instead to substances other than milk which gave less trouble. The modification of animal milk for the purpose of infant feeding was in 1850 and for the greater part of the ensuing half century a matter for experiment and an issue surrounded by controversy. Even towards the end of this period, when techniques of modification had been placed on a firm theoretical basis, significant practical problems remained. By 1900, however, progress had been made in both the theoretical and practical fields in milk-feeding. The nature of those difficulties which persisted was understood, and the urgent need for a solution appreciated. In this, as in other areas of artificial infant feeding, the period of adjustment was over and the way ahead was clear.

Even in the 1850s, it is unlikely that more than a few doctors envisaged the prolonged or exclusive use of non-milk foods in early infancy; Mrs Baines, who wrote prolifically during this period on the theory as well as the practical dangers of artificial feeding, put in a plea for the use of more vegetable foods, declaring in 1860 that

> The idea that one or other of the animal milks must afford the best substitute for breast-milk in bringing up a child by hand is so generally entertained, and...so well established, that it requires more than ordinary courage to attempt to refute it. [1]

Her own efforts, though not lacking in courage, did little to alter this situation, and the choice of the milk of some other animal as the handfed infant's most appropriate food remained to most authorities an obvious one. The question of which animal should be chosen was more controversial. The matter was to a large extent decided by the chemical analysis and comparison of the various alternative milks which presented themselves. This was a line of investigation already well-established in 1850, and British writers on infant feeding were familiar with the researches of chemists working in this field in France and Germany as well as in Britain. The best known French analyses were probably those of Henri and Chevallier[2] and Vernois and Becquerel.[3] Among German work in this field

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1 M.A. Baines, The Comparative Properties of Human and Animal Milks (1860) 9.

2 W. Davidson, A Treatise on Diet (1843) 248.

3 T.H. Tanner, A Practical Treatise on the Diseases of Infancy and Childhood (1858) 81.

that of Professor Simon of Berlin was quoted[1], while among English milk analysts those most frequently referred to were A.H. Hassall[2] and his colleagues. The principal aim of the analysts was to ascertain the chief components of the different milks and the proportions in which they were present. They then compared these milks with human milk, to discover which of the animal milks were nearest in content to the child's natural food and to ascertain what kinds of modification each required to make it into an adequate substitute for that food.

The conclusions of the chemists as to which of the animal milks were most suitable for use in infant feeding varied, and the differences between their views were reflected in those of contemporary authorities on feeding. As well as being influenced by the results of chemical analyses, the opinions of contemporaries on the subject of animal milk were also in part based on their own observations as to the characteristics of each milk over and above its closeness to human milk. Here, too, ideas differed. Cows' milk, though not otherwise ideal, was generally the most convenient substitute for human milk, and for this reason many doctors did not bother to

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[1] C. West, Lectures on the Diseases of Infancy and Childhood (1st ed. 1848) 329.

[2] Hassall was well-known for his investigations into the adulteration of milk. See A.H. Hassall, Food and its Adulterations; comprising the reports of the Analytical Sanitary Commission of the Lancet for the years 1851-54 (1855) 320-346.

recommend any alternative. Aside from practical considerations, however, there was a tendency to favour asses' milk. The author of an article in Blackwood's Magazine observed in 1858, 'it appears, we hope without derogation to human dignity, that asses' milk is considerably more like that on which we were suckled, than any of the others.'[1] Because of its low protein content, in which it resembled human milk, the milk of the ass was easily digestible, and in addition to this advantage it was claimed to have remarkable healing properties. Gream wrote of it,

> Anyone who is in the habit of attending to children's diseases will bear witness to its efficacy; nor can they have failed to notice the almost immediate cessation of urgent symptoms, the return of healthy evacuations, and the commencement of increased vigour, and deposit of fat, that follow the exhibition [sic] of asses' milk.[2]

But although often recommended for very young, sick, or convalescent infants, asses' milk was regarded as having a somewhat laxative action[3], and was considered insufficiently nourishing for babies beyond the first few weeks. Not all analysts, furthermore, agreed that asses' milk was nearest in content to human milk, Routh asserting in 1858 that the most recent results available accorded this place to the milk of the goat.[4] Few

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[1] Anon., 'Food and Drink, part II', Blackwood's Magazine LXXXIII (1858) 407.

[2] G.T. Gream, Remarks on the Diet of Children (1847) 105.

[3] H. Davies, The Young Wife's Guide (2nd ed.1854) 75n.

[4] C.H.F. Routh, 'Animal Substitutes for Women's Milk', paper read before the Medical Society of London, February 1858, Lancet I (1858) 224.

authorities recommended goats' milk, however. Most believed it no more easily digested than cows' milk, and less digestible than asses' milk, and many objected to its disagreeable smell, which, Gream thought, was 'stronger if the goat is dark coloured'.[1] The milks of the ewe and the mare, finally, were both described as highly nutritious, but were seldom recommended for infant feeding, although it was said that mare's milk had been used successfully on occasions.[2]

The extent to which particular milks were used in infant diet depended very largely upon their availability, a factor which was especially influential in the case of milks other than that of the cow. Access to different milks varied in different parts of the country, but in few districts were milks from animals other than the cow readily obtainable. Mare's milk was obtained chiefly from other countries, and imported into England in a fermented form as 'koumiss', a food said to be widely used in infant feeding in Russia.[3] Dr Dutton observed that this was a 'very valuable food for children and invalids when the digestive functions are out of order'[4], but it was rarely mentioned by other authorities. Fresh mare's milk, according to Dutton, was difficult to obtain

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[1] G.T. Gream, op.cit., 84.

[2] C.H.F. Routh, Infant Feeding and its Influence on Life (3rd ed. 1876) 305.

[3] T. Dutton, The Rearing and Feeding of Children (1895) 35.

[4] Ibid.

in England, a fact he regretted since the horse was an 'altogether more sanitary animal' than the cow.[1] In most parts of the country goat's milk was rather more readily available; it may have been in common use in infant feeding in Wales and Ireland, but although individual families kept goats there is little evidence for the organised sale of goats' milk in England during this period. Asses' milk, on the other hand, was more commonly found. Certain dairies and dairymen in London, notably Welford's of Maida Vale[2], were said to be able to supply it, and despite 'extravagant'[3] prices there was a good demand. Outside London, families were advised to keep their own asses, or to arrange to have an animal brought to the door to be milked.[4] Both arrangements were no doubt costly. Routh suggested that in some places in winter as little as five shillings would 'gladly be accepted' for a milch ass, whose price was usually not above thirty shillings[5]; this still left asses' milk out of the question for the nourishment of babies in the majority of families.

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1 Ibid.

2 Ibid., 29n.

3 G.T. Gream, op.cit., 106.

4 M. Bakewell, The Mother's Practical Guide in the Early Training of her Children (1862) 27.

5 C.H.F. Routh 'On the Mortality of Infants in Foundling Institutions, and generally, as influenced by the Absence of Breastmilk', British Medical Journal (1858) 288.

Even cows' milk, despite being in general use for purposes other than infant feeding, and despite being produced in quantity in many parts of the country, was not invariably easy to obtain. The areas principally subject to shortages were those in which farmers did not find it worth their while to distribute milk locally, and those in which encroaching industry and other causes had destroyed pastureland, driving dairy farmers into other districts. Dr Thorne, in a report to the Medical Officer of the Privy Council in 1868, noted that at Hastings the proximity of 'several fashionable watering places' caused a great scarcity of milk, although in other areas it was easily procured, 'there being no large towns sufficiently near to make it worth a dairyman's while to send it out of the neighbourhood'.[1] The destruction of pastureland in rural eastern England was observed by Dr Hunter to result in the poorer people in these districts being unable to obtain milk at all[2], while according to the same writer the expansion of ironworks had by the late 1860s led to a similar situation in parts of Wales. At Brynmaur, he reported, the heads of families 'object to purchase the dear and far-fetched luxury of milk', adding that unless they kept up a regular demand, 'they could not possibly

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1 Twelfth Report of the Medical Officer of the Privy Council, BPP 1870 XXXVIII 922.

2 H.J. Hunter, 'Report on the Excessive Mortality of Infants in some Rural Districts of England', Sixth Report of the Medical Officer of the Privy Council, BPP 1864 XXVIII 461.

obtain it'.[1] At Crickhowell, in the same area, a 'total privation of cows' milk' was described as 'one of the greatest miseries the young population had to submit to'.[2] The impression that the difficulty of obtaining milk in some country districts was no new problem was given by the Rev. C. Merivale, describing the conditions in a rural parish in the south of England in 1869. Milk, he observed, was 'more difficult to attain [sic] than ever'.[3]

Even where cows' milk was available its high price frequently put it out of the reach of many who required it. Ordinary milk was sold throughout the second half of the nineteenth century at about 4d. per quart, a sum considered extortionate, and evidently more than many could afford to pay. 'In the case of the poor', John Tatham wrote in 1880, 'this price is simply prohibitory'.[4] It was also, he calculated, an unjust price. Milk could 'undoubtedly be produced at an outside cost of eightpence per gallon', which, with the addition of fourpence per gallon, or 50%, to cover the cost of distribution and 'to show a fair return for invested capital', might still

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1 Ibid., 508.

2 Ibid.

3 Rev. C. Merivale, 'Some Remarks on the Physique of the Rural Population', Contemporary Review X (January-April 1869) 259.

4 J. Tatham, 'Special Dangers to Health in Large Towns', Manchester and Salford Sanitary Association Health Lectures for the People, 3rd series 6 (1879-80) 109.

result in a final price of no more than 3d. per quart.[1] This was a counsel of perfection. Despite the large profit margin allegedly enjoyed by milk dealers, it is unlikely that most milk sold during this period at the price quoted by observers was either fresh or whole. It was stated in 1867, in evidence to a committee set up by the Society of Arts in 1866[2] to enquire into the food of the people, that no new milk was sold in London other than for the use of infants and invalids, and that where such milk was available, it would be likely to cost 5d. per quart.[3] Doctors constantly warned mothers of the 'extreme folly' of attempting to 'bate [sic] a milkman down' over the price of his milk.[4] More than 5d. per quart was probably sometimes paid; certainly little fit for the feeding of infants could be obtained for less.

The poor quality of milk, which was a matter of complaint throughout this period, was attributed by contemporaries partly to the insanitary surroundings in which it was produced and prepared for sale. Conditions

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1 Ibid.

2 See Announcements by the Council, Journal of the Society of Arts XV (1866-7) 69.

3 Proceedings of the Food Committee of the Society of Arts, Journal of the Society of Arts XV (1866-7) 355.

4 P.H. Chavasse, Advice to a Mother (8th ed. 1866) 98.

in the towns were particularly bad. Until the cattle plague of the mid-1860s, which resulted in the closing down of many of the town cowhouses, all large towns contained their own 'milkwalks' and dairies, many of which were poorly maintained. In an article in the Quarterly Review in 1854 on 'the London commissariat' Dr Andrew Wynter estimated that there were at that time twenty thousand cows in the metropolitan and suburban dairies of London.[1] The larger dairies, he thought, were on the whole 'admirably managed', but the smaller ones were often cramped and insanitary, with 'animals... sometimes cooped in sheds, placed in tiers one above another'.[2] By the mid-1870s, according to Routh, some improvement had been brought about[3], but the situation was still unsatisfactory. He agreed with Dr Merei that the condition of the cow-houses, with which, through proximity, they were well-acquainted, was a major factor in causing the distrust of milk so widely exhibited by the working classes.[4]

From the late 1860s onwards, increasing awareness of the role played by both milk and water in the spread of disease added another dimension to the idea of contamination. In earlier decades, ignorance of this role had imposed limitations on ideas of hygiene which persisted even among

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1. A. Wynter, 'The London Commissariat', Quarterly Review XCV (1854) 61.

2 Ibid.

3 C.H.F. Routh, op.cit., 320.

4 Ibid., 325.

some noted authorities up to the middle of this period. One such limitation was the failure to connect the diseases of animals with those of humans in such a way as to conceive of their being spread from the one to the other. In 1843, one observer gave it as his opinion that even milk containing visible blood and pus from cows known to be diseased was 'rarely impregnated with such principles, or even so altered by disease, as to be injurious to the health'[1] of persons drinking it. Thirty years later, Edward Smith could still state, though not all doctors agreed with him,[2] that

> the milk of diseased animals does not appear to contain any known germs or disease, and that it differs from that of healthy animals only in the lessened proportion of all the nutritive elements.[3]

A similar lack of concern as to the dangers of adulterating milk with unclean water was shown in the 1850s by some commentators. Dr Normandy stated in evidence to the Select Committee on the adulteration of food and drink that milk adulterated with unclean water was highly dangerous to health[4], but the author of an article in the Quarterly Review observed, in contrast, that if milk 'must be adulterated in large towns, water is undoubtedly the most harmless ingredient'.[5] Edward Smith, however, was

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1 W. Davidson, op.cit., 252.

2 Select Committee on the Adulteration of Food, Drinks and Drugs, Minutes of Evidence, Q.773, BPP 1854-5 VIII 296.

3 Edward Smith, Foods (2nd ed. 1873) 320.

4 Select Committee on Adulteration of Food, Minutes of Evidence, Q.774, loc.cit., 296-7.

5 Anon., 'Food and its Adulterations', Quarterly Review CXCII (1855) 475.

well aware by 1873 that the addition of foul water to milk, or even the use of such water for washing utensils used for milk, had 'been known to communicate infectious disease'[1], and during the same decade the dangers of milk infected by the animals themselves, already pointed to by Normandy and others[2], increasingly came to be appreciated by the medical profession. During the 1870s several outbreaks of infectious disease were traced to farms and dairies found to be employing people suffering from these diseases, and clear evidence obtained of the transmission of diseases such as enteric fever by means of milk.[3] Later, it came to be realized that tuberculosis, another great scourge of nineteenth century children, was spread in the same way. The hypothesis that this disease was passed from cows to humans attracted increasing attention during the 1890s, and was generally accepted within the medical profession by the end of that decade.[4]

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1 Edward Smith, op.cit., 320.

2 Select Committee on Adulteration of Food, Minutes of Evidence, Q.773, loc.cit., 296.

3 See J.N. Radcliffe, Report on an Outbreak of Enteric Fever in Marylebone and the Adjoining Parts of London, Appendix 6, Report of the Medical Officer of the Privy Council and Local Government Board, new series 1, BPP 1874, XXXI 137-178; see also Report by Dr Thorne on the Effects produced on the Human Subject by consumption of Milk from Cows having Foot-and-Mouth Disease, Twelfth Report of the Medical Officer of the Privy Council, loc.cit., 920-5.

4 T. Dutton, op.cit., 126.

The carriage of milk over long distances to its place of sale was a recognised cause of staleness and generally impaired quality. It was observed in the early fifties that the introduction of the transport of milk by rail meant that it was 'occasionally possible to obtain a good and pure fluid'[1], but in general it was believed the effect had been to lower standards. Wynter noted that milk which came by railway did not keep nearly so long as 'the indigenous produce of the metropolitan dairies'[2], and it was stated that milk carried over long distances seldom arrived at its destination with cream on it. When the latter fault could be rectified, it was observed, 'there would be an additional argument for the abolition of the London cowsheds'[3]. The railway companies made efforts to improve the conditions of transport by having sprung wagons constructed, but Wynter concluded that despite this innovation 'the churning effect of sudden joltings cannot altogether be got rid of'.[4] The transport of milk by rail to the big towns, stimulated by the cattle plague in the sixties[5], gave rise to further refinements in carrying techniques. Metal churns with close-fitting lids replaced the old wooden tubs, and milk

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1 R. Ellis, Disease in Childhood (1852) 121.

2 A. Wynter, loc.cit., 61.

3 Food Committee of the Society of Arts, loc.cit., 322.

4 A. Wynter, loc.cit., 61.

5 Food Committee of the Society of Arts, loc.cit., 321.

was cooled before being transported, first by the device of standing the churns in water, and later by the circulation of the milk in a special cooling frame adapted from a device formerly used in the breweries.[1] Even in the later years of the century, however, 'railway milk' was regarded as inferior to 'farm milk', and small retailer-producers took advantage of this preference by sending milk into the cities on their own floats from farms on the outer fringes.[2]

Although carelessness and ignorance commonly led to poor quality in milk during this period, deliberate adulteration for profit, most frequently by means of dilution with water, was probably a more important factor. The watering of milk, dangerous both for the contamination it introduced and for the nutritional diminution it brought about in the milk, was most widespread in the early part of the period, but continued to a lesser degree throughout the half century. In the early 1850s, London was 'frightened from its propriety'[3] by a book published by Mr Rugg, purporting to lay bare the facts of milk adulteration.[4] Dr Hassall's investigations for the Analytical Sanitary Commission of the Lancet in the early 1850s suggested, however, that Rugg's allegations were

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1 C.S. Orwin and E.H. Whetham, History of British Agriculture, 1846-1914 (1964) 148.

2 Ibid., 365.

3 Anon., 'Food and its Adulterations', loc.cit., 475.

4 H.H. Rugg, Observations on London Milk (c1850).

exaggerated, and that rather than being adulterated with solid ingredients, milk was principally tampered with by means of dilution with water.[1] Such dilution was, nevertheless, excessive. The common belief that the London milking pail 'went as often to the pump as to the cow'[2] was confirmed by Hassall's findings, which revealed that London milk was liable to be diluted with as much as fifty per cent of water[3]. An Act designed to prevent the adulteration of food and drink, passed in 1860, had little effect, being permissive rather than compulsory legislation.[4] The Manchester and Salford Sanitary Society reported in 1863 that samples of milk selling on the open market and examined by the Society's inspector had been found to contain as much as six times their volume of water.[5] The result of this situation was that children supposed to be receiving nourishment from their milk were instead being 'merely starved on water'.[6] After the passing of a second Act against adulteration in 1872, there was felt to have been some improvement.[7] The

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1 A.H. Hassall, op.cit., 341-2.

2 Anon., 'Food and its Adulterations', loc.cit., 475.

3 A.H. Hassall, op.cit., 341-2.

4 See J.L. Brand, 'The British Medical Profession and State Intervention in Public Health 1870-1911' (London Ph.D., 1953) 371-2.

5 Manchester and Salford Sanitary Association, Report of the Sub-Committee on the Adulteration of Food (1863) 11.

6 Ibid.

7 Report from the Select Committee on the Adulteration of Food Act (1872) BPP 1874 VI 246.

watering of milk continued, however,[1] and it was believed by observers that the law would go on being flouted as long as the fines imposed amounted to less than dealers could make in profit 'out of a good day's watering'[2]. As late as the 1890s the reports of the public analyst for the London parish of Hammersmith recorded instances in which milk was found to be adulterated with thirty-seven per cent. of water[3], and show that this commodity was still largely sold in an adulterated state.

The nutritional value of milk, already reduced by watering, was frequently further diminished by the removal of cream. In the poorer parts of London milk was reported to have all its cream taken off for sale in the West End[4], and in other parts of the country the product sold 'in the immense majority of shops'[5] was skimmed. As contemporaries pointed out, this situation presented particular dangers in the feeding of infants, for whom skimmed milk was often used; it was, moreover, an area of danger which advancing technology extended, rather

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1. Select Committee on the Adulteration of Food Act (1872), Minutes of Evidence Qs. 2407-2513, BPP 1874 VI 386-391.

2 B.B. Joll, Nursery Hygiene (1884) 49; see also A. Ballin, From Cradle to School (1902) 71.

3 Annual Report of the Public Analyst, Fourth Annual Report of the Vestry of the Parish of Hammersmith (1889-90) 99.

4 Anon., 'Food and its Adulterations', loc.cit., 475.

5 A.S. Merei, 'Breast-feeding and Bottle-feeding', British Medical Journal (1858) 154.

than diminished. In the early part of the period, skimmed milk, though recognised as too low in fat to be a suitable food for infants, was nevertheless not one which was wholly devoid of fat owing to the relative ineffectiveness of handskimming methods; the development during the 1880s of the mechanical cream separator[1], by increasing the amount of cream which could be removed, much reduced the value of skimmed milk as a food. Even where skimmed milk was sold as such and not passed off, as was often the case, as whole milk the public was nevertheless being supplied with this commodity under a name 'associated from time immemorial with an article of much greater value'.[2]

Milk which had been skimmed and watered tended to betray this fact by its appearance, and until legislation had some success in outlawing the grosser types of adulteration various solid ingredients were added to milk after adulteration to restore body and to give an impression of creaminess. The effect of these additions was so bad in some poorer areas that a witness to the Food Committee of the Society of Arts in 1867, in answer to a question about the supply to the inhabitants of certain parts of London, expressed doubts as to 'whether some of them can get milk at all'.[3] He had been told that people going

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1 Third Annual Report of the Vestry of the Parish of Hammersmith (1888-9); see also C. Singer et al., A History of Technology, V (1958) 33.

2 5th Annual Report of the Vestry of the Parish of Hammersmith 1890-91, 193.

3 Proceedings of the Food Committee of the Society of Arts, Journal of the Society of Arts XVI (1867-8) 437.

early to a milkshop would see

> a man bring a kettle full of boiling water from the parlour, put it into something at the back of the counter, and then take a scoop of something, stir it all up, and serve it into the cups...'warm from the cow'. [1]

The author of an article in the Contemporary Review suggested that evidence of this sort from the poorer districts 'might possibly have a much closer application... to even the richer ones' than was commonly imagined.[2] Substances allegedly used in the restoring of diluted milk included starch, flour, treacle, anatto[3], sheeps' brains, and chalk. The former 'adulterator-in-chief' of a London dairy, apprehended by the police after robbing his employer, told them that these ingredients were generally made into a compound known in the trade as 'simpson'.[4] Brains were included to 'give the milk a creamy consistency', burnt sugar to 'preserve a due proportion of saccharine matter', and anatto for colouring.[5] Small wonder, contemporaries observed, that babies fed this 'bastard sort of fluid'[6] became 'violently disordered'.[7]

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1 Ibid.

2 J. Routledge, 'The Food Supply of London', Contemporary Review 9,(1868) 281.

3 An orange-red vegetable dye, also used for colouring cheese.

4 Origin unknown; extract from Birmingham Daily Post, quoted in P.H. Chavasse, Counsel to a Mother (3rd ed. 1874) 80.

5 Ibid.

6 Anon., Baron Liebig and the Children (Lily and Co., 1873) 22.

7 Anon., 'Food and its Adulterations', loc.cit., 475.

One solution to the problem of adulterated milk was that families should keep cows of their own. Not only did this provide a reliable source of milk, but it also enabled those in charge of a child's diet to follow precisely the instructions given by doctors as to the best type of cow and the most suitable food for it. The breed of cow, though not universally considered important, was believed by some authorities to have a significant influence on the milk produced, the most highly recommended cow being the Alderney.[1] The food of the cow was generally considered to be of some importance. Hay and grass feeding was widely supposed to produce the finest milk, but Mrs Hale asserted that clover was particularly valuable, and that cows fed on sainfoin produced richer and more abundant milk than those fed on anything else.[2] Other vegetable foods were recommended; beetroot was supposed to produce a 'sweeter and better flavoured milk than many other vegetables'[3], and turnips, carrots and beetroot were all believed to 'furnish a very abundant and rich' supply.[4] Parsnips were often thought to have a similar effect, and other vegetables considered valuable included potatoes, cabbages, peas, beans, and even yams.[5] Advice was also given on foodstuffs to be avoided. 'Brewers'

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[1] T.H. Barker, Right Foods for Infants and Children (1866) 15.

[2] S.J.B. Hale, The New Household Receipt Book (1854) 455.

[3] W. Davidson, op.cit., 248.

[4] Ibid.

[5] S.J.B. Hale, op.cit., 456.

wash', or 'slop from the distilleries'[1], came high on the proscribed list, along with other foods given to town cows which were said to result in the acid milk so common in urban dairies. Also unsuitable were plants which flavoured the milk, among them not only stinking hellebore and hemlock, but also the innocent-sounding camomile, field-garlic, and mustard.[2]

Where a family kept a cow of its own, attention could be paid not only to the breed of cow and to its diet, but also to those details of milking which were thought to be important in obtaining the best kind of milk for infants. It was believed by some that the child should draw its milk directly from the cow itself. This may not have been a common practice, but there is evidence that it did occur; as late as 1909, a manual of advice to mothers published by Mrs Sadler[3] had as its frontispiece a photograph of a child taking milk from the udder of a goat. A procedure commonly recommended in the earlier decades of this period, which was again easier to carry out where a family owned its own cow, was the drawing of milk for a baby from a single animal, rather than from the mixed yield of an entire herd. By ensuring a more consistent milk in this way, some authorities believed, it was possible to guard children against a source of disorder.[4]

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[1] J. Higginbottom, Mothers, Doctors, and Nurses (Ipswich Temperance Tracts 149, 1850) 3.

[2] Anon., Alimentary Enzymes in Theory and Application (Benger's Food, Ltd., 1912) 32.

[3] S.H. Sadler, Infant Feeding by Artificial Means (1909)

[4] P.H. Chavasse, Advice, op.cit. (12th ed. 1875) 19; see also T.H. Barker, op.cit.,15.

It was not until late in the century that it was suggested that this was an outmoded notion, and that milk obtained from the mixed yield of a good herd was preferable to that of a single cow.[1] Other recommendations concerned the time and the stage of milking at which the milk for an infant should be drawn. It was observed that the quality and constituents of milk varied according to the time of day at which milking took place and according to whether the milk was the first or last drawn of the yield. Eustace Smith was notable for his belief, supported by other commentators, that the best milk for handfed babies was 'strippings', the milk taken from the cow after her normal yield had been withdrawn, which, he believed, was particularly rich in cream and low in curd.[2]

Where it was not practicable for a family to keep its own cow, the authors of mothers' manuals advised that good milk might still be obtained from dealers provided certain precautions were observed. They stressed the importance of dealing only with reputable suppliers, and, in towns, preferably with those who either themselves kept cows in the country or obtained milk largely from some country district. It was considered worthwhile to pay a good price for the milk, and if this were done, most milkmen were found to be prepared to offer

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1. H.A. Allbutt, Every Mother's Handbook (1897) 70.

2 J.F. Goodhart, The Diseases of Children (3rd ed. 1888) 27.

what the customer required. Mrs Pedley, writing in 1866, confirmed that 'in small milk walks the proprietor will generally consent to reserve a special milk for "baby's" use'[1], and the same need was met by the 'nursery milk' sold by the larger establishments.

Where there was any doubt as to the quality of the milk supplied,or simply as a prophylactic measure, mothers were advised to check the specific gravity by means of a lactometer. The use of 'hydrometers' and lactometers for the testing of milk was mentioned by Davidson in the 1840s[2], and by several writers in the succeeding decades, and by the middle of the period large consumers of milk, such as institutions, were evidently making use of these instruments. Edward Smith stated that very large consumers usually agreed upon a standard cream content with their suppliers. He cited the Liverpool workhouse authorities, who adopted a standard of ten per cent., paying ½d. per gallon more for each degree above this figure and the same amount less for each degree below it.[3] The use of lactometers by the domestic consumer, to ensure a satisfactory product, was widely recommended during the later years of the century. Dr Joll, writing in 1884, described two types of lactometer: the first, 'a cheap instrument for ascertaining the density

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1 Mrs F. Pedley, Infant Nursing and the Management of Young Children (1866) 18.

2 W. Davidson, op.cit., 250.

3 Edward Smith, op.cit., 313.

of milk', registered a number when placed in a tumbler of the liquid; the second, 'now commonly sold', tested the milk 'by the colour of a thin layer of the specimen tested spread on its disk, as compared with that of milk of known quality'. The latter test Joll described as very simple and, he believed, 'tolerably accurate'.[1] It was suggested that the specific gravity should be between 1030 points and 1032, and that milk which showed a figure below 1028 should be returned to the supplier.[2] Such tests did not always have the desired effect. Dr Bradshaw observed in 1869 that milkmen were well aware how to treat watered milk in order to make up the specific gravity to an acceptable figure.[3] It was, nevertheless, a minimum precaution.

Like the ability to keep a cow, the use of scientific instruments for ensuring a good milk supply was confined to the more comfortably situated families. The poor, relying on a source of milk near at hand and unable to pay 'fancy prices'[4] for a special product, had to take what they could get. It was observed that even in the towns milk was obtainable which was of a high standard, but that this depended upon the dealer. Those who supplied the poor were recognised to be the least reliable. Some rich families kept cows for the express purpose of supplying

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1 B.B. Joll, op.cit., 50.

2 T. Dutton, op.cit., 30.

3 W. Bradshaw, The Theory of Diet (1869) 39.

4 M. Harland, Common Sense in the Nursery (1886) 39.

'the labouring classes with milk at 1d. per pint',[1] but those who received such largesse were unusually fortunate. Edward Smith noted in 1864 that skim milk could sometimes be obtained for as little as ¼d. or ½d. per pint, but only where farmers did not prefer to reserve this commodity for feeding their pigs.[2] Merei had written in the fifties that no great improvement could be effected in the infant feeding of the poor without Government regulation of the sale of milk;[3] intervention of a kind which affected the availability of milk to the poor, however, as opposed to affecting merely the quality of the milk supplied, was not even to be attempted by government until the establishment of the municipal milk depots.

The development of the municipal milk depots enabled the corrupt and expensive commercial market to be bypassed and brought clean fresh whole milk into homes where it can seldom if ever have been found before. The first of the depots was established in Lancashire in 1899 and in the course of the next few years others followed in Liverpool, Battersea, Bradford and elsewhere.[4] They at first provided ordinary fresh milk, but later sold cheap feeding bottles, dried milk and sterilised fresh milk[5] to women unable to feed their babies at the breast.

1 Edward Smith, Practical Dietary for Families, Schools, and the Labouring Classes (1864) 207.

2 Ibid., 207-8.

3 A.S. Merei, loc.cit., 154.

4 G.F. McCleary, The Early History of the Infant Welfare Movement (1933) 72.

5 Anon., 'Infantile Mortality in Liverpool:Artificial Foods and the Sterilised Milk Supply, Lancet I (1904) 872.

Commentators were later to criticize the role played by the depots and to condemn them for encouraging bottle-feeding[1], but at the time they were established they were welcomed as performing a valuable service. Where no depot existed, conditions continued to be poor. In St Pancras in 1907 the organizers of the School for Mothers stated that the need for greater control of the milk supply was 'demonstrated constantly', and that they would be 'thankful to know where to send the mothers for safe milk at a price they can pay'.[2]

The problems produced by the use of fresh milk in infant feeding during this period were to some extent solved by the development of preserved milks. The desire to evolve some means of preserving milk was a natural reaction to the difficulties arising from its tendency to rapid deterioration, especially in hot weather and under the conditions in which it was transported to the retailer. The preservation of milk for short periods, sufficient to allow it to be kept without souring for several hours was achieved by simple methods such as boiling or scalding, and by the addition of various chemical preservatives used both in the home and commercially, such as bicarbonate of soda.

By the middle of the nineteenth century methods were being developed for preserving milk for much longer periods. Techniques of evaporating milk were practised

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[1] Lane-Claypon, op.cit., 56-7.

[2] E.M. Bunting et al., A School for Mothers (1907) 44.

in the 1830s, a British patent being taken out in 1835.[1] In the following decade Davidson described an early example of the process, in which milk or cream was preserved by 'evaporating the half of its watery contents in a water bath, putting it into bottles, exposing these to the boiling water-bath, and carefully corking and sealing them'.[2] Later in the same decade Mr Grimwade took out a patent for a commercial evaporating process[3], and in the mid-fifties for a process by which milk was dried and powdered, producing a 'patent Desiccated Milk' mentioned by Routh in the 1860s.[4] When mixed with water in the recommended proportions, this was said to embody 'all the peculiarities of good rich milk'[5], and it evidently met with some success. By the mid-1870s, however, its use as a substitute for fresh milk had been 'pretty generally superseded'.[6] Desiccated milk became an important ingredient of the milk food compounds which later became popular among richer consumers; its successor in general use, popular with rich and poor alike from the seventies onwards, was condensed milk.

Condensed milk was acknowledged in the 1880s to be the best available substitute for fresh milk;[7] moreover in certain circumstances it had undisputed advantages. These

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1 C. Singer et al., op.cit., 35.

2 W. Davidson, op.cit., 250.

3 J.C. Drummond and A. Wilbraham, The Englishman's Food (1957) 302.

4 C.H.F. Routh, Infant Feeding, op.cit., 328.

5 Ibid.

6 Ibid.

7 C. West, The Mother's Manual of Children's Diseases (1885) 58.

advantages were chiefly felt on journeys, during epidemics, and at other times when a reliable supply of fresh milk could not be obtained, or when fresh milk was found difficult for a child to digest. Before the boiling of milk for infants was commonly practised, the fact that tinned condensed milk was sterile at least until the container was opened naturally gave it a great advantage over contaminated fresh milk, and it was observed that children fed on condensed milk frequently escaped illness suffered by others.[1] Where digestion was difficult, the fact that the condensing process rendered the casein, or curd, of the milk more easily assimilable gave the preserved milk an additional advantage.[2] In poorer families, for whom the provision of fresh milk for babies frequently caused difficulty, the development of condensed milk proved particularly valuable, since such milk had the supreme advantage of being readily obtainable and cheap. The poorer classes, particularly in large towns, were by the latter decades of the nineteenth century observed to be buying condensed milk in large quantities.[3] In many of these families, it is probable that condensed milk was the only form of milk available to infants.

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[1] C.H.F. Routh, Infant Feeding, op.cit., 329.

[2] W.B. Cheadle, On the Principles and Exact Conditions to be Observed in the Artificial Feeding of Infants (1889) 58.

[3] H. Simpson, 'The Choice of Food', Manchester and Salford Sanitary Association Health Lectures for the People 3rd series 5 (1879-80) 93.

Despite the advantages of preserved milks in some circumstances, contemporary authorities believed that the exclusive use of these foods in infant diet resulted in the severe impairment of health. The chief disadvantage of both condensed and dried milks as foods for babies was thought to be their low fat content[1], particularly noticeable in the cheaper brands, manufactured from machine-skimmed milk, which were most commonly bought by poorer mothers. As regards condensed milk there were, in addition, some 'dishonest articles' produced in response to the great demand for this commodity, from which up to 90 per cent of fat was alleged to have been removed.[2] The high concentration of sugar in most condensed milks was also seen as a defect. By the 1880s it had become unnecessary for condensed milk to contain large quantities of sugar for the purpose of preserving it, as had formerly been the case, and unsweetened milks came on to the market; doctors, however, were still uncertain how long these would keep, and often recommended the sweetened milks for the sake of safety.[3] Mothers, too, evidently preferred the sweetened milks. The sugar made them acceptable to babies, and gave them, in addition, a plump and flourishing appearance which encouraged parents to believe that their children were thriving. As doctors

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[1] S. Jex-Blake, The Care of Infants (1884) 22.

[2] T. Dutton, op.cit., 40.

[3] W.B. Cheadle, op.cit., 60; C. West, Mother's Manual, op.cit., 53.

pointed out, however, infants reared exclusively on condensed milk were in reality far from healthy. His own experience had shown, wrote Dr Neale in a letter to the British Medical Journal in 1879,

> that...as a daily article of food, it proves most deleterious, the infants often appearing to thrive while taking it, but...only as far as fat is concerned, for the bones too often become rickety, the skin covered with...eruptions.../and/ if attacked with severe illnesses, the little patients quickly, and often suddenly, succumb. [1]

Dried milks were believed to provide no more adequate nutriment for babies than condensed milks, and the cheaper varieties were, again, particularly deficient. Though both were recognised to be convenient preparations, likely, provided they were of good quality, to be useful as temporary substitutes for fresh milk, their general use in preference to the latter was seldom advised.

Once milk in whatever form had been obtained for a child, it was on its modification that the success of handfeeding depended. The need for some adjustment of animal milk before it could be used as a satisfactory substitute for human milk was not in dispute, and the various chemical analyses gave an indication of the adjustments required, the basic correction being in the balance of ingredients. Cows' milk was agreed by most authorities to have a greater amount of protein than human milk, and to need dilution for the use of the human infant,

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[1] R. Neale, 'Condensed Milk for Infants', British Medical Journal II (1879) 682.

and it was usual to add a little sugar to make up for that lost in the dilution. The amounts of both sugar and water recommended differed according to the ideas of different authorities, to the age and powers of the child, and to the state of the milk available, but before the 1880s little further modification was thought to be required. The milk of animals other than the cow were believed to require essentially the same kind of modification as that advised for cows' milk, though again precise details varied according to the ideas of different authorities.

The frequent failure of the basic form of modification to produce a milk which children could digest encouraged a search for further refinements. The problems involved in the modification of fresh cows' milk were particularly difficult to resolve. The tendency for cows' milk to disagree with children was believed to be the result of a combination of factors, among which acidity was widely felt to be a fruitful source of digestive upsets. The usual way of dealing with this problem was to add to the milk an alkaline substance such as lime- or barley-water.[1] Other additives employed included bicarbonate of soda, carbonate of potash, magnesia, prepared chalk, arrowroot and other starchy substances, and even soap.[2] The use of ordinary lump or

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[1] W.B. Cheadle, op.cit., 50.

[2] C. West, Lectures, op.cit., 370; W. Davidson, op.cit., 252.

loaf sugar to sweeten milk was regarded as liable to cause an acid reaction, and it was often suggested that sugar-of-milk or beetroot sugar be used in its place.[1] It was also often considered desirable to enrich milk for infants. Various means were suggested, such as the addition of extra fat in the form of cream, or of other nourishment in the form of sugar-of-milk or starchy substances such as baked flour.[2] It was also recommended that less than the usual amount of water be added where it was suspected that milk had been diluted before sale.

The problem which more than any other was to bedevil the use of cows' milk in infant feeding was that of casein. Chemical analyses of cows' milk showed that in comparison with human milk it contained considerably more casein (protein), or curd; further tests showed that not only was the curd greater in quantity, but it was also different in kind, being denser and heavier than that found in human milk.[3] That 'cows' casein' was therefore more difficult for children to digest seemed to be confirmed by frequent vomiting of large masses of undigested curd. One suggested means by which this difficulty might be overcome was by 'pre-digesting' the curd. This was thought possible by boiling the milk, or alternatively by the addition of limewater. Routh advised that half an ounce of limewater

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[1] S. Jex-Blake, op.cit., 24.

[2] W.B. Cheadle, op.cit., 75-78.

[3] Ibid., 47.

added to every half pint of milk or milk and water would ensure 'the solubility of the casein and the emulsion of the fatty matters.../so that/ both...become more assimilable'.[1] More complicated methods of predigestion, however, became popular during this period. To these were added equally sophisticated methods of solving the casein problem by means of reducing the quantity of curd in the milk before the feed was given to the child. This process was known as /'humanising' the milk.

Predigestion and humanisation techniques were carried out both in the home and commercially. A substance commonly used for the purpose of predigestion was malt. Malted milks were developed by Liebig in the 1860s[2], and later produced by British manufacturers. These milks retained their popularity throughout the period and were made at /home according to Liebig's recipe or purchased already prepared from Liebig's own firm or other companies such as Horlicks'. In the late 1880s, 'peptonised' or 'pancreatised' milks, made by the addition to fresh milk of substances prepared from the digestive juices of the cow, were also observed to be 'valuable additions...to an infant's dietary'.[3] These milks, like malted milk, could be bought already prepared, but they were more generally advised for preparation in the home, with the use of peptonising powders or solutions,

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1 C.H.F. Routh, Infant Feeding, op.cit., 328.

2 See J. von Liebig, Food for Infants (2nd ed. 1867, trans. E. von Lersner-Ebersburg.)

3 J.F. Goodhart, op.cit., 26.

such as Messrs. Burroughs, Wellcome and Co.'s 'zymine', or Messrs. Benger's 'Liquor Pancreaticus'.[1] These were added to the milk which was then heated to induce the chemical action. The foods produced by these methods were believed, provided their use was not prolonged, to be beneficial in certain circumstances. Cheadle observed, however, that they usurped the proper function of the infant's digestive system and when used unnecessarily in healthy children were 'liable to debilitate and demoralise.../the/ stomach by relieving it of work which it ought to do for itself'.[2] In some ways more appealing than predigestion was the idea of removing a part of the curd from the milk. This method, described as 'humanisation', had become a commercial proposition by the 1880s, and the product sold by the larger dairy companies was found by Miss Wood and others to 'answer very well' as an ingredient of artificial infant diet.[3] The process of humanising milk was also carried out in the home, and recipes were supplied in infant feeding manuals in use during this period. The best known recipe was probably that of Dr Frankland[4], modifications of which appeared under a variety of names, among them 'mincasea', recommended by Mr Lobb.[5] All involved skimming a certain

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1 F.H. Alderson, Diet and Hygiene for Infants (1906) 102.

2 W.B. Cheadle, op.cit., 85-6.

3 C. Wood, A Handbook for the Nursing of Sick Children (1889) 174.

4 This was also referred to as Dr Franklin's (C. Wood, 1889) and Dr Falkland's (C.J.F. Routh, 1876); S. Jex-Blake, op.cit., 25-6, gives the recipe in full.

5 C.J.F. Routh, op.cit., 358.

quantity of milk and laying aside the cream; separating the skimmed milk with the aid of rennet and removing the curd; replacing the cream in the remainder of the milk; and then adding either more cream, or an equal quantity of new milk.

Predigestion and humanisation were methods of modifying milk which were not unsuccessful; milk subjected to such processes was available, however, only to a small proportion of the population. For most people, the only practical way of modifying milk, which began to achieve greater popularity during the last years of the nineteenth century, was by boiling it. As a process which made milk more digestible, boiling had been recommended and indeed practised before the middle of the century.[1] It had not, however, become an established part of infant feeding procedure; even in the 1880s mothers and nurses were said to be prejudiced against it[2], and members of the medical profession continued to show little enthusiasm for it. The chief reason for this attitude was the belief that boiled milk gave rise to constipation, an ailment regarded as the starting point of many more serious diseases.[3]

While the precaution of boiling milk and water for children was not widely observed, neither the casein problem nor the various other difficulties of milk feeding

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[1] W. Davidson, op.cit., 252.

[2] W.B. Cheadle, op.cit., 10.

[3] S. Jex-Blake, op.cit., 26.

could satisfactorily be resolved; with the acceptance of the desirability of boiling milk, other more elaborate and expensive forms of casein-modification were rendered unnecessary, though they continued for some time to be popular. A serious barrier to the successful employment of animal milk in infant feeding had thus been removed. Practical difficulties remained for many families, for whom even simple culinary procedures were hazardous and inconvenient, but the provision of sterilised milk not only by commercial concerns but also by the municipal milk depots was by the early twentieth century having the effect of alleviating these problems.

Although in 1900 animal milk remained for the poor, at least, a more reliable, safer, and more satisfactory food for infants in theory than it was in practice, the situation had begun to improve. The difficulties facing many mothers were still severe. Except in those few areas in which local authorities had taken on the responsibility of providing milk for mothers unable to feed their infants at the breast fresh milk, even after 1900, was both dear and unreliable, while poverty-stricken and ignorant mothers making use of preserved milks continued to do their babies harm by feeding them with the cheapest brands of these foods. Living conditions, moreover, were still poor, and even when milk reached shop or home in a sterile condition, it quickly became contaminated. The boiling of milk and other ostensibly

simple measures, widely recommended, were seldom observed; as a result, animal milk was liable to be as potent a source of danger to young babies in the poorer classes in 1900 as it had been in 1850. Nevertheless, moves were being made to remedy a problem which in its essentials was understood. In 1850 and for many years after that date, the question of the use of animal milk in infant feeding had been surrounded by the deepest uncertainty; in 1900 this was no longer the case.

CHAPTER 4

The use of household starch foods.

Lack of appreciation of the need for milk in infant feeding and the difficulties which the use of animal milk entailed led throughout this period to the reliance on alternatives in the form of starch foods. In 1850 a number of ready-made patent infant foods were available[1], but starch foods were still commonly made at home from household ingredients, and consisted of the traditional pap, or panada, of the previous century[2], made with sweetened milk or water mixed with bread, flour, or oatmeal. Similar foods were made with rusks, biscuit-powder or rice, or with imported root-starches such as arrowroot and tapioca. By the 1870s, doubts among members of the medical profession as to the suitability of foods of this kind in early infancy were encouraging informed mothers to abandon starch feeding altogether in the first six months, or to employ starch only in some specially treated form. Household starches could be subjected to a predigesting process at home, but it was more usual to employ one of the increasing number of patent foods, which were already predigested, or which were composed in such a way that the process

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[1] See Chapter 5, below, 115-139.

[2] For the introduction of such foods into infant diet in the C18, see D. Forsyth, 'The History of Infant Feeding from Elizabethan Times', Proceedings of the Royal Society of Medicine 4 (1911) 122.

would automatically take place when the food was heated. 'Untreated' household starches came to be recommended for use in the later months of infancy, when the child's digestive system was judged capable of coping with them.[1] The early use of the traditional starch foods remained popular in many families, however, even after the end of the century, either because no alternative was available to them or because, despite medical opinion, such foods continued to be thought valuable or found convenient. The belief of observers that the practice of starch-feeding was a major factor in serious digestive disorder and thus in infant mortality caused it to remain a source of controversy throughout this period.

Despite the fact that doubts as to the wisdom of starch-feeding in the early months of life were already being expressed by some doctors in 1850[2], manuals of infant care in use at that time gave a variety of recipes for household starch foods intended for use at all stages of infancy, either with or without milk. These foods were of two kinds: those which consisted merely of the liquid in which some species of starch had been cooked, and the more characteristic thickened foods in which the whole of the starch was retained. The liquid foods, such as barley-water, or sago- or rice-milk, were not considered nourishing foods in their own right, but thought valuable

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1. A. Pope, A Medical Handbook for Mothers (1873) 150.

2. C. West, Lectures on the Diseases of Infancy and Childhood (1848) 337.

chiefly for diluting milk[1]; the thickened foods, in contrast, were still regarded by many doctors as nutritious, as well as light and digestible, foods for infants.[2]

The thickened foods included those articles referred to by contemporaries as 'sops', 'paps', 'panadas', 'bouillies', 'jellies', or 'gruels'. These conformed to a simple pattern, consisting of a spoonful or two of some 'farina', or starch, such as flour or arrowroot, or a slice of bread or a rusk or biscuit, soaked or boiled in water or milk and sweetened, a further quantity of milk or water then being added until the food reached the desired consistency. Additional ingredients such as lemon rind or a stick of cinnamon for flavouring[3], butter or cream for extra fat[4], or salt to prevent worms[5], were sometimes suggested. Cane sugar was generally used to sweeten the food, but sugar-of-milk, or grape-sugar, obtainable from chemists, was recommended by some doctors as less likely to 'turn acid on the stomach'[6], while moist

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1 T.H. Tanner, A Practical Treatise on the Diseases of Infancy and Childhood (1858) 84.

2 J. Pereira, A Treatise on Food and Diet (1843) 307.

3 Anon., The Mother's Thorough Resource Book (c1860) 106.

4 Edward Smith, Practical Dietary for Families, Schools and the Labouring Classes (1864) 197.

5 P.H. Chavasse, Advice to a Mother (7th ed. 1864) 21.

6 W. Bradshaw, The Theory of Diet (1869) 31.

brown sugar was considered valuable in cases of constipation.[1] Other sweetenings were treacle, chiefly used by poorer families in the north of England, honey, also found useful for curing constipation, manna[2], and molasses.[3] The amount of sweetening desirable was a matter of dispute: in the fifties it was observed that there was 'a general impression' that sugar was bad for children but the writer was himself of the opinion that the notion of sugar rotting the teeth was 'a lot of nonsense'.[4]

The most commonly recommended household starch foods were those made from cereals. Among these wheat, in the form of wheat-flour, bread, rusks and biscuit-powder, was especially popular. Of the foods made from these ingredients, 'flour-pap' was one of the most highly regarded, since its long cooking was believed to render it especially suitable for infant feeding. This food was made by mixing flour with milk or water and sugar in the usual way, but in this case the flour used was specially prepared, in order that the starch cells should be thoroughly broken down and the food thereby, it was believed, made more digestible.[5] A recipe given by Dr Pye Chavasse in 1843 instructed mothers to take

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1 T.H. Barker, Right Foods for Infants and Children (1866) 19.

2 A sweet juice obtained from manna-ash and other plants.

3 T.H. Barker, op.cit., 19.

4 Anon., 'Extract from a Lecture delivered at Brighton, by Dr Pettigrew', The Mothers' Friend X (1857) 65.

5 T.H. Barker, op.cit., 19.

> about a pound of flour, put it in a cloth, tie it up tightly, then put it in a saucepanful of water, and let it boil four or five hours; then take it out, peel off the outer rind, and the inside will be found quite dry, which grate. [1]

Chavasse directed that a small quantity of the 'flourball' thus manufactured should be made into a food in the same way as gruel.[2] Flour baked in the oven was often recommended as an alternative to boiled flour, but was believed by some authorities to be less digestible.[3]

An easier food to prepare was plain boiled bread and milk, or bread and water.[4] This was either strained and eaten warm, or left to cool and set into 'bread jelly', well-known as a bland and nourishing food for infants and invalids alike.[5] Bread, however, was objected to by some authorities on the grounds that it contained yeast[6], and had not received sufficient cooking to make it easily digestible.[7] In preference, pap made from better cooked ingredients such as baked crumbs was recommended[8], and slices of bread baked in the oven to form rusks were also used.[9] Another kind of rusk equally acceptable as an

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[1] P.H. Chavasse, op.cit. (1st ed. 1843) 38.

[2] Ibid.

[3] Ibid.

[4] Ibid.

[5] F. Churchill, The Diseases of Children (1850) 31.

[6] J. Pereira, op.cit., 314.

[7] T.H. Barker, op.cit., 19.

[8] P.H. Chavasse, op.cit. (6th ed. 1861) 15.

[9] Anon., Mother's Resource Book, op.cit., 127.

ingredient of infants' food was made to a more complicated recipe using butter and eggs.[1] A variation of this was found in the well-baked wheaten rolls known as 'tops and bottoms'.[2] These were made of dough kneaded into pieces about the size of a walnut, which were cooked thoroughly and then split in half and baked again, before being made into pap in the usual way.[3] Other materials which had received longer cooking and were thought more suitable than bread for the purpose of infant feeding included biscuits and biscuit-powder.

Finally, three wheat compounds sometimes used in their household form for the preparation of starch foods for babies were 'soujee'[4], semolina[5] and 'mannacroup'[6], all substances whose small grains were believed to make them easily digestible to infants. Mannacroup was a coarse wheatmeal commonly used for soups and puddings, which was imported from eastern Europe. It was mentioned by T.H. Barker during the 1860s as obtainable from Russian merchants[7], but difficulty in acquiring it may have accounted for the fact that it was not widely used. Barker himself

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1 Ibid., 126.

2 D. Forsyth, loc.cit., 135.

3 G.T. Gream, Remarks on the Diet of Children (1847) 172.

4 J. Pereira, op.cit., 307.

5 Ibid.

6 Ibid.

7 T.H. Barker, op.cit., 26.

regarded it as a valuable food, which deserved more attention than it received.[1] Soujee was said to be of Indian origin, but in the 1850s it was being manufactured in England by a London firm.[2] It was thought to be 'as nutritious as semolina, if not more so'[3]. Both soujee and semolina, however, more frequently appeared as ingredients of patent infant foods[4] than in their household form.

Although wheat was generally supposed to be the most nutritious of the cereals[5], oatmeal and barley were also in common use in infant feeding[6], and during this period rice and cornflour gained in popularity.[7] Oatmeal was used in many forms. Fine oatmeal or oat flour was thought most suitable for infants' foods, but pap, gruel and soups for babies were also made from the coarse meal, as well as from groats and 'Scotch grits'.[8] Though believed to be nutritious, oatmeal was often found to be an

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1 Ibid.

2 E. Acton, Modern Cookery (1855) 13.

3 Ibid.

4 See Chapter 5, below, 115-139.

5 T.H. Barker, op.cit., 19.

6 J.M. Keating, The Mother's Guide to the Management and Feeding of Infants (1883) 17.

7 C.A. Cameron, A Handy Book on Food and Diet in Health and Disease (1871) 22.

8 T. Barrett, Advice on the Management of Children in Early Infancy (1851) 38.

irritant, and was for that reason chiefly recommended as a laxative.[1] It was however found valuable as an ingredient of pap when mixed with wheat flour.[2] Barley was used for making gruel for infants[3] or, in the form of pearl barley, for barley water.[4] It was found to be nutritious, but in the form of barley water was chiefly employed as a corrective for animal milk, or for the feeding of sick children requiring a very light diet. Rice was regarded by medical opinion as the least nutritious and the most starchy of the farinaceous foods.[5] Rice grains[6], ground rice[7] and rice flour were however used for making infants' foods and were believed to be valuable in the treatment of diarrhoea.[8] Rice was also sometimes stated to be an ingredient of 'cornflour'[9]; the reason for this is not clear but the practice of using rice in this way

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1 P.H. Chavasse, op.cit. (13th ed. 1878) 21.

2 P.H. Chavasse, op.cit. (8th ed. 1866) 19.

3 F. Churchill, op.cit., 31.

4 E. Ellis, A Manual of what Every Mother Should know (1881) 121.

5 C.A. Cameron, op.cit., 16.

6 P.H. Chavasse, op.cit. (6th ed. 1861) 16.

7 M.A. Baines, On the Prevention of Excessive Infant Mortality (Manchester Statistical Society 1868) 17.

8 P.H. Chavasse, op.cit. (13th ed. 1878) 23; E. Ellis, op.cit., 121.

9 Advertisement in C.A. Cameron, op.cit.

was described with approval by some authorities.[1] True cornflour, or maize-flour, was, however, thought superior by most commentators.[2]

During the 1850s and 1860s, cereal foods were already being rivalled as constituents of infant pap by starches obtained from roots or tubers. Of these the most popular household variety was arrowroot, followed by sago and tapioca. These were used both in the form of thin foods such as arrowroot-milk and sago-milk, as well as in the more usual thickened form. Other root starches used in the feeding of infants were 'tous-les-mois', a starch obtained from canna and imported from the West Indies[3], and salep, a powder obtained from the root of a plant of the orchis family.[4] Two common root vegetables also used were potatoes, in the form of potato flour, and carrots. The latter was added to flour pap to make 'carrot pap', a trusted remedy in cases of constipation.[5] Of the root starches, the substance sold as arrowroot was

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1 Ibid.

2 T.H. Barker, op.cit., 19,

3 P.H. Chavasse, op.cit. (9th ed. 1868) 20; a mixture of wheat-flour and arrowroot was also sold as 'tous-les-mois'; Anon., Mother's Resource Book, op.cit., 131.

4 T. King-Chambers, A Manual of Diet in Health and Disease (1875) 66.

5 Anon., Mother's Resource Book, op.cit., 111.

the most variable in content and in quality, being made up of different ingredients depending on its price, the particular name under which it was sold, and the integrity of the dealer. According to the Analytical Sanitary Commission of the Lancet, the term arrowroot was originally applied to the root of the plant arundinacea Maranta on account of its efficacy in healing arrow wounds;[1] since that time, however, the name had come to be less precisely employed and by 1850 it referred not only to the 'true Maranta', but to three other substances as well. These were the 'Otaheite', 'Tacca', or 'East India' arrowroot, prepared from the root of the cassava or tapioca plant; 'British arrowroot', which was in fact potato starch; and the so-called 'Portland arrowroot', prepared in Dorset from the common cuckoo pint.[2]

Pap for infants was sometimes made from the legumes. Bean-flour, pease-meal and lentil flour were all used in their household forms, but although they were known to provide a valuable source of protein[3] they were not popular in infant feeding. They seldom made successful foods since they were not readily digestible and were found to have a disagreeable taste which could not be disguised.[4]

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1 Report of the Analytical Sanitary Commission of the Lancet, Lancet I (1851) 139.

2 Ibid.

3 P.H. Chavasse, op.cit. (6th ed. 1861) 17.

4 J. von Liebig, Food for Infants (2nd ed. 1867, trans. E. von Lersner-Ebersburg) 15-16.

The use of the legumes in their household form was recommended by some authorities,[1] but they were more successful as constituents of the prepared or patent foods.

The starch foods as they were recommended for use in infant feeding in the 1850s and 1860s had three functions: to correct milk, to supplement it, or to replace it. Of these, correction was to a number of doctors, even in 1850, the only justifiable function. To all authorities it was an important one, whether the need for it was believed to arise through the poor quality of the animal milk available[2], or through inherent shortcomings in milk itself.[3] Starchy substances were among the materials most frequently employed for correcting deficient animal milk and were used to counteract acidity[4], to enrich milk[5], and to make it more digestible.[6] Many doctors in the early decades of this period also considered the supplementing

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1 P.H. Chavasse, op.cit. (9th ed. 1868) 16.

2 See Chapter 3, above, 61-70.

3 M.A. Baines, On the Comparative Properties of Human and Animal Milks (1860) 10.

4 Ibid.

5 Ibid.

6 J. von Liebig, op.cit., 16; A. Combe, A Treatise on the Physiological and Moral Management of Infancy (1854) 81.

of milk, even of breastmilk, to be necessary if the child were to be nourished adequately.[1] Doctors frequently recommended the introduction of supplementary starch foods at the second or third month, if not earlier, either on the grounds that the child was ready for a more solid diet[2], or, in the case of breastfed children, as a safeguard against the failure of the milk and the dangers of sudden weaning.[3] The use of starch foods to replace milk entirely, however, was not generally advised by medical men. It was accepted as necessary only in cases where a child seemed wholly unable to digest milk of any kind. Doctors often failed, however, to stress the importance of milk in the artificial diet and there must be some doubt as to whether they realised its necessity.

In the mid-nineteenth century the belief of many doctors in the need for starch foods in infant diet was influenced by certain traditional ideas on the use of milk. Among these was the belief that it was dangerous to mix human and animal milks in the diet. This meant that a breastfed child whose diet required supplementing had to be given non-milk foods for this purpose. Dr Cheadle, commenting in the 1880s on this still surviving but by then discredited theory, wrote of it as the belief

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[1] J.T. Conquest, Letters to a Mother (1852) 141.

[2] T. Barrett, op.cit., 38.

[3] Ibid., 27.

> that the cow's milk and the mother's milk do not agree, as if they quarrelled in some curious way within the child's body, and fought it out there to its great discomfort and damage. 1

As early as the 1840s, this was denounced as an 'absurdity'[2] but such an opinion was then far from unanimous. Dr Braidwood, who had himself supported this 'fallacy' at least until 1874, had explained the dangers resulting from the admixture of milks by saying that 'different degrees of digestion and assimilation' were required by human and cow's milk, and that the child's inability to provide both simultaneously inevitably gave rise to serious digestive disorder.[3] The use of starch foods in infant diet was encouraged in a more positive way by the traditional view of such foods as valuable source of nourishment in sickness and in cases of digestive impairment. Bread itself, described in 1842 as 'the sweetest and best food in the world'[4], had long been considered as the basis for nourishing, light and digestible food in such cases, and arrowroot and oatmeal gruels were foods with a similar tradition. Foods thought suitable for the diet of people whose digestion was feeble through sickness were naturally put forward as suitable for those whose digestion was feeble through immaturity.

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1 W.B. Cheadle, On the Principles and Exact Conditions to be Observed in the Artificial Feeding of Infants (1889) 40.

2 G.T. Gream, op.cit., 163.

3 P.M. Braidwood, The Domestic Management of Children (1874) 24.

4 W.A. Alcott, The Young Mother (1842) 122.

Long held ideas of the value of starch foods in infant diet reflected not only specific ideas as to how animal milk should be used, but also a general distaste for, and distrust of, animal milk. This may in part have been a legacy of old fears and misconceptions about the nature of milk itself, such as the idea that the use of animal milk in infancy resulted in the transmission of the characteristics of the animal itself.[1] In the main, however, popular distrust of milk was the result of its poor quality and the ill-effects which it was seen to have on children. Doctors who wished to see infants fed on milk alone in the first months of life either felt they could not insist on this because it was so often unsuccessful, or, if they did advise such a regime, they found their instructions disregarded by mothers and nurses who discovered that they were practically impossible to follow. Routh observed that the 'difficulties which surround the employment of cows' milk, in the state in which only it is procurable' had led to 'ingenious contrivances for its modification'[2]; still more frequently such difficulties led to the abandonment of milk altogether in favour of starch foods.

The faith of mothers in the household starch foods was greater than that of the medical profession. Some doctors were recommending, even in 1850, that infants under

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[1] D. Forsyth, loc. cit., 115.

[2] C.H.F. Routh, Infant Feeding and its Influence on Life (3rd ed. 1876) 327.

six months should be restricted to an exclusively milk diet[1], or at least that starch foods should be introduced no earlier than the second or third month.[2] The fact that mothers and nurses habitually fed babies with paps and panada almost from the moment of birth was deplored. Dr Ellis, writing in 1852, described the feeding methods which prevailed in lying-in rooms at that time, which dictated that the new-born child be

> drenched with stews of biscuits, bread, farinaceous compounds, and cows'-milk, often rendered fermentible with sugar, and dangerously irritating by the addition of various spirituous stimulants. 3

Such practices, he observed, were 'regarded by every reflecting medical practitioner with abhorrence, and indeed with dismay'.[4] Equally deplored was the habit of mothers and nurses of giving starch foods too thick. Doctors recommended that foods should be of a thin consistency[5]; mothers and nurses, on the other hand, regarded the thickness of food as a measure of its ability to nourish.[6] Rather than give starch foods of the recommended consistency they preferred to administer them in the form of thick porridges and pastes, thereby, doctors believed, severely straining the infant's digestive powers.

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[1] Anon., The Mother's Medical Adviser (1846) 4.

[2] T. Barrett, op.cit., 38.

[3] R. Ellis, Disease in Childhood (1852) 54.

[4] Ibid.

[5] T.H. Barker, op.cit.,

[6] J. von Liebig, op.cit., 13.

The poor were seen to rely particularly heavily on starch feeding.[1] This was attributed largely to practical factors, notably to the cheapness and ready availability of household starches, especially bread, in comparison with milk.[2] Milk was not commonly drunk in poorer families even by adults[3] and a special effort had often to be made to obtain it. Even where milk could be obtained, its poor quality militated against its exclusive use in infant feeding. Where mothers were away from their homes during the day and obliged to leave their children with hired nurses, the use of starch foods in preference to milk was almost inevitable, partly for reasons of economy and ease of preparation and also because starch-fed babies required less attention[4] and, being more liable to constipation, could be kept cleaner.[5] These advantages must have attracted many mothers; they appealed particularly to hired nurses, who, as was often pointed out, had little incentive to make a special effort

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1 C. West, op.cit., 337.

2 See Chapter 3, above, 59-61; 75-77.

3 J. Burnett, Plenty and Want. A Social History of diet from 1815 to the present day (Penguin, 1968) 201.

4 H. Ashby, 'Infant Feeding in Relation to Infant Mortality', Manchester and Salford Sanitary Association Health Lectures for the People, 5th series 6 (1881-2) 78.

5 Ibid.

for children who were not their own, and from whose care they had to make a living.

Bread, already the staple food in many poor homes, was the cheapest and most readily available starch food for use in infant feeding. Dr Greenhow, reporting to the Medical Officer of the Privy Council in the early 1860s on the diet of the infant poor in several industrial towns, noted the frequency with which bread superseded other foods.[1] Alternatives such as arrowroot, sago or oatmeal were rarely used. Children in poor homes in Coventry, partly fed by hand, were recorded as eating 'bits of bread soaked in warm water and sweetened with sugar and treacle'.[2] The same mixture was given among the poor of Manchester, Nottingham and Blackburn. Another observer on the staff of the Medical Officer of the Privy Council, Dr Hunter, noticed similar feeding patterns. He noted the use, among other foods, of

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[1] E.H. Greenhow, Reports on the Prevalence and Causes of Diarrhoea at Coventry, Birmingham, Wolverhampton, Dudley, Merthyr Tydfil, Nottingham, Leeds, and Manchester with Chorlton and Salford, Appendix to Second Report of the Medical Officer of the Privy Council, BPP 1860 XXIX 279.

[2] Ibid.

> sugar sop, a lumpy mass of bread, water, and sugar...either given cold, or left on the fire hob in a cup,...whence the fermented and sooty mass is heaped into the infant's mouth. [1]

Another variation, observed in Wales, was 'a thick porridge of bread, water, sugar and butter'.[2] The child fed with this mixture was a fortnight old.

The faith of the poorer mother in thick farinaceous foods was suggested by one commentator to be linked with the hunger experienced by many adults in poorer families.[3] This, it was argued, led them to place a high premium on the 'satisfying' and filling nature of foods, and to look upon the practice decried by others as 'stuffing' the child as evidence of the highest regard for his comfort and happiness. The desire to fill children with food was also in part a reaction to a specific scourge of nineteenth century infants, namely, 'wasting disease'.[4] Doctors constantly stressed the fact that wasting could be brought about by unsuitable food as well as too little food, and that thick paps constituted just such unsuitable food. As in other aspects of infant

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[1] H.J. Hunter, Report on the Excessive Mortality of Infants in Some Rural Districts of England, Appendix to Sixth Report of the Medical Officer of the Privy Council, BPP 1864 XXVIII 462.

[2] H.J. Hunter, Report on the Sanitary State of Crickhowell, Appendix to Seventh Report of the Medical Officer of the Privy Council, BPP 1865 XXVI 508.

[3] Anon., On Handfeeding (Ladies' Sanitary Association 1872) 11.

[4] See Chapter 6, below, 146-7.

feeding among the poor of which they disapproved, however, overfeeding was a habit over which the medical profession exercised little influence; working class mothers seldom took their babies to a doctor even if they badly needed medical attention[1], and chemists, whose attention was more frequently sought, advised on medicine rather than on food.

During the 1860s and 1870s, the gulf between the attitudes of mothers and those of the medical profession towards starch feeding was growing wider. Even before 1850 there had been doctors, like Dr Charles West, founder of the Children's Hospital, Great Ormond Street and noted authority on infant feeding, who had been opposed to the use of any form of thickened food in the diet of young infants[2], but at that time ideas on the subject in the medical profession as a whole had varied. Some doctors agreed with the view of West and his colleagues; others went part of the way towards it by recommending the restriction of starch foods at least until three months of age; still others continued to advocate, or at least to condone, the administration of starch from a much earlier age[3], even as the principal ingredient in the diet. The first sign of a qualification of this last approach was a growing emphasis on the need

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1 Second Report of the Medical Officer of the Privy Council BPP 1860 XXIX 279, 304.

2 C. West, op.cit., 333-4.

3 F. Churchill, op.cit., 31.

for starch foods to be given only with a substantial quantity of milk, and the rejection of the idea of them as substitutes for milk. The emphasis on the value of starch foods as supplements to milk was superseded by the idea that starch was inferior to milk in the nourishment of very young children and an unnecessary element in their diet. This in turn gave way by the seventies to the more radical view increasingly widely accepted in the medical profession, that any form of ordinary household starch given before six months of age was not only valueless as a source of nourishment, but constituted a positive danger to the child's life and health.

Changes during this period in the attitude of the medical profession towards starch-feeding are illustrated in the work of Dr Pye Henry Chavasse. Dr Chavasse was best known for his manual of infant care Advice to Mothers, of which thirteen editions prepared by the author came out between 1839 and 1878.[1] Chavasse still believed in 1865 that animal milk and human milk tended to disagree, and that animal milk ought not to be included in supplementary starch foods given to breastfed children until after the first five or six months.[2] Editions of

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[1] Fifteen editions between 1850 and 1900 are noted in the catalogue of the British Museum Library, of which the last two, in 1885 and 1898, were edited by other writers; between 1906 and 1939 another six editions appeared edited by other writers.

[2] P.H. Chavasse, op.cit. (8th ed. 1866) 18.

his book appearing during the 1860s, however, place increasing emphasis on milk as the staple ingredient in the diet of infancy.[1] In the 1868 edition of Advice to Mothers there appeared on this subject a passage of particular force, in which Chavasse stated that it was 'absolutely necessary for his very existence', that a baby of up to nine months 'MUST have...milk of some kind, as the staple and principal article of his diet'.[2] Farinaceous foods, in contrast, received markedly less attention than before. In 1870, Chavasse suggested that mothers should try a little sweetened diluted cows' milk 'before trying any farinaceous food whatever'[3], and by 1875 this advice had been replaced by the recommendation that starch foods should be avoided completely during the first six or seven months of life. Accompanying this last direction was the statement that before a child had cut his teeth, farinaceous foods of all kinds 'are worse than useless; they are, positively, injurious'.[4] During the early period of infancy, such foods, it was suggested, were 'perfectly indigestible', and frequently brought on convulsions.[5] Finally, in 1878, the use of farinaceous foods for children under six months was denounced entirely

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[1] P.H. Chavasse, op.cit. (7th ed. 1864) 26.

[2] P.H. Chavasse, op.cit. (9th ed. 1868) 28.

[3] P.H. Chavasse, op.cit. (10th ed. 1870) 70.

[4] P.H. Chavasse, op.cit. (12th ed. 1875) 31.

[5] Ibid.

by Chavasse. They were, he stated, 'one and the principal cause of the frightful infant mortality at the present time existing in England and which is a disgrace to any civilised land!'[1]

The objection of doctors to the use of household starches in the form of traditional pap and panada in infant feeding was that the immature stomach could not properly digest starch; it could not be converted into grape sugar and thus it could not be assimilated and could not nourish the child; furthermore, it collected undigested in the bowel, where it fermented, causing diarrhoea.[2] If starch feeding was persisted in, it was observed, the child wasted from lack of nourishment[3] and from diarrhoea, and eventually died. The idea that starch foods were indigestible in early infancy was not new, hence both the earlier avoidance of certain types of starch altogether by doctors, and the insistence by them on the prolonged cooking of those starches which were used, as in flourball. Not until later in the century, however, were precautions such as prolonged cooking rejected as insufficient to produce a digestible starch. This had to be accepted when experiment showed that the method used to produce flourball and similar foods was almost invariably ineffective in converting starch into

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1 P.H. Chavasse, op.cit. (13th ed. 1878) 31.

2 A. Pope, op.cit., 150.

3 C. West, op.cit., 334.

grape sugar. Thus Leeds conducted an experiment, described by Edmund Cautley, which showed that flour boiled in a bag for five days, fifteen hours a day, contained on analysis 'almost identically the same percentages of soluble and insoluble carbohydrates... before and after the boiling'.[1]

Improved methods of rendering starch digestible were put forward during this period. One of these was a method developed by the German chemist, Baron von Liebig.[2] Liebig advanced the common criticism of starch foods, namely that the labour of converting the starch into sugar was too much for the immature digestive system. Finding, however, like many others, that the use of animal milk alone was unsatisfactory, he experimented with various additives. His investigations resulted in the discovery that a suitable food was obtained with a milk pap in which the wheat flour content had been replaced by a mixture of wheat and malt flour in certain proportions. When this food was cooked according to the directions given by Liebig it was stated by him that the starch content of the wheat flour was entirely converted into grape sugar by the action of the malt, and could then be digested by the youngest infant.

Liebig's technique was received by the medical profession with varying degrees of approbation, but ultimately it failed to make the use of household starch foods

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[1] E. Cautley, The Natural and Artificial Methods of Feeding Infants and Young Children (1897) 345.

[2] See J. von Liebig, op.cit.

in the early months of infancy acceptable. Starch of all kinds continued to be regarded by the majority of doctors as unnecessary and dangerous at this stage in whatever way it was treated. It was felt that the infant's natural food did not contain starch and therefore that no artificial substitute ought to contain it.[1] There was also some doubt as to whether Liebig's method of converting starch was as successful as was claimed.[2] A major drawback to the method was its complexity, and the amount of time and attention which the different stages of preparation required. Critics of Liebig's Food asserted, and Liebig himself admitted[3], that mothers and nurses were prejudiced against the Food for that reason. When they could be persuaded to make it they did so without due care, with the result that the desired effect was not achieved. Even when the method was given full attention the number of ingredients it required and the number of different processes which had to be carried out gave rise to an even higher risk of contamination than was usual in the preparation of infants' food.[4] Dr King-Chambers wrote of the Food that it was altogether unnecessarily complex. 'Sensible parents', he concluded, ' will be content to leave the recipe for some coming race who may prefer art to nature'.[5]

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[1] J.T. Conquest, Letters to a Mother (4th ed. 1852) 141.

[2] T. King-Chambers, op.cit., 125.

[3] J. von Liebig, op.cit., 17.

[4] T. King-Chambers, op.cit., 135.

[5] Ibid.

The chief contribution of Liebig's and other methods of predigesting household starches was to encourage the division of starch-foods into the 'treated' and the 'untreated'; of these the latter were considered quite unsuitable for infants in the early months, while the former, though believed to be unnecessary, were generally thought permissible. Owing to objections to most domestic methods of preparing starch, the household starches fell chiefly into the 'untreated' category and were recommended only for use after the first six months. In the households of the richer and better-informed, such starch foods declined in use and were replaced by exclusively milk diets, increasingly feasible with improved methods of milk modification, or by 'treated' starch in the form of one or other of the patent babyfoods. For the poor, however, neither animal milk nor patent foods were practicable or desired as the sole constituents of a child's diet. It was observed that there was a widespread tendency among poorer mothers to supplement the diet of infants with 'a little bit of what we have ourselves' and with starchy foods which could not be digested.[1] Where the grosser forms of pap feeding were modified, the cause lay more often in developments in the provision of cheap preserved milks and of mass-produced feeding bottles, than in techniques of predigestion or in the spread of knowledge relating to the dangers of starch feeding.

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[1] F.H. Alderson, Diet and Hygiene for Infants (1906) 29.

The change in attitudes during this period within the medical profession towards the administration of untreated household starch in early infancy was ultimately of great importance to the health and welfare of the infant population. Immediately, however, it benefitted only a small proportion of that population. The hand-feeding of infants in richer families was made dangerous by the zeal with which some parents followed new trends and fashions.[1] Such families were at least, however, amenable to the influence of the medical profession and many new-found 'fashions', such as the sterilization of milk, were of benefit to the children they affected. In the poorer section of the community feeding patterns were not so easily influenced, and new ideas within the medical profession took far longer to become assimilated; moreover, major changes in the organization of the supply of food were necessary before such ideas could be put into effect. No attempt to alter existing feeding patterns among working class mothers could be successful which did not take into account the fact that in many families no adequate alternatives existed. The acceptance by 1900, however, of the role of household starch feeding in the mortality of early infancy was a critical advance, from which practical improvements in the supply of milk were already beginning to spring.

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[1] Ibid.

CHAPTER 5

Patent Infant Foods

The development of ready prepared foods for infants was an important aspect of the rise of artificial infant feeding during the second half of the nineteenth century. The first patent foods had been introduced in the 1840s.[1] These were supplementary starch foods, designed to be both safe for infants and simple and quick to prepare, thus filling the gap which existed in the household starches between those which were easy to make into babyfoods but which were not thought to be very good for infants, such as bread, and those like boiled flour which, though considered suitable in other ways, were time-consuming and troublesome to prepare. As time went on, patent foods gained in sophistication and were extended in their uses, becoming adapted to new ideas and to developing needs. While the simple starch supplements remained, new foods appeared on the market which were complete in themselves and intended not as adjuncts to human or fresh animal milks but as substitutes for them. In the later decades of the period, many such foods were claimed to be identical with the natural food of the child, and a perfect alternative to it from birth onwards. The patent foods enjoyed great popularity

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[1] D. Forsyth, 'The History of Infant Feeding from Elizabethan Times', Proceedings of the Royal Society of Medicine 4 (1911) 122.

among mothers and nurses, and by the end of the century they had extensively supplanted not only the household starches on which they had originally been based but also fresh milk of all kinds. By the end of the century the influential role which these foods had come to play in the nutrition of infants was arousing concern in the medical profession. The deficiency in them of essential elements present in the natural diet of infants made them inadequate foods in many circumstances, and their extensive use for young babies was believed to play an important part in infant mortality and morbidity.

As early as the 1850s, the small number of patent farinaceous foods introduced in the previous decade had gained a considerable following among mothers and nurses, and limited approval among members of the medical profession. 'Different kinds of proprietary articles' were by 1853, according to Thomas Graham, 'commonly sold by all respectable grocers and oil-men'[1], and numerous references to these foods can be found in contemporary manuals of advice to mothers on infant feeding. According to Forsyth, the earliest type of patent food was 'tops and bottoms'[2], a kind of rusk already well-known as a food for infants in its home-made version.[3] Forsyth states that tops and bottoms were first specially prepared for infants

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[1] T.J. Graham, On the Management and Disorders of Infancy and Childhood (1853) 219.

[2] D. Forsyth, loc.cit., 135.

[3] See Chapter 4, above, 94.

by the London firm of Robb and Company, at the suggestion of Mr Golding, the founder of Charing Cross Hospital, who believed that they would be particularly useful as a cheap food in poor families.[1] This and similar foods were in use throughout the fifties. Other proprietary foods available took the form of powders of wheat flour and other farinacea, some containing a single ingredient, others two or more mixed together, with or without added sugar. Several of these foods had received some cooking, designed to break up the starch cells and thus make the foods more digestible.

The primary advantage of the patent starches over their household counterparts was their convenience. The idea that household farinacea had to be baked or boiled for long periods in order to make them digestible meant that they took both time and trouble to prepare, whereas patent foods such as Hard's Farinaceous Food[2] or Robb's Biscuit[3] required only the addition of milk or water to be ready for use. Beyond their convenience value, however, the proprietary foods had an appeal for parents in that they were expressly designed for infants, and gave the impression both in the names - 'Nutritious Farina'[4], 'Prince and Princess's Farinaceous Food'[5] - and in

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[1] D. Forsyth, loc.cit., 135.

[2] P.H. Chavasse, Advice to a Mother (6th ed., 1861) 16.

[3] Ibid., 14.

[4] Report on farinaceous foods by the Analytical Sanitary Commission of the Lancet, Lancet I (1851) 677.

[5] Ibid., 678.

what was claimed for them that they were purer, more wholesome and more suitable foods for babies than the old-fashioned multi-purpose kitchen starches, such as flour or oatmeal. At a time when many foods of that kind were quite seriously adulterated, there was an undoubted attraction in named and carefully packaged articles, and mothers were encouraged to feel that foods were designed to take into account the special digestive and other problems with which all those who practised artificial infant feeding were familiar.

As well as drawing the attention of mothers and nurses to the convenience of their products, the manufacturers of patent foods emphasised their nutritional superiority in comparison with the household starches. This superiority, the advertisements stated, was due to the greater proportion of nitrogenous matter, 'indispensably requisite for nourishment'[1], which the patent foods contained. Thus the makers of one food described it as containing nitrogenous elements of which 'sago, arrowroot, tapioca, and other farinaceous substances...are utterly devoid'[2], while the manufacturers of another product made the specific claim that it contained 'five times the amount of the staminal principle of nourishment found in wheat-

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[1] Manufacturer's description of Gardner's Alimentary Preparation, Report on farinaceous foods by the Analytical Sanitary Commission of the Lancet, Lancet I (1851) 675.

[2] Ibid.

flour'.[1] The nutritional value of the patent foods was enhanced, it was claimed, by special processes in their preparation, the main purpose of which was to remove the tendency to acidity.[2] Foods thus 'admirably adapted' to the immature and feeble stomach of the infant were found by their manufacturers to be 'decidedly superior to arrowroot, tapioca, isinglass, etc.'.[3]

The impression that the aims of the manufacturers of proprietary babyfoods were wholly identified with those of scientific research in this field was encouraged by the use of scientific or semi-scientific terms in the descriptions of these foods. It was further promoted by the emphasis placed on the approval of such foods by the medical profession. Wherever possible, the names of individual doctors were appended to advertisements, and advertisers frequently quoted from testimonials received from doctors.[4] Foods were almost uniformly referred to as 'highly patronised and strongly recommended by the medical profession', or 'highly approved by the faculty'. A link with scientific research was further suggested by the frequent reference to patent foods as 'discoveries'. Thus one advertisement, noting that the efforts of scientists had long been directed towards the production of a nourishing yet non-acid food for infants, declared that this

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[1] Manufacturer's description of Bullock's Semola, Lancet Commission, loc.cit., 676.

[2] Manufacturer's description of Prince of Wales's Food, Lancet Commission, loc.cit., 677.

[3] Lancet Commission, loc.cit., 677.

[4] Ibid., 675-9.

> grand desideratum has at length been attained by this unrivalled preparation, which is justly considered one of the greatest triumphs of vegetable chemistry which the present age can boast. 1

This food, the advertisement added, was agreed by the 'highest medical authorities' to provide the 'purest and most nutritious diet for children ever discovered'.[2]

Patent foods, in the role assigned to them in the advertisements, were by no means as warmly or as universally approved by the medical profession as their promoters sought to persuade the public. Although some of these foods were recommended by doctors as useful adjuncts to infant diet in certain circumstances, doubts were already being expressed in the early 1850s as to whether the majority of them had any real value. It was felt that many provided little more than the material for an extensive confidence trick on the part of their manufacturers, whose claims, especially on the subject of the supposed supremacy of their products over the household starches, were entirely specious. Far from being an improvement on household starches, it was said, many of these 'hundred and one preparations...paraded under so many attractive titles'[3] and invested with such nutritional powers were identical with them; they were composed, their critics alleged, of simple wheat-flour and other

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1 Ibid., 677.

2 Ibid.

3 Anon., 'Food and its Adulterations', Quarterly Review CXCII (1855) 483.

> familiar ingredients, which would not take with anxious parents unless christened with extraordinary names, for which their compounders demand an extraordinary charge. 1

Some patent foods, it was observed, were in fact inferior to good quality household farinacea, being mixtures of poor grade substances, some of which were not generally considered at all suitable for infants. Certainly, as was suggested, the prices charged for these foods were considerably in excess of what was warranted by their contents. Thus 'Leath's Alimentary Farina', consisting of wheat flour, sugar, potato flour, indian cornmeal and tapioca, cost one shilling and sixpence a pound, and 'Prince Arthur's Farinaceous Food', consisting of wheat flour alone, one shilling a pound; 'Jones' Patent Wheat Flour', by comparison, cost only twopence-halfpenny a pound.[2] The fact that people were content to pay these prices was itself evidence that the statements of manufacturers had given them a false idea of the products they were purchasing.

Doubts as to the purity of the patent foods and the truth of the claims made for them by manufacturers were largely based on the findings of the Lancet's Analytical Sanitary Commission on the adulteration of food and drink, which reported on farinaceous foods in 1851.[3] Of eleven proprietary foods sold for the purpose of infant feeding, the

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[1] Ibid.

[2] Lancet Commission, loc.cit., 676.

[3] Ibid., 675-9.

Commission found the majority wanting. Five alone were found to contain pure wheat flour which had been exposed to heat in order to render the starch more digestible for infants; on the basis of contemporary beliefs, these foods could reasonably lay claim to some superiority over their household counterparts. The remaining articles were all the subject of some degree of fraudulent representation by manufacturers. Two were not pure, but contained a mixture of wheat flour and other cheaper ingredients, including potato starch, pea and bean meal, corn flour and tapioca. A further two contained ingredients which were unmixed, but neither of which the Lancet's investigators found superior to their household equivalents. One of these foods, described as containing a high proportion of 'nitrogenous matter' in comparison with other farinacea[1], was found to be made up entirely of rice. Contrary to the suggestion of advertisements for this food, rice was not regarded by contemporary medical opinion as nutritious[2], but as a substance which, except for its value in diarrhoea[3], was rarely of use in infant feeding. Unjustified claims of nutritional value were also made for the two remaining foods on the Lancet's list. One of these, described by the manufacturers as an

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[1] Ibid., 675.

[2] See Chapter 4, above, 96.

[3] P.H. Chavasse, Advice to a Mother (13th ed. 1878) 23.

unparalleled 'triumph of vegetable chemistry'[1], was found to be made up exclusively of potato flour, a substance seldom recommended for the purpose of infant feeding; the other, equally strongly praised by its manufacturers for its nutritional qualities, was found to be composed of the same substance, but in this case 'of a pink and rosy hue, the colouring matter probably being ROSE PINK'.[2]

The appeal of the patent foods, which continued despite warnings received from various sources concerning some dishonest articles, was strengthened by an increasing emphasis on the therapeutic and prophylactic value of these foods. Patent foods were frequently advertised as being particularly suitable for the weak or invalid stomach, and many were sold as invalid, as well as infant, food.[3] This in itself made them attractive when infants were so often ill, and when digestive disorders, in particular, were prevalent. Prominent among the medicinal properties claimed for certain foods was the power of alleviating diarrhoea,[4] a claim which exerted a powerful influence on mothers and nurses. Another property claimed, at once therapeutic and prophylactic, was the power to 'build up' the child, of correcting, and at the same time protecting against, debility. A

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[1] Manufacturer's description of Prince of Wales's Food, Lancet Commission, loc.cit., 677.

[2] Lancet Commission, loc.cit., 677.

[3] Ibid., 675-9.

[4] Manufacturer's description of Gardiner's Alimentary Preparation, Lancet Commission, loc.cit., 675.

substance which was regarded as being of particular importance for this purpose, and which doctors were stated in the sixties to be 'in the habit of giving to soft-boned children'[1], was phosphates. This was administered in the form of different chemical preparations, among them 'Wheat Phosphates', or 'essence of bran', described by T.H. Barker as containing 'an important principle which has the power of aiding digestion...termed cerealin'.[2] This was recommended in cases of rickets, impaired digestion, eruptions, and other symptoms of debility. By the middle of the 1860s, phosphates had been added to certain of the patent foods, a development which was welcomed by members of the medical profession.[3] Debility was a condition frequently noted in infants, and as it was observed to end fatally in many cases, foods designed to treat the condition naturally attracted attention.

The use of improved methods of predigesting starch in the manufacture of patent infant foods further enhanced their appeal. Objections to starch as unsuitable for the diet of early infancy were providing an increasingly cogent argument against the use of household starches and patent foods alike in the early months of life[4] and the earlier idea that prolonged boiling made starch digestible did not alter the view of doctors that starch was unnecessary

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[1] T.H. Barker, Right Foods for Infants and Children (1866) 17.

[2] Ibid.

[3] Ibid.

[4] See Chapter 4, above, 107-113.

and dangerous for the very young. The introduction of Liebig's method of converting starch into grape sugar by means of malt[1], however, and the emergence thereby of starch foods believed to be suitable for the youngest infant, had a far-reaching effect on attitudes to patent foods. The purchase of Liebig's food ready-made avoided the problems raised by its preparation in the home[2] and despite Liebig's own misgivings about the way in which other manufacturers made use of his method[3], its incorporation into foods such as Savory and Moore's produced results which were highly approved by doctors.[4] The use of 'treated' starch, apparently digestible by babies, contributed to a widening of the gulf between patent foods and ordinary household starches. While some 'treated' starch in fact differed little from the untreated, the existence of this distinction and the stress laid on it by the medical profession meant that by the middle of this period patent foods for infants, already convenient to use, had acquired an additional validity and could no longer so readily be replaced by those household materials with which earlier they had been unfavourably compared.

The discovery of an artificial means of converting starch into grape-sugar was of major significance in the development of patent foods. It marked their transition

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[1] Ibid.,

[2] Ibid.,

[3] J. von Liebig, Food for Infants (2nd ed., trans. E. von Lersner-Ebersburg, 1867) 17.

[4] T.H. Barker, op.cit., 17.

from foods which were acknowledged to be only imperfect substitutes for the child's natural nourishment, to foods which were believed to reproduce precisely the chemical composition of the mother's milk. At the mid-century it had still been considered that to produce a chemical equivalent of mother's milk was an impossibility in the existing state of medical knowledge.[1] Subsequently this began to seem less impossible, but it continued to be stressed that such an alternative was not to be found in starch-based patent foods, since starch did not form any part of the child's natural diet. Starch as grape-sugar, however, as in malted foods, was a different matter. Not only, according to Liebig, was it entirely digestible in that form, being the form into which the healthy mature stomach itself converted starch, but it was an essential element in a compound which was a chemical equivalent of human milk. Foods containing starch in this form Liebig thus believed to be immeasurably superior to the animal milk and water imitations of human milk which had hitherto been thought the best form of artificial infant diet.[2]

By the early 1870s, a development had occurred in the emergence of the milk food compound which appeared to provide the means of perfecting the complete 'mother's milk food'. Hitherto, the fact that milk had had to be added

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[1] R.T. Evanson and H. Maunsell, A Practical Treatise on the Management and Diseases of Children (1847) 51.

[2] J. von Liebig, op.cit., 16.

to the patent foods by the consumer had been an impediment to their correct use, since many mothers and nurses had failed to understand the necessity for milk or had been unable to obtain it. Liebig, recognising this problem, had himself provided a partial solution to it by setting up his Registered Concentrated Milk Company[1] to provide fresh malted milk, ready made up, to families living in London and the suburbs. Later he was able to offer a remedy which had a more widespread application: by producing an extract of his malted food, in which dried milk was incorporated, he ensured that the food could not be made up without this necessary ingredient. At the same time, the food was made easier to prepare. Advertised as 'the most convenient, most portable, most suitable, most agreeable, and the most economical food for children'[2] the Malted Extract required no cooking, and the addition of neither milk nor sugar, but merely had to be mixed with water. As well as being convenient, the Extract was also said to be much cheaper than the same food made with fresh milk. Advertisements described it as the 'cheapest Infant Food in the market' costing only threepence-halfpenny a day to feed a child exclusively on it.[3] When prepared as directed, it was stated, the food was identical with human milk, both substances containing in the same ratio of 1:3.8 the warmth-producing and blood-producing elements which formed

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[1] Ibid., advertisement, 31.

[2] Anon., Baron Liebig and the Children (Lily and Company, 1873) 29.

[3] Ibid., advertisement, 49.

the basis of Liebig's analysis.[1] The Extract was highly praised by medical men whose opinion was solicited by the manufacturers, including such well-known doctors as Edwin Lankester, C.H.F. Routh and J.B. Curgenven.[2] It was the first of a number of similar milk foods produced in the later decades of the period.

The array of patent foods on the market in the 1880s and 1890s was so large and various that no writer on infant feeding would have been justified in omitting to mention them. Widely differing views were expressed. Some manuals of advice for mothers showed enthusiasm for patent foods[3], while Dr Sophia Jex-Blake and others determinedly rejected 'the whole tribe'[4] as being largely to blame for high rates of infant mortality and morbidity.[5] In the main, the note struck was one of caution. 'As everyone knows', Goodhart wrote in 1888, 'all sorts of concoctions are abroad which are supposed to outdo Nature in appropriateness of composition and directness of aim'.[6] Competition, however, was a 'hard taskmaster'[7] and Nature, he concluded,

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1 J. von Liebig, op.cit., 10.

2 Anon., Baron Liebig, op.cit., 38.

3 H.A. Allbutt, Every Mother's Handbook (1897) 75 et seq.

4 S. Jex-Blake, The Care of Infants (1884) 18.

5 E. Cautley, The Natural and Artificial Methods of Feeding Infants and Young Children (1897) 266.

6 J.F. Goodhart, The Diseases of Children (3rd ed., 1888) 26.

7 Ibid.

not easily outdone. Both Goodhart and other authorities were happy to recommend certain patent foods for limited use in particular circumstances, and acknowledged their value in these instances; such foods were not, however, felt to be necessary in the majority of cases as long as good milk was available.

In a series of lectures to his students at St Mary's Hospital and at Great Ormond Street, published in 1889, W.B. Cheadle made a comprehensive survey of patent foods for infants, describing the advantages and disadvantages which he believed attached to their use.[1] He found that many were valuable as a means of adding to the diet both extra protein in the form of gluten and extra carbohydrate in the form of grape-sugar. Extra protein, he observed, was often necessary in the diet of infants fed principally on animal milk. Such milk was often of poor quality, and in an attempt to overcome the difficulty many infants experienced in digesting it, it was frequently further impoverished by dilution to a point at which it became nutritionally inadequate. The addition of properly digested carbohydrate to the diet was also, Cheadle felt, often of great benefit. It appeared to make animal milk more digestible, and he found it, furthermore, more satisfactory as a sweetening agent than the cane sugar which was generally used for that purpose. Finally, in cases of serious sickness or debility, particular kinds of proprietary products, such as pancreatised foods, were considered by

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[1] W.B. Cheadle, On the Principles and Exact Conditions to be observed in the Artificial Feeding of Infants (1889) 66-103.

Cheadle to be,as many parents had found, of great value.

Cheadle's approval of the patent foods was, however, tempered with caution, and he stressed that their usefulness was limited. Milk was the infant's 'type-food';[1] nothing could surpass or replace it, and patent articles were only valuable in so far as they served to promote and facilitate its use. When they ceased to be regarded as accessory foods, Cheadle believed, they not only ceased to be useful but began to constitute a serious threat to the life and health of the child. In this respect the development of the milk foods, in particular, was unfortunate.[2] In so far as they replaced patent foods made without milk of any kind, they were useful, but when they replaced foods which had been made with fresh milk, they represented a serious deterioration in the diet. Although they were advertised as complete foods requiring no additions, the milk foods lacked both sufficient protein and sufficient fat to meet the infant's needs,[3] thus interrupting growth, and causing loss of energy and rickets. Such foods also supplied a harmful excess of carbohydrate, and failed to protect the child against scurvy.[4] In contrast with foods made with fresh milk, ready-prepared dried milk foods offered mothers and nurses convenience, for which many were prepared to pay more money. It was acknowledged that the real price of such convenience was paid, however, in impaired health and development, by the child.

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[1] Ibid., 87.
[2] Ibid., 91.
[3] Ibid.
[4] Ibid., 93.

Even when patent foods were used in conjunction with fresh milk, some problems remained, one of which was the difficulty of digestion. Some of the methods stated by manufacturers to be capable of transforming starch into grape-sugar were, in fact, Cheadle observed, incapable of doing so, or only partially completed this task. Where this happened, the food was suitable only for infants capable of digesting untreated starch, that is, according to general consensus, those over three months of age. Despite this, foods containing imperfectly treated starch were both advertised and used for infants below this age, with deleterious effects. In this category of foods Cheadle included those based on baked flour and those of the malted variety in which the process of conversion was only partially carried out before preparation, and the starch finally completely altered in the child's stomach. The pancreatised foods, widely used during the 1880s,[1] posed a different kind of problem. This method of pre-digestion was criticised not for its failure to convert starch adequately, but rather for its too effective action in converting protein and fat as well, thus digesting on his behalf substances with which the healthy infant was able to cope for himself. This, Cheadle believed, was detrimental to the digestive system. While pancreatised foods might prove invaluable for use temporarily in cases of genuine impairment of the digestive powers, he did not recommend them for babies in normal health[2], and deplored

[1] See Chapter 3, above, 84-5.

[2] W.B. Cheadle, op.cit., 86.

their unnecessary use by mothers and nurses.

Many contemporary commentators suggested that the misuse of patent foods was largely the responsibility of their manufacturers. Edmund Cautley, in an analysis of the patent foods available in the 1890s, dealt at some length with inaccuracy and misrepresentation in advertising.[1] Like Cheadle, Cautley acknowledged that there were instances in which patent foods were valuable. In the main, however, he believed that the 'amount of harm and the mortality due to their use far outweighs the advantages derived from them in a few cases'.[2] Among the practices for which he criticised manufacturers was the publication of misleading chemical analyses of their products. Analyses made of the same foods by disinterested persons and published by Cautley in his treatise[3] showed that the figures given in several advertisements were either incorrect, or incomplete in some significant respect, so concealing substantial differences between the product advertised and the child's natural food, with which they were attempting to prove its identity. The pictures of large, healthy-looking babies published by the manufacturers of patent foods Cautley condemned as equally misleading, observing that the 'fine, fat, blooming children of the...advertisements only exist in the imagination, or, when seen in the flesh, are simply fat

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[1] Cautley, op.cit., 272, 277.

[2] Ibid., 279.

[3] Ibid., 272, 277.

and rachitic'.[1] He alleged that further misrepresentation occurred where figures, given for the constituents of certain foods referred to their content before, instead of after, dilution, and where foods varied in their composition from year to year, cheaper ingredients and processes being substituted for those which had originally been employed.[2]

The nineteenth century mother and nurse were little disposed to question what they learned about infant feeding from advertisements. Despite the exposure of dishonest products in the press, despite the cautions of the medical profession, despite the high price of the products themselves, and even where an extensive trial of them had failed to produce good results, patent foods continued to be relied upon. One child, under the care of Edmund Cautley in the 1890s, was described as surviving only by the greatest good fortune, having, by the age of three months, been fed on no less than fourteen different proprietary foods.[3] Among the 'thousands of mothers'[4] whose faith in the patent foods was the reason for there being ever greater numbers of these products on the market were included not only the rich, but also the poorer classes, who, though unable to make extensive use of them,

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[1] Ibid., 267.

[2] Ibid., 266.

[3] Ibid., 280.

[4] E. Kanthack, The Preservation of Infant Life (1907) 38.

were said to believe in the patent foods 'most religiously'.[1] Such adherence on the part of the poor is evidence both of the pull and the misrepresentation of the advertisements, since these mothers could seldom afford to feed infants exclusively on patent foods and were forced to sacrifice other elements in the diet, often milk itself, in order to allow the child even a small quantity of the patent food. Under these circumstances babies rarely thrived, but the popularity of the proprietary foods was undiminished, largely, as contemporaries observed, because the deficiency diseases suffered by the poorly fed child often went unnoticed or were attributed to some non-dietary cause.

The acknowledged influence of patent foods on the nutrition of infants was increasingly resented by doctors. They felt that infant feeding was 'more in the hands of untrained nurses and manufacturers of articles of infant diet than under the control of the medical profession'[2], with the result that 'children of all classes...suffer from...being unsuitably fed'.[3] In contrast with that of the patent food manufacturers, the voice of the medical profession was infrequently heard by the bulk of the population. The manufacturers' influence was widespread by virtue of their ubiquitous advertisements, which penetrated into the poorest districts by means of various

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[1] B.B. Joll, Nursery Hygiene (1884) 49.

[2] F.H. Alderson, Diet and Hygiene for Infants (1906) 1.

[3] Ibid.

kinds of outdoor advertising[1] and into the very homes of the rich in the form of circulars and free samples of patent foods sent to addresses from which birth announcements had been made in the newspapers.[2] The foods which were recommended by doctors in place of these highly advertised articles received, in contrast, no advertisement, while those who advocated their use had limited opportunities to do so personally. Even in richer families, it was stated, little care was taken in obtaining medical treatment for infants, some parents expecting to pay less for their children's care than for their own[3], and many obtaining the services of unskilled medical men for this purpose.[4] Where competent doctors were consulted, they complained that their instructions were overridden by the nurses. Of the many manuals of advice on the management of infants which circulated among middle class mothers during this period, many were of dubious quality and failed to give adequate or up to date advice on the subject of patent foods. Though an increasing amount of published advice was available to poorer mothers towards the end of the century, still comparatively few benefited from it. Poorer families seldom called a doctor for infantile complaints, and access

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[1] E.M. Bunting, et al., A School for Mothers (1907) 43; A. Money, The Health of Children (1888) 7.

[2] E. Kanthack, op.cit., 38.

[3] C. West, Medical Women: a statement and an argument (1878) 28-9.

[4] J. Tatham, 'Special Dangers to Health in Large Towns', Manchester and Salford Sanitary Society Health Lectures for the People, 3rd series 6 (1879-80) 110.

to medical advice through Schools for Mothers and similar institutions was not generally available even after 1900. Since the greater pressure of the advertisers was, furthermore, directed towards persuading mothers to use foods already more convenient and appealing than those recommended by doctors, it is not surprising that that pressure prevailed.

Novelty, and a natural anxiety on the part of mothers to give their children the benefit of modern ideas and discoveries, were influential factors in the appeal of the patent foods. From the 1850s manufacturers showed themselves to be aware of this, by modifying their products in accordance with scientific advances. By the 1900s, the current 'creed of the public'[1] in regard to infant feeding was the sterilisation of food. 'Among the more wealthy mothers of the community', Alderson wrote in 1906,

> there is a tendency to fix their faith absolutely to any milk food preparation or other patent food provided...above all that the magic word "sterilised" is printed in large letters on the bottle or tin. 2

Earlier preoccupations had been the predigestion of starch, or the degree of similarity to the mother's milk as shown by chemical analysis. Throughout this period ideas on infant feeding changed to such an extent that almost every decade saw some new preoccupation or shift of emphasis, each given poignancy and often an inflated importance by the

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[1] F.H. Alderson, op.cit., 29.

[2] Ibid.

acknowledged need to find an answer to persistent problems. The patent foods provided a vehicle for the expression of changing ideas, whether the impetus for change was provided by anxiety or merely by a desire to be modern or fashionable, and as such they fulfilled a need on the part of their public which was not so readily met by the cheaper, unadvertised, and more mundane foods.

The unsatisfactory nature and scarcity of alternative foods was an additional factor in encouraging the use of patent foods, and one with which the medical profession was equally powerless to deal. Disapproval among doctors of the indiscriminate way in which the proprietary foods were used was due to their conviction that patent foods were normally unnecessary in infant feeding. That is, no such food was required for children under six months who could thrive on fresh animal milk, or for whom good milk, cream and sugar were available. These ingredients were not, however, normally available to the mass of the population. Cream they certainly could not obtain, and witnesses testified to the fact that many still lacked any reliable source of milk a decade after the close of the nineteenth century.[1] Many infants in all classes failed to thrive on such milk as was available. In the absence of those good basic materials which were supposed to make their use superfluous, patent foods inevitably found a market. Preserved milks, particularly sweetened condensed milk, were in some sense an alternative to patent foods, but

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[1] See Chapter 3, above, 77.

the use of these was not wholly satisfactory; furthermore, the desire of many mothers and nurses to give babies something more substantial encouraged the use of the patent foods. The difficulty of distinguishing between the fat rachitic child and the blooming infant of the advertisement confused mothers into believing that their choice was a wise one.

An historical analysis confirms the validity of contemporary views on the effect of patent foods upon the health of babies during this period. It is difficult to calculate the extent to which these foods were used, but it is clear that they were commonly employed except among the very poor. Even the best and most honestly promoted of these foods was open to abuse, and it is evident that many were misused, either through being wrongly prepared, or because they were relied upon as the sole ingredient of the child's diet. The less honestly marketed foods were more dangerous. In addition to giving rise to the scurvy and debility which were often the result of the use of the superior patent foods, they produced rickets and other symptoms of malnutrition. Digestive disorder resulting from the inferiority and indigestible nature of the starch content of these foods was also common. Had it been possible to ban the use of patent foods under one year of age as Cautley, in despair, desired,[1] the problem would not, however, have been solved entirely. Certainly, as Cautley and others were convinced, some benefit would have accrued to

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[1] E. Cautley, op.cit., 266.

the infant population. But this benefit would have been restricted to those children for whom properly prepared and suitable alternative foods were available. More important than a ban on patent foods was the education of mothers in the dangers of their use and the provision of an adequate supply of alternative foods. The degree of understanding of the role of the patent foods, particularly in the deficiency diseases, which had been gained through the work of Cheadle and others by the end of the nineteenth century provided the necessary starting point for such advances.

CHAPTER 6

Quantity and the timing of feeds.

The quality and nature of the diet given during this period are not the only factors to be taken into account in assessing the effect of artificial feeding on the health of very young children; the quantity and timing of feeds was also of significance. In any scheme of infant feeding, whether natural or artificial, quantity cannot fail to be an important consideration; artificial feeding, however, inevitably stresses quantitative issues. It allows greater opportunities for regulating the diet than are offered by breastfeeding, and in doing so raises questions of a quantitative nature which do not need to be answered so precisely where infants are breastfed. The knowledge required for the wise control of quantity and timing in artificial feeding was still being acquired in the second half of the nineteenth century. The growth of this knowledge was a vital thread in the development of artificial feeding techniques during this period.

In the eyes of contemporaries, the principal quantitative problem in artificial feeding was overfeeding. The tendency to overfeed infants was, it was noted, a long-standing one, occurring in breastfeeding as well as in wholly artificial regimes. Dr Barker, advising on breast-feeding in 1852, remarked that 'prejudice and tradition often lead mothers and nurses to distrust the sufficiency of

nature's resources',[1] their fear of starving the child resulting in the administration of gruel and other foods in the intervals between suckling. Where children were fed from an early age entirely by hand, the danger of overfeeding was felt to be considerable. The practice was noted by critics throughout this period. In the 1890s it was observed to be giving rise to a marked difference between the gastric capacities of handfed and breastfed children.[2] The consequences of overfeeding were believed to be serious: it was thought to constitute a major cause of infantile disease, leading initially to a variety of gastric complaints and if prolonged, to more severe and possibly fatal disorders, including atrophy and convulsions.[3]

Handfeeding was thought to be particularly conducive to overfeeding in its encouragement of the practice of giving too much food at once. 'If a child be at the

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1 T.H. Barker, 'On the Diet of Infancy and Childhood', British Mothers' Magazine VIII (1852) 194.

2 E. Cautley, The Natural and Artificial Methods of Feeding Infants and Young Children (1897) 163.

3 P.H. Chavasse, Advice to a Mother (10th ed. 1870) 29; Eustace Smith, On the Wasting Diseases of Infants and Children (1868) 17; A. Combe, A Treatise on the Physiological and Moral Management of Infancy (6th ed. 1847) 70; M.A. Baines, The Comparative Properties of Human and Animal Milks (1860) 12.

breast...alone', Chavasse observed, 'there is no fear of his taking too much; but if he be brought up on artificial food, there is great fear of his over-loading his stomach'.[1] The possibility that the child might over-eat of his own volition was attributed to various causes, among them the administration of food which was highly sweetened and thus particularly palatable. The type of feeding utensil which was used was also believed to be a cause either of the infant himself taking too much food, or of the mother or nurse forcing on him more than he required. Thus it was felt that the practice of leaving a full feeding bottle in the cot to be sucked at will, which came into vogue with the development of the more sophisticated tubed bottles[2], encouraged children to overfeed.[3] Dr Graham suggested that the spoon, on the other hand, was to blame because it did not make the child work for his meal. Infants fed in this manner, he remarked, 'and subject only to the trouble or pleasure of swallowing the food' were tempted to take too much at a time.[4] Furthermore, Graham believed, feeding by means of the spoon

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1 P.H. Chavasse, op.cit., 29.

2 See Chapter 7, below, 174-179.

3 T.C. Wigg, The Feeding of Infants, together with the Preparation of Food for the Sick and Infirm (1880) 13.

4 T. Graham, On the Management and Disorders of Infancy and Childhood (1865) 216.

constituted an undue temptation to the nurse 'to force down an additional boatful or two' against the child's natural inclinations.[1] The administration of unsuitably large quantities of food in this way was frequently taken to extreme lengths, one authority reporting having seen children shaken at intervals during feeding 'as if to pack better',[2] another comparing the nourishment of infants with the fattening of turkeys for the market.[3] 'Many a...child', Chavasse declared, 'has been, like a young bird, killed with stuffing'.[4]

It was not only the large size of infants' meals which drew the censure of critics, but also the fact that they were too frequent, a fault which was described by the Ladies' Sanitary Association in 1872 as 'one of the principal causes of the failure of artificial feeding'.[5] Doctors accused mothers and nurses of feeding children 'at every whimper', regardless of whether it signified hunger or not, thereby setting up a vicious circle in which their charges were continually filled with food in response to cries which originated solely in indigestion brought about

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[1] Ibid.

[2] A. Combe, op.cit., 70.

[3] C. West, The Mother's Manual of Children's Diseases (1885) 54.

[4] P.H. Chavasse, op.cit., 29.

[5] Anon., On Handfeeding (Ladies' Sanitary Association, 1872) 20.

by earlier overfeeding.[1] The 'tormenting officiousness' of nurses[2], which allowed no time for one meal to be digested before another was given, was rendered particularly dangerous by the nature of the food administered. This was too thick, in many cases, to allow the child the relief of vomiting, instead, fermenting in the bowel and causing severe 'gripes'.[3]

The desire to keep children quiet was given as one of the chief reasons for the popularity of feeding on demand. Crying, it was asserted, was frequently automatically identified with hunger, and, as Mrs Barwell noted, 'a crying hungry child offers a great temptation to quiet it by [sic] food'.[4] It was noted that nurses were particularly prone, even against express instructions, to feed children if they cried in the intervals between meals. Where mothers worked in domestic industry it was observed that the children who often deputised for them were adept at 'stuffing' their young charges; often this was because the child's crying interrupted the older children's play, or because babies did not appreciate attempts made to amuse them. Reginald Bray described one such incident.

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1 T. Graham, op.cit., 136.

2 Ibid.

3 W.P. Dewees, A Treatise on the Physical and Medical Treatment of Children (Philadelphia 1842) 175; L.M. Barwell, Infant Treatment under Two Years of Age (1859) 17.

4 Ibid., 22.

> A luckless baby, with features puckered like a monkey, is rigidly fixed in a 'go-cart'... /it shrieks/...Finally relief comes...: the small attendant produces from a dusty pocket some deleterious sweetmeat and thrusts it into the infant's mouth. [1]

As critics noted, feeding was usually an effective means of pacifying children in an 'irritable, restless and wakeful condition', even if it was a short-term solution.[2]

The desire to keep a child quiet was not, contemporaries pointed out, the only cause of the too frequent or too lavish administration of food. Kindness as well as impatience resulted in excessive feeding, 'the attendant having recourse to it as a solace and amusement to the child'[3], or because it was thought to be beneficial to him.[4] The Ladies' Sanitary Association observed that in overfeeding children through a desire to spoil or comfort them, nurses 'especially err'.[5] The reason, it was suggested, was that in the poor families from which such nurses were largely drawn, a plentiful supply of food was regarded as a luxury, and rarely seen as a potential source of danger to health.[6] 'Cramming' was a ready means of indulging a child, and an overfed infant was as likely to be one on whom too much care had been bestowed as one who

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[1] R. Bray, The Town Child (1907) 86.

[2] E. Cautley, op.cit., 166-7.

[3] M. Underwood, A Treatise on the Disorders of Childhood, and Management of Infants from the Birth (10th ed., with additions by H. Davies, 1846) 60.

[4] L.M. Barwell, op.cit., 21.

[5] Anon., Handfeeding, op.cit., 20.

[6] Ibid., 17.

had been deprived of attention. A similar use of food can be seen in the habit, said to be common among working class parents, of feeding babies titbits of food from their own plates.[1]

It was constantly noted that behind the use of food as a general panacea and as a means of indulgence lay the firm belief of mothers and nurses that large quantities of food were essential for the adequate nourishment of infants. This idea was encouraged by the high incidence of wasting diseases among very young children.[2] Mothers and nurses were found to be unable to understand that a quantitatively generous diet might nevertheless be an insufficiently nourishing one, and constantly attempted to ward off or to cure wasting by feeding children large amounts of unsuitable food in the belief that quantity and bulk alone would solve the problem. As Eustace Smith observed, undernourished and badly fed children often displayed ravenous appetites, and consumed a very large quantity of food.[3] He recorded that 'the fact

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[1] W.N. Maccall, 'Health and Recreation in Childhood', Manchester and Salford Sanitary Association Health Lectures for the People, 3rd series 3 (1879-80); H. Ashby, 'Infant Feeding in Relation to Infant Mortality', Manchester and Salford Sanitary Association Health Lectures for the People, 5th series 5 (1881-2) 84.

[2] Eustace Smith, op.cit., 14.

[3] Ibid., 23.

that, in spite of such voracity, the child should still continue to waste excites much wonder amongst his attendants'.[1]

The evidence adduced by contemporaries for the frequent overfeeding of infants during this period is on the whole convincing. There are, nevertheless, factors which suggest that their view may have been exaggerated. In the first place, a number of symptoms common in infancy which were attributed by nineteenth century authorities to overfeeding would now be considered less obvious indications of its existence. An example is the appearance of green bowel motions, now sometimes referred to as 'starvation stools'[2], which were attributed by nineteenth century writers to overfeeding coupled with undernourishment, but which could as readily have coexisted with underfeeding.[3] Furthermore, some of the circumstances believed by contemporaries to favour overfeeding would not now be thought to do so. The practice of leaving infants to feed themselves, for example, was pointed to by nineteenth century doctors as likely to lead to overindulgence[4]; authorities have more recently suggested, however, that infants are less likely to glut themselves than

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[1] Ibid.

[2] R.S. Illingworth, All about Feeding Your Baby (British Medical Association, c.1970) 14.

[3] Ibid.

[4] M. Underwood, op.cit., 59; T. Graham, op.cit., 131.

to go hungry, some even being happy to starve and likely to do so unless active measures are taken to avoid this.[1]

In addition to placing too much emphasis on the problem of overfeeding in handfed infants, contemporary authorities may have given too little attention to underfeeding. Although contemporaries rarely felt this to be a cause of failure in hand feeding, there are indications that it affected a larger number of children than was generally suspected at the time. One factor which suggests this is the problem of the collapsing teat. Dr Ballard noted in 1860 that the tendency of teats, in particular the teats on the earlier feeding bottles, to collapse in infants' mouths led to the damaging practice of 'fruitless sucking'.[2] Ballard believed that fruitless sucking had dangers of its own, and he did not proceed to consider underfeeding as an associated factor. Both logic and the symptoms he described suggest, however, that underfeeding did result from this cause. Later bottles were successful in avoiding this problem, but difficulties remained in the form of the blocked teat. This was seldom referred to as a problem by nineteenth century doctors, but authorities have more recently suggested that blocked teats, or those with too small a hole, are responsible for a good deal of underfeeding in infants.[3]

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[1] R.S. Illingworth, op.cit., 5.

[2] T. Ballard, A New and Rational Explanation of the Diseases Peculiar to Infants and Mothers (1860) 1.

[3] R.S. Illingworth, op.cit., 21.

Another factor which almost certainly contributed to underfeeding in infants during this period was the frequent administration of drugs.[1] It was noted that children who were regularly drugged became emaciated[2], and that their appetites were impaired.[3] Doctors were not frequently called upon to attend the class of child most likely to be heavily drugged, and seem to have regarded these symptoms as the result of the action of the drug itself, rather than of underfeeding. Underfeeding cannot, however, be ruled out; not only does loss of appetite suggest that it was difficult to persuade such children to eat, but the failure of a drowsy child to cry for food also makes it likely that his needs would have been neglected by busy or otherwise careless mothers. In the manufacturing districts, where drugging was common, it was well known that children often pined away as a result of being constantly drugged.[4]

Both over- and underfeeding are likely, for obvious practical reasons, to have been most common in working class families. The conditions in which babies were looked after in such families, particularly among the poorest classes, whether as regards the food which could be obtained,

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1 See Chapter 8, below, 194-216.

2 Ibid.

3 Ibid.

4 Anon., 'Labour and the Poor in the Metropolitan, Rural and Manufacturing Districts of England and Wales', Supplement to the Morning Chronicle (January 4th, 1850) 19.

the equipment available, or the time the mother was able to allot to feeding, were such as to increase automatically any tendency to error. Working class families did not, however, exercise a monopoly of error. Even in a more favourable environment similar tendencies were found, and the prejudices and mistaken notions which combined with bad material conditions to produce feeding error in poorer families existed, too, among the middle and upper classes. The nurses employed in wealthier families were often the means by which prejudices were transmitted. They had themselves been reared in very different conditions from those in which they later worked, and despite the material advantages offered in their employers' households the beliefs and practices of their own early years frequently continued to influence them.[1]

When Conquest wrote in 1852 of the 'lamentable... /and/ utter ignorance of all concerned as to the amount requisite for the healthy carrying-on of the functions of life'[2], it is not certain whether he included the medical profession in the scope of his condemnation. In the earlier years of the period, however, the ignorance of mothers and nurses on questions of the quantity and timing of feeds was certainly little relieved by assistance from the medical profession. Despite the constant criticism

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[1] See Chapter 4, above, 104, 106.

[2] J.T. Conquest, Letters to a Mother (4th ed. 1852) 132.

directed by doctors at contemporary feeding practices, their published works on the subject tended to leave quantitative questions to those immediately concerned with infant care. As in other aspects of infant feeding, the attitude seems to have been that errors were chiefly the result of neglect or carelessness, and that moral exhortation rather than practical guidance was what was required of the medical adviser. It was the view of Graham that 'a little careful observation on the part of the nurse...and she will soon become familiar with the proper quantity to be administered...habit will soon enable a careful and observing woman to determine the quantity'.[1] Furthermore, as Combe observed, 'there are great differences in constitution in infants, and some require and digest double the quantity...required by others'[2], a fact which made any attempt to lay down comprehensive rules on matters of quantity appear doubly inappropriate. It was those closest to the child, it was felt, who alone could properly understand his language and estimate his needs; beside their personal knowledge and experience the abstractions of medical science were of little value.

By the doctors' own admission, however, these simple rules were inadequate to ensure that handfed infants received the correct amount of food. As Combe himself observed, general principles which doctors might expect to

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[1] T. Graham, op.cit., 220.

[2] A. Combe, op.cit., 65-6.

be accepted as a matter of course were frequently not accepted at all; thus, far from accepting that vomiting after a meal might be an indication that a child had taken too much food, nurses turned such vomiting into a goal.[1] 'Observing', Combe wrote, '...that immediate relief follows the emptying of the stomach, they...adopt the notion that vomiting is a sign of health, and by this false reasoning are led to persevere in a course of positive mischief to the child'.[2] It was such apparently elementary misconceptions which constantly frustrated doctors in their dealings with mothers and nurses and which seemed to them to put the success of artificial feeding in jeopardy.

Later in the century, largely because of the ignorance of mothers and nurses, it became common for medical writers to acknowledge the need for more precise rules on the timing and quantity of feeds administered by hand. Eustace Smith, writing in 1868, recognised the desirability of a more stringent approach. On the subject of infant diet, he wrote,

> it is necessary to state distinctly...the quantities to be allowed at each meal, and the frequency with which the meals are to be repeated. It is advisable to write down all such directions that misunderstandings may be avoided. 3

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[1] Ibid., 80.

[2] Ibid.

[3] Eustace Smith, op.cit., 9.

In short, he believed, the same attention was to be paid to such instructions as was customarily paid to the ordering of drugs.[1] From this approach it was a short step to laying down rules for quantity and timing in infant feeding which might have a more general application.

The chief principle which came to be expounded by contemporary authorities in regard to the timing of feeds was the need for regularity. The allotment of sufficient time for food to be digested was recognised as a factor to be taken into account, but the emphasis on timing was as much on training the child in orderly and convenient habits as on his quantitative requirements. It was thought by the majority of commentators that intervals between feeds of one and a half to two hours during the day were appropriate in early infancy, these lengthening to intervals of three and four hours as the child became older. Night feeds were the subject of some disagreement, and were not invariably acknowledged to be necessary at all. At one extreme, authorities regarded any night feeding as 'a physiological mistake'[2], while at the other, it was felt that children required feeding during the night even as late as the sixth month. Between the two extremes there was, however, a substantial body of opinion which asserted that night feeds should be given for the first two months or

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[1] Ibid.

[2] J.G. Beaney, Children: their Treatment in Health and Disease (Melbourne 1873) 70.

so, at intervals rather longer than those observed during the day. After the age of two months, it was generally felt that children could be trained to do without night feeding, and that a night 'consecrated to repose' would be found beneficial to both mother and infant.

Just as doctors acknowledged the need for precise regulation of the timing of feeds, so they recognised the necessity for laying down the quantity of food to be administered at each meal; but whereas their search for principles governing the timing of feeds met with some success, their attempts at precision regarding the size of feeds failed. Agreement on timing had not been reached as a result of detailed understanding of the infant's quantitative requirements: agreement on the size of individual meals could depend on nothing else. It was agreed that the best plan was to keep as closely as possible to Nature. Exactly what Nature laid down was, however, unknown, since research into matters such as the size of the stomach, which would have afforded some guidance to those involved in infant feeding, was scanty and inconclusive. As late as the mid-1880s, Dr West mentioned research into stomach capacity in infancy undertaken by 'two very distinguished French physicians'[1], but concluded that 'their observations were not sufficiently numerous to be decisive and their results were very conflicting'.[2] In the following decade

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[1] C. West, op.cit., 54.

[2] Ibid.

Edmund Cautley mentioned attempts to estimate the size of the infant stomach by Caillé[1], but dismissed the latter's findings on the ground that they had been based upon research carried out on dead and therefore probably abnormal infants, and that there was 'great liability to err in the method of measurement adopted'.[2] By that time, other research workers had published their findings, among them Frowlowsky and Rotch, on whose work Cautley's own estimates were based[3], but there was still no general agreement among doctors on this subject.

Despite the seriousness with which quantitative questions were being approached, the later decades of this period show as great a disparity between the recommendations of different doctors on the subject of the quantities to be administered as had existed earlier. Some of these variations are illustrated in the accompanying table. As they show, there existed at that time no single definition of the requirements of any infant at any particular age or stage of development, and that there was therefore no agreed yardstick by which mothers could usefully be advised.

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[1] E. Cautley, op.cit., 163.

[2] Ibid.

[3] Ibid., 162-164.

Age of child	Quantity of food suggested in 24 hours (1970)[1]	Quantity of food suggested in 24 hours (C19)	Date	Authority
2 weeks	c. 21 ozs.	8 ozs.	1865	Graham[2]
		9 ozs.	1897	Allbutt[3]
		14-16 ozs.	1897	Cautley[4]
		20-25 ozs.	1888	Goodhart[5]
4 weeks	c. 23 ozs.	16-24 ozs.	1887	Cheadle[6]
		20+ozs.	1885	West[7]
		25-30 ozs.	1888	Goodhart[8]
		30-60 ozs.	1888	Eustace Smith[9]
5 weeks	c. 23 ozs.	18-24 ozs.	1865	Graham[10]
		32-36 ozs.	1888	Goodhart[11]
6 weeks	c. 23 ozs.	8-10 ozs.	1897	Allbutt[12]
		18 ozs.	1905	Serjeant[13]
		36-40 ozs.	1888	Goodhart[14]
8 weeks	c. 26 ozs.	c. 20 ozs.	1889	Wood[15]
		25 ozs.	1884	Jex-Blake[16]
		40-80 ozs.	1866	Barker[17]
9 weeks	c. 28 ozs.	c. 20 ozs.	1889	Wood[18]
		28 ozs.	1906	Alderson[19]
		48 ozs.	1884	Joll[20]
11 weeks	c. 31 ozs.	c. 20 ozs.	1889	Wood[21]
		32 ozs.	1906	Alderson[22]
		c. 80 ozs.	1866	Barker[23]
4 months	c. 36 ozs.	21-28 ozs.	1897	Cautley[24]
		30-35 ozs.	1887	Cheadle[25]
		c. 42 ozs.	1888	Goodhart[26]
6 months	c. 41 ozs.	30 ozs.	1897	Allbutt[27]
		35-45+ ozs.	1887	Cheadle[28]
		48-56 ozs.	1905	Serjeant[29]

Footnotes to Table appear on following page 157.

Footnotes to Table on page 156.

[1] R.S. Illingworth, op.cit., 30-1.

[2] T. Graham, op.cit., 127.

[3] H.A. Allbutt, Every Mother's Handbook (1897) 70.

[4] E. Cautley, op.cit., 169.

[5] J.F. Goodhart, The Student's Guide to Diseases of Children (1885) 29.

[6] W.B. Cheadle, On the Principles and Exact Conditions to be observed in the Artificial Reeding of Infants (1889) 76.

[7] C. West, op.cit., 54.

[8] J.F. Goodhart, op.cit., 29.

[9] Eustace Smith, op.cit. (5th ed. 1888) 19, 33.

[10] T. Graham, op.cit., 132, 203.

[11] J.F. Goodhart, op.cit., 29.

[12] H.A. Allbutt, op.cit., 70.

[13] H. Serjeant, op.cit., 8.

[14] J.F. Goodhart, op.cit., 29.

[15] C. Wood, A Handbook for the Nursing of Sick Children (1889) 180.

[16] S. Jex-Blake, The Care of Infants (1884) 26.

[17] T.H. Barker, Right Foods for Infants and Children (1866) 13.

[18] C. Wood, op.cit., 180.

[19] F.H. Alderson, Diet and Hygiene for Infants (1906) 62-3.

[20] B.B. Joll, Nursery Hygiene (1884) 48.

[21] C. Wood, op.cit., 180.

[22] F.H. Alderson, op.cit., 63-4.

[23] T.H. Barker, op.cit., 13.

[24] E. Cautley, op.cit., 169.

Footnotes to Table continued

[25] W.B. Cheadle, op.cit., 27.

[26] J.F. Goodhart, op.cit., 29.

[27] H.A. Allbutt, op.cit., 70.

[28] W.B. Cheadle, op.cit., 27.

[29] H. Serjeant, op.cit., 8.

The discrepancies evident through this period in the advice given by medical authorities as to the size of feeds derived largely from their use of the age of the child as the sole gauge of the amount of food he required. This was an imprecise criterion. At every age there were infants of a variety of sizes and weights, and these differences were reflected in the variety of estimates given as to their requirements. Such variations afforded little guidance to mothers and nurses, while an attempt to adhere strictly to any one estimate might well have been harmful to the child. The assessment of requirements by age alone not only failed to make allowance for children whose weights, though normal for their age, differed considerably; it also entirely failed to cater for children whose weight was abnormal and required correcting. These problems could only be overcome by the use of age and weight together as the basis for assessing a child's quantitative requirements. This approach was becoming more common during the last decades of this period[1], and its emergence is of significance. It marked the end of the period of greatest uncertainty in quantitative assessment in infant feeding, and paved the way for a more soundly based system subsequently.

Even when doctors became convinced that the size of feeds should be related to the weight and age of children rather than to their age alone they had still to overcome the

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[1] See E. Cautley, op.cit., 161-6.

prejudices of mothers and nurses before a new approach could be implemented. It was widely believed in the last years of the nineteenth century that weighing was a practice which in some way endangered the infant. Mrs Bunting, writing in 1907 about the 'School for Mothers' at St Pancras, stated that superstitions in regard to weighing had been overcome in that institution, and that mothers by that time accepted it as 'one of the usual processes';[1] previously, however, it had been regarded as 'an unlawful dealing with the occult'.[2] Other sources indicate that fear of weighing persisted for much longer than was suggested by Mrs Bunting. Miss Lane-Claypon referred in 1920 to a belief still 'very prevalent in many parts' that if a baby were weighed he would die.[3] The origin of this superstition was, she stated, unknown, but there was a suggestion that it was connected with the fear of attracting punishment 'similar to that visited on Israel and Judah after the numbering of the people by David'.[4] When mothers did not know the precise weight of their babies it was of little use, even for those doctors who wished to do so, to give instructions for feeding which were based on that criterion. It is unlikely that much progress was made towards introducing the weighing of babies as a routine

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[1] E.M. Bunting, et al., A School for Mothers (1907) 46.

[2] Ibid.

[3] J. Lane-Claypon, The Child Welfare Movement (1920) 23.

[4] Ibid. See 1 Chronicles 21.

procedure before the coming of the schools for mothers and similar institutions after 1900, not only because of emotional resistance but also because of the need for specialised equipment, which the majority of people would be obliged to use outside their homes. This inevitably retarded the process by which feeding schedules were becoming more precise. Nevertheless, advances were being made, and the use of schedules both for timing and for the measurement of individual means became more common. The development of graduated feeding bottles[1] is evidence of concern with precise measurement, while the renewal of interest in the tubeless feeding bottle[2] encouraged a regular programme of feeds by making it impossible for infants to be left to feed by themselves for indefinite periods.[3] Manuals of advice for mothers emphasised the need for regularity and precision in feeding and such publications found their way to an increasing extent into poorer homes. Cautley records that the mothers of babies brought to his outpatients' clinic in the 1890s were both able and willing to carry out the feeding instructions he gave them.[4] Such mothers constituted to some extent an untypical group, likely to be more willing to follow advice than the majority, but their attitude illustrates changes

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[1] H.A. Albutt, op.cit., 62.

[2] See Chapter 7,below, 180-184.

[3] Ibid.

[4] E. Cautley, op.cit., 259.

which were beginning to take place. By 1900 quantitative problems had to a large extent become problems with a social origin and needed to be tackled as such, as the success of the educational programmes of the schools for mothers, combined with the practical aid they gave, was shortly to demonstrate.[1]

Despite the advances made in its last years, this was a period in which a degree of quantitative error in the handfeeding of infants was inevitable. Notwithstanding the emphasis laid by contemporaries on overfeeding as a cause of infantile disease it is unlikely, however, that errors of this kind were as much to blame as some believed for the ailments of the handfed child. Errors in the quantity and timing of feeds were commonly associated with nutritionally faulty feeding. Overfeeding in particular, as contemporaries recognised, was closely associated with unsuitable and innutritious diet.[2] It is difficult to separate these errors and to attribute ill effects thought to be the result of feeding to one rather than to the other. It would seem, however, that errors in the selection of foods were more important than errors in the measurement of these foods, and that over- or under-feeding, though influential in determining the effect of the diet, contributed less to its success or failure than the nature of the food itself. Quantitative error nevertheless remains a factor in the generally poor nutritional environment of many handfed children during this period, and as such played its part in their mortality and morbidity.

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[1] See E.M. Bunting et al., op.cit.

[2] See Chapter 4, above, 106.

CHAPTER 7

The feeding bottle

The second half of the nineteenth century was pre-eminently the era of the 'sucking bottle.' Other methods of handfeeding such as spoon, cup and boat were also in use in 1850[1], but the bottle was in the ascendant and before long had become the most widely used of infant feeding utensils. The development of the bottle and artificial nipple, prompted by the desire to follow as closely as possible the natural method of feeding, appeared in many ways beneficial to the child, but it had grave disadvantages which went unrecognised before the spread of disease by means of bacteria was understood. From 1850 until the 1880s, when the ideas of Louis Pasteur began to affect English feeding practice, feeding bottle design had been directed towards the perfection of a mechanical apparatus of some complexity, the purpose of which was to enable the child to feed unattended. The emergence during the 1880s of increasingly stringent standards of hygiene showed this complex bottle to be a dangerous utensil, and a new set of priorities urged upon the public a simpler bottle which, though less convenient to use, was easier to clean. This was an advance of crucial importance to the welfare of the handfed infant, comparable with later developments in the sterilising of

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[1] F. Churchill, The Diseases of Children (1850) 32; T. Bull, The Maternal Management of Children (6th ed., 1857) 68; L.M. Child, The Mother's Best Book (1859) 10.

food and utensils. The task of explaining it to a largely unenlightened public, however, in the absence of institutionalised channels for the communication of health information, was a difficult one, and the complicated dangerous bottles were still being employed at the end of the century. The use of such utensils constituted a major hazard of artificial infant feeding, contributing significantly to the high rates of infant mortality and morbidity which characterised this period.

The infant's feeding bottle, described by Forsyth as 'a kind of pocket wet-nurse'[1], had been in use during the eighteenth and early nineteenth centuries, but had not achieved widespread popularity. By the early 1850s, however, its increasingly common employment was regarded as a great advance in artificial feeding. Thomas Graham wrote in 1853 that 'the boat, the spoon and the horn are in no wise to be compared'[2] with the bottle, and observed that its modern use was 'considered by all professional men a great improvement in the rearing of children'.[3] One of the chief points in favour of the feeding bottle was felt to be that unlike other methods in common use it allowed the child to feed at his own pace. In spoon or boat feeding, doctors felt, the food was given too quickly, and the child

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[1] D. Forsyth, 'The History of Infant Feeding from Elizabethan Times', Proceedings of the Royal Society of Medicine 4 (1911) 113.

[2] T. Graham, On the Management and Disorders of Infancy and Childhood (1853) 207.

[3] Ibid.

forced to take it whether he wanted it or not. 'A child so fed', West observed, 'has no choice in the matter, but must either swallow or choke'.[1] The author of The Mother's Best Book wrote of the feeding boat, it

> should be discarded from the nursery - the mode of feeding with [it] is most objectionable. The boat is replenished and laid on the tongue of the infant [and] the food is poured on those parts of the throat, the irritability of which immediately prompts them, in self-defence, to the act of swallowing. 2

When the bottle was used the food could not be poured down the child's throat in this way; he was less likely to be overfed, or to take his food too hot, or in indigestible lumps;[3] he was also less likely, it was believed, to take in air with his food and thus to suffer from wind.[4] In addition, it was noticed that the use of the feeding bottle was less likely than the boat or spoon 'to render the child uncomfortable by wetting it'.[5] It was the act of sucking, however, which was felt to be of greatest benefit to the child. This, it was argued, was the child's natural mode of feeding. By 'imposing on the child some little degree of labour'[6] it exercised and fatigued him; equally important,

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1 C. West, The Mother's Manual of Children's Diseases (1885) 54.

2 L.M. Child, The Mother's Best Book (1859) 10.

3 T.H. Barker, 'On the Management of Infancy and Childhood', The British Mothers' Magazine VIII (1852) 268.

4 S. Barker, The Diet of Infancy and Childhood (1864) 58.

5 T.H. Barker, loc.cit., 268.

6 T. Graham, op.cit., 208.

sucking led to 'the more copious secretion of saliva'[1], which was an 'important auxiliary to digestion'.[2]

It was observed that the feeding bottle was also of advantage to the nurse, in that it kept the child quiet, being 'so contrived as to please'[3] him with its resemblance to the mother's breast. An attempt to make this resemblance still more striking was made during the 1850s by Routh, in collaboration with a London chemist.[4] 'A bottle of strange and curious appearance', Barrett observed, 'has been devised by Dr Routh... It is somewhat [sic] breast-shaped, and can be worn by the nurse or mother upon the chest, being kept in position by a band or handkerchief'.[5] Although he concluded that few infants would be deceived by the device, Barrett acknowledged that it was 'not without some merit in certain circumstances'.[6] Apart from pleasing the child, the use of the feeding bottle had other advantages for the nurse: it required less attention than either the

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1 T.H. Barker, loc.cit., 268.

2 Ibid.

3 T. Graham, op.cit., 208.

4 C.H.F. Routh: 'On the Mortality of Infants in Foundling Institutions , and generally, as influenced by the Absence of Breastmilk', British Medical Journal (1858) 287.

5 H. Barrett, The Management of Infancy and Childhood in Health and Disease (1875) 43.

6 Ibid., 44.

spoon or the boat, later models being designed to enable the child to feed entirely unaided[1], and finally, with the exception of a minority with open ventholes, bottles could usefully be employed to keep milk warm in the child's or nurse's bed, thus saving the time and trouble required to heat feeds by other means.[2] This was found particularly convenient at night.

The bottle best known in the early 1850s was the 'common glass feeding bottle'[3], usually flat in shape, some having a central venthole for the admission of air. The bottle itself was not considered of great importance. Conquest, in an edition of his Letters to a Mother published in 1848, found no objection to the use of a horn provided that it was fitted with a teat[4], and suggested that a simple alternative means of 'effecting the necessary contrivance' was to fit a teat on to the neck of a 'common phial'[5] or medicine bottle. By 1850 the use of glass bottles was recommended by most authorities in preference to those of metal or earthenware which had been in use earlier[6], chiefly because glass was easier to keep clean than other materials.

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1 Ibid., 41.

2 W.P. Dewees, Physical and Medical Treatment of Children (1842) 172.

3 S.R.P., How to Manage a Baby (Ladies Sanitary Association, 1861) 22.

4 J.T. Conquest, Letters to a Mother (3rd ed., 1848) 145.

5 Ibid.

6 Ibid., 146.

It was also noted that both earthenware and copper, in addition to being opaque, 'acted chemically' on the food.[1] The use of an inner tube in the feeding bottle, which was later to become widespread as a means of avoiding the child sucking up air with his food, was not common in the early bottles. The use of such tubes was mentioned by Dewees in 1842.[2] They appear to have acted like straws, the purpose being to draw milk from below the surface of the liquid in the bottle, thus excluding air. Dewees himself disapproved of the tube on account of its tendency to become blocked with curd, and he also noted that its extremity was less acceptable to the child than the ordinary artificial nipple.[3] In common with other authorities, Dewees preferred the flat oblong tubeless bottle[4] which was generally popular in 1850.

It was the teat which was generally regarded as the most important element in the mid-nineteenth century feeding bottle, and various different kinds were used. The simplest were made from folds of linen or cotton, after the fashion of the French cambric or muslin nipples described by Bouchut[5], and these were then stuffed with sponge to give the child something to grip and to prevent the too rapid

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1 W.A. Alcott, The Young Mother (1842); W.P. Dewees, op. cit., 171n.

2 W.P. Dewees, op.cit., 172.

3 Ibid.

4 Ibid.

5 J.E. Bouchut, Practical Treatise on the Diseases of Children (Trans. P. Hinckes Bird, 1855) 45.

flow of milk.[1] Washleather teats made in the same way, 'in shape and size like the little finger of a glove'[2], were probably more common. Many authorities, however, recommended the use of the preserved nipple of a young heifer.[3] These teats, again stuffed with sponge to prevent the milk being taken too rapidly[4], were found to be firmer and thus more efficient than those made of washleather[5], and equally acceptable to the child. It was observed, however, that unless the nipple were firmly secured to the neck of the bottle with thread, there was some danger of it being swallowed.[6] Other teats in common use were made of cork[7], or of ivory from which 'the earthy part' had been removed[8]. Both were said to make teats which were flexible, soft and elastic.[9] By the early 1850s india-rubber had begun to be employed in the making of teats, but these had not yet achieved great popularity, largely because of the 'repulsive taste'[10] and unpleasant smell[11]

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[1] Ibid.

[2] F. Churchill, op.cit., 32.

[3] L.M. Child, op.cit., 10.

[4] W.P. Dewees, op.cit., 172; T. Bull, op.cit., 68.

[5] F. Churchill, op.cit., 32.

[6] T. Barrett, Advice on the Management of Children in Early Infancy (1851) 48.

[7] S.R.P., op.cit., 22; F. Churchill, op.cit., 33.

[8] F. Churchill, op.cit., 33.

[9] Ibid; J.E. Bouchut, op.cit., 45.

[10] Anon., 'The Biberon, a New Feeding Bottle', Lancet I (1851) 184.

[11] Ibid.

still associated with this new material. By the end of this decade, however, rubber teats were receiving more favourable reports.[1]

Although useful, the common feeding bottles gave rise to certain problems. Those with open ventholes were often thought to be an advance over those without, in that they allowed air into the bottle, thus preventing the formation of a vacuum as the child sucked, followed by the collapse of the teat and the subsequent cessation of the flow of milk. On the other hand the open venthole was a disadvantage in that it allowed the contents of the bottle to escape easily, and at the same time encouraged the sucking in of air with the food, which caused the child to suffer from wind. It was recognised that the situation in which the teat collapsed and the flow of milk was arrested or in which the child imbibed air with his food could be avoided by the efforts of a competent nurse.[2] Alternatively, it seemed possible to remedy both difficulties by means of the mechanism of the feeding bottle itself. Doctors had little confidence in the skill or attentiveness of nurses[3], and preferred the idea of a feeding bottle designed not as a tool for the nurse, but as a mechanism perfect in itself and so contrived as to operate with a

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[1] T. Ballard, A New and Rational Explanation of the Diseases Peculiar to Infants and Mothers (1860) 20.

[2] S. Barker, op.cit., 59.

[3] C.H.F. Routh, loc.cit., 287; L.M. Child, op.cit., 10.

minimum of intervention. This approach was to lead ultimately to a feeding bottle which completely obviated the need for supervision, and although this stage had not yet been reached in the early 1850s, indications of future developments already existed. In addition to the simple feeding bottle, at least one more complex patent feeding bottle had been produced, which incorporated several devices designed to increase the efficient functioning of the utensil.

A feeding bottle invented by 'an ingenious French mechanic'[1] M. Darbo, was introduced into England at this time by the London manufacturer, Benjamin Elam.[2] It incorporated three innovations: an 'incorruptible' cork nipple[3], a spiral groove to admit air as the child sucked, and a pin device to adjust the flow of milk without the nipple being removed from the child's mouth. This invention was received with interest by the medical profession[4], and warmly recommended to mothers. The combination of the cork nipple and the groove to admit air seem to have been successful in solving the problem of the collapsing teat, the nipple forming a 'firm point d'appui to which the child can fix its tongue and jaws'[5] and the resulting effect being 'exactly the reverse of what exists in the ordinary bottle

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1 T. Ballard, op.cit., 19.

2 Anon., 'The Biberon', loc.cit., 184.

3 T. Barrett, op.cit., 49n.

4 Anon., 'The Biberon', loc.cit., 184.

5 T. Ballard, op.cit., 19.

with the collapsible teat, and the wide-open venthole'.[1] The small spiral groove was observed to play a vital part, embodying the advantages of the open venthole without either allowing any spillage of the contents of the bottle, or necessitating the placing and replacing of the nurse's thumb over the hole, as had previously been necessary.[2] The regulating pin was also useful in that it enabled the flow of milk to be altered and controlled without the child being disturbed.

During the later 1850s and 1860s a number of new patent feeding bottles were produced. Together with the ordinary cheaper bottles these offered considerable choice in type of bottle and in price, the most expensive, Elam's, costing seven shillings and sixpence[3] and the cheapest, one shilling and sixpence[4] or less. Increasing pressure of advertising accompanied the growth in the number of feeding bottles on sale. Samuel Barker wrote in the mid-sixties, 'their name is legion...could the little beings for whom they are designed read the puffs in recommendation of the superiority of each, they would be sadly perplexed... which to choose among so many'.[5] A prominent manufacturer declared that his expensive bottle was 'now in use from the

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[1] Ibid., 20.

[2] H. Davies, The Young Wife's Guide during Pregnancy and Childbirth, and in the Management of her Infant (1854) 76.

[3] Advertisement in Lancet II (1853) 24.

[4] Advertisements in Lancet I (1859) 454.

[5] S. Barker, op.cit., 59-60.

palace to the cottage'[1]; this was an optimistic claim, but it gives some idea of the general acceptance which the feeding bottle had gained. The author of a pamphlet published by the Ladies' Sanitary Association in the early 1860s noted that the patent bottles were 'very good; but they cost too much for the poor to buy them'[2]; on the other hand, they were 'not so simple or so easily cleaned as the common feeding bottles'.[3]

Not all the patent feeding bottles produced at this time were complicated in design. Among those mentioned during the late 1850s was a 'cornucopian vessel' designed by a Mr Edwards[4], which was described as a simple glass feeder, fitted with a rubber nipple, which could be regulated either by means of the inventor's patent 'Air-spring Stopper' or by means of the thumb on the venthole, either of which methods would protect the child from 'the possibility of...imbibing a particle of air'.[5] Despite the apparent demand for feeding bottles, Edwards seemed uncertain of the market for his invention, which he sought to make applicable to a wide range of customers. In addition to serving as an infant feeder, the bottle was adaptable for use in 'hospitals (especially lunatic asylums), for administering liquid food and medicine'[6], and for

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[1] Advertisement in Lancet I (1859) 454.

[2] S.R.P., op.cit., 22.

[3] Ibid.

[4] Anon., 'Edwards's Feeding Bottles', Lancet I (1858) 415.

[5] Ibid.

[6] Ibid.

agricultural use, in 'giving physic to horses, cattle, and other animals'.[1] It was also available 'constructed with a long spout for the flow of oil,...for lubricating steam engines, machinery, etc.'.[2] 'These useful inventions of Mr. Edwards', concluded a notice in the Lancet, 'certainly deserve commendation'.[3]

Other feeding bottles currently being produced were at once more specialised and more elaborate, and a device which was becoming increasingly popular in patent bottles was the internal tube. Cooper's British Feeding Bottle of 1857, incorporating the regulating pin of the 'biberon Darbo' as well as the tube, was described as being 'of the usual form'.[4] Its advantages, like those of earlier bottles, was listed as its ability to be placed in any position without its contents escaping, the fact that the flow of food could be adjusted without the child being disturbed, and that no air could be drawn in with the food, the latter being further ensured by means of the tube, which passed from the neck of the bottle below the surface of the liquid in it. A further sophistication was added to this bottle in the form of a valve or stopcock in the tube itself. This was another device designed to prevent air being drawn in by the child but it had the additional purpose of dissuading nurses from feeding children by laying them in

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1 Ibid.

2 Ibid.

3 Ibid.

4 Anon., 'The British Feeding Bottle for Infants', Lancet II (1857) 554.

their laps with their heads lower than their trunks.[1]

During the 1860s the rubber teat greatly increased in popularity, the material becoming more pleasant to use and the possible dangers of other types of artificial nipple becoming more evident to the medical profession. 'Do not', Chavasse cautioned in Advice to a Mother in 1864, 'use calves' teats or wash leather for the feeding bottles: - fortunately, since the invention of india-rubber teats, they are now nearly exploded; in olden times they were fruitful causes of thrush'.[2] Cork teats continued to be recommended by authorities for several years[3], and even the calf's nipple was still sometimes used,[4] but there is little doubt that the rubber teat had assumed first place. Not only was it acceptable to the child, and readily kept clean; its elasticity allowed it to fit more easily and more closely on to the neck of the bottle.[5]

Recognition of the dangers of the old-fashioned teats were not paralleled by any acknowledgement of similar dangers arising out of the increasingly elaborate internal mechanism of the feeding bottle. Bottles with internal tubing only were still being produced in the late 1860s[6], but a notable innovation later appeared in the form of the

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1 C.H.F. Routh, loc.cit., 287.

2 P.H. Chavasse, Advice to a Mother (7th ed., 1864) 83.

3 Anon., The Mother's Home Book (1879) 44.

4 Ibid.

5 Ibid.

6 Anon., 'The "Mamma" Infants' Feeding Bottle', Lancet II (1869) 488.

extended tubing of bottles such as the 'Alexandra' model, manufactured by Mather's.[1] In earlier bottles, the tubing had run from the nipple at the neck of the bottle down into the interior, for the purpose of excluding air and enabling the child to feed without the nurse having to tip the vessel. In the new bottle, the tubing, instead of ending at the neck of the bottle, passed through a cap sealing the neck, which also incorporated a small valve for the admission of air, and extended outside it for some inches, culminating in a small nipple.[2] The portion of the tube outside the bottle was made of rubber and flexible; this made the feeding bottle completely manipulable by the child alone, and meant that the final stage had been completed in the transformation of the bottle from a utensil similar to cup or boat but simply fitted with a nipple, to a machine which was in a much more precise sense Forsyth's 'pocket wet-nurse', in that its internal mechanism entirely took over the task of the nurse in assisting the child to feed.

The long-tubed feeding bottle had all the advantages of the earlier models with internal tubes only. The flexible external tubing meant, however, that this bottle had the additional advantage of being able to be placed in a secure position beside the child or resting on his chest as he lay in his cot with far less risk than before of it slipping and

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1 Anon., Mother's Home Book, op.cit., 43; J.C., Babies, and how to take care of them (c1879) 30.

2 Advertisement for Mather's "Princess" Feeding Bottle, in J.C., op.cit.,

its weight dragging the nipple from the child's mouth. That the bottle was used in this way is clearly shown by contemporary evidence, both from sources advocating and from sources condemning the custom. In 1875 Barrett stated that it was 'the usual practice' in feeding infants to place the bottle in the cot, put the mouthpiece of the tube in the child's mouth and then 'leave it to help itself, trusting thus to avoid trouble and to quiet the child by a perpetual solace'.[1] It was confirmed by other authorities that bottles were designed specifically with this end in view. 'J.C.', writing in 1879, considered it one of the points most in favour of the Alexandra bottle that 'it sits, so to speak, against the child, when the latter is in a lying posture, and so cannot be constantly tumbling down every time he moves, which is the case usually with straight bottles'.[2] Dr Eustace Smith, who allowed his name to be used in advertisements for this bottle, believed that it could not be surpassed 'for elegance of design and accuracy of detail'[3], and he, too, clearly took it for granted that the child would feed alone, citing as one of the most valuable characteristics of the bottle its double curve towards the neck 'to provide against any sudden bending of the flexible tube against the cap'[4] which would result in the flow

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[1] H. Barrett, op.cit., 41.

[2] J.C., op.cit., 30.

[3] Advertisement in J.C., op.cit.

[4] Ibid.

of milk being arrested. This would not have been important if feeding had been closely supervised by the nurse.

By the 1870s, the complexity of its internal mechanism had ceased to distinguish the patent feeding bottle from its cheaper counterpart. Though the 'ordinary shilling bottles'[1] did not exhibit the refinements of stopcock or valve, they did by this time contain the long tube. Barrett felt that the cheaper bottles were 'to be avoided; for it will be seen that each time the child ceases sucking for a minute, the column of milk drops down to the level of the milk in the bottle, necessitating a long pull of air, before the child can get the milk up again'.[2] The better bottles, in contrast, were made with tubes containing a valve. Tubed bottles of some kind were, however, now available to all, and the simple tubeless model, though still suggested for weak infants unable to suck their milk up through a long tube[3], appears to have ceased to be generally used. By the end of the decade tubed bottles could be purchased for sixpence[4], and prices were stated to be 'within everybody's reach'.[5] In 1875 it was observed that a new feeding bottle appeared on the

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1 H. Barrett, op.cit., 43n.

2 Ibid.

3 P.H. Chavasse, Counsel to a Mother (3rd ed., 1874) 26.

4 J.C., op.cit., 30.

5 Ibid.

market 'almost every month'[1], and that it was difficult to select one from such a large number.

During the 1880s ideas on infant feeding, increasingly influenced by the theories of Pasteur[2], entered a period of greater attention to hygiene which resulted in a new approach to the design of the feeding apparatus. At the beginning of the decade the advantages of the long-tubed feeding bottle were still frequently remarked upon, but a note of doubt is discernible as to whether these advantages are not balanced by concomitant disadvantages unnoticed before. Thus Sophia Jex-Blake, observing that 'there is no doubt...that bottles with tubes are more convenient for use in the baby's cot'[3], noted nevertheless that 'it is extremely difficult to keep the tube perfectly clean and sweet'.[4] Other doctors were also beginning to feel that the complex bottles so much in vogue, 'all more or less theoretically perfect in construction'[5], were nevertheless 'very defective practically'[6] on account of the immense difficulty of keeping them clean. The idea

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1 H. Barrett, op.cit., 43.

2 See J.L. Brand, 'The British Medical Profession and State Intervention in Public Health, 1870-1911' (London Ph.D., 1953) 136; see B.B. Joll on diphtheria, Nursery Hygiene (1884) 86.

3 S. Jex-Blake, The Care of Infants (1884) 24.

4 Ibid., 23-4.

5 T.C. Wigg, The Feeding of Infants, together with the Preparation of Food for the Sick and Infirm (1880) 12.

6 Ibid.

that a dirty feeding bottle could be dangerous to a child was not a new one. It had long been observed that milk was liable to rapid decomposition, and that the 'acidity' which resulted was harmful to the health of babies;[1] the stage at which a bottle ceased to be fit for use had not, however, been clear, and a bottle which looked clean had been treated as clean. Recognition of the fact that disease was spread by means of organisms invisible to the naked eye inevitably had an influence upon the approach to cleanliness in the feeding bottle, and complex mechanisms such as tubes and valves became suspect as ideal places for the harbouring of bacteria. The prevention of infection from this source became the chief objective in feeding bottle design, and the desire to create a mechanically perfect self-operating feeding utensil which would protect the child from the much criticised feeding practices of nurses became less evident.

The result of changed attitudes towards hygiene during the 1880s was that doctors first began to recommend far more stringent precautions for the cleansing of tubed feeding bottles than had been suggested before, and then, convinced that this was not sufficient to render their use safe, to recommend once more the simple tubeless feeding bottle which had long gone out of fashion. 'Custom', wrote Miss Wood in 1889, 'has unfortunately made a favourite of the feeding bottle with the tube, and custom has done this

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[1] T.H. Barker, loc.cit., 268.

because it dislikes trouble; but the trouble is shifted from the nurse's shoulders to the baby's inside'.[1] Cleanliness was impossible with such a bottle, and instead the oldfashioned boat-shaped utensil was recommended, having no tube, but only a teat.[2] Other authorities were of similar opinions. West observed that many French physicians preferred the exclusive use of the spoon in infant feeding[3], but he himself advocated the 'old-fashioned flat bottle, with an opening in the middle, and a short end to which the nipple is attached without any tube, the only one known in the time of our grandmothers'.[4] Apart from its easy cleansing, this oldfashioned bottle was also recommended because unlike the tubed bottle it necessitated the constant attention of the nurse during feeding.[5] Just as it had been the object of the designers of the tubed bottle to dispense with the unwelcome attentions of the nurse, so it became the aim of those advocating the return to the simple utensil to secure her assistance. Just as the interfering nurse had earlier been criticised for pouring food down the child, almost choking it, now the lazy nurse, who left the child to feed alone, taking its food too fast or sucking at an empty bottle, was equally condemned.[6]

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[1] C. Wood, A Handbook for the Nursing of Sick Children (1889) 181-2.

[2] Ibid., 182.

[3] C. West, op.cit., 55.

[4] Ibid.

[5] C. Wood, op.cit., 182.

[6] C. West, op.cit., 55.

Middle and upper class families were the first to be influenced by alterations in ideas in the medical profession in matters of hygiene, and they were assisted in the change to a simpler feeding bottle by the comparatively ready availability of such utensils. During the 1880s and 1890s patent feeding bottle manufacturers such as Allen and Hanbury's[1] and Eggington's[2] were producing boat-shaped or cylindrical tubeless bottles, sometimes marked in ounces which was a useful sophistication[3], and fitted with rubber teats and, in the case of the boat-shaped bottles, a rubber cork or valve at the end opposite the teat. Tubeless bottles were also supplied by the manufacturers of milk sterilising equipment, such as Soxhlet's.[4] Such apparatus was well-known by the end of the century, and provided as an integral part of it were simple glass bottles which with the addition of rubber teats were quite adequate as feeding bottles and had the additional merit of having themselves been sterilised in the course of the operation. The use of these as feeding bottles was recommended by the medical profession.[5] Similar bottles were provided by dairy companies, such as the Walker Gordon

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[1] F. White (ed.), Children's Ailments and how to treat them (1901) 20.

[2] H.A. Allbutt, Every Mother's Handbook (1897) 63.

[3] Ibid.

[4] P.H. Chavasse, op.cit. (15th ed., revised and edited by G. Carpenter, 1898) 50-51.

[5] Ibid.

Company, mentioned by George Carpenter in 1901.[1] These bottles served the double purpose of milk containers and feeding utensils.

The working class family, whichneither made use of milk sterilising equipment nor patronised dairy companies, found tubeless bottles less readily obtainable and had little incentive to abandon the tubed model. This was still the cheapest on the market in 1907[2], and the price alone was sufficient reason for it to continue in use. Its convenience, too, was likely to be more readily appreciated in poorer households, and the dangers of using it less easily understood. Not until after 1900 did some municipal milk depots help to make the tubeless bottle more readily available to providing such bottles free to mothers being supplied with depot milk.[3] Mothers were unwilling, even then, to abandon such a valued utensil as the tubed bottle, which not only saved time and effort, but also kept the baby happy. In 1906 Dr Alderson, although describing this kind of bottle as distinctly 'old-fashioned' and 'fast passing out of date'[4], felt constrained to add that still 'prejudice in its favour dies hard'.[5] In the

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1 G. Carpenter, Golden Rules for the Diseases of Children (1901) 14.

2 E. Kanthack, The Preservation of Infant Life (1907) 50.

3 Anon., 'Infantile Mortality in Liverpool: Artificial Foods and the Sterilised Milk Supply', Lancet I (1904) 1238.

4 F.H. Alderson, Diet and Hygiene for Infants (1906) 30.

5 Ibid.

following year Miss Kanthack observed that the cheapness and the evident attractions of the tubed bottle made it 'a difficult mission to find convincing arguments'[1] against its use, although its dangers were plain enough for others to see. Of the best known of the tubed bottles she wrote, 'they should by rights be known as Infant Murderers, instead of having the name of Queen Alexandra attached to them'.[2]

In any assessment of the effects of the use of the feeding bottle on infant health, the question of hygiene is clearly the most important issue to be considered. Problems traceable to lack of hygienic precautions in the use of feeding utensils were common throughout this period, ranging from indeterminate 'digestive disorders', which were probably largely the result of defective hygiene, to conditions such as thrush and diarrhoea in which, as contemporaries became increasingly aware, infection by means of feeding utensils played a major role. Although the acceptance of the part played by bacteria in the spread of disease marked a turning point in the theory of hygiene, like many advances in artificial infant feeding it had at first only a limited practical application. Even after bacterial theories had become well established among the informed public and in the medical profession, the precautions

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[1] E. Kanthack, op.cit., 50.

[2] Ibid.

which they showed to be necessary were not always stringently observed or even recommended by doctors themselves. Thus, though it was suggested that feeding bottles should be sterilised to avoid infection, teats did not always receive the same treatment; some authorities on the other hand, recommended the boiling of teats but not of bottles. Associated measures, such as washing the hands before feeds were prepared, were seldom recommended. By the end of the century, however, stringent hygienic precautions in the use of the feeding bottle had become routine in many middle and upper class households. In the working classes, this was far from the case. Here, both the type of bottle used and the way in which it was employed meant that a high level of infection from this source, likely to result in serious illness among young babies, was still to be expected. In regard to hygiene in the use of feeding utensils, it might well be said that conditions among poorer families in artificial infant feeding were as bad in 1900 with the widespread employment of the tubed bottle as they had been in 1850 with the boat and spoon.

In the early part of this period attention to hygiene in relation to the feeding bottle was rudimentary throughout society, and even those who exercised the greatest care took precautions which were to be regarded as inadequate in the light of later ideas. Even the simple glass feeding bottle, considered a great improvement on the more complex model when doctors advocated a return to it later

in the century, produced problems in 1850 or 1860. The practice of serving a fresh feed on the remains of an old one was not confined to situations in which bottles were used, but being rather more trouble to wash than cups or boats they may have encouraged it. Certainly doctors constantly warned against such habits. It is clear that feeds were often served in bottles which, though they may have been empty, had not been washed, since even the instructions of doctors did not always include cleaning the bottle after every meal. The recommendation of Bull in 1857 that feeding bottles should be scalded after each feed[1] was unusually stringent. Samuel Barker, in a book published in 1864, noted the advisability of keeping both bottle and nipple 'scrupulously clean', but merely added 'by careful washing, at least twice daily in hot weather',[2] a routine which could scarcely have achieved his objective. Hot water was usually advised for washing the bottle, but without soap or any other agent, though it was suggested by some authorities that 'a few shot, or tea-leaves'[3] should be shaken in the bottle to help to get it clean. Cold water was sometimes thought satisfactory[4]. The use of two feeding bottles was often suggested but few doctors advised leaving bottles to soak while they were not in use. T.H. Barker, however, did recommend this, adding that the soaking water should contain a little soda.[5] A major hazard was

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[1] T. Bull, op.cit., 70.

[2] S. Barker, op.cit., 57.

[3] S.R.P., op.cit., 22.

[4] Ibid.

[5] T.H. Barker, loc.cit., 268.

represented by the practice of keeping feeds warm for long periods, either in the child's bed, or by means of some mechanical device. The dangers of this practice were not at first appreciated by the medical profession who themselves advocated both methods throughout the early decades of this period.[1] Night lights or lamps specially designed for this purpose were on sale, and a number of feeding bottles were intended to be used with special frames in which they could be suspended over the heat.[2] In this way, it was stated, food could be kept hot for 'any number of hours'.[3] Not until the 1880s was it recognised that milk kept warm in this way provided an 'incubator' for germs.[4]

The early teats were more dangerous than the feeding bottles to which they were attached. The preserved animal teat presented particular hazards. It was directed to be cleaned after use, and the sponge washed, and most authorities recommended that it should be kept in a solution of alcohol between feeds.[5] It eventually decomposed, however, and was probably not infrequently used in a state of decay. Chavasse suggested in 1843 that such a teat, kept in a weak gin and water between feeds, might safely be used for as long as ten days or a fortnight.[6] The

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1 W.P. Dewees, op.cit., 172; see also C.H.F. Routh, loc.cit., 287.

2 Anon., 'Edwards's Feeding Bottles', loc.cit., 415.

3 Ibid.

4 J.F. Goodhart, The Student's Guide to the Diseases of Children (1885) 29.

5 T.H. Barker, loc.cit.,268; F. Churchill, op.cit., 32.

6 P.H. Chavasse, Advice to Mothers [sic] (3rd ed.,1843) 41.

author of The Mother's Best Book believed that the heifer's teat was less easily kept clean than other types of artificial nipple, but argued that it was nevertheless 'more eligible, as it brings the necessity of constant cleansing'.[1] The precautions suggested, however, consisted merely of keeping the teat between feeds in distilled or rose-water 'with a few drops of spirit of wine'.[2] The sponge and washleather teat was observed by the same writer to be difficult to keep in a satisfactory state[3], and this was confirmed by other authorities. It was not easy to clean and was frequently evidently used for too long as it became 'sour and hard'.[4] Cork, though popular as a material for teats, was not entirely safe, since it soaked up milk and rapidly became dirty.[5] The advent of rubber nipples provided the only hope of reasonable cleanliness, but since this depended on their frequent sterilisation it was a hope not always realised even at the end of the century.

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1 L.M. Child, op.cit., 10.

2 Ibid.

3 Ibid.

4 L.M. Barwell, Infant Treatment under Two Years of Age (1859) 20.

5 H. Ashby, 'Infant Feeding in Relation to Infant Mortality', Manchester and Salford Sanitary Association Health Lectures for the People, 5th series 6 (1881-2) 79.

The growth in popularity of the tubed bottle was clearly of major influence in the spread of infections by means of feeding utensils. By 1880 some authorities had begun to suggest that feeding bottles should be kept, when not in use, in a disinfectant solution[1], but even where this was done it was still felt that it was difficult to ensure absolute cleanliness in the more complex bottles. The tubes themselves were made of a variety of materials, not only rubber and glass, but also earthenware, for the joints, and metal. These were observed to be in common use in the mid-1880s.[2] Goodhart noted that even the simplest of metal joints and valves were 'impossible to clean, and emit an unpleasant odour after very little use'.[3] Brushes were sold, with which to clean the tubes, but this was regarded by many authorities as useless. The only safe course, it was suggested, was to replace teats, tubes, and all other fitments at very frequent intervals.[4] Not only the joints and valves but also the caps of feeding bottles were made of tin, and these caps were often also lined with cork, which made them, like cork teats, hard to clean and liable to become infected.[5]

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[1] See T.C. Wigg, op.cit., 12.

[2] J.F. Goodhart, op.cit., 28.

[3] Ibid.

[4] Ibid.

[5] H. Ashby, loc.cit., 79.

The tubed feeding bottle was not only dangerous as a source of infection, but also as a factor in the prevalence of digestive disorder resulting from other causes. Babies were frequently noticed to suffer from flatulence, and it is certain that this problem was greatly accentuated by the tubed bottle, despite the fact that efforts were made to design this utensil in such a way as to avoid the child imbibing air. As later authorities were to recognise, no mechanical device could successfully achieve this end; the only real safeguard was a competent and attentive nurse. Sophisticated tubes with stopcocks and bottles with complex valves were useless in preventing children taking in air with their food, since this was caused not only by the mouthpiece of the bottle not being kept full of milk, but by a variety of other factors. These included faulty teats, which allowed the child to take his food too fast, or prevented him taking it fast enough, twisted external tubing which arrested the flow of milk, and the child's sucking at an empty bottle, all of which could be remedied only by the attention of the nurse. Another important way in which the use of the tubed feeding bottle contributed to causing flatulence was in its encouragement to nurses to allow infants to feed lying down. As modern authorities point out, feeding a child in this posture prevents his swallowing easily[1] and is certain to result in difficulty.

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[1] R.S. Illingworth, All about Feeding Your Baby (British Medical Association, c.1970) 23.

The significance of the teat in causing wind in babies was almost certainly an important one. It is observed by modern authorities that the child obtains milk by pressing the teat against the roof of his mouth and squeezing out the milk;[1] the teat must not, therefore, be too soft, as nineteenth century authorities recognised, but it must not, again, be too hard, a fact which they tended to overlook. Certain types of teat used during the nineteenth century were constructed on what appears to be quite the wrong principle according to modern ideas. These included cork teats, both with and without ivory mouthpieces. These were designed not to collapse, and to give the child something firm to grip on with his mouth; they could not, however, be used to press milk from, but rather needed to be sucked through, like a straw. Other teats were too hard to press against the roof of the child's mouth for different reasons. Hardness could result from the teat being too new; some new teats were described as so harsh that they required soaking for a fortnight in strong gin before being used.[2] Harshness could also result from the teat being too well-used, as in the case of washleather, which became hard and caused the child a sore mouth. Furthermore, teats of all kinds were liable to become blocked, thus allowing children insufficient food. This danger was accentuated by the fact that the anxiety of the medical profession was chiefly that the child would receive his food too quickly, rather than too

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[1] Ibid., 22.

[2] J.C., op.cit., 30.

slowly, although the latter was just as likely to cause wind. Even rubber teats are likely to give a good deal of trouble in this respect. Modern authorities strongly recommend constant testing to ensure that the milk comes out of the teat at a suitable rate[1], but this was not a point on which nineteenth century doctors had much advice for mothers.

Children did not die as a direct result of either thrush or flatulence produced by unsatisfactory feeding bottles. Both conditions, however, had important repercussions in an indirect way. Thrush resulted in soreness, especially if efforts were made to scrape the mouth free of the white specks which are characteristic of this complaint, and this would tend to result in increased feeding difficulty. The most obvious dangers of wind lay in the drugs and medicines which might be given to allay the fractiousness and sooth the pain it caused.[2] These were only of temporary benefit, and if the true cause of flatulence were not discovered and remedied, their continued use was likely to cause the child far greater harm than his original symptoms. There was also a danger that frequent attacks of wind would be attributed to an inability to digest milk, and that some inferior food would be substituted for it. The principal direct effect of the feeding bottle on the death rate of infants during this period was, however, in its contribution to the diarrhoeal diseases, notably

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[1] R.S. Illingworth, op.cit., 22.

[2] See Chapter 8, below, 211.

'summer', or 'epidemic', diarrhoea, which at the end of the century was not only a major killer in the early months of life, but actually increasing.[1] Deaths from diarrhoea were noticeably higher among the poorer classes, and there is little doubt that their continued use of the tubed feeding bottle was among the causes of the high incidence of infections of this kind. The most important contribution of medical science in this period as regards the utensils used in infant feeding was without doubt the emphasis towards the end of the century on the importance of simpler bottles. By 1900, the direction in which further progress lay was well-established; as in other areas of infant feeding, improvement in feeding utensils was now to be achieved not through medical research and experiment, but by the education of the poorer and less well-informed mother and the provision of practical help to enable her to put into effect the important lessons which had been learned. The foods women employed to nourish their infants were of vital importance, but so too were the means by which they were administered.

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[1] See G. Newman, Infant Mortality: a Social Problem (1906) 43-60.

CHAPTER 8

Domestic Drugs and Medicines

Domestic drugs and medicines formed an integral part of the diet of many infants during the second half of the nineteenth century, and the influence of these substances on the health of young babies cannot be overlooked. The indiscriminate use of narcotics was condemned by the medical profession during the 1850s and 1860s as the root cause of a large proportion of deaths in the early months of life, and the passing of legislation to restrict the sale of poisons was in part prompted by this situation. This legislation, though valuable, placed only limited restrictions on the sale of opiates and they continued to be employed. The widespread recourse to stimulants and purgatives, at first less generally deplored by doctors, was increasingly regarded as another major cause of infantile morbidity. Strong warnings against the indiscriminate drugging and 'physicking' of babies had only a limited effect on mothers and nurses. Such warnings were useful in so far as they dispelled ignorance as to the effects of certain medicines, but valueless in that, like arguments against artificial feeding, they offered no solution to the problems which underlay the practices they sought to discourage. Both the administration of narcotics and the widespread use of regulative medicines were based to some extent on a misunderstanding of the value of such agents; these practices were also encouraged by needs and difficulties which education alone was not sufficient to resolve, many of them bound up with a low

standard of infant feeding.

It was agreed that the administration of narcotics to infants in the early decades of the period was most widespread where mothers were employed away from their homes during the day, as was the case, for example, in the industrial towns of the north and the midlands. Bull, writing in The Mother's Friend in 1849, observed that the habit of administering opiates to young children had become prevalent 'to an alarming degree'[1], in the manufacturing counties; this practice was not, he found, 'confined to infants suffering from disease, but also extends to those in a state of health', the object being 'to ensure their more easy management when the mother is absent from home'.[2] In some cases it was the mothers themselves who dosed the children. Thus Hogg was informed that women in Manchester were obliged to put their children to sleep with opium during the day because they could not afford to pay nurses to mind them.[3] The same practice was observed elsewhere in the north of England.[4] It was also said that infants were drugged in order that

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1 T. Bull, 'The Management of Children, IV', The Mother's Friend IV (1851) 154.

2 Ibid.

3 C. Hogg, On the Management of Infancy, with Remarks on the Influence of Diet and Regimen (1849) 24.

4 H.J. Hunter, Report on the Excessive Mortality of Infants in some Rural Districts of England, Appendix to Sixth Report of the Medical Officer of the Privy Council, BPP 1864 XXVIII 464.

their parents might enjoy uninterrupted sleep at night.[1] But although mothers were responsible for some drugging, it was observed to be hired nurses who 'carry the practice to the greatest extent'[2], often without the mother's knowledge or against her express wishes.[3]

The use of hired nurses to mind children while their mothers were at work was widespread, and the treatment received by babies at the hands of these ill-educated and sometimes unscrupulous women was influential in determining their chances of survival. The author of an article on the use of narcotics published in Blackwoods Magazine in 1853 stated 'upon unquestionable evidence' that in 'the large manufacturing towns of Lancashire it is a common thing for mothers who work in the factories to put their children to nurse'[4], and 'equally common for the nurses to dose the children with opium for the purpose of keeping them quiet or of setting them to sleep'.[5] Hatton, writing in 1854 of the sanitary condition of Chorlton-upon Medlock, referred to 'the administration of opium, in one form or

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1 Anon., 'Labour and the Poor in the Metropolitan, Rural and Manufacturing Districts of England and Wales', Supplement to the Morning Chronicle (January 4th, 1850) 19; J. Tatham, 'Special Dangers to Health in Large Towns', Manchester and Salford Sanitary Association Health Lectures for the People, 3rd series 6 (1879-80) 110.

2 Anon., 'Labour and the Poor', loc.cit., 19.

3 Ibid.

4 Anon, 'The Narcotics we indulge in', Blackwoods Magazine LXXIV (July-December 1853) 611.

5 Ibid.

another' as a practice 'almost universal amongst the lower orders'.[1] There was no doubt that it arose, he concluded, 'from the mothers being obliged to leave their children early in the morning to attend their work, under the charge of nurses not acquainted with the judicious feeding of infants;...when they become restless these nurses fly to the soothing influences of opium.../for/ relief'.[2] Similar practices were observed in Coventry, Nottingham and other industrial towns.[3]

The use of opiates was not confined to the factory towns, but was observed to exist to a 'monstrous' extent in some rural areas.[4] Mothers working in domestic industry may have been partly responsible for this[5], but as in the manufacturing districts, the employment of mothers outside their homes and the abandonment of infants to hired nurses was given as the chief reason for the administration of narcotics. From his researches in eastern England among the families of women employed in agriculture, Hunter

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1 J. Hatton, A Lecture on the Sanitary Condition of Chorlton-upon-Medlock (1854) 28.

2 Ibid.

3 E.H. Greenhow, Reports on the Prevalence and Causes of Diarrhoea at Coventry, Birmingham, Wolverhampton, Dudley, Merthyr Tydfil, Nottingham, Leeds and Manchester with Chorlton and Salford, Second Report of the Medical Officer of the Privy Council, BPP 1860 XXIX 279, 334, 357.

4 Select Committee on Chemists and Druggists Bills, Minutes of Evidence, Q.386, BPP 1865 XII 332.

5 See Anon., 'Labour and the Poor', loc.cit., 19.

concluded that the use of opiates was more common in these districts than in the manufacturing towns.[1] This he attributed not only to the desire to keep children quiet in the absence of their mothers, but also to the fact that the people of the east coast were particularly familiar with the use of opium. 'Half a century ago', Hunter wrote,

> the growth of poppies for the London drug market was conducted in this light land. Then the husbandman took poppy drink with him to the field; and now, although the cultivation of the article for sale is almost abandoned, the poppy capsule forms the principal ingredient of the herb teas and domestic medicines of the neighbourhood.[2]

'Poppy tea' and other opium mixtures were often made at home not only in eastern England but also in other parts of England and Wales. Hunter noted in the early 1860s that the domestic preparation of such remedies was common in Crickhowell and the surrounding areas of Wales, where a home-made infusion was known as daod cwsc, or 'sleepy beer'.[3] 'This luxury', Hunter recorded, was made by 'boiling a poppy capsule in treacle and water, and fermenting the decoction'[4]; this produced a mixture of uncertain strength, regarded by Hunter as 'highly dangerous'.[5]

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1 H.J. Hunter, Report on Infant Mortality, loc.cit., 461.

2 Ibid., 463.

3 H.J. Hunter, Report on the Sanitary State of Crickhowell, Appendix to Seventh Report of the Medical Officer of the Privy Council, BPP 1865 XXVI 507.

4 Ibid.

5 Ibid.

The greater proportion of drugs administered to infants was purchased, however, from retailers. Opium was sold in a variety of forms, including laudanum, paregoric, diocodium and peppermint, and 'syrup of poppies'[1], all of which, in addition to a number of other dangerous drugs such as arsenic, were in the mid-nineteenth century readily obtainable to any purchaser. The vendors were not necessarily 'regular druggists' or chemists, but in the manufacturing towns as well as in the country districts were often small general shop-keepers[2], 'oilmen'[3], grocers or drapers[4], who dealt in 'certain drugs and poisons'[5] as part of their ordinary trade. Such an arrangement was felt to be unsatisfactory. Apart from errors frequently made in the sale of poisonous substances, as a result of which adults and children were made seriously ill or even lost their lives[6], there was always the possibility of dangerous drugs being misused either for criminal purposes or through ignorance as to their effects. It was felt by members of the medical

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[1] P.H. Chavasse, Advice to a Mother (7th ed., 1864) 70.

[2] Fourth Report of the Medical Officer of the Privy Council, BPP 1862 XXII 195 ;H.J. Hunter, Report on Infant Mortality, loc.cit., 463; A. Taylor, Report on Poisoning, and the Dispensing, Vending and Keeping of Poisons, Appendix to Sixth Report of the Medical Officer of the Privy Council, BPP 1864 XXVIII 753-769.

[3] A. Taylor, loc.cit., 753.

[4] Ibid., 758.

[5] Ibid.

[6] Ibid., 753-769.

profession that opium and laudanum were among those substances which should not be so freely available.[1] Thomas Barrett, the author of a manual of advice to mothers published in 1851, stated that as long as opiates were 'part...of nursery furniture, at the command of every nurse or attendant'[2], there could be no safety for infants. While acting as Coroner in the late 1840s, Barrett had drawn the attention of the Secretary of State to 'the evils resulting from the facility with which poisons of the most deleterious character were accessible to purchase by all'[3], and he noted that in regard to the most dangerous substances, at least, such as arsenic, there was some support for his views.[4] No steps were taken at this time, however, to restrict the sale of opiates, which continued to be purchased freely not only in the form of opium and laudanum, but also as ingredients in a variety of patent 'nostrums'.

Among the 'cloaks for opium'[5] in common use were

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1 Select Committee on Chemists and Druggists Bills, Minutes of Evidence, Qs 84, 173, loc.cit., 318, 323.

2 T. Barrett, Advice on the Management of Children in Early Infancy (1851) 69.

3 Ibid., 72.

4 Ibid.

5 T.H. Barker, 'On the Management of Infancy and Childhood', The British Mothers' Magazine VIII (1852) 265.

'Infant's Cordial'[1], 'Infant's Mixture'[2], and the inappropriately named 'Infant's Preservative'.[3] Another was a 'popular nostrum, quaintly and truly called "quietness"'.[4] Perhaps the best known compounds of this kind, however, were those sold under the name of 'Daffy's Elixir'[5], 'Dalby's Carminative'[6], and 'Godfrey's Cordial'.[7] Of these, 'Godfrey's Cordial', known more familiarly as 'Godfrey', was the most notorious. 'Godfrey' was reported in 1850 to have been 'more or less in vogue for near a century'.[8] It consisted of 'laudanum, sweetened by a syrup, and further flavoured by some essential oil of spice'.[9] A Salford druggist stated that every member of his profession 'makes his own Godfrey'[10], and the mixture varied accordingly. It was observed that the stronger it was made the faster it sold,[11] and some druggists were said to put twice or three times as much laudanum into

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1 Anon., 'Labour and the Poor', loc.cit., 19.

2 Ibid.

3 P.H. Chavasse, op.cit. (9th ed., 1868) 68.

4 P.H. Chavasse, op.cit. (5th ed., 1860) 66.

5 Select Committee on Chemists and Druggists Bills, Minutes of Evidence, Q 154, loc.cit., 322.

6 Ibid.

7 T.H. Barker, loc.cit., 265.

8 Anon., 'Labour and the Poor', loc.cit., 19.

9 Ibid.

10 Ibid.

11 Ibid.

their Godfrey as others.[1] Generally speaking, one witness believed, the mixture contained 'an ounce and a half of pure laudanum to the quart'[2], and the dose was from half a teaspoonful to two teaspoonfuls. 'Infant's Cordial, or Mixture' was, he thought, 'stronger, containing on the average two ounces of laudanum to a quart'.[3] Paregoric, which was 'one-fourth part as strong as laudanum'[4] was occasionally used.

In the early decades of this period the demand for narcotics for administration to infants was very great. Hunter noted of rural eastern England, 'there is not a little village shop in the country that sells anything that does not sell...Godfrey'[5], and in the factory towns a druggist might hope to sell several gallons of opiates a week. In 1851, a 'respectable druggist' in Manchester was quoted by Bull as saying that he sold 'in retail alone, five gallons per week of "Quietness", and half a gallon of "Godfrey's" - the former preparation being so strong as to contain a hundred drops of laudanum to the ounce'.[6]

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[1] Ibid.

[2] Ibid.

[3] Ibid.

[4] Ibid.

[5] H.J. Hunter, Report on Infant Mortality, loc.cit., 463.

[6] T. Bull, loc.cit., 154.

In 1860, a chemist in the same town was reputed to be selling as much as thirty gallons of Godfrey in a week.[1] The report of the Medical Officer of the Privy Council for 1861 quoted a Nottingham Town Councillor 'likewise in the drug trade, [who] deposed that he sells about four hundred gallons of laudanum annually, at least one half of which he believes to be administered to infants'.[2]

By the middle of the 1860s, the demand for some measure of control over the unrestricted sale of dangerous drugs by persons with no professional training as druggists was becoming increasingly strong. In 1865 a Select Committee of the House of Commons was set up to consider two Bills which had been presented to the House on this subject, and to hear evidence from members of the medical profession and others with experience in the matter.[3] The desire to control the sale of dangerous drugs arose chiefly from the need to ensure that the population as a whole did not suffer from the mistakes of unqualified vendors, rather than from a wish to protect infants from the misuse of such drugs. The common practice of administering opiates to

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1 E.H. Greenhow, Reports on Diarrhoea, loc.cit., 357.

2 E.H. Greenhow, Report on the Circumstances under which there is an Excessive Mortality of Young Children among Certain Manufacturing Populations, Appendix V to Fourth Report of the Medical Officer of the Privy Council, BPP 1862 XXII, 659.

3 See Select Committee on Chemists and Druggists Bills, loc.cit., 303.

very young children was, however, discussed[1], and it was felt that legislation which covered opium as well as other drugs would be useful in restricting this practice, which was so widely destructive of infant life.[2] The Pharmacy Act of 1868, which was in part the product of the deliberations of the Select Committee, accordingly included in its list of poisons 'Opium and all Preparations of Poppycapsules or Opium'.[3] These poisons, the Act directed, were only to be sold by registered chemists or druggists who had shown themselves capable of understanding their dosage and use[4], and only to be sold - marked Poison - to persons known to the vendor or those introduced by someone known to the vendor.[5] A record was to be kept, furthermore, of the quantity of the poison sold, the purpose for which it had been bought, and particulars of the purchaser.[6]

The Pharmacy Act of 1868, though valuable in many respects, was of limited benefit to the infant population. It did not prevent the sale of opium to the general public and, more importantly, its provisions did not apply at all

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1 Ibid., Minutes of Evidence, Qs 84, 154, 172, 173, 386, 319-332.

2 Ibid., Q 84, p 319.

3 An Act to regulate the sale of Poisons and alter and amend the Pharmacy Act, BPP 1867-8 V 42.

4 Ibid., 33.

5 Ibid., 38-9.

6 Ibid., 38.

to proprietary medicines.[1] The trade in Godfrey's Cordial and similar preparations, widely used in the drugging of infants in many parts of the country, was not, therefore, affected. In 1871, three years after the Pharmacy Act had been passed, it was stated that the widespread use of narcotics persisted. The 'habitual drugging of children in...day nurseries'[2] in the factory towns was noted to be a continuing scandal. 'You will get evidence easily from the manufacturing districts', a witness told the Select Committee on the Protection of Infant Life, 'that opiates are sold by gallons by druggists there'.[3] The sale of opiates for use in day nurseries formed, he believed, 'a very large part of the trade of many of the druggists in those districts'.[4] As Joll observed more than a decade after the passing of the 1868 Act, 'thousands of...nostrums, often highly poisonous, [are] permitted to be sold by any shopkeeper to any person'.[5] Furthermore, the use of such substances, though deplored by many doctors, was still

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1 Ibid.

2 Select Committee on the Protection of Infant Life, Minutes of Evidence, Q 209, BPP 1871 VII 638.

3 Ibid.

4 Ibid.

5 B.B. Joll, Nursery Hygiene (1884) 101.

constantly encouraged in other quarters. Too many drugs, Joll believed, were recommended in manuals and textbooks 'for mothers to dabble with and dose their little ones, many of them powerful remedies, and...potent in their mischief-making propensities,- such...as opium'.[1] Such drugs were also recommended to mothers by people who might have known better. 'Parsons and their wives', it was observed, were 'rather noted for indiscriminate advice of this kind, from kindliness and charitable motives towards the parishioners'.[2]

It is difficult to assess the quantity of opiate taken by infants individually. Bull postulated a figure of one ounce, containing one hundred drops of laudanum, per week.[3] Hatton, however, cited on 'undoubted evidence, little innocents of seven or eight months old...[consuming] half an ounce, or a tablespoonful of...quietness', of the same strength,in twenty four hours.[4] This estimate may have been exaggerated by the fact that children of that age were likely to have begun teething, and thus to be exceptionally fractious, but on the whole the dose does not seem an unusually large one. It was observed that among the children of the poor sleeping was 'encouraged to the utmost obtainable extent'[5] and that wakefulness was

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1 Ibid., 100.

2 Ibid.

3 T. Bull, loc.cit., 155.

4 J. Hatton, op.cit., 29.

5 Report of the Infant Mortality Committee of the Obstetrical Society of London, Transactions of the Obstetrical Society of London XI (1870) 136.

almost invariably taken either as an indication of the need for food, or as a signal for the administration of 'Godfrey'. If a child were given only a teaspoonful or two teaspoonfuls on each occasion, the quantity would quickly amount to that quoted by Hatton. Greenhow, endeavouring to estimate how much Godfrey's Cordial was consumed by infants in Coventry in the 1860s, concluded that 'such children as are habitually drugged with this compound must take a large quantity of opiate'.[1] A witness giving evidence in 1871 to the Select Committee on the Protection of Infant Life stated that such large quantities of 'quietning' were given by babyfarmers that 'amongst the honester class...a difference is made in the price at which they take children according as the mother finds the opiate or as they have to find it'.[2]

The effect on infants of frequent dosing with narcotics was described by many witnesses. A Manchester doctor who worked as a factory medical inspector and in 1850 had a large practice 'among the operative classes'[3], reported that the child continually drugged 'sinks into a low torpid state, [and] wastes away to a skeleton'.[4]

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1 E.H. Greenhow, Report on the Mortality of Young Children, loc.cit., 659

2 Select Committee on Infant Life, Minutes of Evidence, Q 208, loc.cit., 638.

3 Anon., 'Labour and the Poor', loc.cit., 19.

4 Ibid.

Hatton, in 1854, confirmed that the administration of opium increased 'the liability to...marasmus'[1], and this was corroborated by Hunter's findings a decade later in Kent and the Fens. 'Surgeons who are used to this country', he wrote, 'know an opium-eating baby at once; they are brought to him wasted, but without apparent organic disease, and without symptoms other than wasting. Some said they "shrank up into little old men"; others /that/ they "wizzened /sic/ like little monkeys".'[2] Hunter further stated that 'The "living skeleton", who travels from fair to fair'[3], was a native of the fens, and that the union surgeon who attended him as a child had said that his striking emaciation was caused 'by continuous administration of Godfrey'.[4] The living skeleton was, it appears, lucky. He was at least alive, and able, furthermore, to make a living out of his peculiar disability. Most of the children drugged as he had been drugged did not survive.

The 'free use of opiates'[5] was widely acknowledged to exert a significant influence on infant mortality. The high mortality rate among infants in the cotton towns was ascribed to a combination of the 'drugging system, and...defective nursing, its certain concomitant'[6], and the

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1 J. Hatton, op.cit., 28.

2 H.J. Hunter, Report on Infant Mortality, loc.cit., 463-4.

3 Ibid., 464.

4 Ibid.

5 19th Annual Report of the Registrar-General, BPP 1857-8 XXIII 24.

6 Anon., 'Labour and the Poor', loc.cit., 19.

same was said of the rural areas investigated by Hunter, where 'disease, whatever it might be, was considered as a merely subordinate agent to starvation and drugging'.[1] Although 'a great many cases of infantile death are certified by medical practitioners as caused by atrophy, tabes /mesenterica/, marasmus, etc.', Hunter observed, the 'attendant is usually... ready to admit that the primary cause was the general bad nursing, and that it was the use of opium which did the most mischief'.[2] Although surgeons frequently complained of the readiness with which coroners and registrars allowed the real causes of infant deaths to be concealed, Hunter found that 'none were willing to certify to any cause of death which would inculpate anybody'[3], each surgeon preferring 'the doubtful course of certifying the advanced symptoms as the cause of death'.[4] Although cases of opium poisoning were supposed to be common, they were only 'occasionally... the subject of inquests'[5], and most deaths from this cause were recorded as the result of 'overlying', 'debility from birth', or 'prematurity'.[6] Deaths from

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[1] H.J. Hunter, Report on Infant Mortality, loc.cit., 464.

[2] Ibid., 463.

[3] Ibid., 464.

[4] Ibid.

[5] Ibid., 463.

[6] Ibid.

these causes continued to be registered and to appear in the official statistics, and it must be assumed that a proportion of them remained the product of the use of opiates.

The use of opiates for the deliberate drugging of infants, though most common among poorer families, was not restricted to the working classes. It was often noted by contemporary critics that the nurses employed in middle and upper class families employed such means to put the child to sleep and thus obtain for themselves rest and free time. Sophia Jex-Blake observed in 1884 that 'for the sake of securing their own unbroken repose'[1] unprincipled nurses were apt to avail themselves of 'soothing syrups' without the mother's knowledge, and other authorities warned that nurses were liable to conceal the use of these remedies from their employers. Higginbottom, in a tract published in 1850, quoted an earlier writer, Dr Hamilton of Edinburgh, who

> used to say...that if we suspect a nurse of being guilty of intemperance, indolence, or inattention to her charge, we have only to examine the bed and look under the pillows, and we should be sure to discover a bottle of Godfrey's Cordial. 2

The particular nostrum varied, but it was a warning reiterated by doctors throughout the years that followed.

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[1] S. Jex-Blake, The Care of Infants (1884) 11.

[2] Ibid.

The use of opiates was not confined to those who drugged children for their own convenience, but was extended to cover a variety of medicinal purposes. 'Godfrey' and other mixtures were commonly employed throughout society to relieve flatulence and colic, to calm convulsions, and to treat pain or fractiousness. Such remedies were also frequently used as prophylactics, being put into food prepared for babies in order 'to make it sit easy on the stomach'.[1] Less suspect motives on the part of nurses did not make the results of such drugging less serious than where infants were habitually drugged for the attendant's own purposes. Many observers noted that the injudicious use of 'soothing syrups' had been responsible for the deaths of infants when used on the mother's or nurse's own initiative. Chavasse referred to the dangers of paregoric and other opiates 'unless administered by a judicious medical man'[2], and was firm in his insistence that they should not be given by mothers. 'The newspapers', he wrote in 1864, 'teem with cases of deaths from mothers incautiously giving syrup-of-poppies'.[3] Bull found that 'many cases of poisoning'[4] had occurred from the injudicious use of the same remedy, while paregoric had also been given with fatal

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[1] L.M. Barwell, Infant Treatment under Two Years of Age (1859) 21.

[2] P.H. Chavasse, op.cit. (4th ed., 1852) 93.

[3] P.H. Chavasse, op.cit. (7th ed., 1864) 70.

[4] T. Bull, loc.cit., 154.

results, though not, he believed, as frequently.[1] Godfrey's Cordial had been 'abundantly destructive[2], and Bull recorded the death of a child of four months old who had allegedly been killed by half a teaspoonful of this 'most popular quack-medicine'.[3]

Although by the 1880s the quantity of narcotics sold for administration to young children seems to have been declining, it continued to be stated by critics that '"soothing syrups" and other dangerous compounds'[4], were still too largely used, especially 'in those cases where the mother's care and sustenance are withheld from her offspring'.[5] In middle class homes as well as in poorer families, such remedies were still common. Particular mixtures such as 'Godfrey' had become less popular, but others had arisen to take their place and to perpetuate their consequences. Sophia Jex-Blake observed in 1884 that as Combe had written many years earlier, 'whenever the mother of a family is observed to be ready with doses of...cordials, anodynes, and other active drugs, the likelihood is that one-half of her children will be found to have passed to another world'.[6] Soothing syrups, Dr Jex-

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[1] Ibid.

[2] Ibid.

[3] Ibid.

[4] J. Tatham, loc.cit., 110.

[5] Ibid.

[6] S. Jex-Blake, op.cit., 95.

Blake believed, ought 'one and all to be marked Poison as regards young infants'.[1] The Patent Medicine Act of 1884[2] attempted to remedy the situation in which proprietary substances, whatever their contents, were subject to no investigation and might be sold freely by any person. The Act laid down that such substances could be analysed by the Pharmaceutical Society, and that if they were found to contain ingredients included in the category of poisons laid down by the Pharmacy Act of 1868, they were to be subject to the same restrictions as ordinary poisons within the meaning of that Act.[3] These provisions put into practice an important principle, but this legislation did not succeed in entirely removing the problem.

The widespread use of alcohol in the domestic treatment of infants was one reason why the restriction of the sale of dangerous drugs, even when patent medicines were included under that heading, was not a completely successful method of preventing the use of strong sedatives and anodynes in infancy. Alcohol was widely available, constantly in use for other purposes, and could not be prevented from reaching the youngest child. Even in poorer homes, in which legislation had by the mid-1880s certainly affected some reduction in the supply of opiates, a ready alternative was thus available to mothers, the use

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[1] Ibid., 11.

[2] See A Bill to Restrict the Sale of Patent Medicines, BPP 1884 VI 31.

[3] Ibid.

of which had already been common earlier in the century. Hunter, having described the use of opium to quieten infants left at home by mothers working on the Welsh coal tips[1], also noted that women were frequently seen 'pouring spirits down the children's throats',[2] again to prevent any disturbance from them as they lay in bed with 'an ever changing succession of adult women'[3] coming home from shift work. Whisky and brandy were used to 'stupefy'[4] infants, even by educated mothers with no idea that their actions were 'otherwise than commendable'.[5] Dr. Jex-Blake warned that certain of the proprietary anodynes were based on alcohol, notably 'Mrs Winslow's Soothing Syrup',[6] frequently used in the later decades of the century. 'Gin and peppermint'[7] was another commonly employed domestic anodyne. The effect on young babies of the administration of alcohol in any of these forms was observed to be the same as the effect of opiates. Miss Wood stated that 'an alcoholic child will be a dwarfed child - witness the "gin babies"

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[1] H.J. Hunter, Report on Crickhowell, loc.cit., 507.

[2] Ibid.

[3] Ibid.

[4] S. Jex-Blake, op.cit., 101.

[5] Ibid.

[6] Ibid., 100.

[7] P.H. Chavasse, op.cit. (7th ed., 1864) 31.

among the poor - and all healthy appetite will be destroyed'.[1] Chavasse declared that by the administration of gin and peppermint many children ' have been made puny and delicate, and have gradually dropped into an untimely grave'.[2] No form of alcohol, doctors advised, should be given by mothers and nurses without medical advice.

While either patent 'soothing syrups' or some household alternative such as gin or whisky were available, the drugging of infants was likely to continue, for a reason pointed to throughout this period by the medical profession, namely the prevalence of disorders produced by poor feeding. The most viable and effective solution to the drugging problem was not governmental intervention in restricting the sale of drugs, though this was undoubtedly valuable, but the improvement of diet and thus the reduction of the digestive complaints which gave rise to the bulk of the carminatives, cordials and mixtures, whether opium- or alcohol-based, which posed such a problem in infant health. 'Most, if not all infantile diseases', wrote Balbirnie in 1850, 'originate in errors of diet'.[3] Though the cure, as Balbirnie noted, was not 'the exhibition [sic] of "soothing syrups", "Godfrey", or other poisons'[4], these were bound to be resorted to as long

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1 C. Wood, A Handbook for the Nursing of Sick Children (1889) 198.

2 P.H. Chavasse, op.cit. (4th ed., 1852) 66.

3 Dr Balbirnie, 'The Physical Management of the Young', The British Mothers' Magazine VI (1850) 86.

4 Ibid.

as illness caused by mismanagement continued. Poor feeding produced indigestion and flatulence, indigestion and flatulence were followed by the administration of anodynes and sedatives, which for a time gave the appearance of having cured the disorder but in fact worsened it. With this 'continual round'[1] contemporaries were only too familiar.

Another class of medicines whose use in infancy attracted the attention of critics during this period consisted of aperients and stimulants designed to remedy bowel irregularity. Such medicines formed the 'staple of the nursery pharmacoepia'[2], and were heavily relied on by mothers and nurses. The medical profession, while deploring the too frequent or too zealous use of 'regulative' medicine,believed aperients to be the most useful means of treating the majority of infantile complaints. Not only were such medicines employed specifically to deal with constipation in babies; they were also seen as an essential part of treatment in the early stages of fevers and other diseases, both specific and non-specific. With the use of blisters and bloodletting, the purging of the bowels was a major aspect of treatment in 'antiphlogistic' medicine, which was based on the assumption that illness was caused by inflammation, which had to be reduced by depleting or lowering

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[1] T. Bull, Hints to Mothers for the Management of Health during the Period of Pregnancy and in the Lying-in Room (1851) 301.

[2] T. Barrett, op.cit., 64.

procedures. Thomas Hood wrote in 1845, the

> theory of inflammation, and the belief in its frequent occurrence in the disease of infants, have taken deep root in the minds of many practitioners, and have naturally influenced the treatment which they employ for subduing many of the severe complaints to which children are subject... Thus antiphlogistic remedies...have been looked upon as the 'sheet anchor' of successful practice. [1]

Such remedies were believed by the opponents of the antiphlogistic theory to be unsuited to the requirements of the very young, whose lives were felt to be put 'in great jeopardy'[2] by too much purging.

Even when depleting procedures came to be less strongly advocated by the medical profession, the emphasis on the use of purgatives remained. The theory of 'irritation', which in many diseases of children replaced that of 'inflammation'[3], still held that disease of the whole body could result from disorders originating in the bowel, and the regulation of the system thus continued to be seen as playing an important part in the maintenance of health.[4] Thomas Graham, noting in 1865 that it was 'unquestionable that diseases...have often received an unfavourable turn from officious interference in the employment of strong medicines'[5], still advocated

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[1] T. Hood, Practical Observations on the Diseases most fatal to Children (1845) 1.

[2] Ibid., 224.

[3] Ibid., 49.

[4] Ibid., 24; T.W. Cooke, Hydrocephalus Reconsidered (1850) 48.

[5] T. Graham, On the Management and Disorders of Infancy and Childhood (2nd ed., 1865) 478.

the treatment of disease with 'a simple domestic aperient and low diet'.[1] And of the principal domestic medicines he listed in his book on infantile disorders, a large proportion consisted of purgatives and laxatives. Dr West, in 1885, stated that 'aperients are the medicines most frequently needed in the minor ailments of children'[2], and manuals on infant care throughout this period listed a great variety of domestic 'opening medicine' for use in clearing away 'any matter which is setting up irritation'.[3] The laxative or constipating effect of different infant foods were also important criteria in estimating their value and the way in which they should be used.[4]

Whatever the importance accorded in medical theory to the regulation of the body's system, it was agreed by all reputable doctors that attempts at control by artificial means could be dangerous when made by 'unprofessional persons'. They deplored the tendency of mothers and nurses to dose children from birth onwards not only with a wide variety of milder domestic remedies, but also with strong drugs which were considered unsuitable for administration except under medical supervision. During this period it was increasingly strongly emphasized by

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[1] Ibid.

[2] C. West, The Mother's Manual of Children's Diseases (1885) 23.

[3] A.S. Ballin, From Cradle to School (c1902) 143.

[4] See Chapter 4, above, 95-6.

doctors that the regulation of the bowels was best achieved by proper feeding, especially by keeping infants exclusively to the breast. If it were necessary to feed a child by hand, foods with an aperient effect, such as oatmeal[1], might be given; if the opposite effect were required, foods such as rice were more suitable.[2] If the child were too young to be given starch, a number of 'natural' aperients were suggested, such as plain cold water, brown sugar, treacle, or fruit.[3]

Despite the recommendations of members of the medical profession, it is clear that mothers and nurses commonly made use of regulative medicine. Their intervention began, in many cases, almost as soon as the child was born, the first preoccupation being with the meconium, or the mucous which collected in the intestine and bowel of the new born infant. This was normally removed by the action of the first milk, the colostrum. There were occasions, however, on which the colostrum was not available to the child, either because he was to be handfed, or because he was fed by a wetnurse whose milk, having already been drawn some days or weeks, had ceased to have the necessary characteristics. For

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[1] Ibid.

[2] Ibid.

[3] See P.H. Chavasse, op.cit. (4th ed., 1852) 86; P.H. Chavasse, op.cit. (5th ed., 1860), 60; H.A. Allbutt, Every Mother's Handbook (1897) 95.

such children, and even for those who were to receive their mother's milk, a dose of some purgative substance was often forthcoming almost as soon as the child had left the womb. 'Rue-tea'[1] or butter and sugar[2], were frequently used. Some doctors, particularly earlier in the period, had little to say on this subject, beyond expressing a view that such practices were probably unnecessary.[3] There was an increasing tendency, however, for the medical profession to regard the intervention of nurses in this respect as a pernicious and dangerous habit, and one which was responsible for much later disorder.

During the early months of life, the use of 'opening medicine' continued with increased fervour in many homes. 'Many mothers', wrote Bull, 'are continually giving medicine to their children...dose follows dose until illness is really produced, and the medical man summoned to treat a disorder occasioned entirely by the love of drug-giving'.[4] Chavasse commented on the folly of mothers who were perpetually 'physicking' their 'poor unfortunate babies' with magnesia 'to cool them'[5] or with

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[1] P.H. Chavasse, op.cit. (6th ed., 1861) 60.

[2] Ibid.

[3] Ibid.

[4] T. Bull, loc.cit., 10.

[5] P.H. Chavasse, op.cit. (9th ed., 1868) 67.

castor oil 'to heal the bowels';[1] 'it would be a blessed thing', he concluded, 'if a baby could be brought up without giving him a particle of opening medicine'.[2] Sophia Jex-Blake believed that mothers and nurses were 'often needlessly solicitous'[3] as regards the condition of the bowels. Even healthy babies, she observed, varied in this respect and 'though it is of course desirable to ensure regularity, it is by no means necessary to dose the child with physic whenever the slightest deviation from rule occurs';[4] on the contrary, the nursery medicine-chest 'is simply an abomination, and when "well-filled" it is usually the source of untold evil'.[5]

Many of the medicines employed by mothers and nurses for regulating the infant's system were felt by doctors to be highly dangerous. Chief among these were the 'mercurials'. Mercury was commonly used throughout this period as an aperient and also as a 'favourite but highly improper remedy'[6] in diarrhoea. It was sold in the form of calomel, described by Barrett as 'that most

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[1] Ibid.

[2] Ibid.

[3] S. Jex-Blake, op.cit., 97,

[4] Ibid.

[5] Ibid., 94.

[6] P.H. Chavasse, op.cit. (9th ed., 1868) 73.

dangerous and pernicious of medicines in unskilled hands'[1], or as 'grey powder'[2] or 'blue pill'.[3] The common practice of giving mercury to infants was encouraged, Chavasse observed, by the 'readiness with which it may be administered, it being small in quantity, and nearly tasteless'.[4] Its administration by mothers and nurses was, however, a 'practice [which] cannot be too strongly reprobated, as the constant giving of mercury weakens the body, predisposes it too cold, and frequently excites king's evil [scrofula] - a disease too common in this country'.[5] Mercury in the form of 'grey powder' was observed to be 'a favorite [sic] in the nursery'.[6] Some critics noted that doctors themselves were too enthusiastic in their use of it. In The Medical Times and Gazette in 1859, a correspondent stated that it was too commonly resorted to, especially in the case of young children, being prescribed for the smallest ailment, the most simple derangement of the stomach and bowels'.[7] It was very common, however, the writer continued, for

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[1] T. Barrett, op.cit., 64.

[2] C. West, op.cit., 25.

[3] Ibid.

[4] P.H. Chavasse, Advice to Mothers [sic] (3rd ed.,1843) 81.

[5] P.H. Chavasse, op.cit. (5th ed., 1860) 62.

[6] Ibid., 61.

[7] 'Mater', 'Grey Powder, its Use and Abuse', Medical Times and Gazette 19 (July-December 1859) 248.

'mothers, through their blind faith in this drug, to apply to chemists for "a grey powder for the baby", and administer it to the infant, without the advice or sanction of a medical man'.[1] It 'undoubtedly', it was stated, 'has the effect of a slow poison, /and/ the sooner the General Practitioner and the public are enlightened on the subject the better'.[2] Towards the end of the century doctors still found it necessary to warn mothers against the use of mercurial medicines as 'edged tools'[3], which should have no place among domestic remedies.

Other purgatives in common use were condemned by many doctors for their drastic action. Senna tea and jalap, Chavasse noted, were frequently given, although they were 'griping remedies for young infants'.[4] Forty years later jalap was still in use; West observed that it was not a desirable domestic remedy as it often caused pain.[5] In the following decade mothers were again warned against the use of this purgative, which was described by Allbutt as 'a very griping remedy'[6] which ought never to be given. Castor oil was another remedy which, although generally approved of within the medical

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[1] Ibid.

[2] Ibid.

[3] C. West, op.cit., 25.

[4] P.H. Chavasse, op.cit. (3rd ed., 1843) 82.

[5] C. West, op.cit., 24.

[6] H.A. Allbutt, op.cit., 127.

profession, was nevertheless felt by some doctors to be too freely administered. Where overdoses were given, the oil was believed to pass unchanged into the bowel; some authorities stated that this had the effect of irritating the bowel and advised for that reason that the medicine should be avoided.[1] The likelihood of overdoses of castor oil being given appears to have been high. Sophia Jex-Blake strongly cautioned mothers not to allow children to be dosed on the authority of the nurse. 'The affection for the castor-oil bottle that is displayed by the less intelligent class of nurses', she wrote, 'is something amazing'.[2] Other remedies, which were liable to be violent in their action and were therefore to be avoided were scammony[3] and syrup of buckthorn[4], both in use for infants during this period.

It was felt by the medical profession that aperients and stimulants, like opiates, were often given in excess to remedy infantile disorders brought about in the first place by the administration of the wrong kinds of food, or of food in unsuitable quantity. Dutton listed four major feeding errors which gave rise to the use of

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[1] Ibid.

[2] S. Jex-Blake, op.cit., 11.

[3] C. West, op.cit., 27.

[4] P.H. Chavasse, op.cit. (6th ed., 1861) 64.

otherwise unnecessary medicines: underfeeding, overfeeding, the giving of food deficient in the necessary elements, and the giving of diet unsuitable for the child's immature digestive system.[1] These errors gave rise, he stated, to constipation or diarrhoea, to indigestion and pain, convulsions, sleeplessness, peevishness and debility.[2] Whenever any of these symptoms appeared, which were 'quite unnatural and should never develop in a healthy child properly fed'[3], the mother generally resorted to medicine, and from that period, Dutton declared, 'the child's stomach is...converted into an Apothecary's shop'.[4] Other authorities were unanimous in attributing the existence of 'a great deal too much miscellaneous dosing in the nursery'[5] to the same causes. It was observed that in addition to being unnecessary, the medicines given were actually harmful, that all aperients in particular interfered with digestion, and for that reason should be avoided.[6]

The notion that regulative medicine was an essential element in the treatment of young children, not only for

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[1] T. Dutton, The Rearing and Feeding of Children (1895) 7.

[2] Ibid.

[3] Ibid.

[4] Ibid.

[5] A.S. Ballin, op.cit., 139.

[6] P.H. Chavasse, op.cit. (3rd ed., 1843) 82.

constipation but in every kind of ailment was, however, deep-rooted, particularly in middle and upper class families. It was observed that nurses regarded castor oil as so necessary that they persisted in administering it even when told by the medical attendant that nothing at all was to be given to a child, and it is clear that it was regarded as something of a panacea. A middle-class correspondent writing in The Mother's Friend in 1853, stated that her little boy always received a spoonful of this medicine in brown sugar if he had a cold, or a fever, or 'woke up crying'[1], symptoms which would not necessarily suggest an identical form of treatment, nor appear to require an aperient at all. Regular 'dosing' is invariably a well-remembered feature of life in nineteenth century nurseries, and the extent to which such regimes persist over half a century later is indicated by the fact that a manual of advice on infant care published by the British Medical Association in the late 1960s or early 1970s still included a warning to mothers against the use of a 'regular Friday night purgative'[2] for babies.

The widespread use of regulative medicine was encouraged by a number of factors. In the first place, as contemporaries recognised, infants did suffer during

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[1] 'Hannah', 'Letters from the Nursery, no.1', The Mother's Friend VI (1853).

[2] R.S. Illingworth, Common Ailments in Babies (British Medical Association, c.1970) 23.

this period from what would now be regarded as an unusual degree of digestive disorder, occasioned both by unsuitable diet and by unsatisfactory feeding methods. The large quantities of starch consumed by many young children predisposed them to constipation, interspersed with bouts of diarrhoea produced by contaminated food or utensils. Generally poor nourishment was probably an additional cause of impaired digestion. The liberal use of medicines which this situation tended to promote was further encouraged by unrealistic demands for regularity on the part of mothers and nurses, which led to needless anxiety and to unnecessary interference.

The desire to regulate and control the digestive system was not unnatural in a period in which the need for order and discipline was emphasized in most aspects of infant and child care, both material and psychological. This attitude was expressed in the ideas of the medical profession, and it is to be expected that an even greater rigidity should exist among ill-informed mothers and nurses, interpreting instructions on the simplest level and accepting medical theories in their crudest form. Furthermore, the regulation of the system was a matter which preoccupied adults in relation to their own health, and here, too, there was great faith in artificial means of regulation. Patent medicines were widely used, but their popularity was particularly evident among the

middle and upper classes. In a lecture to the students of the London Hospital, published in the early 1900s, Hutchison commented, quackery

> is as rife, nay, I venture to say it is more rife, in Belgravia than it is in Bethnal Green. The upper classes...have a belief in patent medicines...which is almost incredible. [1]

Among the most frequently employed of all proprietary medicines, Hutchison noted, were aperients, a sign of 'the immense prevalence of chronic constipation and all its attendant ills'.[2] Such a preoccupation with the regulation of the bowels in adults made it inevitable that such regulation should assume importance in infancy, while the free use of patent aperients demonstrates the extent to which artificial means were preferred to the natural methods, in the form of the adjustment of the diet, which were advocated by many doctors.

The widespread use of purgatives in infancy must also be seen as part of a situation in which few other medicines were available for use in the many ailments of young children. Poorly nourished infants suffered from a variety of distressing complaints which mothers and nurses constantly, and with cause, feared might lead to a fatal conclusion. In many cases little could be done, but it was natural for those in charge of a sick child to

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[1] R. Hutchison, Patent Medicines (1904) 44.

[2] Ibid., 39.

attempt to fill this frustrating void with a positive and reassuring activity which would enable them to feel that they were contributing to his recovery. The concept of purging the body of impurities as a means both of keeping disease at bay and of combating it once it had manifested itself was a simple one, which could readily be followed in practice. In contrast, the preventive or curative courses advocated by more enlightened members of the medical profession, such as the disinfecting of utensils, the sterilization of milk, and the use of foods other than those which were the most convenient or the most familiar, both required a greater understanding and, having no one positive result, were necessarily less reassuring to the ill-informed.

It is probable that damage was done to infant health not only by the use of opiates and purgatives, but also by the administration of substances designed to strengthen the child. Alcohol was noted to be used for this purpose[1], and was generally believed by contemporaries to exert the most dangerous influence. Other substances may have been equally harmful if given in large amounts. Cod-liver oil was one such substance. It is now recognised that when given in large quantities this causes hypercalcaemia, the symptoms of which are

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[1] B.B. Joll, op.cit., 103.

anaemia, failure to thrive, vomiting and constipation.[1] These symptoms are so general that it is impossible to say from their incidence in the population whether or not overdoses of codliver oil were likely to have been given. But the faith displayed in this remedy[2] makes it almost certain that large quantities were administered. It is likely that the children of the middle and upper classes were principally affected, since the poor, although very generally appreciative of the value of codliver oil were 'frequently unable to avail themselves of [it] ... on account of the prohibitory prices charged by retail chemists'.[3] Those who could afford it found codliver oil a valuable remedy. Like the excessive use of other medicines, the use of codliver oil was encouraged by poor feeding, since it was in the weakly and poorly nourished child that its value was most evident.

The use of excessive quantities of drugs and medicines in the care of infants could be regulated to some extent by restrictions on the sale of the more dangerous substances outside the medical profession. Any such restriction could not, however, affect the damage done by alcohol, or by many of the purgatives which, though harmful for infants and children, were safe for adults and

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[1] M.A. Duncombe, Aids to Paediatric Nursing (1961) 26.

[2] See Chapter 9, below, 251-2.

[3] S. Jex-Blake, op.cit., 100.

thus unlikely to be restricted. The most effective means of reducing the harmful and excessive 'physicking' of infants were the continued education of mothers in the dangers of the frequent use of drugs and medicines, and, more important still, the improvement of standards of nutrition and hygiene which, in improving health, would render the use of such remedies less necessary. The second half of the nineteenth century did not produce a system of organized infant welfare provision sufficient to achieve these ends, but the recognition during this period of the need for such provisions ensured their later emergence.

CHAPTER 9

Artificial feeding and infantile morbidity, 1850-1900: contemporary and retrospective assessments

Contemporary and retrospective analyses of the state of infant health during the second half of the nineteenth century concur in assessing it as poor, and in citing as the principal cause the tendency of mothers to feed their babies artificially. Contemporary observers and later commentators arrived at the latter conclusion after rather different processes of analysis and by means of rather different lines of reasoning, and the arguments put forward in the earlier part of the period, especially, for the relationship between infant feeding and infant mortality and morbidity cannot now be fully accepted. This does not put in question, however, the existence of such a relationship, nor cast doubt on the kind of relationship it was. The morally-biassed explanations for the failure of bottle-feeding given by some mid-nineteenth century commentators, for example, do not affect the fact that it did fail, nor does the attributing of diseases now known to have a dietary origin to other causes alter the fact that they did exist. The existence of both a high infantile mortality and a high incidence of diseases associated with malnutrition, both of which were asserted by contemporaries and recorded by the official agencies, can, with the help of modern knowledge, be deduced independently from evidence as to the

kinds of diets administered to infants at the time. And in the later decades of the century, in fact, the growing sophistication and expansion of ideas on diet and disease in infancy brings the more advanced nutritional theory of the time increasingly close to its modern counterpart.

The seriousness of the implications for infant health and survival of the change from breast to bottle was recognised by contemporary observers throughout the period. Babies 'brought up by hand' were frequently described as pallid, puny, and feeble when compared with breastfed infants, with low resistance to disease and little power of recovery. Some appeared drawn and wasted, with wrinkled faces, distorted limbs, and abnormally large bellies and heads, while others were disproportionately fat, their flesh concealing poorly developed bone structure and distracting attention from their pale faces and lack of energy. Large numbers of handfed infants suffered from skin complaints, imperfect growth, and convulsions, and showed signs of rickets, 'scrofula', and anaemia. By the last quarter of the century it was felt that progress had been made towards improving methods of handfeeding; this should ideally have reduced the worst of these effects, but the persistent gap between theory and practice ensured, as observers pointed out, that handfeeding continued to have the gravest consequences. Ignorance of the methods recommended by the medical profession remained widespread

among the mass of families, where little improvement in the safety of artificial feeding could be discerned. Official statistics, borne out by the personal experience of doctors, indicated that up to and beyond the end of the nineteenth century thousands of infants were dying every year, leaving behind them thousands more individuals gravely impaired, as a result of diseases which doctors considered to be either directly or indirectly the outcome of the improper practice of handfeeding.

Although handfeeding in the middle and upper classes was by no means exempt from criticism, it was the working class infant who was felt to suffer most from the transition from breast to bottle. A pamphlet published by the Infants' Health Society in 1905 referred to 'the almost complete failure of our present method of rearing the infants of the working class';[1] of the handfed infants in this class the Medical Officer of Health for Liverpool observed despairingly, 'it is...a comparatively rare thing to find a single case of healthy growth and development. They are either dead or diseased by the end of the first twelve months'.[2] If the implications of this state of affairs were serious for the individual, they were - it was observed - no less so for the nation as a whole. Malnutrition resulting from poverty and ignorance was believed to be

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[1] Anon., The Present Conditions of Infant Life and their Effect on the Nation (Infants' Health Society, 1905) 1.

[2] Ibid., 3.

widespread in all age-groups;[1] malnutrition at the very start of life, however, both in itself and by virtue of its later repercussions, was widely regarded at the time, and must still be regarded, as the most serious aspect of this situation.

In the 1850s and 1860s the blame for the evident failure of artificial feeding tended to be placed on intrinsic factors in artificial feeding itself, but later there was a movement away from this generalised antipathy in favour of the idea that mortality among handfed infants was primarily the result of artificial feeding improperly and imperfectly carried out. The effort to suppress artificial feeding thus became an effort to improve it. Inevitably there was disagreement as to where the boundary between judicious and injudicious artificial feeding lay and indeed with changing ideas judgements on this matter altered; there was, however, little argument as to the gross injudiciousness of the bulk of artificial feeding carried on during this period. Whatever the extent to which doctors might argue about the precise amount of milk required by a child, or which kind of milk was best, few disputed that milk of some kind, in fairly large quantities, was required throughout infancy. Similarly, however great the variety of solutions offered for the digestive problems resulting from artificial feeding, all authorities agreed that a minimum level of digestibility had to be ensured in

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[1] E. Kanthack, The Preservation of Infant Life (1907) 21.

infant diet, and that certain kinds of diet offered to infants fell very definitely below this minimum level. Finally, however vague the hygienic precautions advocated by doctors, all took for granted the need for considerable care in this respect if a child were to remain healthy. Agreement among authorities in these minimum areas resulted in the immediate classification of infant feeding practices in large numbers of families, particularly among the poor, as undesirable, and these practices provided grounds for criticism of artificial feeding throughout this period. As knowledge was extended, and as additional and different practices came to be regarded as necessary, these areas of agreement were enlarged, and the principles recognised as governing handfeeding came increasingly to resemble those accepted today. By 1900, infant feeding theory was characterised, in embryo if not in final form, by most of the essential tenets which now form its basis.

One of the major dangers in artificial infant feeding was suggested by contemporary authorities to be the provision of a diet which was deficient in essential nutrients. As far as the question of dietary deficiency was concerned, it was - among handfed infants at least - the qualitative rather than the quantitative aspect which caused nineteenth century observers the greatest anxiety. The possibility of infants starving to death for sheer want of food of any kind was recognised to exist, but this was principally thought to be found among breastfed infants where the mother's milk was insufficient and the diet

unsupplemented. Among handfed infants, however, starvation not for want of food in itself, but for want of the right kind of food, was seen as very common. It was observed that food was often abundant - even over-abundant - but that children were nevertheless imperfectly nourished[1], to the detriment of their health and development.

Among the identifiable elements considered to be essential in infant diet, 'nitrogenous' food, or protein, was regarded by contemporary opinion as one of the most important. By the mid-century, doctors such as Charles West were already well aware of the need for, and the function of, protein in diet, and of the extent to which it was lacking in the diets of artificially fed infants. One of the principal reasons for a deficiency of protein in artificial feeding was recognised to be lack of milk. Writing in 1848 of the effects of the administration of farinaceous foods in place of milk, West observed that

> by such a diet, the health, if not the life, of the infant must inevitably be sacrificed. The body wastes most rapidly, for it is forced from its own tissues to supply the nitrogenous elements essential to the maintenance of life, and which its food contains in too scanty a proportion. 2

Wasting was recognised by authorities as one of the chief effects of a diet containing insufficient protein; others included abnormal bone development, irritability and restlessness, lack of energy, pallor, and low resistance to

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[1] See Chapter 6, above, 146.

[2] C. West, Lectures on the Diseases of Infancy and Childhood (1848) 334.

disease.[1] There were believed to be a very large number of infants who did not receive sufficient milk in their diets, largely through the ignorance of those caring for them but also, it was admitted, because it was difficult to obtain, because of the poor condition in which it was sold, and through its tendency, for this and other reasons, to be indigestible.[2]

A deficiency of fat in the diet was considered by later nineteenth century authorities to be an important cause of disease in infancy. Dr Cheadle, in the early 1880s, was one of the chief proponents of the administration of a certain amount of fat in the diet of infancy, associating a deficiency with rickets.[3] Further effects of such a deficiency were suggested by Hutchison in his textbook on diet published in 1901, in which he stated that children receiving insufficient fat were unable to maintain their body temperature and rapidly lost vigour, becoming susceptible to 'catarrhs of the lung and bowel'.[4] Fat deficiency, like that of protein, was believed to be common in artificially fed infants, and this view is supported not only by the frequency with which symptoms associated with fat-deficiency were suffered by them, but also by evidence of the widespread adherence of mothers and

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[1] W.B. Cheadle, On the Principles and Exact Conditions to be observed in the Artificial Feeding of Infants (1889) 10.

[2] See Chapter 3, above, 59-70; 75-77; 86-88.

[3] W.B. Cheadle, op.cit., 11.

[4] R. Hutchison, Diet (1901) 414.

nurses to fatless farinaceous diets and to dried and condensed foods which also lacked fat. Many children who did receive fresh milk were known to be given it skimmed[1], so that here again a deficiency of fat had to be assumed.

A crucial aspect of dietary deficiency which was not at first appreciated but which came to be suggested in the latter part of the century was what was much later to be called vitamin deficiency. Vitamins were not known as such in the nineteenth century, either by that name or in a chemically isolable form, but recognition by Cheadle and Barlow of the existence of infantile scurvy and its connection with artificial feeding[2] pointed to the evident need for a measure of diet in infancy, other than the protein/carbohydrate/fat criteria, and in particular the need to provide in that diet what was described as the 'anti-scorbutic' element.[3] This element was believed to be present in fresh foods, and in unboiled milk; its deficiency, which appeared to be widespread, was attributed to the use of milkless diets, and those which only contained milk in dried or sterilised form. The occurrence of deficiencies leading to scurvy in infants resulted in the use of the first prophylactics in infant

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[1] See Chapter 3, above, 68-9; Chapter 5, above, 130.

[2] See F.J. Poynton, 'Dr Cheadle and Infantile Scurvy', Archives of Disease in Childhood X (1935) 219-222.

[3] W.B. Cheadle, op.cit., 21-2.

diet. Among these was meat juice, which Cheadle recommended for infants on diets of dried patent foods, in order to replace the substances lost in the preparation of these foods and to convert them back into acceptable items of infant diet.[1] Orange juice and grape-juice were also recommended as anti-scorbutics.[2]

The indigestibility of many artificial foods administered to infants was a problem closely linked in the minds of contemporaries with dietary deficiency. Doctors were aware that in order to nourish, foods had to be assimilated by the child.[3] Many foods, owing to their unsuitability in the diet of infancy or their unsuitability in particular circumstances, such as sickness or convalescence, could not be absorbed by the infant and this gave rise to malnutrition. As one authority wrote, whether 'all food is withheld from an infant, or whether it is supplied with food which it cannot assimilate...the main result is the same, and the child dies of inanition'.[4] Among children who suffered in this way were the 'cornflour children'[5], who so often arrived at the children's hospitals with severe digestive disorder resulting from their starchy milkless diets.

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[1] Ibid., 93.

[2] F.H. Alderson, op.cit., 4.

[3] Eustace Smith, On the Wasting Diseases of Infants and Children (1868) 17; W.B. Cheadle, op.cit., 29; S. Jex-Blake, The Care of Infants (1884) 19-20.

[4] C. West, op.cit., 339-40.

[5] S. Jex-Blake, op.cit., 19.

Cheadle wrote of these children,

> they are always hungry, always crying for food. In spite...of the large quantity they consume, they grow thinner and thinner, and die of atrophy...from the want of life-giving, tissue-making proteid and fat. They are starved to death in the midst of plenty. [1]

Simple wasting was liable to be accompanied with diarrhoea and vomiting which compounded the nutritional deficiency already present and increased the likelihood of death from atrophy, convulsions, anaemia or some supervening infection which the child had lost all power to withstand. The digestive problem was made immeasurably more severe in the opinion of contemporaries by the marked tendency among mothers and nurses not only to feed infants with highly unsuitable materials, but to feed them far too large quantities.[2] Where the diet was poor in the first place, it was observed, over-feeding merely compounded the error; where the diet was not so bad, it created problems where none might have existed.

Advances in the predigestion of starch and of milk-protein, which led to the development of various patent foods[3] and patent methods for predigesting foods in the home[4], were regarded by some doctors, but not by all, as the solution to the digestive problem as it arose from the too frequent resort to starch foods. Even those

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[1] W.B. Cheadle, op.cit. (4th ed., 1896) 109.

[2] See Chapter 6, above , 141-4.

[3] See Chapter 5, above , 124-6.

[4] See Chapter 3, above , 84-5.

who unreservedly welcomed the use of the new methods observed that their introduction exerted relatively little influence on the deep-rooted starch feeding patterns of poorer mothers. Commentators noted that working-class infants continued to be given a diet of porridge, boiled or baked flour, biscuit-powder and other substances regarded by the medical profession as not only indigestible in themselves, but by their constant use liable to set up disorders in the child which prevented milk or any other food from being properly digested and assimilated. In so far as breastfeeding decreased among the poorer classes, and animal milks of a suitable kind and condition remained difficult to obtain, this problem was seen during this period as one of increasing severity. Furthermore, as Alderson observed, patent foods, despite their high cost, lacked 'the essentials of life'[1] and the wealthy children fed on them suffered from both scurvy and rickets.[2]

Contemporary authorities were aware that many 'digestive disorders' were brought about not only by the inability of the infant's system to deal with the food offered, but by insufficient attention to cleanliness either in the food itself or in its preparation and administration to the child. Before the destruction of

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[1] F.H. Alderson, Diet and Hygiene for Infants (1906) vi.

[2] Ibid.

bacteria became the central aim of hygienic precautions in the 1880s, the main purpose of cleanliness in artificial feeding was seen to be the avoidance of sourness in the food.[1] Here milk posed immediate problems in the eyes of contemporaries. Their anxiety over the effects of sour milk on the infant's stomach was probably linked with the fact that when children vomited partly digested milk it was seen to have curdled, and instead of recognising this curdling as part of the normal digestive process, mothers and doctors often assumed sourness to have been the cause of the upset. Mothers were warned that the slightest sourness, caused either by new feeds being prepared on top of old, or food being placed in unwashed or carelessly washed bottles, could cause digestive disturbance. Apart from sourness, obvious uncleanliness and carelessness in the preparation and administration of food caused anxiety as to its effect on infant health. Thus authorities commented on the use of feeding bottles with evil-smelling and grimy teats and corks, and there were also in the early part of the period still references to the use of materials other than glass for feeding vessels. Knowledge of the existence of bacteria and their role in the spread of disease considerably altered the attitude of doctors towards hygiene, however, and subsequent medical recommendations in this sphere were more stringent.[2]

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[1] See Chapter 7, above , 179-80.

[2] Ibid.

The failure of mothers and nurses to observe the precautions urged upon them by the medical profession, meant, doctors noted, that despite advances in knowledge, the problem of contamination, like other major problems in artificial infant feeding, persisted throughout this period. The sterilization of infant food was eventually to become something of an obsession among some middle and upper class mothers[1], and special equipment for sterilizing and special sterilized foods were advertised[2]; among less conscientious or poorer mothers, however, these kinds of precautions continued to be ignored or were so impracticable as to be impossible to carry out. The sale of tinned sterilized condensed milk was one development which was taken advantage of by a wider public, and this did help to cut down the risk of infection. It did not, however, entirely solve the problem; by the time tins had been opened, often, as Miss Kanthack pointed out, with an 'unspeakably dirty ' tin-opener in the shop where they were bought[3], and then left, as was common in the inadequately equipped homes of the working class, to stand uncovered within reach of flies and other sources of contamination, tinned milk might well be as infected as milk from any other source. Practices such as leaving bottles full of milk in the baby's cot for prolonged periods, or to keep warm overnight, compounded the dangers, and proved

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[1] F.H. Alderson, op.cit., 29.

[2] See Chapter 7, above , 182; Chapter 5, above, 136.

[3] E. Kanthack, The Preservation of Infant Life (1907) 80.

the more difficult to eradicate since they had earlier actually been recommended by the medical profession. The lack of elementary hygienic precautions was observed to be particularly dangerous in hot weather, and the high incidence of 'summer', or 'epidemic', diarrhoea in the warmer months was cited in proof of this.[1]

A modern evaluation of artificial infant diet during this period suggests that serious malnutrition must, as contemporaries believed, have existed. In the main, the categories into which contemporaries divided errors in artificial infant feeding remain the divisions of a modern assessment. Dietary deficiencies of protein, carbohydrate, fat minerals, and vitamins were evidently common, both through ignorance of what was required, through the poor condition in which foods were available, and through poverty and the resulting inability to obtain the right foods even when they were available. Indigestibility, again, which played such an important role in dietary disorders according to the contemporary view, seems in retrospect to have been no less important than was believed at the time, and to have led to nutritional deficiencies comparable with those produced by initially inadequate diets. Finally, the problem of hygiene, and the effects of inadequate hygienic precautions on the quality

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[1] E. Cautley, The Natural and Artificial Methods of Feeding Infants and Young Children (1897) 9.

of the food given to handfed infants can scarcely be said to have been exaggerated by contemporaries.

Among dietary deficiencies in infant feeding during this period, that of protein assumes a major role. Protein deficiency stemmed from two main sources: the over-dilution of milk, and the giving of little or no milk at all in the diet. The over-dilution of milk appears to have been widespread, both through efforts to render it more digestible, and through the illicit watering of milk by dealers, which, despite legislation designed to prevent it, continued throughout this period.[1] Little guidance was given to mothers as to the quantity of milk required by their children, or as to the degree of dilution consistent with adequate nourishment. Children fed on alternative foods, usually bread and sweetened water, with perhaps a very little milk added, or scraps from their parents' plates supplemented by biscuit powder or some other farinaceous food mixed with water, must have suffered a serious lack of protein.

Protein deficiency in handfed infants was not believed by contemporaries to give rise to any specific disease, but the disparate symptoms which they reported may have formed a more coherent syndrome than they realised. The principal disease now recognised to result from serious deficiency of protein such as must have been common among

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[1] See Chapter 3, above, 67-8.

nineteenth century babies and which in a similar situation is now widespread among children in some of the less developed countries, is kwashiorkor. This, translated, means 'the disease of the deposed child when the next one is born'[1], and the syndrome is described as follows:

> The young baby is breastfed and develops normally during the first months of life. During weaning, however, the baby is given a predominantly starchy diet and not introduced to a variety of foods including protein foods. Since protein is restricted, growth is retarded and the child becomes seriously ill and many die before they reach five years old. 2

This sequence of events corresponds closely to that which occurred in nineteenth century England, except that protein restriction occurred in that case not so much with the birth of a succeeding child, but much earlier, with the abandonment of breastfeeding at an early stage or even with the commencement of handfeeding at birth. Many authorities deplored the fact that children were often handfed very early in life, and in many cases protein deficiency must have hampered even the very first stages of development. Despite the fact that the syndrome of kwashiorkor was not recognised as such by contemporaries, it has been suggested by a modern nutritionist that there are distinct elements of it in old descriptions of rickets in England.[3] It may be, if this is correct, that

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[1] A.M. Brown, Practical Nutrition for Nurses (1966) 25.

[2] Ibid.

[3] A. Burgess and R.F.A. Dean (Eds.), Malnutrition and Food Habits (1962) 40.

kwashiorkor occupied a position similar to that of scurvy in the earlier part of the period, the latter having itself either been ignored or been considered as part of the rickets syndrome before the work of Cheadle and Barlow established it as a distinct disease. That the deficiency state suffered by many artificially fed infants did, as would be expected, contain elements of kwashiorkor in addition to rickets is suggested by the effect of the treatment administered. In many cases codliver oil was observed to be beneficial, but an increase of protein alone, without additional Vitamin D, was also noted to produce a remarkable cure. Thus Miss Wood, writing in 1889, observed of children fed chiefly on cornflour or arrowroot,

> these poor little starvelings are piteous objects, arms and legs thin and shrunken, and the abdomen abnormally large, the face like that of age, and the fretful wailing cry /that/ of hunger; change their diet to a generous one of milk, and the improvement will be marvellous. [1]

A deficiency of vitamins was clearly another major short-coming in artificial infant diet at this time. This is likely to have been particularly severe since animal milk itself, the best kind of artificial food for infants, is nevertheless poor in certain vitamins. This is either an intrinsic characteristic, or is due to the way in

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[1] C. Wood, A Handbook for the Nursing of Sick Children (1889) 198.

which the milk is prepared. Thus milk is, per se, a poor source of vitamin D[1], and when boiled, it is also a poor source of vitamin C.[2] Children today are given supplementary doses of both these vitamins, in codliver oil and orange juice, after the first few weeks of life, and are thus protected against the results of a deficiency of these valuable elements, in the form of rickets and scurvy.[3] During the nineteenth century, however, such protection through prophylactics was rare. Even when fruit and meat juices began to be recommended for use with dried patent infant foods, their use was inevitably limited. The idea that all children, however fed, required supplementary doses of certain substances, moreover, was far from common, if it existed at all. Where children received a diet of good milk unaccompanied by starch, but did not have additional sources of vitamins, some deficiency might have been expected, especially if the milk were boiled; where the diet consisted of poor or over-diluted milk, or of mainly starchy ingredients, the deficiency of both Vitamin C and Vitamin D would have been severe. It is therefore not surprising to find both rickets and scurvy mentioned in the accounts of contemporary critics. Rickets is likely to have been encouraged not only by poor diet but also by lack of sunlight, in particular

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[1] A.M. Brown, op.cit., 82.

[2] Ibid., 47.

[3] M.A. Duncombe, op.cit., 25.

where mothers were at work during the day, either inside or outside their homes, and did not take children out.[1]

Artificial infant diet during this period is likely to have been low not only in Vitamin C and Vitamin D, but also in Vitamin B, the quantity of which supplied in most artificial diets was probably insufficient to meet the needs of young children. Supplementary doses of vitamins in the B group are not normally given to babies today, but the large proportion of starch consumed by many infants during the nineteenth century may have increased their requirements, since Vitamin B is necessary for the digestion of starch.[2] The starch foods commonly consumed were usually made from white flour, which during the course of the nineteenth century became more and more refined and thus itself a less and less good source of Vitamin B, which is contained in the germ of the wheat, removed in the refining process in order to improve the colour and texture of flour.[3] Lack of Vitamin B in the diet produces the deficiency diseases pellagra and 'beri-beri'.[4] Among the symptoms are diarrhoea and dermatitis,[5]

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[1] Ibid., 227.

[2] Sir R. McCarrison and H.M. Sinclair, Nutrition and Health (3rd ed., 1961) 50.

[3] J.C. Drummond and A. Wilbraham, The Englishman's Food (1939) 351.

[4] A.M. Brown, op.cit., 49, 51.

[5] Ibid., 51.

and it is possible that the prevalence of digestive disorders and skin complaints in infants during this period was due in part at least to a lack of this vitamin.[1]

Striking evidence of the absence of sufficient vitamins in the diet of nineteenth century infants, already suggested by records of disease and by material relating to the diets themselves, is afforded by the reaction of poorly nourished children to such corrective dietary treatment as was available. Among the substances frequently used in such treatment was codliver oil. Codliver oil was by 1850 already known as a successful medicine in the treatment of rickets.[2] Throughout this period it continued to be used for this purpose, while also becoming well-known and advertised as a general tonic valuable in cases of poor nourishment and weakness, especially when associated with poor bone formation and other symptoms suggestive of rickets. The results of its use were startlingly beneficial. John Brown wrote of it in his 'Five Lay Sermons' on health,

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[1] Sir R. McCarrison and H.M. Sinclair, op.cit., 67.

[2] I.G. Wickes, 'A History of Infant Feeding', Archives of Disease in Childhood XXVIII (1953) 497.

> You often hear of the wonders of cod-liver oil, and they are wonders; poor little wretches who have faces like old puggies' [sic], and are all belly and no legs, and are screaming all day and all night too, - these poor little wretches under the cod-liver oil, get sonsy [sic][1], and rosy, and fat, and happy, and strong. 2

Infants whose diet was so lacking in nutrients as to give rise to severe wasting would almost certainly have suffered not only from protein and vitamin deficiency but also from a deficiency of certain essential minerals, notably iron. Milk is a poor source of iron[3], and the infant's supply is principally drawn from iron stored by the foetus before birth.[4] This store does not last long, and according to modern nutritionists supplementary iron should be introduced into the diet at an early stage.[5] Where this is not done, as in nineteenth century infant diet, anaemia will result. Evidence that young children did suffer from a deficiency of iron during this period is given in contemporary accounts which describe the response of poorly nourished infants to medicinal doses of iron. Iron was administered throughout this period in cases of recognised anaemia, but this was not often thought to arise in young babies poorly nourished. Babies were, however, sometimes given general tonics containing iron, and these had a noticeably good effect.

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1. Bonny.

2 J. Brown, Health. Five Lay Sermons to Working People (1862) 46.

3 M.A. Duncombe, op.cit., 25.

4 Ibid.

5 Ibid.

According to Dr Sophia Jex-Blake, who administered such tonics to her poorer patients in the 1880s, the results were 'like magic'.[1] Codliver oil she found equally rewarding, and of this and 'Parrishes' Chemical Food', a compound of iron, soda and lime, she wrote in 1884,

> I believe that few greater charities could be practised than the purchase of these articles at wholesale rates, and their distribution at cost price to the weakly infants of the poor. 2

Malnutrition arising from the administration of foods which could not be digested was evidently, as contemporaries noted, an important factor in the high incidence of wasting and other effects of inadequate nutrition. The 'digestive problem' in artificial feeding was mainly caused by the indigestibility of cows' milk[3] and the indigestibility of starch.[4] The elaborate efforts of nineteenth century authorities to find means of dealing with the difficulties of 'cows' casein'[5] were to some extent misguided, in that there are simpler and more effective methods which can be used, notably boiling,[6] of which they neglected to take full advantage. Nevertheless, they were correct in their assessment of the problem. It is now recognised that in order to render cows' milk suitable

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1 S. Jex-Blake, The Care of Infants (1884) 99.

2 Ibid.

3 See Chapter 3, above, 81-3.

4 See Chapter 4, above, 110-111.

5 See Chapter 3, above, 83.

6 M.A. Duncombe, op.cit., 19.

for the nourishment of young babies, considerable alterations need to be brought about in the nature of the casein, or curd;[1] there are also other reasons, such as its relatively high fat content[2], which explain the difficulties experienced by nineteenth century mothers and nurses in the use of cows' milk in infant feeding. It is observed by modern authorities that such difficulties are likely to be increased in very young babies or in those recovering from gastro-enteritis[3], and the general impairment of the digestive system common to poorly nourished infants was another factor in the problems associated with animal milk feeding during this period.

The use of starch in infant diet provoked greater problems than those of cows' milk because it did not provide any of the nutrients required in a digestible form. Real or imaginary shortcomings in milk were often the spur to the use of a totally or predominantly starchy diet in infancy, but this, as became increasingly clear to contemporaries during this period, was in no way the answer to this aspect of the digestive problem, merely creating a new and often more acute difficulty in its place. By the end of the period, the use of a very little

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[1] Ibid.

[2] Ibid.

[3] Ibid.

predigested starch with milk was recognised to assist in its digestion and to be a harmless expedient[1], but for the most part starch was not administered in this cautious manner, but rather as part of a totally starchy diet, or one in which starch was in a far greater proportion than milk, or in which the type of starch employed was unsuitable. The severe indigestion which this use of starch engendered, and the impossibility of its adequately nourishing the child, made it one of the worst aspects of artificial infant feeding in this period, while the deep rooted prejudices and the persistent difficulties with milk which largely gave rise to it made it one of the most intractable.

A grave offshoot of a situation in which digestive problems were rife was the encouragement of the use of medicines and drugs.[2] Two purposes for which these substances were employed during this period were the treatment of symptoms produced by indigestion, and the quietening of children whose indigestion made them fractious. Digestive ailments were the complaints of infancy most commonly treated with domestic medicines, and the use of such remedies was extremely common. Mothers tended to be anxious about problems such as constipation in their babies, and although doctors advocated the use of

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[1] E. Cautley, The Natural and Artificial Methods of Feeding Infants and Young Children (1897) 265.

[2] See Chapter 8, above, 194-231.

dietary cures for these complaints, the use of medicines was faithfully adhered to by parents and nurses and these were often administered regularly whether anything was wrong or not. The strong purging drugs which were in common use served to increase the infant's troubles and further impair his health. The prevalence of digestive disorders and the pain and irritation which they caused in fact made the use of such remedies almost essential if women were to be able to manage their babies. It is doubtful whether mothers generally realised the devastating effects of these drugs upon young babies, but even had they done so, it seems likely that the temptation to use them would have been overwhelming.

The use of drugs and medicines, whether for the purpose of treating ailments, or to induce sleep and quietness, resulted in many cases in a vicious circle of ever-worsening health, not infrequently culminating in death. The use of purges, begun in many instances in the first hours after birth, continued throughout the early months of life, and was regarded by contemporaries as an influential factor in the digestive problem. The newly born infant would be given food 'which a child six months old could hardly digest'[1], after which, Popham declared, 'indigestion follows, the bowels become deranged, and the child irritable; recourse is had to Godfrey's Cordial, or

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[1] W.H. Popham, The Nursery Guide (1847) 13.

syrup of poppies, and thus the child is physicked out of the world almost as soon as it enters it'.[1] Acton condemned the whole process of artificial feeding, even among the middle and upper classes, in similar terms, regarding it as inevitable that the child consigned to the 'pap-bottle' should also be given up 'to...indigestion and the grave'.[2] The distrust of purging felt by the more enlightened nineteenth century authorities is shared by modern nutritionists, who have suggested that frequent dosing with substances such as castor oil may lead to chronic gasto-enteritis, which, in turn, affects the intake of nutrients.[3]

Dietary deficiencies leading to wasting and other symptoms of malnutrition did not result only from the administration of foods which were indigestible or lacking in essential nutrients. They also came about as a result of conditions, such as diarrhoea, which might initially be only indirectly connected with the diet but which gave rise to malassimilation of food. According to modern authorities malnutrition can itself produce malabsorption[4], and 'relatively trivial infections in a poorly nourished child will produce diarrhoea and...the diarrhoea may accentuate the malnutrition to the point that the malnutrition perpetuates the diarrhoea'.[5] The risk of

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[1] Ibid., 13-14.

[2] W. Acton, 'Unmarried Wetnurses', Lancet I (1859) 176.

[3] A. Burgess and R.F.A. Dean, op.cit., 35.

[4] Ibid., 37.

[5] Ibid.

this occurring during the nineteenth century was high, since diarrhoea was for a variety of reasons extremely common, and there was little which could be done to arrest it. It is clear that much of the generalised wasting and debility observed in infants during this period arose from this combination of causes.

Two factors operated during this period to increase still further the severe deficiencies observed in artificial infant diet. The first of these was that many mothers, especially in later pregnancies, were themselves poorly nourished, and may not have been able to supply their infants in the womb with all the nourishment they required.[1] Infants thus in many cases started their lives with a poorer store of nourishment and in a poorer state of health than is now usual. As a result, they were more than usually in need of a good diet in infancy, and less able to withstand its absence. Secondly, and perhaps more important, there is evidence that a growing number of children were being born prematurely.[2] The neonatal death rate[3] rose in the latter decades of the century[4], presumably largely as a result of this, and those

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[1] See A. Burgess and R.F.A. Dean, op.cit., 30.

[2] G. Newman, Infant Mortality. A Social Problem (1906) 15.

[3] Deaths in the first month of life, usually assumed to be the result of ante-natal rather than post-natal factors.

[4] G. Newman, op.cit., 15.

children who survived were undoubtedly often left in a weak state. The premature baby starts life at a distinct disadvantage nutritionally, with low reserves of iron and calcium, and the modern view is that he should receive supplements of both these nutrients, as well as of Vitamins A, C and D.[1] No such treatment was available or even advocated for the nineteenth century infant born prematurely, who must consequently have suffered severely. Combe, among others, noted that premature babies fed artificially had a poor survival rate when compared with handfed children born at full term.[2]

As contemporaries were aware, poorly nourished infants not only suffered from what are known as 'deficiency diseases', but were also victims of a general inability to resist the onslaught of disease.[3] This led to a tendency for infants to succumb to trivial infections which a well-fed child would have been able to withstand, and accounts for a high incidence of more serious conditions such as nervous disorders and respiratory infections. It has been observed by modern nutritionists that infants suffering from rickets or other diseases caused by dietary deficiencies are particularly prone to respiratory

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[1] A.M. Brown, op.cit., 84.

[2] A. Combe, A Treatise on the Physiological and Moral Management of Infancy (8th ed., 1854) 78.

[3] Eustace Smith, op.cit., 3.

infections[1] and to other symptoms common in nineteenth century infants such as diarrhoea and vomiting[2], and this was also recognised by nineteenth century authorities. Not only, Joll wrote in 1884, were the 'diathetic' or constitutional diseases, such as scrofula, themselves the cause of deaths[3], but 'the influence which the constitutional weakness has upon other acute diseases of children is extremely fatal. At the same time the diathetic state predisposes children...to any other morbid influence to which the infant may be exposed at any time.[4]'

The writer observed that in a large class of diseases not directly referrable to dietary deficiencies, namely the nervous diseases, one of the diathetic diseases was found to be an important factor.[5] A low standard of health as the result of poor nutrition made it difficult for nineteenth century infants to recover quickly or completely from disease. Not only did relatively large numbers of infants die from the common infectious diseases of childhood, such as measles and whooping cough, but many also suffered from severe complications resulting from these diseases, and either died or were left in a weak

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1 M.A. Duncombe, op.cit., 228; Sir R. McCarrison and H.M. Sinclair, op.cit., 54.

2 M.A. Duncombe, op.cit., 228.

3 B.B. Joll, Nursery Hygiene (1884) 80.

4 Ibid.

5 Ibid.

and impaired state, highly susceptible to any supervening infections. It was noted as early as 1850 that the secondary effects of primary diseases, in the form of anaemia and other deficiency states, more often destroyed children than the original disease.[1] When diseases such as scarlet fever or measles did not kill the infant, they often produced 'evil after-effects', 'rendering a previously healthy child a miserable, puny, "grizzling" creature; tiresome and unhappy itself, and a source of painful and anxious concern to its parents'.[2] The failure to provide an adequate and suitable diet was clearly a factor in this situation.

Infant health was frequently put at risk by infections resulting from the use of unclean foods and utensils. As contemporaries suggested, a major source of error in artificial infant feeding was poor hygiene. As with other mistakes in infant feeding, errors in hygiene were due initially to lack of experience and understanding of artificial feeding on the part of the medical profession, whose members did not themselves recognise the full extent of the hygienic precautions which were required. Error also arose, and persisted even after great theoretical changes, as a result of ignorance, poverty and carelessness. Thus, although by

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[1] T.W. Cooke, 'On Some Distressing Sequelae of the Diseases of Infancy', Lancet II (1850) 45.

[2] Ibid.

the late 1880s the kinds of hygiene precautions which were being advocated by the medical profession closely matched even those which are required today, yet the disregard of precautions common among poorer families in 1850 continued almost unchanged in 1900.[1] During this period, certain technological improvements in feeding techniques and in the types of foods available occurred which theoretically should have had some effect upon the general level of hygiene in infant feeding, but in practice were not sufficiently widespread to do so. The tubed feeding bottle, for example, although superseded in the later nineteenth century by the tubeless variety, remained in use in many families, to the evident detriment of infant health.[2] Other advances which should have improved standards of hygiene in infant feeding were to a large extent vitiated by ignorance and poverty. Preserved milks often replaced grossly impure fresh milk carrying numerous infections, but as observers of infant feeding in many poorer families pointed out, the advantage of this was often lost later by disregard of hygienic precautions. The result was a high incidence of gastro-enteritis[3], with all the dangers to young infants which this complaint brought with it.

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[1] See Chapter 7, above, 185.

[2] Ibid.

[3] G. Newman, op.cit., 60.

Food itself was a major source of infection in other ways. Fresh milk was a principal offender, both because of its tendency to become sour, and because of its function as a carrier of numerous serious infections.[1] Furthermore, the way in which milk was distributed throughout most of this period, the number of different hands through which it passed and the difficulty of supervising the way in which it was handled, all gave rise to a situation in which a high risk of contamination was inevitable. Two types of disorder resulted. One consisted of recognisable infections such as tuberculosis, typhoid fever, diphtheria and scarlatina, contracted by means of bacteria carried either from persons or from animals suffering from these diseases at any point where they had been in contact either with the milk itself or with water later added to it, between the farm and the customer's doorstep or the milkshop counter. The other result of the contamination of milk was digestive disorder: flatulence, diarrhoea, vomiting. Digestive disorder caused by contamination is indistinguishable at this distance from the digestive disorder caused by the indigestibility of milk protein or starch. Contemporary observers were themselves confused by the similarity of the symptoms. It was observed, however, that children were often violently disordered by their milk feeds and in the light of the known contamination of milk, which was clear even before the existence of bacteria was recognised, this

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[1] See Chapter 3, above, 63-4.

does not seem surprising.

The process by which disease arising directly from dietary deficiencies actually kills even a young child may be slow, and the contribution of deficiency states to mortality is more likely to be to so lower the child's resistance to infection that he succumbs to some fatal condition which is not directly connected with diet, such as bronchitis or measles. In this way the influence of diet on infant health is carried beyond the deficiency diseases and the diseases caused by infection in food or utensils, and extends indirectly to almost every type of infection or condition to which the child is prone. We cannot, therefore, look to individual causes of death for an indication of the effect of malnutrition on mortality. Attempts were made by contemporary authorities to separate 'diseases of nutrition' from those brought about by other factors[1], but it is clear that the immediate cause of death, whether it is diarrhoea, convulsions, or bronchitis, is unimportant in this connection; almost all were affected by the poor nourishment of infants and their consequent poor development and low vitality.

The poor quality of infant diet was not the sole reason for the high rates of mortality and morbidity in infancy characteristic of this period. The low standard of midwifery was a contributory factor[2], as was child-

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[1] J.B. Curgenven, The Waste of Infant Life (1867) 3.

[2] F.A. Fawkes, Babies; how to rear them in Health and Happiness (c1883) 9.

murder[1], the resort to unskilled medical attention in infantile disease, the general neglect of infants among the poor, particularly their exposure to cold, and sickness and degeneracy in parents. In the view of contemporary observers, however, none of these causes had as crucial an effect as poor feeding, and a modern analysis indicates that this assessment was correct. A more important subsidiary influence stressed by later commentators, notably by Newman,[2] was that of the health of the mother during pregnancy. Even the immaturity at birth believed to result from maternal ill-health would, however, have given rise to fewer infant deaths than were attributed to it had the feeding of infants after birth been more satisfactory.

Whatever part other factors in their environment played in bringing about death and disease in young children, it is clear that shortcomings and errors in their feeding were sufficient in themselves to give rise to severe impairment of health, particularly in poorer families, where conditions were most unfavourable. It is suggested by authorities on infant feeding that in Britain

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[1] Ibid., 14; F.W. Lowndes, 'The Destruction of Infants Shortly after Birth. In what manner may it be prevented', Transactions of the National Association for the Promotion of Social Science, 1876 (1877) 586-593.

[2] G. Newman, op.cit., 47.

today the neglect of breast feeding involves some increase in the risk of disease and impaired development generally in young babies.[1] In the nineteenth century the effect was far more severe; the tendency of mothers to choose bottle-feeding in preference to the breast implied a high likelihood of premature death and serious physical weakness in their infants, and for the society as a whole, physical impairment of the adult working population to an extent which necessitated urgent remedial action. That this was required first and foremost in infant feeding was by the early twentieth century recognised by all authorities in the field.

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[1] M.A. Duncombe, op.cit., 16-17; R.S. Illingworth, All about Feeding your Baby (British Medical Association, c. 1970), 1-2.

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M. Hewitt, Wives and Mothers in Victorian Industry (1958)

E.M. Hubback, The Population of Britain (Penguin 1947)

J. Lane-Claypon, The Child Welfare Movement (1920)

G.F. McCleary, The Early History of the Infant Welfare Movement (1933)

W.F. Neff, Victorian Working Women (1929)

C.S. Orwin and E.H. Whetham, History of British Agriculture 1846-1914 (1964)

R. Shryock, The Development of Modern Medicine (1948)

C. Singer et al., A History of Technology vol. V (Oxford 1958)

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D. Forsyth, 'The History of Infant Feeding from Elizabethan Times', Proceedings of the Royal Society of Medicine 4 (1911) 110

A.H. Gale, 'A Century of Changes in the Mortality and Incidence of the Principal Infections of Childhood', Archives of Disease in Childhood XX 101 (1945) 2

F.J. Poynton, 'Dr Cheadle and Infantile Scurvy', Archives of Disease in Childhood X (1935) 219-222

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I.G. Wickes, 'A History of Infant Feeding', Archives of Disease in Childhood XXVIII (1953) 151; 232; 332; 416

iii) Theses:-

J.L. Brand, 'The British Medical Profession and State Intervention in Public Health, 1870-1911', (London Ph.D. thesis, 1953)

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A.M. Brown, Practical Nutrition for Nurses (1966)

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