while in other cases hospitals started dispensaries, really forerunners of the modern out-patients' departments. The dispensary was a very much easier and cheaper institution to run than the hospital, it dealt with a large number of patients and ministered to every kind of disease. It formed an even better school for the doctor than the hospital. The dispensary doctor learnt at first hand "how the poor lived" and the writings of the London dispensary doctors in the early 19th century give us a vivid description of the health conditions of the poor and of the valiant efforts made to combat disease. They pay tribute to the courage and patience of the poor and combat the popular notion that their sufferings were due to sloth and drink. At the General Dispensary patients who were well enough to do so attended as out-patients, but those seriously ill were attended in their own homes. One dispensary doctor writing in 1774 says simply, "visiting patients at their own homes is peculiarly laborious to the physician."[7] In this unboasting, matter-of-fact spirit, the dispensary doctor took his life in his hands as he went about his duty and so little was said about his unremitting and heroic labours, either by himself or anyone else, that they were almost unnoticed by his contemporaries and totally forgotten by posterity.

The crown and glory of 18th century medicine is that it first attempted to bring such knowledge as it had to the service of the mass of the people. The rich physician, pampering the imagined ills of the wealthy, has been taken as typical of the age, but he is common to all ages; the new figure was the dispensary doctor risking his life daily in the disease-ridden hovels of the poor.

CHAPTER XI

General Hygiene and Midwifery

Eighteenth century medicine is distinguished from that of preceding centuries in that it made a definite and by no means unsuccessful effort to prevent disease, especially epidemic disease, as opposed merely to curing it. Prevention was sought along four different lines, all of which are still followed in modern practice and all of which had roots in the past. In the first place the policy of segregation was developed, systematized and applied to a larger number of diseases. Secondly, there was detailed and scientific experiment with various antiseptics and a satisfactory technique of disinfection was worked out, at any rate in regard to certain types of infection. Thirdly, the method of artificial infection was introduced in the case of one disease. Lastly, and perhaps most important, the avoidance of the conditions of life which cause disease was definitely inculcated by medical reformers. The advocacy of personal and public hygiene was in part a reflection of the general philosophical attitude of the time with its admiration and respect for nature, and in part the result of the renewed discriminating study of the ancients. Ancient Greek medicine had excelled in personal hygiene, Roman administration in public, while the Jewish religion had inculcated many excellent dietic and other hygienic rules. But most, if not all, of this knowledge had been lost in the dark ages and a distrust of and disdain for the body and its requirements had been borrowed from the East. The Hypocratic School had held strongly that the natural condition of the body was one of health and that disease could be checked and prevented by proper surroundings. The deep consciousness of sin, inculcated by religious teaching, inclined Christian Europe, however, to the idea that, since the soul of man is naturally wicked, his body is naturally diseased and, that

just as frequent prayers and confessions were necessary for the guilty soul, so frequent potions and bleedings were necessary for the sick body. Only very slowly is Europe regaining the old ideal of a healthy mind in a healthy body and the concept of health as the natural and usual thing.

The importance of fresh air and cleanliness began to be preached by the best doctors in the 17th century and with increasing vigour in the 18th century. Dirt and " all nastiness " was condemned as unhealthy as well as unpleasant and the origin of disease began to be ascribed to dirt, damp situations, bad water and bad food instead of to the will of the Almighty. It would be possible to quote pages of extracts from 18th century doctors preaching the efficacy of soap and water and fresh air. If it is said that, judging by early 19th century conditions, all this preaching was wasted, the reply is that we have no conception of the Augean stables which had to be cleansed and there is little cause for surprise if the work was not finished in fifty years. It is not, of course, finished even now. The pioneers had to overcome not only the physical evil but a mass of inertia, superstition and ignorance that might well appal them; for among the wealthy and educated, and even in the ranks of their own profession, they found ignorance of some of the rudiments of hygiene. What they failed to achieve is writ large in many volumes, what they succeeded in achieving has been forgotten. It is hoped in some measure to recall it in these pages. The doctors took a smaller part in the slow recovery of civic hygiene. The first reforms, which have already been described, seem to have been due to the requirements of commerce and to obvious convenience rather than to a care for public health. But the doctors applauded these efforts and pointed out the benefit to health and it is possible that in some degree the demand for a higher standard of civic convenience may have been a natural development from increased personal cleanliness.

Naturally it was in the sick room that the doctor was best able to enforce his advice. Sydenham's famous " cool regimen " in fevers was nothing more than the enforcement of what would now be considered the ordinary rules of ventilation. Its curative success in the case of certain titled patients gave it

great advertisement. Slowly, very slowly, fresh air and cleanliness became increasingly advocated, first as cures for disease and then as preventives.

The respect of and admiration for nature of the new medicine was nowhere more potent in reform than in the care of women in child-birth and in infant nurture. The art and practice of midwifery depended until modern times upon verbal tradition and personal tuition, it was essentially a craft. It is true that the doctors of antiquity had some general remarks to make on the subject and seem also to have practised some of the cruder forms of operative obstetrics, but throughout the dark and Middle Ages this branch of medicine was entirely in the hands of ignorant women. No doubt most of these women had learnt a certain traditional lore, some useful, some harmful, and may have further acquired a certain manipulative skill. The harrowing accounts which are from time to time given of the suffering of modern Indian and Chinese women through the ignorance of midwives, would apply equally to those of European women before the 18th century. Not only were the midwives too ignorant to help in cases of difficulty, they were often too ignorant to let well alone in normal cases. Respect for nature is the result of knowledge not of ignorance. A 17th century doctor says, " I wish and desire all midwives not to be too forward, or too officious in their undertakings, least they disquiet nature, whose onely work it is, and I would have them to understand, that they bee but nature's servants in all their performances and that they must attend her time and motion, as hereafter shall be shewed ". This writer cites many cases of torture by brutal ignorant midwives, including that of one who tried to remove a cancerous tumour under the impression that it was a child. The doctor at least discovered the real cause of the woman's agony and left her in peace to be eased of her " disquiets within of a few months afterwards . . . by death ".[1]

In England any woman could set up as a midwife, as the same authority says, " the meanest of women, not knowing how, otherwise to live, for the gitting of a shilling or two, to sustain their necessities, become ignorant midwives, then travailling women suffer tortures, by their halings, and stretching

of their bodies, after which followeth the ruinating of their healths, and sometimes death ". In some parts of the continent the midwives were subject to a certain amount of regulation. In 18th century Paris the midwives were controlled by Royal Ordinance and had to pass an examination before they could practise, and similar regulations existed in other towns. In England the profession was totally unregulated and remained so until the 20th century.[2]

In the 16th century the doctors with their growing knowledge of anatomy and the revived knowledge of the classical fragments began to turn their attention to obstetrics. For instance, the French surgeon Ambroise Paré revived the operation of *podalic version* which had been known in classical times. During the 17th century numerous treatises were published on the subject but most of them were not the result of the observation of nature but were based on theory or conjecture or were a mere repetition of the classical tradition. Much of the literature was written for the use of ignorant midwives and was therefore purposely elementary in form.[3]

The earliest clinical work was done in Paris, and in the writings of Mauriceau and La Motte in the latter half of the 17th century the beginnings of scientific midwifery can be traced. During this period the employment of a "man midwife" became customary at the French Court. Jules Clément attended several Royal ladies, also la Vallière. Indeed, scandalous legend has it that the custom of employing a man arose through the desire of la Vallière to conceal the nature of her illness and therefore employing a physician instead of a midwife. The truth of this story seems more than doubtful; moreover, the employment of a man doctor in cases of difficulty was already well established among the well to do. At this period the appointment of an accoucheur to Royal ladies probably corresponded to the appointment of a consultant obstetrician to Royalty at the present day, that is to say, unless difficulty arose the midwife practically remained in charge. Prior to the 18th century the male practitioner was only called in as a last extremity, his work was largely destructive and his advent nearly always meant death to the child and often to the mother. Many of the male

practitioners had scarcely seen a normal birth and were totally unacquainted with the normal processes of nature. Paris was ahead of other cities in this branch of study and early in the 18th century students there had the advantage of studying cases in the maternity wards of the Hôtel Dieu. The title of Father of Modern Midwifery, however, has been bestowed upon a Dutchman, the accoucheur Hendrik van Deventer, whose treatise was published in 1696. His work was the first to give a scientific description of the pelvis and further made some attempt at a scientific description of the process of parturition. It is not without significance that Deventer's wife was a midwife, so he had more knowledge of normal cases, if only by hearsay, than most male practitioners.

In the meantime Great Britain remained backward, her midwives unregulated and untrained, her doctors content to translate continental works and the facilities for training almost non-existent. Edinburgh University appointed a Professor of Midwifery in 1726, but not until 1739 was there any opportunity for the clinical study of midwifery in London. At that date a ward of the parochial Infirmary of St. James, Westminster, was set apart for lying-in women; this reform was due to the initiative of Sir Richard Manningham, at that time the leading London accoucheur. He taught his students in this ward, which was supported by public subscription. Twenty years later London was held by some to surpass Paris in its facilities for studying midwifery. For one thing there had been between 1739–59 a marvellous growth in the number of institutions devoted to this branch of medicine. The Middlesex Hospital made arrangements for receiving lying-in women in 1747 and appointed a physician accoucheur. In 1749 the British Lying-In Hospital (for married women) was founded. The City of London Lying-In was founded in the following year, the Queen Charlotte's (for unmarried as well as married) in 1752, the Royal Maternity in 1757 and the General in 1778. Not only the quantity but the quality of the instruction available in London was improving during the period and this largely owing to the exertions of one man.

William Smellie (1697–1763) was born in Lanark. Little is known of his early life, he was almost certainly trained to his profession by apprenticeship, as that was the only available method in Scotland at that period. He set up as a general practitioner in Lanark in 1720, obtained a good practice and a considerable local reputation, especially as an accoucheur. About 1738 this prosperous provincial doctor threw up his practice in order to become again a student and a beginner. He journeyed to London in order to study there the latest methods of midwifery and was extremely disappointed to find that the metropolis had little or nothing to teach him and he almost at once passed on to Paris. Here he attended the lectures of the famous Grégoire but again confessed to disappointment; in some matters the provincial general practitioner could have taught even the specialists of Paris. In 1740 he returned to London and set up in practice in Pall Mall as an accoucheur, but, until his name was made, he was obliged to pursue as well the humble activities of an apothecary.

Smellie founded scientific midwifery in England. His work was based upon the observation of normal cases, upon the application of mechanics and the laws of moving bodies to parturition and upon an exact measurement of the pelvis to distinguish between normal and contracted pelvis. He improved the forceps[4] and other instruments and revolutionized the instrumental side of the obstetric art. After him the accoucheur became the herald of life instead of death, his advent brought hope instead of despair and terror. Smellie was not only a great practitioner but a great teacher, he trained over 900 male students and an unrecorded number of women. For teaching purposes he constructed an improved "phantom" or model, made of parts of a real skeleton covered with soft leather and a little doll to represent the fœtus. He also kept a detailed case book which he had started in Lanark. But in Smellie's view no teaching could be satisfactory unless students could see and practise upon actual cases. He therefore started a scheme by which he and his students attended poor women gratis in their own homes. To induce the women to submit to his attendance they were given maintenance

during their lying-in, this maintenance was provided out of a fund to which every student contributed 6s. When he began this work Smellie had to endure much from prejudice and ignorance, on more than one occasion he and his students were in actual danger from the mob. He had to face the jealous anger of the midwives, his most redoubtable antagonist, Mrs. Nihell, in particular libelled and abused him, made coarse jests about his "phantom" and called him "a great horse god-mother of a he-midwife". Smellie, indeed, was not aided by his manner, he had not, unlike many of his countrymen, come to cities early in life, he was an uncouth 18th century provincial Scot, with personal idiosyncracies of manner in addition. Yet, in spite of all these handicaps, he won his battle; his honesty, his faith, above all his ability, conquered. He won the guerdon he sought, not personal glory or honour, but an incalculable reduction of human suffering.[5] Smellie had many able successors, of whom William Hunter, brother of the anatomist, was the most famous. After five years' study at Glasgow University he became a pupil of Smellie, in itself a tribute to the latter's reputation, and subsequently became the leading obstetrician of London.

The numerous maternity charities benefited women of all classes by the facilities which they afforded for the training both of medical students and of midwives. This indeed was one of the reasons for their establishment, as was stated in regard to the Dublin Lying-In Hospital (1745), "one of the great objects of its founder Dr. Moss being that it might afford facilities for clinical instruction and thus save students the necessity of resorting to Paris to learn this branch of the healing art." The authorities of the British Lying-In Hospital when asking for subscriptions in 1805 pointed out that by "such institutions the physician is enabled from the number of patients under his care . . . to derive considerable improvement to his profession".

The Lying-In Charity for delivering poor women in their own homes, which was founded in 1757, also trained midwives and is typical of this kind of charity. It gave a free training to midwives, who had to obtain a certificate of proficiency

from the physician of the charity, and in return for their training they were pledged to work for two years at low fees. London had a number of similar institutions, in some cases forming a department of a general dispensary, as in the case of the Westminster General Dispensary. Taken together, the lying-in charities in the latter part of the 18th century must have aided a considerable proportion of the poor women of London. The Lying-In Charity alone delivered 5,428 women in the year 1774–5, nearly one third of the total baptisms in the Bills of Mortality. The yearly average for this institution was between 4 and 5 thousand, that of the British Lying-In between 500 and 600. The accommodation of the latter institution was reduced during the first years of the 19th century, owing to the high cost of provisions, and the number fell to between 300 and 400.

The provinces seem to have followed London but slowly in the matter of Lying-In Charities, but by the end of the 18th century either hospitals or out-patient charities had been established in most important towns. In a guide to Manchester published in 1804 there is a description of the Salford Lying-In Hospital founded in 1790 for attending poor married women in their own homes. There was a small in-patients department for cases in which difficult delivery was anticipated, where the home circumstances were unsuitable or where the patient lived outside the district served by the midwives. The charity employed 16 paid midwives and there were also attached to it three accoucheurs, who were only to be called in in cases of difficulty. The charity was a training centre for midwives and nurse tenders and also kept a register of wet nurses. Free inoculation or vaccination was performed on both women and children and the charity also provided medical attention for children under two years and for diseases peculiar to women. The house for in-patients was furnished with iron bedsteads with white curtains and coverlids, and the patients were clothed in white. In total a very large number of doctors and midwives must have been trained by the various institutions, and though no doubt many untrained midwives and half-trained doctors remained in practice, yet even they must have picked up some

of the new knowledge and in most towns skilled aid could be called upon in cases of difficulty. To the poorest the maternity charities were a more direct boon; before their establishment, the only place of refuge for those who could not afford help and maintenance was the general mixed workhouse; while the only paid attention available for the poor had been that of rough, totally untrained women, who often combined the employment of midwife with that of hawking fish and vegetables.

If one may judge by the records of the British Lying-In Hospital there was a considerable reduction in both maternal and infantile mortality during the second half of the 18th century. During the first ten years (1749–58) the average of deaths among the mothers was 1 in 42 (24 per 1000), among children 1 in 15 (66 per 1000). In 1779 to 1788 the corresponding figures were 1 in 60 (17 per 1000) and 1 in 44 (23 per 1000), in 1789–98 the figures were 1 in 288 (3·5 per 1000) and 1 in 77 (13 per 1000), in 1799–1808, 1 in 216 (4·5 per 1000) and 1 in 92 (10·8 per 1000). It must be remembered in considering these figures that a maternity hospital was at a disadvantage because, in the words of the Report for 1805 of the British Lying-In Hospital, "Women who are the most deformed or who are in very bad health, in general take the most pains to procure letters of admission into this charity, which certainly must add to the number of deaths, as of those . . . many would have died of disease, if they had not been with child." The dangers from puerperal fever were likely to be greater in a hospital and, in the earlier period, also from typhus and other infectious disorders not connected with child birth. Indeed it seems more than possible that a proportion, and possibly a large proportion, of the above quoted reduction in mortality was due, not to an advance in midwifery but to the reforms in general hygiene and hospital management.

According to a contemporary description of an "unreformed" confinement, the unfortunate woman was placed in a small room with a large fire, crowded with friends, and was given large doses of strong liquor. A rich woman after delivery was "covered up close in bed with additional cloths, the curtains are drawn round the bed and pinned together,

every crevice in the windows and door is stopped close, not excepting even the keyhole, the windows are guarded not only with shutters and curtains but even with blankets, the more effectually to exclude the fresh air and the good woman is not suffered to put her arm, or even her nose, out of bed for fear of catching cold. She is constantly supplied out of the spout of a tea pot with large quantities of warm liquors, to keep up perspiration and sweat, and her whole diet consists of them ". The writer says that the poor living in cellars suffered from damp and those in attics from the stifling, heated air of tenement houses, while the maternity hospitals were stuffy, over-crowded and insanitary. He adds, " This description may seem over-charged for a picture of that improved practice which is introduced by modern professors of the art; but upon a close examination I believe it will appear that many of the most important errors do in reality prevail, and this I impute in great measure to the large share which nurses have in directing the management of lying-in women, to whose interference practitioners must in some measure submit, though contrary to their better judgment." The writer advocated a return to nature and in particular the application of Sydenham's " cool regimen ", i.e., fresh air.[6] In this connection a report of the work of the Paris Maternité in 1808 is very significant. The figures for this institution contrast very unfavourably with the comparable figures for the British Lying-In. In the Maternité for the five years ending 1808 the average mortality of the mothers was 1 in 23 (43·5 per 1000) and of children 1 in 29 (34·5 per 1000), while for the British Lying-In the average of ten years ending 1808 was 1 in 216 (4·5 per 1000) for women and 1 in 92 (10·8 per 1000) for children. In fact, the Paris figures for maternal mortality were worse in 1808 than the English figures for 1760. The British Lying-In, however, was for married women only, whereas one department of the Maternité was open to poor married women, another to unmarried girls of previously good character and another to women of the town, though this last class contributed very few patients. This difference in the class of patient doubtless raised the proportion of deaths due to venereal infection but on the other hand, for

the reasons quoted above, the English institution would be likely to have a larger number of malformed patients, since many would enter the Paris institutions because they had no other refuge and not because they particularly needed skilled attention. But the explanation for the remarkable difference in the figures probably mainly lies in general hospital management; the writer of the description of the Maternité remarks that the maternal mortality figures improved from 1 in 23 to 1 in 32 in the years when the hospital was free from puerperal fever, " où il ne regne que des fièvres bileuses *putrides* " (typhus), " miliaire ou autres maladies." [7] In this connection it must be remembered that Howard, that impartial and severe critic, found the British Lying-In " clean and well managed ".[8]

There are no English statistics available for the maternal mortality of the whole country and unfortunately the Carlisle tables do not include any figures for childbirth but only for the sub-heading, " difficult delivery." Dr. Short calculated in 1760 that 1 in 60 (16·7 per 1000) women died in childbed but Dr. Black writing in 1781 said, " others upon better foundation " calculated 3 in 200 (15 per 1000). Such calculations had to be based upon the very imperfect registers and Bills of Mortality. If they are at all reliable the difference caused by skilled attention is startlingly revealed by comparing these estimates with the figures of the British Lying-In and also those to be found in the Midwifery Reports of the Westminster General Dispensary published by Robert Bland in 1781. Here out of 1897 women delivered only 7 women died, that is a proportion of 1 in 270 (3·7 per 1000), a very near proportion to that of the British Lying-In at the same date. Of these seven deaths, four were due to puerperal fever. In comparing these figures with those of the present day it must be remembered that this scourge was then unpreventable, as, despite detailed study, medical science had failed to find either its cause or the means of prevention. To-day it is largely preventable and yet in the year 1922 there were 1,079 deaths from it in the United Kingdom, more than one-third of the total maternal deaths. Indeed, considering the great advance in general medical knowledge and hygiene the present day figures give little cause for

gratification and it seems possible to claim, that relative to its knowledge, the end of the 18th century has a better record in this vital matter of maternal well being than the end of the 19th or even the beginning of the 20th century.[9]

The advent of the qualified doctor into the lying-in room brought with it a revolution in infant nurture. From the first, the doctors protested against the excessive clothing and tight swaddling beloved of the old nurse. A story is told of one of the early doctors who, seeing the unfortunate infant nearly choking, did not stop to have it unswaddled but promptly cut off its clothes. It is suggested in the story that this drastic action was necessary to save the infant's life; it was more probably a dramatic gesture akin to that of those later doctors who broke closed windows with their walking sticks. The doctors began also to advocate fresh air, cleanliness and sensible feeding; the kind of advice which advanced doctors were giving to well-to-do mothers in the middle of the 18th century can be gathered from Dr. William Cadogan's "Essay upon Nursing" published in 1747. This pamphlet was written in the form of a letter to the Governors of the Foundling Hospital, but the greater part of it is taken up with diatribes against the over feeding and over clothing of the children of the wealthy and with sensible, if caustically given, advice as to the rearing of the children of the rich. Cadogan was of the opinion that the children of the poor were healthier and had a better chance of survival than those of the rich, since the poor were unable to kill their children with mistaken kindness. He, perhaps, did not know very much about the children of the poor. Cadogan thought that child nurture should be considered in the light of science and the best medical knowledge and should no longer be a matter of custom and tradition, or as he somewhat unchivalrously expressed it, "In my opinion, this business has been too long fatally left to the management of Women . . . they presume upon examples and transmitted Customs of their Great-Grand-Mothers, who were taught by the Physicians of their unenlightened days." He mentions as examples of these customs that new born children were nearly choked by dabs of butter and sugar or caudle being forced down their throats, some

people even gave new born infants morsels of roast pork! Cadogan protested vigorously that the only food for the infant was its mother's milk. He inveighed against the common practice of employing a wet nurse, stating it to be dangerous for the infant and deleterious to the health of the mother. "Dry feeding" he considered practically tantamount to murder. He gave sensible advice as to the choice of a wet nurse should one be absolutely necessary. He pointed out to fashionable mothers that suckling their infants need not interfere with their comfort and pleasure, since it should only be at stated intervals and that four times in the 24 hours, as a rule, was sufficient. He condemned night feeding. For older children he advocated the inclusion of ripe fruit and vegetables in their diet and combated the current notion that such food was indigestible. Cadogan advocated fresh air and cleanliness, stating that "some imagine clean Linen and fresh cloaths draw and rob them" (the infants) "of their nourishing juices". On the contrary, infants cannot be changed too often since, as he frankly says, "it would free them from stinks and sournesses." Finally, this curiously modern adviser gave his contribution to the controversy of heredity and environment, he held that few diseases were inherited except scrofula and venereal diseases and that most disease was the result of wrong nurture. Cadogan, with his evident distrust of the female sex, implored fathers to exercise their marital authority in the vital matter of the rearing of their children. Whether they did so to the extent, at any rate, of presenting their wives with his pamphlet, or whether the wives were sufficiently enlightened to buy it for themselves, the fact remains that it went into ten editions between 1747 and 1772 and presumably at least some of the advice was followed. In 1773 a Dr. Clarke published a book upon the management of children in which he gave similar good advice as to light clothing, cleanliness and fresh air. He, more tactful than Cadogan, warned his readers that they would have to contend against the ignorant prejudice of nurses who "foolishly imagine that clean linen and fresh cloths draw away and rob them (i.e., the infants) of their nourishment". The same

idea had formerly been held about sick persons and Sydenham was one of the first to combat it.

The new ideas had a mass of ignorance and prejudice to overcome, even among the well to do, but they slowly gained ground and through the channels of the maternity hospitals, the trained midwives and, most of all, the dispensaries, even penetrated to some degree to the homes of the poor. In 1816 a baby clinic (though not of course so called) was actually established in London. The Universal Dispensary for Sick Children, founded in that year, had as one of its objects the spread of the knowledge of infant and child management among the poor. Bound up with its report is a copy of the pamphlet distributed to poor mothers. This pamphlet advocated breast feeding, cleanliness, bathing, loose clothing and fresh air. The mother was warned against quack medicines and told to avoid night feeding. There was another pamphlet on the management of young children with advice upon similar lines.[10]

All contemporary authorities give the better care of infants as one cause of the diminution of the death rate, another was the better treatment and partial prevention of infantile diseases, particularly smallpox. Together all these improvements resulted in a reduction of infantile mortality which has only been equalled in the 20th century.[11] Dr. Lettsom wrote in 1774, " In the nurture and management of infants, as well as in the treatment of lying-in women, the reformation hath equalled that of the small pox; by these two circumstances alone, incredible numbers are rescued from the grave ".[12]

CHAPTER XII

Rickets and Scurvy

" For if Rome decreed the Civic Crown to him who saved the life of a single citizen, what wreaths are due to that Man who having himself saved many perpetuates . . . the means by which Britain . . . may preserve numbers of her intrepid sons ". (Sir John Pringle. Discourse on occasion of presentation of Copley medal to Captain Cook, 1776.)

It has been suggested in the previous chapter that a considerable part of the credit for the reduction of the infantile death rate must be given to the medical profession. But by no means all the credit was due to the doctors, a good deal must be ascribed to the general advance of society and in particular to the advance of agriculture. Undoubtedly a great deal of the infant and child mortality was due to malnutrition, sometimes causing direct specific disease, sometimes only leading to an impaired vitality. In this connection the histories of rickets and scurvy are important, not only in themselves, but as indicators of the general condition of the food supply of the population.

Rickets is a disease of malnutrition in childhood which shows itself in the lack of proper calcification of the bones. For a very long period it has been recognised as a dietic disease and many factors have been suspected in the past, such as a lack of lime in the water, too early or too late weaning and so on. Modern research has lately revealed a close correlation between rickets and the absence of fat-soluble vitamin A, which vitamin is present in most animal fat, and, in smaller quantities, in some vegetables. Butter and milk are particularly rich in it. But it is not believed that the absence of vitamin A is the sole determining factor in rickets. Obviously bone cannot be formed without calcium and phosphorus and a deficiency of either of these or a lack of balance between the two may lead to rickets.