Major Medical Explanations for High Infant Mortality in Nineteenth-Century Europe

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Abstract. Statistics initially developed as a recognized field in the social sciences in the middle of the nineteenth century. The European medical profession first made use of mounting statistical evidence to dramatize infant mortality, one of the great social problems of the century. Those telling statistics amply demonstrated the general proportions of the problem as well as pinpointing the fact that a large percentage of the dying was neonatal in character. The medical profession also insisted that these infants were passing away from a series of ailments. Number one on their list was what they called debility, followed by respiratory disorders, gastro-intestinal problems, and convulsions. While nineteenth-century European medicine did not necessarily solve this social problem, it did evidently convince the larger society that these high tolls were morally unacceptable.

Résumé. La statistique s’est taillée une place en tant que champ de recherches au sein des sciences sociales vers le milieu du dix-neuvième siècle. La médecine européenne a fait un premier emploi du témoignage statistique croissant pour mettre en évidence les taux élevés de mortalité parmi les enfants, l’un des grands maux dans la société de l’époque. Les données statistiques marquées exposaient de façon convaincante le problème dans ses dimensions générales, en même temps qu’elles précisaient qu’une prépondérance de ces décès touchait au nouveau-nés. Les médecins soulignaient aussi que les enfants mouraient de causes multiples. En tête de la liste des maladies venait ce qu’on appelait à l’époque la débilité, ensuite les troubles respiratoires et gastro-intestinaux et les convulsions. Quoique la médecine européenne du dix-neuvième siècle n’ait pas forcément donné la solution à ce problème social, elle aurait réussi à convaincre la masse de la société que ces taux élevés étaient intolérables sur le plan moral.

"Of all the things in life, there should be nothing as preventible, as there is nothing on the face of it so unnatural, as the death of a little

In the 1880s Robert Koch, the founder of modern bacteriology, described tuberculosis as the greatest infectious killer in European history. By comparison, the most "bruising epidemic" ever, and the one which over the centuries had clearly caused far more dying than tuberculosis, was infant mortality, or death in the first year of life. The European medical profession began to take a serious look at the very high rate of infant mortality, for the first time, in the second half of the eighteenth century. And that attention took on a decidedly pessimistic tone. As the German physician Antonius Graf pointed out in 1782: "There is reason to be pessimistic about child birth because so many infant lives seem to be little more, in this existence, than pieces in a game of draughts, some win and some lose." Even a century after this remark, in the 1870s, most doctors in Europe would have generally agreed that infant mortality rates were still much too high and, more particularly, would have gone along with the declaration of the French commentator, Paul Nalin, that "infancy was the least viable age." As it was, over the course of the eighteenth and nineteenth centuries, evidently no social class was spared this scourge, although proportionally speaking, aristocratic and middle-class families were less susceptible than lower-class families, where the death toll was greater. This long-standing pattern of high mortality among infants began to fall off near the dawn of the twentieth century. Before this happened, the medical profession was deeply involved in pinpointing the numerical toll here as well as assessing the reasons as to why infants were being so singled out for early death.

EUROPEAN MEDICINE AND THE ADVENT OF STATISTICS

The birth of the modern science of statistics largely took place in the middle of the nineteenth century. Almost immediately, the medical profession made use of the advent of statistical studies to illustrate just how large a problem infant mortality actually was. By the 1860s, one of the great pioneers in this didactic effort, the well-known British civil servant and statistician, William Farr, was producing indisputable evidence that infant mortality was one of the great social problems of his age. What alarmed and even frightened the medical profession in the second half of the nineteenth century was ever-accumulating numerical evidence that the infant death rate, in one country after another such as Britain, France, Prussia, and Sweden, was persistently hovering between 150 and 200 per 1,000 live births. These distressing statistics,
published by national and urban governments, were so uniform across the continent and so personally disturbing that the leading French physician Felix Boudet, speaking to the French Imperial Academy of Medicine in 1866, meeting in Paris, sounded a warning. He described infant mortality as “an evil” and told his audience: “We must guard against viewing [infant mortality] fatalistically and as a normal form of dying.” Boudet, in his address, quite justifiably pointed to history, declaring that “the question of infant mortality had, indeed, occupied previous epochs deep into the past.” And it had. As it turned out, the European medical profession was finally awakening, as a result of one statistical study after another, to the true proportions of this problem. What the European medical establishment did not really understand in the middle of the nineteenth century was that infant mortality had been an even larger problem in the late eighteenth century. Certain keen eighteenth-century medical men had sensed this demographic disaster in the decades before 1800, but they did not have accurate figures at their disposal whereby they might have illustrated its exact proportions to others.

PREVIOUSLY HIGH RATES OF INFANT MORTALITY

Comparatively speaking, the infant mortality rate prior to the nineteenth century had been considerably higher, constantly in the neighborhood of 25% of all live births. Studies completed over the past few decades of various institutional records bear out this bleak pre-industrial picture. Those institutions which took in the unwanted infants of the poor had a notoriously bad record for keeping these very young children alive. Of those who were surrendered to the Parisian foundling hospital in the seventeenth century, one third never survived infancy. The death toll could be worse and was in Prague, between 1719 and 1789. Here, a total of 3,028 male infants were turned into the city’s foundling hospital, and of them, 1,999 died during their first year of life. This lamentable situation was clearly just as dire in rural areas. One study done in the mid-1970s of parish records pointed out that over two centuries in the English village of Colyton, infant dying constantly fluctuated between 120 and 200 per 1,000 live births, depending on the year. Along the same lines, a current in-depth examination of two French villages in the middle of the eighteenth century has reported the existence of very similar conditions. For example, in the French village of Crulai the infant mortality rate over time was 250 per 1,000 infants born. And in Tourouvre-au-Perche, another French village comparable to Crulai, of 351 first-born children, 72 died within the first month.
Even after the turn of the nineteenth century, these pernicious rates continued to exist in some locales. In Sweden and Norway, between 1806 and 1810, it has been determined that the overall infant mortality rate was stuck at 213 per 1,000.\textsuperscript{15} Even worse, in the Finnish village of Petalax, between 1827 and 1859, the figure was an almost unbelievable 346.\textsuperscript{16} Virtually all that is known about this very high rate of infant mortality prior to industrialism in Europe is the product of recent demographic research into eighteenth-century conditions. These telling figures were, in the main then, unknown to the continent’s medical men as the nineteenth century unfolded. What they did not perceive was this: infant mortality had actually declined from its historic highs, but was once again stuck on yet another plateau during this new industrial age, vacillating now between 150 and 200 per 1,000 live births.\textsuperscript{17} So what did strike the nineteenth-century medical mind was a plethora of then current statistical studies that demonstrated that Europe was suffering a high loss of population in the first year of life as the industrial age was coming on.

**THE WORRISOME PERIOD, 1850-1900**

What motivated the medical profession to investigate the causes of infant mortality was not history, but current developments. Those detailed statistical studies, done by one European physician after another in the nineteenth century, and compiled from vital statistics, not only raised the level of consciousness about the problem as never before, they also alerted a wider and wider circle within the medical profession to the true proportions of this population disaster. In the wake of this publicity, this loss of life would no longer be acceptable professionally as fate; something would have to be done about it. This new attitude pervaded the position taken by the Irish physician C. D. Purdon. Speaking to the annual session of the Ulster Medical Society in 1880, he explained: “an examination of the [statistical] registers show that the mortality among infants is so great that special attention should be directed at the exciting causes of those disorders that annually carry off so many of our young to an untimely grave.”\textsuperscript{18} The examination of such records was not only occurring in northern Ireland, but across the European continent and it was producing a plethora of highly revealing information. Those concerted studies began largely in the 1850s and continued to be produced, in an unabated fashion, right into the 1890s, creating a very powerful impression.

The statistics on infant mortality produced by European doctors in the second half of the nineteenth century primarily focused on national and urban developments, with a regional study appearing now and again. Using figures from the Continent to support his argument that
too many infants were passing away, the Irish medical man William Moore was able to point specifically to alarming French governmental statistics. In round numbers, the French government at mid-century calculated that over a 10-year period, there had been a total of 9,700,000 live births of which 1,500,000 had perished within the first year.\(^19\) At just about the same point in time, Ernest Assmann was producing more precise figures on Prussian infant mortality rates. His findings showed that for the period 1844 to 1853, the death rate per 1,000 live births was 18.07\%. For the years 1859-60, it had jumped up to 19.55\%.\(^20\) Illustrating his exacting studies with long and informative tables, the Swiss physician Lucien Crevoisier demonstrated that between 1876 and 1885, the infant mortality rate in his country was 17.9\%.\(^21\) These consistent national statistics were revealing the proportions of the problem, further proving that there was, indeed, another percentage plateau, somewhat different from the eighteenth century, at work here. This truism was further substantiated by the English observer, Alfred Harris, who produced statistics demonstrating that high rates of infant mortality were likewise persisting in Great Britain. He insisted that the rate was 158 per 1,000, and railed against such a heavy toll, saying that "the dying attracts little attention, save among the few."\(^22\) This, of course, was becoming less and less the case. Meanwhile, again making use of now ubiquitous statistical evidence, the French pediatrician René Lafabrègue was stating what was the obvious. By discussing what was happening in his country, in a larger perspective, he demonstrated that 19\% of all those dying in his country in any single year were infants and that no other age group even came close to that total.\(^23\)

This ever-growing volume of statistical evidence on infant mortality tended to take on a somewhat imprecise, but informative sociological character. To the medical observers of the day, the greatest amount of infant dying seemed to be taking place among the lower classes. To some of these analysts, this meant the peasantry, but to more it was death occurring in urban areas among the working classes, and in particular to those giving birth to illegitimate children. Walser's study, for example, of the German rural district of Leutkirch between 1840 and 1860 demonstrated an infant mortality rate well above the national average, one which he established at nearly 39\%.\(^24\) Whether this was a rural aberration or not is not clear from the statistics so far compiled. What is much easier to conclude is that nineteenth-century reformers insisted that this social problem was far more urban than rural, often forgetting that virtually every European city was now receiving a huge peasant influx from surrounding rural villages. Typical, nonetheless, of the prevailing attitude of the time was Haushalter's investigation of the French provincial city of Nancy, then undergoing industrialization. He saw the
This theme, often in writings taking on the form of an accusation, was repeated over and over again. Illegitimate births were also singled out, in the medical literature of the day, as tilting the scale towards even higher rates of infant mortality. One study of first French hospitals and then French orphanages, both filled with the illegitimate, found infants in those respective institutions dying at a rate of 360 and 420 per 1,000 live births. These figures for illegitimate deaths were further verified by other studies done on a wide scale in the countries of Prussia and Austria.

The statistics that were being compiled, by various central governments, were being used by socially conscious physicians to diagram the huge drain on population that infant mortality was having on one European country after another. Not only did those studies dramatize the true parameters of infant mortality, they poignantly demonstrated one other truth. And that was just how much of that dying was concentrated in the first few weeks and months of life. Probably no one did this more painstakingly than the Hungarian doctor Julius Eröss. Comparing statistics from 16 European cities, including places like Paris, Palermo, Vienna, and Prague, he produced an insightful international study. What he discovered was that of a total of 1,439,056 infants born, in those urban areas during the 1860s and 1870s, 9.5% had passed away within the first four weeks. This type of neonatal dying evidently had a rough kind of parallel in the countryside. For instance, in one German rural district at mid-century it was said, rather generally, that four-fifths of the infant mortality had occurred in the first six months and, as a further indication here, in the French rural department of Vienne, 30% of the infants born actually died in the first 14 days. Moreover, what was being disclosed in this regard as a result of local and regional studies was being repeated at the national level. In France, between 1861 and 1865, neonatal dying was equally as high. In that country, more than half of the infantile dying took place in the first three months, and in Switzerland for the years 1876 to 1885, 49% of the infant mortality occurred in the first two months.

THE BIOLOGICAL EXPLANATIONS: DEBILITY

Once this tremendous toll of infant life was made obvious in Europe, the next medical question that loomed was from what were so many of these infants dying? Biologically speaking, the answers that were given, in order of their priority, were: debility, followed by respiratory and gastro-intestinal problems, then improper nutrition at the breast and, especially, at the time of weaning, and, finally, convulsions. There were essentially more than 300 reports that were looked into for this present
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study. What was revealing in this examination of nineteenth-century documents was how infrequently infectious diseases were mentioned as contributing to death in the first year of life as compared to other causes given. The causes of infant death seemed to be far more physiological than they were the result of toxic microscopic agents.

The European medical profession listed the cause of infant mortality in the first few weeks or months by using such words as “debility” and “atrophy.” Beyond these two words, the general condition that it was describing here was additionally reported to be: “congenital delicacy,” “immaturity,” “innation” [something there at birth], “marasmus” or “wasting away,” and/or “a weak constitution.” The persistence of this vocabulary throughout the nineteenth century was really quite remarkable. What all of these words and phrases referred to was simply the weak and emaciated state of so many newborns. In the 1860s, for example, the Frankfurt physician Georg Varentrapp identified adynamia [the progressive loss of bodily strength] as the number-one killer of infant life in his home town over the course of fifteen years. The Swiss observer, Crevoisier, said that the same thing had been happening in Switzerland over the stretch of two decades. The Russian doctor Anna Kleinmann, from Odessa, studying in Zurich, confirmed his judgment, identifying “wasting away” as the principal cause of youthful dying, again in Switzerland. Others said the same thing. Some medical men, but not the majority, wanted to blame these “retarded constitutions” on the parents of these ill-fated infants. Pointing to environmental factors as a possible cause, the Irishman Moore could assert in 1859 that “Parents, living in a vitiated noxious atmosphere, become feeble and anaemic: the offspring partakes of the same weakly state of constitution, and is easily carried off.” Also sensing what amounted to a biological link here, Dr. Andrei Caron, from Rouen, asked the question: “how much when it comes to reproduction has to do with the anatomical and physiological condition of young parents[?]”

This overly general diagnosis of the major cause of youthful dying gave way to a more specific physiological one. As early as 1873, Assmann understood that debility was actually a natural and organic process that could conceivably turn pathological. Showing a more thoughtful approach than others had evinced in the past, he declared: “The transformation from a foetal existence to an atmospheric existence, from breathing through blood to respiration by means of the lungs, from nourishment given by the placenta to an activation of the stomach and intestinal system constitute in itself a revolution, and this is the greatest act of acclimation that any being has to go through in a lifetime.” Such comments clearly pointed an emerging pediatrics towards a more biological and exact explanation of infant mortality. The
growth of scientific thinking in this particular area would lead to a pro-
gressive focus on foetal development, or the lack thereof, as a cause of
infantile disorders. This was the thrust of the comments of G. Somma,
as he addressed the second Annual Italian Congress of Pediatrics, held
in 1892. Pointing to the foetal stage he was able to say: "the number one
factor leading to infant maladies has to do with gestation and what hap-
pens there."37 The notion of foetal malformation was now being picked
up by others, with the prescient anatomical question now being asked:
just what happened to the lungs, the heart and other organs in the
womb?38 As it turned out, the biochemical connection between mater-
nal nutrition and foetal growth was just being made towards the end of
the nineteenth century. Clearly, it would be made much more emphati-
cally in ensuing decades.39

RESPIRATORY DIFFICULTIES

European doctors in the nineteenth century concerned with infant mor-
tality seemed to have a positive penchant for listing the causes of so
much youthful dying. High on most lists, often enough in second place
after debility, but sometimes in third, was respiratory ailments.40 This
attention to respiratory ailments was persistent and dated back to the
eighteenth century. As early as 1729, in Germany, Gottlieb Berens was
warning of the dangers of "cold air" and what it might do to a still frag-
ile respiratory system.41 The same worry was expressed in 1784 by the
leading London physician, Michael Underwood. Underwood identi-
fied the two chief respiratory ailments that he saw among infants as
whooping cough and pleurisy. Given the state of then existing knowl-
dge, he could have confused those two diseases with bronchitis and
pneumonia.42 The reason why cold air was frightening, and really
ought to be avoided, was explained at the time by the German doctor,
Georg Graf, albeit in quasi-scientific terms. As he said: "the respiratory
system of the very young can be compromised, in particular narrow
passages can be permanently damaged [by cold] to the point where
fluids cannot flow."43 This dictum, in turn, led to the prevailing medical
conviction that a chilly atmosphere could directly cause a series of respi-
ratory ailments. And this view lived on, without much questioning,
right through most of the nineteenth century.44 As that century pro-
gressed, the medical profession was unified in its opinion that the two
major respiratory diseases operating against the infantile portion of the
population were bronchitis and pneumonia. Of note in this instance
was the fact that bronchitis was repeatedly ranked over pneumonia.45
An insight of sorts into just how prevalent bronchitis and pneumonia
actually were in these larger infant tolls was provided by two studies
published at the time. Kleinmann estimated that together they ac-
counted for 25% of all the infant deaths in the Swiss canton of Zurich. Meanwhile in France, Caron could point to yet another detailed study of 633 infants who had perished and which said that of that total nearly 30% had been carried off by bronchitis. Granted, these two studies may not have been totally reflective of what was happening in Europe as a whole, but they were suggestive of what was occurring.

GASTRO-INTESTINAL PROBLEMS

The nineteenth-century documents—including books, tracts, journal articles, and addresses—examined for this study showed a remarkable consensus among medical men in Europe that debility and respiratory diseases were the prime killers of the young. That medical establishment agreed on one other point, that gastro-intestinal problems, in the main diarrhea, posed yet another catastrophic threat to young life. When European medical men initially began to discuss the dangers to infancy in the eighteenth century, a great deal of attention was paid to gastro-intestinal pathology and diarrheal deaths. According to Graf, writing in 1774, "the infant digestive system can be easily disrupted especially if there is an error in eating [and] especially when food [natural or artificial] is first introduced to the system." Graf went on to insist that food must never agitate nor excite the stomach. For the vast majority of medical men in that century, that meant that acidic foods should never be given to an infant. Acidity, according to Underwood, could occur at any time and could exist in either breast milk or solid food given by parents, producing a situation where diarrhea could become virtually habitual and a danger to life. For, as he explained, "many bowel complaints [in infants] will," he added sadly, "not admit of a lasting cure." The all-too-frequent result in the view of the Swedish expert, Nicholas von Rosenstein, was diarrheal deaths, which in his experience occurred, more often, during the summer months. Indeed, throughout the eighteenth and nineteenth centuries, doctors were regularly reporting high levels of diarrheal deaths. Even as late as 1898, Langford Symes speaking to the Irish Royal Academy of Medicine could declare: "Equally striking is the frequency of diarrheal deaths under one." One German doctor, evidently feeling rather hopeless about this loss of life, could only ask rhetorically: "How many millions of children have been slain by diarrhea and how many millions of mothers have lost their children in this way?"

While a physician here and there was still attributing infantile diarrhea to the older concept of an acrimonious diet, medical perceptions about the causes of gastro-intestinal disturbances were sharpening with each passing decade of the nineteenth century. Some were even tying debility and diarrhea together and saying that this combination was the
real reason for the very heavy loss of infant life in the first few weeks and months of existence. If debility meant low birth weight, that meant, according to one recent study of the Swedish village of Urmea in 1807, intestinal disease in that village on a massive scale.\textsuperscript{56} This modern insight reported in 1981 between low body weight and chronic intestinal disorders was progressively recognized by numerous doctors also in nineteenth-century Europe.\textsuperscript{57} The interest at that time in what was alternately called infantile enteritis or inflammation of the intestines, was furthermore being directly linked to the act of weaning, whenever that might take place in an infant's life. In the 1870s and thereafter, French doctors were asserting that, at least, a plurality of infant dying was tied to diarrhea, and that weaning, or better what was given at weaning, was the culprit.\textsuperscript{58} The blame primarily was assigned to the giving of artificial foods, that is, something other than mother's milk. As the Frenchman Émile Ménager explained it: "afflictions of the digestive system are the most frequent among new borns and what kind of food is given to the infant affects the gastro-intestinal system."\textsuperscript{59} The wrong food inevitably led to, as Ménager's English counterpart J. Brendon Curgenven said: "the child suffering [and dying] of diarrhea."\textsuperscript{60}

Within the same context, the second half of the nineteenth century also saw physicians identifying more and more the phenomenon that became known as summertime diarrhea.\textsuperscript{61} There were repeated reports in the medical literature of mid-century and thereafter that this was taking place. One of those studies was done by Varentrapp and focused on two German metropolitan areas, Frankfurt and Berlin. Using statistical evidence, he reported that for those two cities, between 1851 and 1866, the infant mortality rate was higher in the summer months. In Frankfurt, on an annual basis, it was the highest it would be in July and August and in Berlin the rate consistently doubled in July over January.\textsuperscript{62} E. W. Hope likewise was using statistical evidence to call attention, as late as the year 1900, to excessive infant deaths during the summer months in English cities.\textsuperscript{63} On a more local level, W. S. Trench had already illustrated the rise in infant mortality that was occurring in Liverpool during the summer, which he directly attributed to complications from diarrhea.\textsuperscript{64} In the 1890s, also in England, E. Hart was among those condemning death from diarrhea in infants. His figures showed that depending on which district in Great Britain one was talking about, the number of deaths among infants due to diarrhea fluctuated from 13.7 per 1,000 live births to 26.6 on a yearly basis.\textsuperscript{65} To some, the problem had not lessened all that much. The connection, of course, between diarrheal dying and bacteria was just being explored in the late nineteenth century. In the decades thereafter, that linkage would be made abun-
dantly clear as would the impact of proper or improper nutrition on youthful gastro-intestinal systems.66

BREAST-FEEDING AND WEANING

In overall terms it is true that medical men of this time listed debility along with respiratory and gastro-intestinal ailments as the chief reasons for the loss of infant life. But page for page in their writings, they spent less time describing these givens and devoted far more ink to a discussion of breast feeding, nutrition, weaning, and the dangers inherent in giving artificial food too soon to infants, who still had underdeveloped digestive systems.67 Throughout the eighteenth century and a good part of the nineteenth, medical opinion was either universally or overwhelmingly on the side of breast-feeding. The custom of breast-feeding was by that time a thousand years old in Europe and had taken on the proportions, in the words of one recent writer, of a staunch ideological position.68 The statistical studies that were there in the eighteenth century on this point proclaimed to observers that there would be dire consequences if breast-feeding was not given or if it was abandoned too early. A prime example of this was the story told of 132 foundlings in the French city of Rouen, between 1763 and 1765, and their fate. All of them were artificially fed, meaning they were given food other than breast milk, and of the total here, it was said, only five survived.69 By the same token, reports out of Breslau in the eighteenth century told a similarly tragic story.70 Other stories, in the same vein, based on either hearsay or actual fact, persisted into the early part of the ensuing century.71 Furthermore, this strong and traditional belief in the value of breast milk is what made wet-nursing the only real cultural alternative to the milk that mothers could provide.72 In the eighteenth century and through the first five decades of the nineteenth, very few would have argued with the contention of the Scottish physician Richard Dick in 1838, who stated: "The food adapted and provided by nature is mother’s, or, at all events, human milk; since every other substitute, even the milk of animals, which most clearly resembles human, is food far inferior to the last."73 Breast milk was unequivocally the best. Only rarely was it ever suggested that breast milk might possess some highly individual traits or was, sometimes, of quite poor quality.74

The insistence that breast milk was almost sacrosanct continued right into the period after 1850, with few ever asking if that milk was the product of a well-fed mother or a mother who was poorly nourished. Actually, quite apart from the question just presented, there were, after 1850, a few pioneering advocates of cow’s milk speaking up and arguing that it was, indeed, an alternative to mother’s milk. In France, however, Boudet denounced it right off, extolling breast milk and vilifying
the new fare by declaring: “The milk that the mother provides her new born is of a special quality, which she is able to supply without detrimental effect.” His countryman, Nalin, stated that “to assure health in the first year, then above all else there must be a guarantee of mother’s milk.” Meanwhile in Switzerland, yet another medical voice was speaking to this issue. Kleinmann was not as emphatic as Boudet and Nalin, but she was clearly talking for the majority when she said succinctly: “cow’s milk can never be like mother’s milk.” Even into the 1890s, as the medical profession made more and more hesitant concessions to the idea of feeding non-breast milk, another German-speaking doctor could confidently proclaim: “children who are artificially fed are at a great disadvantage as compared to those fed with mother’s milk.”

Meanwhile, when the German physician M. Schmelcher stated in 1869 that “he was convinced that the problem of infant mortality begins when the infant is separated from its mother’s breast and death threatened,” he was expressing a nearly universal opinion within the European medical profession at the time of the 1860s. The fear of what would happen at weaning led one medical man after another to argue for the sustained use of breast milk in the first year. The abandonment of breast-feeding during those 12 months was, in the view of many, inherently dangerous. The problem centred on the feeding of solid food, especially the age-old practice of giving pap. Coupled with that custom and, equally fraught with danger in the medical mind was the new fashion of bottle-feeding with cow’s milk and the even more novel giving of prepared baby foods, or industrial foods as they were commonly being called. Because both old and new methods of feeding at weaning were considered to be untrustworthy and to be empirically contributing to infant mortality, the European medical world, more often than not, pushed the idea of continuous suckling. In France, according to C. M. Fleury, women were universally giving up breast-feeding when their infants were just four or five months old. He argued that suckling should continue right into the second year, and so did his French counterpart, Édouard Guillon, who predicted that the new vogue of bottle-feeding cow’s milk “will never be able to replace the giving of mother’s milk.” Fleury and Guillon had their allies among medical men. One of them was the English pediatrician David Forsyth, who, at the turn of the twentieth century, tried to shame his era by demonstrating that in the seventeenth century suckling was often advised for up to a year and a half and even two. In contrast to the past, he pointed out that in the nineteenth century British mothers were failing to breast-feed much past six months and, further, that the coming of the baby bottle was demonstrably driving that figure down even lower.
Much of the medical literature examined for this present study inferred a definite dread of weaning for fear of what might happen and the concomitant threat of infant mortality taking place immediately thereafter. That was a worry that was often enough the case. The Italian doctor, Romolo Griffini, staunchly condemned the “premature giving of artificial foods” in 1868, saying that the infant was not physiologically or chemically capable of ingesting those foods so soon, and that this could lead to death. The notion that different foods, given early on, could damage an immature gastro-intestinal tract leading to infantile diarrhea was now being commonly stated. This persistent medical condemnation of poor feeding habits extended to the truly ancient practice of giving pap, that is bread or flour in combination with water or, sometimes, milk upon weaning, but little else. Reproached just as much were the practices associated with the first coming of cow’s milk to the European diet. Initially, in German-speaking central Europe, at least, cow’s milk was thought to be just about the same chemically as human milk. But then severe doubts set in and the actual advent of artificial milk, as it was quite often called, became a matter of intense public debate among physicians. Within that discussion, cow’s milk was frequently singled out as a potential or even actual cause of infant mortality. That condemnation seemed to center more on what happened to cow’s milk rather than on its composition. Historically speaking, the giving of cow’s milk became all too easy in the 1850s as a result of the introduction of the baby bottle. Further the suckling bottle with a rubber valve, a sophistication of this original invention in the late 1860s, was in the view of Guillon and other physicians making breast-feeding almost obsolete. To back up his assertion, Guillon pointed to a Viennese study that showed in the 1880s and 1890s that the majority of mothers in the Austrian capital had already gone over to the practice of bottle-feeding, with all its attendant fears for Guillon and other like-minded physicians. Guillon’s compatriot Boudet focused on another concern, calling cow’s milk “a veritable poison to the unfortunate infant when it is poorly kept.” A very large part of the problem here was that feeding bottles were not being properly cleaned. This lack of sanitation in the form of filthy bottles and nipples was criticized by medical men as contributing in the late nineteenth century to a new form of infant deaths.

By the 1890s European medicine slowly was accepting this substitute for breast milk, but insisting that it had to be “pure and sterile” when given. In contrast to this growing acceptance, some doctors like Fleury in France were still antagonistic to bottle-feeding and were, in defense of their hold-out position, able to muster some statistics pointing to a higher rate of infant mortality from the practice of bottle-feeding as opposed to breast feeding. In some of his scorching criticism Fleury
partly was correct. Often enough unpasteurized cow’s milk, poorly kept under unsanitary conditions was, indeed, a kind of “white poison” to some infants, as a serious source of bacterial contamination and diarrhea.  

If there were plenty of travails associated with the advent of the feeding of cow’s milk and an undetermined number of diarrheal deaths from that drink, many difficulties also surrounded the new, so-called industrial foods. These prepared foods again were considered by a host of medical men to be of a dubious nature, especially when compared with breast milk, which was still highly valued. Boudet, among others, warned against these foods as early as the 1860s, as did Nalin in the 1870s. Nalin did not dislike these foods or rail against them because of their nutritional content. He warned against industrial foods because of the way in which they were prepared. That preparation, as he said, was “generally impure and the cause of many infant fevers, and sometimes diarrheal dying.” Medical resistance to cow’s milk and prepared baby foods fell off precipitously by the turn of the twentieth century. That resistance atrophied as these two foods were processed much more safely and as infant mortality levels started to fall to an even lower plateau.

CONVULSIONS

While debility, along with respiratory and gastro-intestinal problems, themselves often incited by inadequate weaning habits, were commonly cited as the generic causes of deaths among infants, numbers of nineteenth-century doctors concurred that convulsions were the real and immediate reason for so much infantile dying. Writing in 1858, the Irish social reformer Moore, talked about infants dying in just such a fashion. He declared that convulsions were taking place all of the time and lamented further: “Convulsions cause more deaths in England and Wales generally, than either fevers, or bowel complaints put together.” A year later, his countryman, H. Minchen insisted that this immediate toll was actually being covered up because only one cause of death could be listed on the standard death certificates of the day. He further pronounced that many of the infantile deaths in his country were being attributed to debility and atrophy, but that this was a kind of fiction. As Minchen declared a lot of infant mortality was “manifestly referable to a congenital delicacy of constitution,” but that actual dying “was frequently attended with convulsions.” What nineteenth-century European medicine meant by convulsions had pretty well been determined by previous eighteenth-century descriptions dealing with the obvious neurological delicacy of newborns. To the eighteenth-century medical mind, neurological immaturity inevitably led to convulsions. In 1775, the Czech physician Joseph Klinkosch explained that certain in-
fants were, in fact, predisposed towards this affliction, because “It is often the case that some infants are not very strong, and are subject to epileptic motion.” At just about the same period of time, von Rosenstein described this disorder in his own way, saying: “The nerves of children are very sensible and irritable. They are also covered with very thin membranes, which make their sensations so much greater.” When overstimulated, he went on, infants commonly experienced convulsions, defined here “as a tightening of their limbs, then jaws locking and their faces turning blue, with some dying in this state.” Underwood concluded this eighteenth-century discussion on convulsions by adding that all of these infantile nervous propensities were the direct result of “a morbid affection of the brain.”

This eighteenth-century diagnosis and explanation continued to live on into the nineteenth century without many alterations. By way of illustration, in 1838, the Englishman John Gardner published a book devoted to the study of infantile spasms, convulsions, and epileptic disorders. In it, he declared that these problems originated in the brain and nervous system and likewise drew attention to the fact that “these head diseases and convulsions are so prevalent and so fatal.” While medical authorities agreed in this new industrial age that they saw a lot of convulsions, they disagreed as to what caused this widespread phenomenon. Kleinmann thought that it had something to do with the morbid composition of the blood. The German doctor M. Marcus agreed, but concluded that it was an apoplexy induced most likely by a blockage or rupture of a brain artery. Another school of thought had it that convulsions were virtually inevitable once breast-feeding was over, either at the moment of weaning or within a day or two of the giving of strange artificial foods. While the medical profession was somewhat at odds as to just what caused the disease that von Rosenstein had earlier on described as “epilepsia infantilis,” there was one thing certain. Hard numbers on those dying from convulsions, even in the more statistically conscious nineteenth century, were, in the main, not present in the medical reports. In spite of this lack of arithmetic, convulsions were repeatedly described in the medical literature from the late eighteenth century through almost all of the decades of the nineteenth, giving credence to both the existence of convulsions as an illness and as an immediate cause of some infant dying.

CONCLUSION

Scientific medicine was born during the course of the nineteenth century. What had often been a more general and philosophical enterprise in Europe prior to 1800, now progressively took on a more exacting empirical character. This kind of scientific precision led to the advent of
both physiology and pathology and a number of great medical break-
throughs that were capped by the discoveries of Koch in 1882 and 1883
that proved the germ theory and were the beginning of modern bacteri-
ology. Many of these new insights were themselves the result of the
growing acceptance of post-mortems and all of the anatomical knowl-
edge that they produced.

The science of pediatrics was also born in nineteenth-century Europe,
but its discoveries came at a slower pace than other fields of medicine.
This branch of medicine grew out of the social concern of a large num-
ber of physicians over the alarming loss of life that was taking place in
the first year of life. That worry led, in an evolutionary fashion, to a con-
stant cataloguing of the apparent reasons why young life was being
taken. Clearly, debility or immature development in the womb was a
dominant factor. Evident also were poorly developed or impaired re-
spiratory and digestive systems, which led, in due course, to the all-too-
frequent deaths from infectious diseases and diarrhea. Add to this the
mortality attributed to convulsions, probably caused by a host of rea-
sons, and the picture did seem like a bleak one in the nineteenth cen-
tury. But more optimistically, the European medical profession was on
the right track in pointing, more and more often, and albeit generally, to
poor nutrition as a seminal cause of so much youthful dying.

Modern pediatrics, with its concern for foetal development and
proper nutrition, was destined to become truly scientific only in the
twentieth century. One of the things that stalled that development in
the 1800s was the lack of infantile post-mortems. An examination and
appraisal of more than 300 nineteenth-century medical tracts, reports,
conference papers, and journal articles done for this study failed to
show a single reference or remark about an infantile autopsy. They sim-
ply may not have been done, with the consequent loss of critical patho-
logical knowledge. Moreover, the lack of a germ theory up to the key
years 1882 and 1883 also hindered progress in this area. What is more,
one of the sources used here in a variety of European languages once
mentioned the word “bacteria,” and by count the word “virus” was
used twice in the literature examined up to the early 1880s. Finally, the
science of nutrition, so critical to what pediatricians now do, was just
coming to the fore towards the end of the nineteenth century. All of this
highly valuable knowledge about foetal and infantile development
was, similarly, just not a part of the nineteenth-century’s intellectual
Zeitgeist.

The European medical profession in the nineteenth century, given its
existing epistemology, did what it could in the area of new knowledge
about infancy. In the process it can be said that it pointed medical think-
ing in the right direction, and, at least, laid some of the vital philosophi-
Major Medical Explanations for High Infant Mortality

...cal groundwork for the final twentieth-century conquest of one of the greatest scourges of the European past—high levels of infant mortality.

NOTES

8 Boudet, *Discours*, p. 8.
9 Boudet, *Discours*, p. 5.
13 Jones, "Infant Mortality," p. 305.


30 Lafabregue, De la mortalité, p. 4; and Crevoisier, Étude statistique, p. 9.

31 George Varentrapp, Statistische Angaben über Kindersterblichkeit in der Stadt Frankfurt am Main, 1851 bis 1866 (Frankfurt: Mahlau and Waldschmidt, 1867), p. 5.


34 Moore, On Infant Mortality, p. 11; and Wilhelm Rau, Worin ist die Unnatürliche Sterblichkeit der Kinder in ihrem ersten Lebensjahr Begründet (Bern: Fischer, 1830), p. 36.

35 Andrei Caron, Des causes de la mortalité des enfants dans les Ville de Fabrique (Rouen: Orville, 1865), p. 9.

36 Assmann, Ueber die Sterblichkeit, p. 13.


38 Haushalter, De la mortalité, p. 229.


40 Selin-Ernest Maurin, De la mortalité des enfants en bas age a Marseille (Marseilles: Cayer, 1872), p. 39; Caron, Des causes, p. 5; and Crevoisier, Étude statistique, p. 18-19.

41 Gottlieb Behrens, De Diæta Virginum (Magdeburg: Johann Hillig, 1729), p. 9.


43 Georgius Graf, Dissertatio Solemnis, p. xvii.


46 Kleinmann, Ueber die Ursachen, p. 15.

47 Caron, Des causes, p. 5.


49 Graf, Dissertatio Solemnis, p. xiii.
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59 Ménager, *De la mortalité*, p. 13, 40.


73 Nalin, *De l’alimentation*, p. 17.

74 Kleinmann, *Ueber die Ursachen*, p. 22.
78 Peter Wilbert, Ueber den Ernährungsweise auf die Kindersterblichkeit (Bonn: Mülheim, 1891), p. 19.
81 Fleury, Les morts-nés, p. 25.
82 Guillon, Essai sur la mortalité, p. 30.
84 Fleury, Les morts-nés, p. 25.
82 Guillon, Essai sur la mortalité, p. 30.
89 Boudet, Discours, p. 15.
91 Fleury, Les morts-nés, p. 22.
93 Boudet, Discours, p. 17; and Nalin, De l'alimentation, p. 15.
95 Moore, On Infant Mortality, p. 9.
100 Underwood, A Treatise, p. 82.
102 Kleinmann, Ueber die Ursachen, p. 40; and Marcus, Wie ist der Grossen Sterblichkeit, p. 12.