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THE

MANAGEMENT OF INFANCY.

THE

MANAGEMENT OF INFANCY,

PHYSIOLOGICAL AND MORAL.

INTENDED CHIEFLY FOR THE USE OF PARENTS.

BY

ANDREW COMBE, M.D.,

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, AND ONE OF THE PHYSICIANS IN ORDINARY IN SCOTLAND TO THE QUEEN.

Tenth Edition.

REVISED AND EDITED

BY

SIR JAMES CLARK, Bart., K.C.B., M.D., F.R.S.,

PHYSICIAN IN ORDINARY TO THE QUEEN.

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TO

HER MAJESTY

THE QUEEN.

MADAM,

In graciously accepting the Dedication of the present Revised Edition of Dr Combe's valuable work, your Majesty has given an additional proof of the interest you are known to take in the progress of Sanitary Science.

And assuredly to no one could a work, having for its object the preservation of Infant Life, and the improvement of the Moral Training and Instruction of the young, be more appropriately dedicated than to your Majesty, whose management of your own family affords a bright example to parents, and a living testimony of the wisdom of being guided, in the treatment of their offspring, by the Laws of Health so clearly indicated by the Creator.

I have the honour to subscribe myself,

Your Majesty's

faithful and dutiful subject,

JAMES CLARK.

INTRODUCTION BY THE EDITOR.

SEVERAL considerations induced me to undertake the pleasant task of revising and editing Dr Combe's valuable Treatise on the Management of Infancy. The subject is one in which I feel a deep interest, and a long and intimate friendship also with the enlightened Author afforded me frequent opportunities of discussing with him the subjects treated of in the following pages. I thus became well acquainted with his opinions on the causes of the frightful mortality which occurs during the earlier periods of infantile life; and I shared with him the conviction, that the hope of diminishing the evil rests *entirely* on the possibility of enlightening parents and the public on the causes of such mortality, and instructing them in the means of its prevention. For these reasons, I felt that I was not unprepared for the task. Moreover, I had the feeling that I could not more usefully occupy my leisure, at the close of a long professional life, than in lending such aid as I could to carry out the benevolent intentions of the

Author; while I should, at the same time, have the gratification of paying a tribute of respect to the memory of a much esteemed friend.

The work has been to me a labour of love; and it has not been a heavy one, as the last edition that the Author himself corrected was left so perfect that little remained for an editor to do.

In making the few alterations and additions which appeared to me necessary, I have endeavoured to identify myself with the Author, and to do merely what I believe he would himself have done, if his valuable life had been spared. In this spirit, I have gone carefully and repeatedly over the whole work. I have altered the order of some of the chapters, with the view of bringing the subjects treated of more consecutively before the reader. I have also ventured to omit some portions, chiefly in the earlier chapters, as less necessary now than during the Author's lifetime. I have given some additional information on the causes and extent of Infant Mortality, taken chiefly from the recent Reports of the Registrar-General; and, lastly, I have added an APPENDIX, in which will be found some useful matter, not so well fitted for the body of the work. My great aim has been to carry out what I know was the object of the Author; namely, to make the book useful to young Medical Practitioners and Teachers of youth, as well as to Parents, for whose guidance

it was originally and mainly designed. To my younger medical brethren, entering on the anxious and responsible duties of their profession, I earnestly recommend a careful study of the work. I know none on the subject of Infant Hygiène, in which is to be found so much sound information, to guide young Medical Practitioners in the management of infants and young children.

I venture to give the same advice, and with equal earnestness, to Teachers, both male and female. In the concluding chapters of the work, they will find principles to guide them in conducting education in accordance with the progressive development of the mental faculties, and the natural aptitude of these for comprehending different subjects of study. To Governesses, I consider those principles specially important. A very large proportion of the children of the upper, and even middle classes in this country, have no sooner left the nursery than they are consigned to the care of a governess, under whose direction chiefly they remain during that plastic period of life in which the character is very often permanently formed. How important is it, then, that this class of teachers should possess such a knowledge of the physical and mental constitution of the young, as shall enable them to cultivate and train the moral feelings, as well as to instruct the mind! Yet, in seminaries for the education of young ladies

intended for governesses, there is, I believe, no such instruction given. Unfortunately, it is a kind of knowledge little understood, rarely even thought of, by either teachers or parents; and yet it is the most important knowledge which they can possess. In my opinion, *no teachers of any class should be considered competent for their duties, till they have given proof of possessing a general knowledge of the structure and functions of the human body, and of the laws of health.* Were proof required of all teachers that they possessed such knowledge, before they were intrusted with the care and education of youth, schools of all classes would be driven to make Physiology a part of their regular course of instruction.

Within the last few years, Physiology, in its application to health, has been taught with considerable success in several seminaries, more especially in the Birkbeck Schools in London, under the enlightened direction and by the liberal support of Mr William Ellis; and it has invariably been found, even at a very early age, to excite in a remarkable degree the interest and attention of the pupils. It is to be hoped, therefore, that the time is at hand when Physiology will form an essential part of the course of instruction in every school.*

It is vain to expect that education will be rightly

* That there is no difficulty in effecting this, see APPENDIX A. for the opinion of the medical profession.

and successfully conducted, until the *Educators* themselves become acquainted with the nature of the physical and mental constitution of those whom they undertake to train and instruct.

How strongly Dr Combe's experience impressed him with the necessity of instruction in Physiology and the constitution of the infant frame being made *an essential part of female education*, appears from the following earnest appeal, which I have transferred from the body of the work, in the hope that it may attract more general attention in this place :—

"In no point of view is it possible to defend the prevailing error of leaving out what ought to constitute an essential part of female education. Till this defect be remedied, thousands of young beings, who might have been preserved, will continue to be cut off at the very outset of existence, to the lasting grief of those who would have been happy to guard them against every danger, *had they only known how.* Even in the best-regulated families, it is rare to meet with a mother who, before becoming such, has devoted the least attention to the study of the infant constitution, to the principles on which it ought to be treated, or to the laws by which its principal functions are regulated. She enters on her important charge with less preparation than if it were a plant or a flower that she undertook to manage, instead of a being in whose existence and happiness her

whole soul is centred. Yet to *her* exclusively the infant looks for that cherishing and affectionate care which its delicate frame requires; to her it directs every appeal, in the full confidence that she will ever be watchful for its happiness and relief, and that from her a look or a cry will procure the requisite sympathy or aid. She it is who provides its nourishment, regulates its exercise, and watches over its slumbers. But when we inquire to what extent her education has fitted her for the intelligent discharge of the duties which thus constitute the chief objects of her social existence, we find that, in the majority of instances, *on no one point relating to them has she received even a tittle of instruction;* and that she marries and becomes a mother without a suspicion of her deficiency in the most ordinary information concerning the nature and functions of the infant whom she is suddenly called upon to cherish and bring up. When her heart is wrung by witnessing its sufferings, and she knows not to what hand to turn to save it from impending danger, she bitterly laments her ignorance and helplessness. But not being aware that much of the difficulty and danger proceeds from her defective education, the idea never occurs to her that those who come after her must, in their turn, go through the same painful and profitless experience with *their* children, unless, with rational foresight, they be prepared, by the requisite instruc-

tion and training, for those duties which they may soon be called on to perform.

"It is true that all women are not destined to become mothers; but how very small is the proportion of those who are unconnected by family ties, friendship, or sympathy, with the children of others! how very few are there who, at some period of their lives, would not find their usefulness and happiness increased by the possession of a kind of knowledge so intimately allied to their best feelings and affections!

"It may, indeed, be alleged, that mothers require no knowledge of the laws of the infant constitution, or of the principles of infant management, because *medical aid* is always at hand to correct their errors. According to the present habits of society, however, professional men are rarely consulted till the evil is done, and the health broken; but even if they were, intelligence and information are needed in the mother, to enable her to fulfil their instructions in a rational and beneficial spirit. On every account, therefore, it is urgently necessary that female education should be such as to fit both mind and body for the duties as well as for the embellishments of life,—for the substantial happiness of the domestic circle, at least as much as for the light and fleeting hours of fashionable amusement; and that, while every effort is made to refine and elevate the mind, the solid substratum of useful knowledge should not be neglected."

No reflecting person can read this appeal without being impressed with the vital importance of the subject to the future welfare of the human family.

Andrew Combe was altogether a very remarkable man. In addition to his extensive knowledge of the human constitution, the result of close observation and deep reflection, he possessed a remarkable felicity in expressing his views, and in explaining the application of the physiological laws to the preservation of health, and to the direction of education according to the age and mental development of the child.

To great intellectual endowments, and a sagacity which I have never known surpassed, were added in Dr Combe the largest benevolence and the gentlest disposition. The good of his fellow-creatures was ever uppermost in his thoughts ; and he omitted no occasion, and spared no exertion within the compass of his power, to accomplish the benevolent objects he had in view. This spirit is evinced throughout the whole of his writings, and in none more than in the present—perhaps the most valuable of his works. Were I to enter more fully into the excellences of Dr Combe's character, it might be attributed to the partiality of friendship ; I shall therefore simply observe, that I never knew a better or more truly religious man, nor one who had the welfare of the

human race more sincerely at heart. Unfortunately for a large circle of friends and for mankind, his enlightened and benevolent mind was united to a feeble frame. A delicacy of constitution showed itself in his childhood; but it was not till after he had arrived at maturity that the delicate state of his health assumed a decided character, and that he became the subject of frequent attacks of pulmonary disease, which on several occasions brought him to the brink of the grave. Such, indeed, was his condition that it might be truly said of him that the greater part of his life was one long disease. Yet, by judicious management of himself and frequent changes of climate, and by a careful adaptation of his mental and bodily labours to his powers of endurance during the periods of comparative health which he did possess, he contrived in a quiet unostentatious way to do much good during his too short life; and he has left behind him writings which are of the utmost value to mankind.* Dr Combe

* In an admirable work, "*Horæ Subsecivæ*," by Dr John Brown of Edinburgh, will be found, graphically drawn, the character of Dr Combe's mind; but for a full knowledge of the man, the reader is referred to his "Life and Correspondence," by his brother, George Combe. He too was taken from amongst us, while still earnestly engaged in the preparation of works on subjects of the highest general interest. His constitution also, during the latter portion of his life, was, like his brother's, very delicate; and it was only by the strictest attention to the laws of health that he was able to complete what is considered the ordinary term of human existence. Two better men, I believe, never lived, nor men who devoted themselves more zealously to promote the good of the human

indeed afforded, in his own person, a remarkable example of what could be effected by a man of very fragile constitution, acting in strict conformity with those physiological laws of which he was himself so able and lucid an expounder. His works have passed through many editions, and have had a very extensive circulation in this country, and in the United States of America. But, extended as has been their circulation, they ought to be still more generally known and studied. Every family and every teacher, from the mistress of the Infant-School to the University professor, should be familiar with Dr Combe's physiological works; and no medical man should commence the practice of his profession without having studied them carefully, and more especially the present volume. I deem this advice the more needful, as Hygiène is but just beginning to receive the attention which it merits as a branch of medical education. The University of London was, I believe, the first in this country in which Hygiène found a place among the prescribed subjects of examination for degress in medicine—a regulation mainly owing to Dr Combe's urgent recommendation.* And assuredly no one has done more than

race; and the works which they have both left behind them are calculated to instruct and benefit mankind for ages yet to come. But the time is not yet arrived for estimating at their full value the whole of George Combe's works.

* See his Letter to the Editor, published in his "Life and Correspondence," p. 311.

he to press its importance on the public, and to enlighten them on it by his published writings.

When the public is made fully aware of the extent to which health may be preserved, and disease averted and mitigated, by knowledge of Physiology, the practice of Medicine will assume a very different aspect from that which it presents in its present unsettled state. And the physician will then be more frequently consulted on the means of preserving and improving health than for the treatment of disease, which is almost solely the purpose for which he is applied to at present.

Before concluding these introductory remarks, already perhaps extended too long, I venture to add one more extract from the Author's Preface to his last edition of the present work :—" In taking leave of a subject which I cannot but feel to be one of vital interest to thousands yet unborn, I would respectfully offer one or two remarks on the spirit in which the following pages ought to be read. . . . The subjects treated of embrace so many important facts and principles of action, which are comparatively new to the general reader, that it is only by their careful and repeated study, and, in time of need, turning again and again to the pages in which they are explained, that a mother can become so familiar with them as to be able to apply them with ease and judgment to the many purposes for

which they are adapted." In this judicious advice I earnestly concur. The work, to be really useful, must be studied carefully, and referred to on all occasions of doubt or difficulty. In order that mothers, and, I take leave to add, young medical practitioners, may derive full advantage from it, they must have their minds thoroughly imbued with the principles so clearly unfolded, and the practical rules so plainly laid down in every chapter of the book.

The foregoing remarks were prefixed to the ninth edition of the present work, edited by me in 1860. A new edition being required, I have again carefully revised the volume, and made some further additions and alterations of the kind above described, in the hope of rendering it still more useful and acceptable to the public.

J. C.

Bagshot Park, Surrey,
February 1870.

THE AUTHOR'S DEDICATION.

TO

SIR JAMES CLARK, Bart., M.D., F.R.S.,

PHYSICIAN IN ORDINARY TO THE QUEEN, AND TO HIS ROYAL HIGHNESS PRINCE ALBERT.

My Dear Sir James,

Two reasons, the one of a personal and the other of a professional nature, induce me to dedicate this treatise to you. I gladly embrace the opportunity which it affords me of publicly expressing my regard for you, as a friend whom I have long and intimately known, and whom, during years of constant and unreserved intercourse, I have ever found, even in the most trying circumstances, animated by the purest integrity, and the kindliest and most benevolent dispositions.

On professional grounds, too, there is perhaps no one to whom I could so appropriately dedicate a work intended to call attention to that comparatively unoccupied, but most important field of medical inquiry, which embraces the hygienic treatment of man,—as to you, who have already laboured in it with great ability and success. For many years, not only have you taken a deep and active interest in the improvement of medical education, and in elevating the character, extending the scope, and increasing the usefulness of our profession; but, acting on the same principles which I have endeavoured to enforce, you have, in your excellent works on Climate and Consumption, rendered no small service to science, by your instructive exposition of the manner in which fatal disease of the lungs so often, and so insidiously, originates in apparently trifling causes connected with disregard of the ordinary laws of health. You have further shown, that when Medicine shall be cultivated in a more liberal and comprehensive spirit, and its principles be recognised as furnishing the only

solid foundation for a proper system of physical, moral, and intellectual education, it will become one of its noblest uses, and, I may add, one of its greatest privileges, to be instrumental, not more in the prevention of disease and suffering, than in contributing to the general happiness and permanent advancement of the human race.

Even as regards the special subject of the present volume, you were the first, in your treatise on Consumption, to insist strongly on the necessity of adopting a proper system of management from the very commencement of infant existence, as the only effectual means of averting that general deterioration of health in which the fatal pulmonary disease has its origin, and of procuring for the individual that measure of health and vigour without which life and its varied duties become sources of suffering rather than of enjoyment. In your volume, accordingly, are to be found many instructive details on the hygienic management of both infancy and youth; and it affords me no small gratification to know, that, while pursuing independently the same ends, we, unknown to each other in the outset, chose nearly the same paths, and arrived together at entirely consistent and not unfrequently identical results.

To you, therefore, on both public and private grounds, I have peculiar satisfaction in dedicating this work, as a mark of esteem and regard, of which, however intrinsically unimportant and inadequate it may be, I know few in every way so worthy as yourself.

Believe me to remain always,

My Dear Sir James,

Yours very sincerely,

ANDREW COMBE.

Edinburgh, 10*th May* 1840.

THE AUTHOR'S INTRODUCTION.

Many excellent treatises on the Management of Infancy already exist; yet few of them are calculated to supply parents with the kind of information which, in their circumstances, is especially needed. Most of those hitherto published touch briefly upon the general management of early childhood, merely as preliminary to an exposition of its diseases; and the perusal of them by non-professional persons frequently leads to dangerous tampering with the lives of the young. On this account, I cannot but consider them as improper guides for any except medical readers. Those again which, as intended for the use of mothers, are free from this objection,—even when abounding, as many of them do, in good sense and excellent practical advice,—lose much of their value and usefulness from presenting their admonitions and rules as so many bare injunctions, and omitting to connect them with the physiological laws or principles on which they are based, and according to which the effects are produced.

Sensible of these imperfections as detracting from the usefulness, as guides for the non-professional reader, of many works in other respects of great merit, I had almost resolved, several years before the publication of the first edition of this book, to enter upon the preparation of a treatise on a more comprehensive plan, and which should, on the one hand, avoid all descriptions of disease, and, on the other, found its precepts, at every possible point, on well-ascertained physiological principles. Under the apprehension, however, of being unable so to simplify the subject as to render it easily intelligible to the general reader, I refrained from putting together the materials which had accumulated in my hands; till at length encouraged by the very favourable reception of my other works on subjects somewhat analogous, and by the numerous testimonies I received of their practical utility, I set seriously to work, and completed the volume. That

it has, at least in some measure, supplied a want extensively felt, may fairly be inferred from the very favourable reception which it has met with both at home and abroad, and also from the spontaneous testimony of many parents and others in different ranks of life, speaking from experience of the deepened sense of the importance of their duties which its perusal had awakened in their minds, and of the comfort and assistance which they had derived from it in the management of the young entrusted to their care.

Bacon has not less profoundly than felicitously remarked, that "Man is but the servant and interpreter of nature, and is limited in act and understanding by the extent to which he has observed the order of nature: beyond this, neither his knowledge nor his power can extend." In accordance with the spirit of this aphorism, it has been my constant endeavour, in the present, as in all my other writings, to allow as little as possible to rest on mere human opinion, but to show a foundation for every rule and injunction in the laws of the human constitution, and consequently in the will of the Creator. The obvious advantage of this mode of proceeding is, that, when once we succeed in discovering any truth, that truth will ever afterwards be regarded as an emanation of the Divine will, and the practical rules deducible from it will claim our obedience with an authority which we cannot dispute. Whereas, if we pass on from subject to subject, and precept to precept, disregarding the relations of facts to each other and to the laws of the constitution, we may add, it is true, much information to our store, but shall often be led to form a very erroneous estimate of its value, and be beset with difficulties in applying it with promptitude and decision to its proper uses, where, rightly directed, it would conduce to the happiest results.

To illustrate this proposition, we may compare a person who undertakes the management of the human constitution, whether in infancy or in maturity, without any reference to the laws under which it acts, to a traveller who, without map or guide, wanders over a new country in search of some particular place. By some lucky chance he may stumble at once upon it, or he may reach it at length by some very circuitous route. But the probability is, that, after wandering about in uncertainty, he will be forced to return, weary and disappointed with the fruitlessness of his journey. He, on the contrary, who is guided by *principle*, may be likened to a traveller who, carrying with him a map in which the chief

features of the country are accurately laid down, advances with comparative certainty towards his aim. If at any time, in consequence of omissions or slight inaccuracies, he chances to wander from the right course, the map itself soon warns him of the fact, and at the same time affords him the means of correcting the error caused by its own imperfections.

It is then on the habitual *application of principle* to the inculcation and advancement of knowledge, more than on any novelty of detail, that the present volume rests its claim to attention. If I have to any extent succeeded in establishing the utility of principle in conducting inquiry, I shall not only have helped to give a more profitable direction to the labours of others in the same field, but have provided the best means for detecting and rectifying errors inadvertently committed either by them or by myself.

In the following pages I have addressed myself chiefly to parents and to the younger members of the medical profession ; but it is not to them alone that the subject ought to prove attractive. The study of infancy, considered even as an element in the history and philosophy of man, abounds in interest, and is fertile in truths of the highest practical value and importance. Thus regarded, it can scarcely fail to arrest the attention of any thinking and intelligent mind which is once directed to it.

In taking leave of a subject which I cannot but feel to be one of vital interest to thousands yet unborn, I would respectfully offer one or two remarks on the spirit in which the following pages ought to be read. It has *often* happened to me to hear myself quoted as the authority for modes of infant management not only unwarranted by, but in some instances actually opposed to, the principles I had expounded. On inquiry, it almost invariably appeared that, instead of the speakers being really familiar with the contents of the book which they professed to follow, or being in the habit of frequently referring to its pages for information when wanted, they fancied they had fulfilled their part by merely reading it once ; and on this assumption they proceeded thenceforth to act on their own vague recollections of what it contained, as if these had been true and accurate transcripts of the book itself. But the subjects treated of embrace so many important facts and principles of action, which are comparatively new to the general reader, that it is only by their careful and repeated study, and, in time of need, turning again and again to the pages in which they are explained, that a mother can become so familiar with

them as to be able to apply them with ease and judgment to the many purposes for which they are adapted. Indeed, it is only by pursuing a similar course that medical men themselves acquire the ready command of their knowledge which enables them at once to decide what ought to be done in any emergency; and surely the interest of a mother in her own offspring ought to be as strong an incentive to her to qualify herself for her arduous task, as a love of science or sense of duty is to the practitioner. To read a book like this, merely as one reads a novel or a newspaper, can be but of little solid or permanent advantage; and therefore, while I value highly the tribute of approval implied in *endeavouring to act* upon the principles I have unfolded, I feel indifferent to even the most eloquent and laboured eulogium, when it is not accompanied by those practical results which are the best guarantees of its sincerity. I am the more anxious to enforce this view, because many will, I believe, read the work with increased interest and advantage, after their attention has been thus directed to its true aim and character.

A. C.

Edinburgh, *June* 1847.

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THE

MANAGEMENT OF INFANCY.

CHAPTER I.

INFLUENCE OF THE CONSTITUTION OF PARENTS ON THE HEALTH OF THEIR CHILDREN.

In looking around upon society, we observe some families apparently possessing every external advantage, yet in which it is found difficult to rear the children to maturity. Either from convulsions, scrofula, consumption, or some other form of disease, one after another is carried off; while those who survive are characterised by great delicacy of constitution, and require the most assiduous care for their preservation. In contrast to this, we meet with other families, seemingly much less fortunate in their outward circumstances, but in which one child after another grows up as if no such thing as disease existed, or as if the ordinary disorders of infancy were but mysterious processes for the further development of the organism. That such remarkable differences exist, must have been observed by all who attend to what is passing around them; and the very important question occurs,—On what do they depend?

To some extent, at least, we have no difficulty in answering the inquiry. The very terms of our statement imply that the unusual susceptibility of disease in the one case, and the immunity from it in the other, arise from no peculiarity of treatment or external circumstances, but are dependent on some inherent difference of constitution that must have been derived from one or both parents. So manifest is the influence of hereditary constitution upon the organism and qualities of the offspring, that from the earliest ages it has attracted the attention of mankind. Apparent exceptions occur, in which the children differ widely from their progenitors; but these are so few, and may for the most part be so easily explained, that the general principle remains unshaken.

Assuming, then, the reality of HEREDITARY INFLUENCE, let us inquire what are the conditions in the parents which affect most powerfully the health of the child.

The following are the most deserving of notice:—

1. Natural infirmities of constitution, bodily and mental, derived from their own parents.

2. Premature marriages, especially of delicate persons, and of those strongly predisposed to hereditary disease.

3. Marriages between persons too nearly allied in blood, particularly where they are descended from an unhealthy race.

4. Marriages contracted too late in life.

5. Great disproportion in age between the parents.

6. The state of health of the parents at the time of procreation.

7. The state of health and the conduct of the mother during pregnancy.

Of these I shall speak in succession.

It may be thought that in a work like the present, destined chiefly for the guidance of parents and young medical practitioners, it is superfluous to treat of any of the first five heads; seeing that the child is supposed to be already in existence, and that it is no longer in our power to avert the consequences of an infirm constitution, or of an ill-assorted marriage. But this objection has little force; for, the more delicate the infant is, the more need is there to detect the true source of the delicacy, in order that the means of remedying it may be used with that discrimination which is essential to its correction. For example, the treatment which is suitable to an infant whose infirm health arises from its inheriting the constitutional tendencies of the race of either parent, may not be so suitable to another whose delicacy is caused by disease occurring accidentally during the pregnancy of the mother. Here, then, is a strong practical reason why we should not only be aware of all the sources of infant delicacy, but also be able, in each case, to discriminate between them.

But even supposing the children already born to be beyond the reach of benefit from the inquiry, it is certain that if the health of the parents be improved, the *future* offspring will participate in their increased vigour, and more easily escape the evils which afflicted the earlier born. Nor is this the only consideration, important though it be: parents have an advising and controlling power over the marriages of their children, and, by convincing their understandings, may call into operation in early life, before the passions can obscure the judgment, a guiding influence which will insensibly put them on their guard against forming an alliance with a very unhealthy or

defective race. A kind and judicious parent may exercise a salutary influence in this respect; and if the young were accustomed to see their parents and guardians acting habitually under the guidance of principle, they would be much less apt than they are to follow heedlessly the bent of their passions, in a matter so directly involving their permanent happiness. But when nothing is done, either by example or precept, to put the young on their guard, it is not surprising that mere inclination, family interest, and pecuniary advantage, should be more important considerations in contracting marriages, than family endowments of mind and body, or soundness of family health; and so long as this shall be the case, so long will much misery continue to be produced, which might otherwise have been foreseen and prevented.

HEREDITARY PREDISPOSITION.

The influence of original constitution is often manifested in the almost inevitable destruction which awaits the children of certain families about the period of adolescence. One after another drops into the grave from consumption, though every precaution has been used to ward off the fatal malady. The principle is also exemplified, in its brighter aspect, in the histories of long-lived persons, almost all of whom are found to have been descended from long-lived ancestors; in fact, nothing is more certain than that, *other circumstances being favourable, robust and healthy parents have robust and healthy children.* This law, indeed, holds good throughout animated nature. In the cultivation of plants, quite as much importance is attached to the quality of the seed as to a good soil and good husbandry; while

in rearing the lower animals, especially the horse, purity of race is prized above all other conditions, and the genealogy of the race-horse, of the hunter, and even of the farm-horse, is regarded as a sure criterion of the properties which may be expected in their progeny. In the dog, the sheep, and the different varieties of cattle, we calculate with certainty on the re-appearance of the qualities of the parents in their young. Man is no exception to the law; and it is a false and injurious delicacy to turn away from a truth so influential on happiness, and which has long forced itself on the notice of physiologists and physicians. The great physiologist Haller mentions a very remarkable instance of two noble ladies who were married on account of their wealth, although they were nearly idiots,—and from whom the mental defect extended for a century into several families, so that some of all their descendants continued idiots in the fourth, and even to the fifth generation.* "Parents," says Dr Gregory, "frequently live over again in their offspring; for children certainly resemble their parents, not merely in countenance and bodily conformation, but in the general features of their minds, and in both virtues and vices. Thus, the imperious Claudian family long flourished at Rome, unrelenting, cruel, and despotic; it produced the merciless and detestable tyrant Tiberius, and at length ended, after a course of six hundred years, in the bloody Caligula, Claudius, and Agrippina, and then in the monster Nero."†

The most remarkable example of the hereditary transmission of qualities with which I am acquainted, is that of a blind man called Moses Le Compte, whose *thirty-seven*

* Elem. Physiol., lib. xxix., sect. 2, 8.

† Conspectus Medic. Theor. cap. 1, sect 16.

children and grand-children became similarly affected. In all of them the defect of sight began about the age of fifteen or sixteen, and lapsed into total blindness about the age of twenty-two.* Sir H. Holland mentions several cases of a similar kind;† but as such facts are by no means rare, and may be observed in a more or less marked degree in ordinary society, it is needless to adduce any further instances.

With such evidence before us, we are warranted in maintaining that the possession, by the parents, of a sound and vigorous bodily constitution, and an active and well-balanced mind, has powerful influence in securing similar advantages to the offspring. If either parent inherits the feeble delicacy or the mental peculiarities of an unhealthy or eccentric race, the probability is very great that the offspring will be characterised by similar qualities. But in compensation for this, the very same law by which the liability to gout, insanity, imbecility, scrofula, and consumption is transmitted from generation to generation, enables us *to reckon with equal certainty on the transmission of health and vigour*, wherever these have been the hereditary features of the race.

Those, then, who desire bodily and mental soundness in their offspring, ought carefully to avoid marrying persons either feeble in constitution, or strongly predisposed to any very serious disease, such as insanity, imbecility, cancer, scrofula, &c.; and, above all, the greatest care should be taken against the occurrence of the same morbid predisposition in both father and mother. Where any peculiarity of constitution is confined to one parent, and

* Baltimore Medical and Physical Repository.

† Medical Notes and Reflections.

is not very strong, it may, in some degree, be counteracted by a judicious marriage and mode of life; but where its influence is aggravated by being common to both parents, the children can scarcely escape. I am acquainted with families in which the consequences of acting in opposition to this principle have been deplorable,—where several of the children have fallen victims to scrofula and consumption, and others have survived in idiocy, occasioned evidently by the imprudent marriage of persons nearly allied in blood, and both strongly predisposed to the same form of disease.

In thus insisting on the necessity of greater attention being paid to the law of hereditary predisposition, I do not mean that the actual disease which afflicted the parent will certainly re-appear in the children; but only that the offspring of such parents will be much more liable to its invasion from the ordinary incidents of life than those belonging to a healthier stock, and will require very careful and judicious management to protect them from it. One of the chief advantages of knowing the nature and extent of the influence, is the power which we gain of counteracting it in the offspring by a system of treatment calculated to strengthen the weaker points of the constitution. Thus, if a child inherits a very scrofulous habit from both parents, and is brought up in the circumstances which induced or maintained the disease in them, there is the highest probability that it will fall a victim to some form of scrofulous disease, or will escape only after a long and severe struggle, to drag on through life with a feeble constitution. But if timely precautions are taken—if the child is put on a proper regimen, kept much in the open air, and perhaps transferred for a few years to a drier and

warmer climate—it may altogether escape the disease, and even enjoy permanently better health than had ever been experienced by either of its parents.

In like manner, the excitable and capricious children of parents who have been insane, or are strongly predisposed to become so, run great risk of lapsing into insanity, if brought up in circumstances tending to increase the irritability of the nervous system, and to call the feelings into strong and irregular action. But if such children are subjected from the first to treatment calculated to allay nervous irritability, to give tone to the body and composure to the mind, the danger in after life will be greatly diminished.

It is, then, the *constitutional predisposition*, and not the actual disease, which is thus transmitted from parent to child.

MARRIAGE OF PERSONS TOO NEARLY ALLIED IN CONSANGUINITY.

Next to the direct inheritance of a family predisposition, the constitutional tendencies derived from the union of persons too nearly allied in blood, and more especially if themselves descended from a tainted stock, are perhaps the most prejudicial to infant health; and their baneful effects are nowhere more strikingly seen than in the deteriorated offspring of some of the royal and aristocratic families of Europe, in which frequent intermarriages have taken place without regard to the morbid predisposition on either side. Such intermarriages are often observed also in private life, especially among the Jews. "The rich Jews in this country," says Dr Elliotson, "have the

same bad custom of marrying first cousins; and I never saw so many instances of squinting, stammering, peculiarity of manner, imbecility, or insanity, in all their various degrees, intense nervousness, &c., in an equal number of other persons."* Marriages between very near relations who are themselves infirm, are usually either barren, or productive of unusually delicate offspring.†

AGE AT WHICH PERSONS MARRY.

Early Marriage.—The ages of the parents exercise a great influence on the health and qualities of the offspring. If they have married before their own full development and maturity, the first children are generally more deficient in stamina than those born subsequently. This is one reason why children of the same family often present considerable differences of constitution and character, and why the first-born is sometimes puny in a vigorous race. Marriage, therefore, ought never to take place before maturity, because the system is not sufficiently consolidated for the important function of reproduction, and both parent and child suffer from anticipating the order of nature. In this country, women do not attain their full development before from twenty to twenty-three years of age, and men from twenty-five to thirty; yet it is not uncommon to encourage even delicate girls to marry at seventeen, at the manifest risk of entailing infirm health on themselves and their offspring. In the case of the lower animals, where money is at stake, great care is taken to avoid the error so frequently committed among ourselves.

* Elliotson's Human Physiology, 5th edition, p. 1098.

† See Appendix, B.

Late Marriages are scarcely less unfavourable to the health of the offspring than those contracted in very early life. Beyond a certain age, neither animals nor plants are capable of producing a vigorous progeny; and hence the postponement of marriage beyond the period of maturity, now so common, especially among professional men struggling in the competition for a livelihood, is frequently injurious to their offspring. The impulse to propagate generally loses much of its force before the age of forty, and comparatively few children are born after that age to parents who have been united soon after attaining maturity. In many cases of late marriages, too, the constitution of the parents has been impaired by mental or bodily labour, by dissipation, or by that disappointment to the domestic affections which involuntary celibacy implies.

Disparity of Age.—Another cause of infirm health in children is great disparity of years in the two parents. When one is very young and the other advanced in life, the constitution of the offspring is very rarely sound.

STATE OF HEALTH OF THE PARENTS.

The next circumstance which permanently influences the health of the offspring is the state of the parents at the time of procreation. It is well known that, while all the children of the same family have a certain general resemblance, no two of them are exactly alike. A chief reason of this difference is the unavoidable change in the state of the parents, induced partly by the lapse of years, and partly by external circumstances acting upon their bodily and mental constitution; and from numerous facts which have been observed, it seems highly probable that

the offspring may be affected even by any temporary disturbance of health in the parents about the time at which conception takes place. Anxiety of mind and unusual depression of spirits in the father, have been found imprinted in ineffaceable characters on the constitution of the child; and instances are known in which idiocy in the offspring has appeared to be the result of casual intoxication on the part of a generally temperate father. A stronger motive to regularity of living, and moderation in passion, can scarcely be presented to a right-minded parent, than the knowledge of the permanent influence of these on his offspring. Many a father has deplored, and perhaps resented, the follies of an irreclaimably wayward son, without suspecting that they were due to some forgotten irregularity of his own.*

Another and a very powerful cause of delicacy in children is a *permanently deranged state of health in the parents*, showing itself in a lowered tone of all the animal functions, and a general feeling of being unwell. Of all the varieties of this cause, perhaps the most frequent and the most injurious to the offspring is *habitual indigestion*, and its consequence, *impaired nutrition*. Many parents pass years in a constant state of discomfort from "bilious" and "stomach" complaints, induced by inattention to diet, exercise, cleanliness, ventilation, sufficiency of light, healthiness of dwelling, and the like; and thus entail a part of the penalty on their innocent offspring. Ignorant of the consequences of their conduct, they are without sufficient

* In regard to intemperance in the parents as a cause of idiocy in the children, see Dr Samuel G. Howe's work "On the Causes of Idiocy in Massachusetts," reprinted at Edinburgh in 1858 for Maclachlan & Stewart.

motive to give up their habitual indulgences, or to persevere in using the easy means of improving and preserving their health; and are surprised when assured that, while thus trifling with their own comfort, they are sporting with the welfare and fate of the dearest objects of their affections.

It is a common saying that clever men generally have stupid children, and the inference has been drawn that the father exerts very little influence on the constitution of his offspring. It is true that the families of men of genius are rarely so remarkable for talent as themselves; but I deduce an opposite conclusion from the fact, and maintain that these very cases afford strong proof of the reality of the father's influence, and ought to be warnings for our guidance. Not to dwell on the circumstance that men of genius frequently marry late, it is notorious that nothing can be farther removed from the standard of nature than their state of health and general mode of life. Are they not, as a class, enthusiastic, excitable, irregular in their habits, the sport of every passing emotion, victims to indigestion and melancholy? And are these the seeds from which Nature has designed *healthy* vigour of mind or body to spring up in their offspring? Take into account also the influence of the mother, and the well-known fact that men of genius rarely select highly-gifted women for their wives, and then say whether high talent can reasonably be expected to emanate from parents, one of whom rises at best only to mediocrity, and the other falls temporarily to or below it, from sheer exhaustion of mind and broken health. Would it not rather be wonderful, if, in such untoward circumstances, genius were always to descend, in unabated splendour, even to the first line of the

posterity? It is not from such materials that living genius has ever sprung. A genius might in some favourable moment be *born* to such a father, but probably he would die before the world could tell that a genius had lived. The circumstances under which the highest order of minds most frequently appears are, where the father is healthy and active, and the mother unites an energetic character with sound health, or with some high and sustaining aim of life, animating her mental and bodily functions. Such was the mother of Napoleon I., and the mothers of most of our celebrated men will be found to have been more or less distinguished by similar characteristics: how often in the biographies of men of genius, do we remark that it was the mother who first perceived and fanned in the child the flame which afterwards burst into brightness!

In some circumstances, however, where, from feelings of admiration, deep interest, or other impressive cause, the mind of the mother is, during gestation, strongly concentrated upon the father's image or character, his reflex or indirect influence on the organism and qualities of the future child is often strikingly great. It is perhaps from some unsuspected cause of this kind, that instances occur in which all the children of a family show a strong resemblance to one parent, and very little to the other.

The influence of the constitution, both physical and mental, of parents, on the health, development, and mental character of their offspring, merits grave consideration, and must, as the knowledge of physiology becomes diffused, force itself upon the attention of every intelligent person. Until the various inherited and even acquired conditions of parents which influence their children are generally understood, and practically recognised in contracting mar-

riages and regulating the mode of living, mankind will never attain the degree of perfection of which they are susceptible, and which, we cannot doubt, they are intended by the Creator to attain. All our knowledge of the physiology of man leads to the conclusion, that, as far as our physical nature is concerned, we are governed by the same laws with the inferior animals, and that with us as with them the health and constitution of the offspring depend mainly on those of the parents. Hereditary delicacy and defects may, in a great degree, be overcome by judicious management of the child from birth to maturity, although perhaps they are never entirely effaced.

The whole subject of hereditary descent is of such moment, and still in some respects so obscure, that it calls for the earnest attention of physiologists and philanthropists.

CHAPTER II.

INFLUENCE OF THE MOTHER'S MODE OF LIVING DURING PREGNANCY ON THE HEALTH OF THE CHILD.

THE last conditions which I shall notice as affecting the health of the future infant are, *the state of mind, the health, and the conduct, of the mother during pregnancy*—conditions which, though in general very little taken into account, are so vitally important, and so directly within the scope of the present work, that I shall devote a separate chapter to their consideration.

The only circumstance that can explain or excuse the indifference shown by many mothers to the state of their health during pregnancy, is their entire ignorance of the injury they are inflicting on their offspring. Many a mother who will not deny herself the temporary gratification of a single desire or appetite on her own account, would be the first and the firmest in resisting temptation, if her reason were fully convinced that every transgression of the laws of health which she commits diminishes the chances of health in her child.

MENTAL EMOTIONS AND LONGINGS.—Some proofs of the mother's influence on the constitution of her unborn child

have already been given, and, were it necessary, many more might be added. Authentic cases might be adduced of mothers, agitated by distressing anxieties during pregnancy, giving birth to children who continued through life a prey to nervous or convulsive disease, or displayed a morbid timidity of character which no subsequent care could counteract. In regard to this class of cases, indeed, popular belief has gone beyond the reality, in ascribing the moles and purple stains with which some children are born, entirely to the working of the mother's imagination.

Times of public danger and sudden alarm furnish many examples of the influence of maternal grief and anxiety on the constitution of the offspring; and if similar results have attracted less notice during quieter times and in private life, it has not been from their non-occurrence, but from their being less obvious. For, even in private life, great and sudden changes of fortune, or accidents which have kept the mind of the parent in a state of intense anxiety or excitement during pregnancy, are sometimes observed to imprint on a single member of a family a distinctive character which cannot be otherwise accounted for.

The constitutional aversion to even the sight of a drawn sword, and to every kind of danger, shown by James I. of England, so admirably portrayed in *The Fortunes of Nigel*, is ascribed, and apparently not without reason, to the constant anxiety and apprehension suffered by Mary during the period of gestation.

We know that a fit of passion in a nurse vitiates the quality of the milk to such a degree as to cause colic and indigestion in the sucking infant. If in the child already born, and in so far independent of its parent, the relation

between the two is thus intimate, surely it must be still closer when the infant lies in its mother's womb, is nourished by its mother's blood, and is, to all intents and purposes, a part of her own body. Facts and reason alike prove the reality of this influence, and much practical advantage would result to both parent and child were the conditions and extent of its operation better understood.

For a long time the local peculiarities and imperfections with which some children are born were attributed to the imagination or the *longings* of the mother; but more accurate information has now shown that a real coincidence between the object longed for and the character of the mark or deformity is extremely rare. In the great majority of instances the longing is followed by no local mark in the child, and very often the mark occurs when no particular longing has ever been experienced by the mother. Cases, no doubt, are mentioned in which deformity of the infant has occurred apparently in consequence of a strong impression made by some mutilated object on the mother during gestation; but we have only to consider how numerous such objects are, and how rarely the supposed consequence follows, to see that the true cause generally lies deeper.

While, however, such cases are so rare that the preponderance of evidence is decidedly against the theory that *local* deformities in the infant are generally the results of an accidental shock given to the feelings of the mother, there is more than enough to establish the existence of a direct relation between the *general* state of health and feelings of the mother and the *general constitution* of the child. Reason, indeed, independently of experience, would lead us to expect this; for whatever affects the general health and

action of the system must affect *all* its component parts,—and the unborn child being virtually a part of the mother, it is natural to suppose that it should be subjected to nearly the same influences as the rest of her organism. If the mother's digestion is impaired, and the quality of her blood deteriorated, by anxiety of mind or continued neglect of her health, how can the infant escape being injured, since it must be nourished by the same blood which is unfit for her own healthy nutrition?

General Constitution.—If vivid emotion in the mother during pregnancy exerts, in extreme cases, a marked influence on the constitution of the child, it is not less certain that the *habitual state* of mind, whether it be that of excitement or depression, or of tranquil or irritable temper, exerts a positive and constant, though of course less remarkable influence on the offspring. In this way the mental disposition of the child is often a legible transcript of the mother's condition and feelings during pregnancy; and here, as already remarked, is one of the sources of variety of character in children of the same family. The later-born often differ greatly, both in mental and bodily constitution, from the earlier progeny; but then, how great also the differenee between the feelings, passions, and physical health of the parent of twenty or twenty-five, and those of the same parent at forty years of age, after long experience of the turmoil and vicissitudes of life!

The extent of the modifying power of the mother is seen again in the fact already referred to, that almost all great men have descended from mothers remarkable for their mental endowments and activity. The influence of the father is probably as direct as the mother's, but, from her

peculiar province, her's continues much longer. Hence, it is likely, her usually greater share in the production of a gifted offspring.

When we contrast the robust constitution of a healthy peasant's child in the country, with the feeble frame of the child of a delicate mother living in the midst of the enervating dissipations of a great city, can we imagine for a moment that *chance* alone has given health to the one and delicacy to the other, and that the mode of life of the parent has had no share in the result? Does not that mother, then, incur a heavy responsibility, who thus, whether from wilful igorance or from the selfish pursuit of pleasure, perils the health and permanent happiness of her offspring? From the moment of conception it is the paramount duty of the mother to endeavour to maintain, by every means in her power, the highest state of mental and bodily health of which her constitution is susceptible; and this is the more binding upon her, since its performance involves no sacrifice worthy of the name—none which will not be amply compensated by its favourable effects on her own health, as well as on that of her infant.

By many women pregnancy is regarded with alarm, as a period full of danger, and doubtful in its result. But it is a consolation to know that this period is not naturally dangerous, and is rendered so only, or chiefly, by neglect or mismanagement on the part of the mother herself. If, regardless of the future, she neglects, as many do, the ordinary laws of health, or gives way to indolent inactivity, to the excitement of passion, to dissipation and the indulgence of appetite, it is not surprising that she should suffer more seriously than if she were not pregnant. But as mothers often err from ignorance alone, it is of

the greatest importance that they should be made acquainted with the relation between their conduct during pregnancy and the health of their offspring.

It is true that instances may be adduced, in which even a dying mother has given birth to a well-grown and robust-looking child; but these rare cases, even if admitted in their broadest aspect, are far from neutralizing the much more frequent opposite instances. There are women in whom severe and fatal disease of a local kind exerts comparatively little effect on the general system. There are others in whom the disease itself is suspended in its course during pregnancy, and the whole energies of the body are concentrated, as it were, on the womb, to complete the evolution of the new being; and the moment this is effected, the malady regains its force, and hurries to a fatal end. This happens frequently in consumption.. The infant may then be, and sometimes is, comparatively healthy, or grows up so when carefully treated and put to a healthy nurse. But instead of disproving the mother's influence, such cases establish it more clearly. If, when the progress of consumption is interrupted during pregnancy, the mother in consequence enjoys a far higher degree of health and energy than before, what stronger proof can there be of the reality of her influence on her offspring than that the unborn child participates in her renewed health and strength, and at length comes into the world with a much better chance of life than if the mother's disease had never been suspended?

The children of scrofulous parents also are frequently regarded as exceptions to the principle of hereditary influence; and it is quite true that, as children, they often present an appearance of health which is apt to deceive

a superficial or inexperienced observer. They may be so plump, well-grown, and rosy-complexioned, as to present the very picture of health. But beneath all this fair and promising surface lurk too often a softness and delicacy of structure, and an excitability of the system, which indicate the absence of real stamina. Such children generally shoot up, tall, thin, and impressionable, or they become full, heavy, and languid; falling victims sooner or later to the very parental infirmity which, in their earlier childhood, seemed least likely to attack them.

The condition of the mother being thus influential on the well-being of her offspring, the importance of contributing in every possible way to her health, comfort, and cheerfulness, especially during pregnancy, is surely very obvious. This, however, must be done by rational observance of the laws which regulate the exercise of the various functions, and not by the foolish indulgence of her whims. Gloomy, painful, and harassing impressions ought to be guarded against, and good-natured equanimity and cheerfulness cultivated by all around her. Let it be her constant aim to engage in healthful and invigorating occupation, which shall afford a wholesome stimulus to her intellectual and moral faculties, and prevent her attention from dwelling too much upon herself. In her leisure hours let her seek some rational and invigorating exercise of mind and body, and be on her guard against giving way to caprice of temper, to the temptations of indolence, to endless novel-reading, or to any form of social dissipation. In very few instances does it become advisable to cease from engaging in the ordinary duties of the family, or to change such habits of life as have been found by experience to be healthful. Among the circumstances

which require attention during pregnancy, even more than at any other time, may be mentioned breathing a free, pure air; sleeping in a well-aired room, on a bed not so soft as to induce relaxation, and either without curtains, or with curtains never closely drawn; regular daily exercise in the open air; and great attention to personal cleanliness, to dress, diet, and all the ordinary conditions of health. Having treated of most of these in my other works, I shall confine myself at present to such modifications of them as apply *peculiarly to the state of pregnancy*, and shall begin with the subject of DIET.

DIET.—A notion is very prevalent, that an unusual supply of nourishing food is required during pregnancy, on account of the rapid development of the child. In some instances in which the general health, digestive powers, and appetite improve during gestation, an increased allowance of food is necessary and advantageous. But in the great majority of cases, where no such improvement takes place, and the appetite is already more vigorous than the powers of digestion, nothing but mischief can follow from an increased diet. When, therefore, during pregnancy, the health is good and the appetite natural, there is no need whatever of increasing the quantity or altering the quality of the food which is found by experience to agree with the constitution, nor can anything but harm ensue from attempting to "support the strength" by too nutritious a diet.

When, from mistaken views, a change is made from a plain and nourishing diet to full and generous living, and especially if the usual exercise is diminished, a state of fulness no less dangerous to the mother than injurious to

the embryo, is apt to be induced, or is prevented only by the digestive powers giving way—which leads to much suffering from nausea, heartburn, flatulence, inordinate craving, weakening perspiration, and other unpleasant symptoms. Where digestion continues unimpaired, and the superfluity of nourishment is taken into the system, a fulness with sense of oppression ensues, which infallibly leads to mischief when not timeously relieved either by nature or by art. Occasionally, bleeding from the nose or lungs, or from piles, removes the impending danger. At other times it may be necessary to draw blood from a vein: now and then nature seeks relief by attempting to re-establish the customary discharge from the womb—in which case imprudence on the part of the mother may induce miscarriage, to the risk of her life. In short, the fulness thus induced must have vent somewhere; and it will depend on the existence of any local weakness, or on some accidental circumstance, how and where the relief shall be effected, and with what extent or danger it shall be accompanied. To the child no less than to the parent its consequences are injurious, not only through the risk of premature birth, but by affecting the future soundness of the child's constitution; and hence arises a solemn moral duty of the mother not to place herself voluntarily in circumstances which, while defeating her fondest hopes of happiness, and leaving her a prey to broken health and enduring regret, may permanently impair the constitution of her offspring.

But in avoiding one error we must be careful not to run into the opposite extreme, and sanction an *insufficient* diet. Many women in the poorer classes suffer grievously in this way, and, from absolute inability to procure

nourishing food in due quantity, give birth to feeble and unhealthy children, whose life is a scene of suffering, but who, fortunately, seldom long survive. This is one cause of the physical inferiority of the children of the working-classes, and the greater mortality observed amongst them; and as it almost necessarily leads to moral inferiority likewise, it eminently calls for the serious attention of our statesmen. As reasonably may we expect fine fruit and rich harvests from an impoverished soil, as well-constituted children from parents exhausted by bodily exertion, and insufficiently nourished. It is in workhouses that the evil is seen in its most glaring form. These are peopled chiefly by the children of the lowest, most sickly, or most improvident parents. From birth they are the worst fed and the most miserably clothed; hence their bodies are stunted and weak, their minds and morals impaired and degraded. If the children in any workhouse be contrasted with the children at even a common country-school, their physical and mental inferiority will be conspicuous, and we shall be struck with the absence from their expression of that elasticity and hilarity of spirit which distinguishes a healthy and happy childhood.

The effects of insufficient diet in impeding the development of the infant in the mother's womb are so well ascertained, that no doubt of the fact can exist in the mind of any one who has examined the subject for himself; and, were this a proper place, I might point out the risk which is incurred, by enforcing too rigid economy in this respect in workhouses, of producing deterioration of the children, and consequently a future increase of pauperism. But I can only allude to the existence of such a risk, and throw out a warning

which those who are interested may afterwards turn to account.

It is naturally the children of the poor that suffer most from inadequate nourishment of the parent during pregnancy; but those of the richer classes also suffer from it, though in a different way. *The system is duly nourished only when food proper in itself is also properly digested;* if the digestion be imperfect, no food, however nutritious, will afford a healthy sustenance. From inattention to this fact, many mothers in the higher ranks give birth to feeble and imperfectly-developed children. Indulging in every luxury, they eat unseasonably, and often largely, till the powers of the stomach are exhausted, and digestion becomes so much impaired that the food ceases to nourish. As regards the infant, the result is the same whether the want of nourishment arises from deficient food or imperfect digestion; and hence the duty so strongly incumbent on the mother to act like a rational being, for her infant's sake if not for her own. Morally considered, it is as culpable on her part to starve the infant before birth by voluntarily impairing her power of nourishing it, as by refusing it food after it is born.

In all instances, the great aim ought to be, *to adapt the kind and quantity of nourishment to the wants of the individual and the state of the digestive organs.* Following this rule, we shall find that while, in general, no increase in the quantity of food is required during pregnancy, there are nevertheless many women who enjoy a higher degree of health in the married state, and especially during pregnancy, than they did before, and in whom the appetite is increased only because digestion and the other organic functions are carried on with greater vigour. In such

cases, an improved diet is not only safe, but natural, and even necessary; care being taken, however, not to push it so far as to impair the amended tone of the system. By a little attention, the proper limit can in general be easily determined. So long as healthy activity of mind and body, aptitude for exercise, and regularity of the animal functions, continue unimpaired, there is nothing to fear; but if oppression, languor, or other indications of constitutional disorder begin to show themselves, no time should be lost in effecting the necessary restrictions in diet.

At no period of life is it so important to observe moderation and *simplicity* in this respect, and to avoid the use of heating food and stimulants, as during pregnancy. Not only is the system then unusually susceptible of impressions, and apt to be disordered by the slightest causes, but in women of a nervous constitution the stomach is often the seat of a peculiar irritability, accompanied by a craving and capricious appetite, which sometimes leads to excess in the use of both wine and food. It requires much good sense and self-denial on the part of the mother to resist these morbid cravings. During the latter stages of pregnancy the risk from this cause is greatly increased; and to a long-existing intestinal derangement, produced by a redundant and heterogeneous diet, Dr Eberle justly ascribes a peculiar and highly dangerous affection, resembling puerperal fever, which comes on soon after delivery, and is often characterised by a remarkable sinking of the vital powers.* In cases of this kind, the disordered health before parturition is not so striking as to arrest the attention of ordinary observers, though perfectly obvious to experienced eyes; and when, after delivery, danger de-

* Eberle on the Diseases and Physical Education of Children.

clares itself, it is viewed with surprise and alarm, although it might have been foreseen, and to a considerable extent prevented by a wise regimen and due attention to the action of the bowels.

In regard to longings for extraordinary kinds of food, much caution ought to be exercised. Such longings rarely occur in a healthy woman of a well-constituted mind. Indeed, they are almost peculiar to delicate, nervously irritable women, who have been accustomed to much indulgence, and have no wholesome *occupation* to fill up their time. Hence, the right way to treat them is, not to yield to every new desire, but to provide proper objects of interest to the intellect and feelings, and to give the stomach the plain and mild food which alone, in its weakened state, it is able to digest. In very capricious and confirmed cases, it is sometimes prudent to yield temporarily; but even then the main object—the means of cure—ought never to be lost sight of.

If the public mind were only enlightened enough to act on the conviction that no effect can take place without some cause, known or unknown, producing it, many evils from which we now suffer might easily be avoided. If women could be convinced that, as a general rule, the danger attending confinement in childbed is in proportion to the previous sound or unsound condition of the system, and to good or bad management at the time, they would be much more anxious than they are to conform to the laws of health, both for their own sake, and for the sake of the child whose welfare is so largely committed to their trust.

During pregnancy, the great aim, for the sake of both

parent and child, ought to be to sustain the general health in the highest state of efficiency. In order to attain this, the mother ought to pursue her usual vocations and mode of life, if these are in harmony with the laws of health. Regular daily exercise, cheerful occupation and society, great cleanliness, moderate diet, pure air, early hours, clothing suitable to the season, and healthy activity of the skin, are all more essential than ever, because now the permanent welfare of another being is at stake, in addition to that of the mother.

Conducted with strict attention to these rules, the first pregnancy may become a means, not only of improving the mother's present health and securing that of her child, but of giving her a higher degree of permanent health than she enjoyed before her pregnancy. On the other hand, neglect of the laws of health during this period, by delicate women, especially when they have been married young, very often lays the foundation of increased delicacy during the remainder of life.

DRESS.—For many years past, common-sense and science have combined to wage war against custom and fashion on the subject of female dress, particularly tight-lacing and the use of unyielding corsets; but hitherto with only partial success. Of late, however, a glimmering perception has begun to prevail, that the object for which the restraint is undergone may be more certainly attained by following the dictates of nature and reason than by mechanical compression; and if this important truth shall make way, fashion will ultimately be enlisted on the right side, and the beautiful forms of nature be preferred to the deformities of misdirected art. Already, a better acquaint-

ance with the laws of the animal economy, added to the lamentable lessons of experience, has convinced many mothers that the surest way to deform the figure, and prevent gracefulness of carriage, is to prohibit exercise, and impede the free expansion of the chest by the use of stiff and tight stays; and that the most effectual way to improve both is to follow the opposite course. It was not by the use of tight bands and stays that the classic forms of Greece and Rome were fashioned, and if we wish to see these reproduced we must secure freedom of action of the whole muscular system. If the body be allowed fair play, the spine will grow up straight and firm, but at the same time graceful and pliant, and the rest of the figure will develop itself with freedom and elegance; while the additional advantage will be gained, of the highest degree of health and vigour compatible with the original constitution. Hence, it ought to be the first duty of the young wife who has reason to believe herself pregnant, to take care so to arrange her dress as to avoid the slightest compression of the chest or abdomen, and thus secure the utmost freedom of respiration. I need only add, that the evils of tight-lacing do not end with the birth of the child; the compression, by preventing the full development of the breasts and nipples, renders them unfit to furnish that nourishment on which the life of the infant may entirely depend. And yet it is only when absolutely compelled to give way as pregnancy advances, that many women loosen their corsets sufficiently to admit of common breathing-space, and remove the unnatural obstacles of steel or whalebone which experience has shown to be so injurious.

While I strongly advocate the bringing-up of young

girls without the use of such ill-judged support, I by no means recommend that delicate mothers, to whom long custom has rendered corsets necessary, should at once lay them aside, although I have known this done with manifest advantage. They ought, however, to substitute thin whalebone blades for the stiff steel in common use, and be very careful to wear them sufficiently loose to admit of the free enlargement and ascent of the womb. If this precaution be neglected, both mother and infant may be seriously injured, the labour rendered more difficult, and ruptures or other ailments induced. To afford the necessary support during the latter months of pregnancy, a broad elastic bandage worn round the body will often be of great service; but every approach to undue pressure should be scrupulously avoided.

Exercise.—Nothing contributes more than exercise to a sound state of health during gestation, and to a safe and easy recovery after delivery. With ordinary care, walking may be continued almost to the last hour, with excellent effect upon all the functions. In this respect the Queen has set an example to her subjects, and her easy labours and rapid recoveries have been in a great measure owing to her systematic observance of daily active exercise in the open air during the whole period of gestation. Many evidences, indeed, prove that the degree of danger attending pregnancy depends very much on the mother herself. Child-bearing is a natural and not a morbid process; and in the facility with which healthy regular-living women pass through it, we have abundant evidence that the Creator did not design it to be necessarily a time of great suffering and danger. Where the mode of life and the

habitual occupations of the mother are rational, the more closely she can adhere to them during pregnancy the better will it be for herself, and consequently also for her infant.

The early part of the day ought to be selected for exercise, especially in winter. Driving in an open carriage is a very useful addition to walking, but ought never to supersede it.

BATHING.—Cleanliness and fresh air are important aids to health at all times, but doubly so during gestation. Hence the propriety of having recourse to tepid bathing, especially in the case of women whose nervous system is unusually excitable. It promotes the healthy action of the skin, abates nervous excitement, tends to prevent internal congestion, and is in every way conducive to health. A bath, at the temperature of 94° to 96° Fahrenheit, once a week during pregnancy, will in most cases be found very beneficial. As a rule, a quarter of an hour is sufficiently long to remain in the bath; and it should never be taken soon after a meal.

Other circumstances might be mentioned as influencing the mother's health, and indirectly that of the child; but as they affect her only in common with other people, and so come under the head of the general laws of health, I shall not now enlarge upon them. Sensible people, who have never thought on the subject, may be surprised at the earnestness with which I have recommended attention to the mother's state, as the surest way of securing the health of the child; but if they will observe and reflect upon what is passing around them, they will see many

proofs of the principle which I have been enforcing, and find reason to admit the importance of its practical results.

MANAGEMENT OF THE BREASTS.—All undue pressure, by stays or otherwise, should be carefully avoided, especially over the nipples, as the skin covering them is extremely delicate and sensitive. The breasts should also be carefully examined by a medical man a month or longer before the termination of a first pregnancy, as it occasionally happens that one or both nipples are compressed and flattened, and artificial means may be necessary to develop them sufficiently to enable the child to suck. Neglect of this precaution may prevent an otherwise healthy mother from suckling her child, and also give rise to inflammations, often ending in painful abscesses of the breast.

CHAPTER III.

GREAT MORTALITY IN INFANCY PRODUCED BY REMOVABLE CAUSES, AND INCREASED BY PARENTAL IGNORANCE.

When we learn from incontestable evidence that between one-third and a half of all the children ushered into the world die within the first five years after birth, the natural conclusion is, that such a frightful result can arise only from great and wide-spread errors in the ordinary management of the young; and this inference is confirmed when we farther consider that among those animals which most nearly resemble man in their general structure, but differ from him in being guided by a natural instinct in the treatment of their offspring, no such mortality is to be met with. Did it occur in wild and barbarous regions only, it might seem a natural consequence of the hardships by which infancy is there surrounded. But the startling circumstance is, that it happens in the midst of comfort and civilisation, precisely where knowledge and the means of protection are supposed to abound; and it is only from our being so much accustomed to its occurrence that it excites so little surprise, and comes to be virtually considered as a part of the established and unalterable order of nature. As the first step towards preventing or curing

an evil, is to obtain a clear perception of its existence and nature, I think it advisable to adduce such evidence as may satisfy even the most sceptical, that the rate of infant mortality is both excessively high, and capable of being greatly reduced by judicious management. If these points be satisfactorily established, we shall be enabled to resume our inquiry into the means of improvement with increased interest and a greater probability of success.

About the middle of last century the London workhouses presented the astounding result of *twenty-three deaths in every twenty-four* infants under the age of one year! For a long time this frightful devastation was allowed to go on, as a thing beyond the reach of human remedy. But when at last, in consequence of a parliamentary inquiry, an improved system of management was introduced, the proportion of deaths speedily fell from 2600 to 450 a year. Here, then, was an annual loss, in those institutions alone, of 2150 lives, attributable, not to any unalterable decree of Providence (as some are disposed to contend, as an excuse for their own negligence), but to the ignorance, indifference, or cruelty of man!

Even in the present century, with all our boasted improvements, the mortality in infancy has continued to be enormous. To prove this, I need only refer to the statistical returns contained in the Annual Reports of Births, Deaths, and Marriages in England, presented to Parliament by the Registrar-General. In the very first of these reports, it is recorded that, of the total deaths which took place in England and Wales in 1838, nearly *one-third* occurred under two years of age! This, be it remarked, was not a year selected for any unusual fatality, but was merely the first in which registration was established; and its

general results are confirmed by the experience of subsequent years, and also of other countries. Thus, the English returns for 1841 show a mortality, under two years of age, of 101,478 out of a total of 343,847 deaths, being rather more than 29 per cent. In Belgium, again, where the population enjoys a high degree of domestic comfort and general intelligence, the earlier returns showed that *one* in every *ten* infants born alive died *within the first month;* while *at the end of five years,* only 5733 out of every 10,000, or little more than one-half, survived.* In Manchester and Salford matters were still worse; for it appears from the Registrar-General's Second Report, that out of 9276 deaths which occurred in that city in the year ending June 30th 1839, 2384, or about one-fourth, were of infants under one year; 3680, or more than one-third, under two years; and 5145, or considerably more than a half, under five years of age !†

From such facts as these, corroborated as they are by more recent statistics furnished by this and other countries,‡ it is plain that many causes of destruction are still active, even in those parts of Europe where science has made the greatest advances, and where the treatment of the young is considered the most rational.

Considering, then, that so great a mortality prevails in infancy even under what are apparently the most favourable circumstances, we are met by the question—Is this mortality a necessary result of the arrangements of Divine Providence, which we can do nothing to modify; or does it,

* Quetelet sur l'Homme et le Développement de ses Facultés, vol. i. pp. 161–167; Paris, 1835.

† See APPENDIX C.

‡ *Ibid.*

on the contrary, proceed chiefly from secondary causes, left to a considerable extent under our control, and which we may partially obviate, or even render innocuous, by making ourselves acquainted with the nature of the infantile constitution, and adapting our conduct to the laws or conditions under which its different functions are intended to act?

Now, if we ponder the facts above stated, there will, I think, be little difficulty in determining that this appalling waste of infant life is *not* a necessary and intended result of the Divine arrangements, but is occasioned *chiefly*, though not wholly, by human ignorance and mismanagement, and may be expected to diminish in proportion as our knowledge and practice improve—that is to say, in proportion as we shall discover and conform to the laws which the Creator has established for our guidance and preservation. Ample confirmation of this view will be found if we contrast the rate of mortality in infancy among the poor with that among the rich; the mortality in densely-peopled manufacturing towns with what is found in the open country; the proportion of deaths which formerly occurred with that which now occurs in public hospitals; and, above all, the enormous waste of life in foundling hospitals—where the natural food of the child and the watchful solicitude of the mother are withdrawn—with the comparatively small mortality in private families, where these advantages are enjoyed. This comparison I shall now proceed shortly to make.

It has already appeared (Chapter II.) how greatly the condition of infants is affected by *the degree of health and comfort enjoyed by the mother during pregnancy*. Where this is the most favourable, there will the offspring, in ordinary circumstances, be the most healthy, and most

capable of resisting hurtful influences. On the contrary, where bad health and misery predominate during pregnancy, the greatest risk is run by the child, and the proportion even of children *born dead* is much higher than usual. As things stand at present, many of the comforts, and some of even the necessaries of life, are beyond the reach of the poorer classes—a circumstance necessarily diminishing the chances of life to their infants. In large towns the want of fresh air in over-crowded dwellings adds fearfully to the rate of infant mortality.* But to these sources of premature death must be added the baneful practice, too prevalent in manufacturing towns and districts, of administering large and frequent doses of laudanum to infants, in order to keep them quiet during their mothers' absence at the factory—a practice which annually destroys thousands, and at the same time perverts or uproots those natural feelings of tenderness and affection which are the best guardians of infant health.

An instructive example of the extent to which infant mortality may be diminished by rational treatment, will be found in an abstract given by the late Dr Joseph Clarke from the Register of the Lying-in Hospital of Dublin; in which it is stated that, at the conclusion of 1782, out of 17,650 infants born alive, 2944, or nearly every SIXTH child, died within the first fortnight. This extraordinary fatality seemed to Dr Clarke to be caused chiefly by the great impurity of the air in the wards; and by adopting means calculated to ensure better ventilation the number of deaths was speedily reduced to only 419 out of 8033, or about one in 19½, instead of one in 6! During the seven years when Dr Collins was master of the same

* See APPENDIX D.

institution, the cases of *trismus* were reduced, by still farther improvements in ventilation and increased attention to cleanliness, to so low an average as three or four yearly; whereas, in 1782, they caused nineteen-twentieths of the deaths.* In 1859, Dr M'Clintock, at that time master of the Hospital, stated that a death from *trismus* then occurred only once or twice a year, and that the sanitary condition of the establishment was satisfactory.† A more striking proof of the fatal effects of impure air and the contrary on infant life could scarcely be adduced.

Having thus shown how greatly infant mortality may be reduced by good management, I might next refer to the experience of Foundling Hospitals for conclusive evidence of the destructive influence of bad treatment where the unhappy outcasts are deprived of a mother's care, and suffer many of the inconveniences by which health is most easily affected and life destroyed. But it will be sufficient to adduce the case of *orphans*, who, next to foundlings, are the most unfortunately situated for the preservation and enjoyment of life, and among whom consequently, other conditions being equal, the mortality is much greater than among children who are tended with a mother's care, and cherished with a mother's affection. Yet it is not less instructive than cheering to observe how much it is possible to do, by kind and rational treatment, even for that unfortunate class. Of this we have a remarkable example in the Orphan Asylum of Albany in the State of New York, which was opened in the end of 1829 with about 70 children, but where the average up to August 1836 subsequently amounted to 80. During the

* Collins's Practical Treatise on Midwifery, p. 513; London 1836.

† Letter to the Editor, July 18, 1859.

first three years, while the management was imperfect, from four to six children, and sometimes more, were constantly on the sick-list; one or two assistant nurses were necessary; a physician was in regular attendance twice or thrice a week; and *the deaths amounted to between thirty and forty*, or nearly one in every month. At the end of this time an improved system of treatment was adopted, and, notwithstanding the disadvantages inseparable from the orphan state of the children, the results were in the highest degree satisfactory. "The nursery was soon entirely vacated, and the services of the nurse and physician no longer needed; and, *for more than two years, no case of sickness or death took place.* In the succeeding twelve months there were three deaths, but they were new inmates, and diseased when they were received, and two of them were idiots." The superintendents farther state, that "since the new regimen has been fully adopted, there has been a remarkable increase of health, strength, activity, vivacity, cheerfulness and contentment among the children. The change of temper is also very great. They have become less turbulent, irritable, peevish, and discontented, and far more manageable, gentle, peaceable, and kind to each other."*

Surely, then, while we contrast the health and comfort enjoyed by the poor orphans under one system of treatment, with the sickness, sorrow, and loss of life inflicted on them by the other, we are forced to admit that parents themselves are in a great measure the arbiters of their children's fate, and that a heavy responsibility attaches to those among them who carelessly undertake such a trust, without any attempt to qualify themselves for the adequate

* Alcott on Vegetable Diet, p. 217; Boston, U.S., 1838.

discharge of its duties. I am anxious to impress this upon the reader, because it is only under a conviction that it *is* possible to avert many of the evils which afflict the young, that an active interest can be felt in investigating the origin of these, and assiduously using the means required for their prevention and removal. If any of the diseases which commonly destroy life in infancy can be warded off by proper care and good treatment—as the above example strikingly shows,—no parent can remain indifferent to the inquiry by what means so desirable an end may be accomplished—nothing can justify neglect where its consequences are so evidently serious.

It may be argued that the examples which I have given are extreme cases, and that no such mismanagement or fatality occurs in strictly private life. Most of them, certainly, *are* extreme cases; but on that very account they have been selected, as showing all the more incontestably how extensive the sphere of our influence is, and how important it is to the young that our management of them should be in strict accordance with the nature of the infant constitution and with the laws of health. But though it be in hospitals and other institutions for children that the most fearful results of bad treatment occur, we must not infer that the records of family practice are unstained with similar errors, and that among the wealthier classes nothing more can be done for the preservation of infant health and life. On the contrary, we have too good reason to believe, that, among the best-educated classes, many lives are cut short by mismanagement in infancy, which might be saved if the parents possessed in time a portion of that knowledge and practical sense which dire experience sometimes impresses upon them when too late.

The grand principle, therefore, which both parents and medical men ought to have ever before their eyes, is, that human life was not intended to be extinguished at its very dawn, and that its early extinction, whenever this occurs, is the result of previously existing causes, some of which might have been discovered and removed, while others might have been entirely or partially counteracted. This being the case, the first duty of parents obviously is to make themselves acquainted with the general nature and proper treatment of the infant constitution, that they may not unnecessarily risk the welfare of their children, and their own peace of mind, upon the mere chance of finding well-qualified substitutes in a lower and still more imperfectly educated class than their own. To the right-minded mother, the management and training of her children ought to appear in the same light as the exercise of a profession. It is her natural and special vocation; and she is as much bound to fit herself for the discharge of its duties, as the father is to prepare himself for the exercise of the profession by which he is to provide for their support.

But it may be asked, Where is the necessary information to be obtained, seeing that none such is taught to girls at school or at home, and that few treatises fit for their perusal are to be met with? This difficulty is not without force. The desirableness of including such instruction in the education of women, and the possibility of giving it intelligibly, have as yet been strongly perceived by only a few, and little has been done to supply the want. Now, however, the omission is becoming every day more widely recognised, and several works, more or less suited to the purpose, have made their appearance. But as none of

them embraces all that I conceive to be required, I have ventured on the present attempt to supply the necessary information in a plain and intelligible way, not with the view of superseding other works, but of adding to their acknowledged utility.

The following important remarks, the result of Mr Simon's extensive experience, will form a fit conclusion to the present chapter :—

"The *death-rates* of young children are among the most important studies in sanitary science, not only on their own account, but as affording a very sensitive test of the sanitary circumstances of the district. Where infants are most apt to die, the survivors are most apt to be sickly; and where the children struggle through a scrofulous childhood to realise an abortive puberty, they beget a still sicklier brood than themselves—less capable of labour, and less susceptible of education—feeble in body and mind. A high local mortality of children almost necessarily denotes a high local prevalence of those causes which determine a degeneration of the race."*

* Introductory Report on "Papers relating to the Sanitary State of the People of England, by E. Headlam Greenhow, M.D." By John Simon, Esq., the Medical Officer of the Privy Council.

CHAPTER IV.

INFANT HEALTH NOT ACCIDENTAL, BUT DEPENDENT ON FIXED LAWS.

In this chapter I shall endeavour to give such an intelligible account of the infant constitution, and of the chief conditions by which infant health is influenced, as may be practically useful in the hands of every parent of ordinary capacity. In the choice of the subjects, and in the manner of treating them, I shall endeavour at once to embrace every important truth, and to avoid offending even the most sensitive delicacy; and wherever I may fall short of my aim, I shall rely on the indulgence of the reader, who, I trust, will make allowance for the difficulties inseparable from the subject.

From the evidence just adduced (Chap. III.), the conclusion is irresistible, that the health and life of the infant depend essentially on the kind of management to which it is subjected, and the circumstances by which it is surrounded. Where both these are favourable, the child will enjoy the highest degree of health of which its natural constitution is susceptible; but where the management is bad, or the child's situation unfavourable, its life and health will be correspondingly precarious.

In practice, the principle implied in the foregoing propositions admits of many most useful applications, and on this account it is that I am so anxious to impress it on the reader. It alone explains the progress which has been already made in diminishing infant mortality, and encourages us to renewed exertion, in the belief that disease and death will be averted from infancy in proportion as we shall succeed in bringing our treatment into harmony with the laws of the human constitution, which are *laws of the Creator*. Much as the management of infancy has been improved of late, a great deal yet remains to be done; and when we consider how little regard has been hitherto paid to the discovery or fulfilment of the conditions required for the healthy performance of the animal functions, and how much disease has thence arisen, we cannot but look forward with hope to the time when the principles of physiology shall be taught in every elementary school, and become a living guide to the parent as well as the physician, in directing the management of the young.

Let it never be forgotten, then, that disease and untimely death are the results, not of chance, or of any abstract necessity, but simply of neglecting the *conditions* on which God has decreed the healthy action of the various organs of the body to depend, and which have therefore been appropriately named the ORGANIC LAWS. When these conditions are fulfilled, health is preserved; when they are infringed, the action of some organ is impeded or disordered—in other words, *disease* begins. Thus, when a fit of indigestion is occasioned by excessive eating or drinking, the disorder proceeds from infringement of that law which requires, as a prerequisite of healthy digestion, that the food and drink be adapted in quantity

and quality to the state of the constitution, mode of life, and powers of the stomach. In like manner, when inflammation of the eye is excited by long exposure to a very bright or concentrated light, the disturbance arises from disregarding the law that light must bear a certain relation to the natural constitution of the eye. If we exercise the eye with a light either too intense or too feeble, or look continuously through glasses calculated either to concentrate or disperse the rays of light in a higher degree than that to which the eye is adapted, disorder of its structure is sure to follow; and so long as the deranging cause is allowed to operate, we shall use in vain the best-devised treatment for the cure of the disease. But the moment we adapt the light and the exercise to the altered state of the organ, so as to give due scope to the preservative powers of nature, the very same treatment may speedily succeed, because now the laws of the function are conformed to. Equally vain is the attempt to cure indigestion by doses of medicine, without fulfilling the requisite conditions of health of the stomach by adapting the diet and mode of life to its deranged state.

In every instance, then, we must inquire what the *cause* of bad health is, and what organs are chiefly implicated. In infancy, for example, convulsions are frequent and dangerous; and if, without attempting to discover their origin, we merely prescribe for the convulsions themselves, we shall not only often fail to arrest them, but probably leave their causes in full operation, when it may be easy, by the removal of these, to prevent the recurrence of the fits. Thus, one cause of convulsions is breathing impure air, another is the irritation of teething, and a third is improper diet; so long, therefore, as fresh air is withheld, or

the irritation of the gums unallayed, or the diet ill adapted to the child, our attempts to remove the disorder must terminate in disappointment.

In the same way, all the causes of disease are infringements of the conditions of health of some organ or organs of the body; and were it in our power to discover the whole of these conditions in reference to *all* the organs, as well as to fulfil them perfectly, we might prevent disease altogether, and prolong our lives till the natural period of decay. The grand aim, therefore, in attempting to improve the treatment of infancy, ought to be, *the discovery and fulfilment of the conditions on which the healthy action of the principal organs depends.*

By fixing our attention steadily on this guiding principle, two excellent practical results will be gained. The first is, that we shall never witness suffering or disease without being instantly stimulated to the discovery, removal, and future avoidance of its cause; and the second, that we shall be kept constantly alive to the influence of surrounding agents, and thus be led to the earliest detection of errors which, if left long unremedied, might be fraught with destruction.

To this view of the origin of disease it has been objected, that diseases are specially sent by Providence for the spiritual benefit of the sufferer, and not with reference to any physical errors or omissions with which he may be chargeable. But this objection arises from a very narrow conception of the workings of God's providence, and is contradicted by daily and hourly experience, as well as by the habitual conduct of mankind. No man capable of observing and reasoning can fail to know that health *is* affected by his own conduct, and *is* under the influence of

fixed laws; nor is there a living being that does not act habitually and instinctively on the faith of this being the case.

It is true that disease and recovery both proceed from the Divine will, and that, like every other dispensation, they ought to be made available to moral and religious improvement, as well as to a better observance of the laws of health. But it is not less true that the Divine will acts through secondary causes and according to an established plan, to which we, as intelligent beings, are plainly required to conform. To know this plan is therefore of high importance to all, but chiefly to those whom God himself has entrusted with the guardianship of a whole family's health and happiness. A natural cause exists for every disease, whether we can see it or not; and, in general, we *can* discover it by careful examination. It is therefore a sacred duty to study the infant economy, and endeavour to discover the causes of the diseases by which infant life is endangered.

In inculcating these views, I am so far from disregarding the influence of Divine power, that, on the contrary, my chief object is to enforce attention to its ever-present existence, and, by explaining the mode in which it operates, to point out the surest way of obtaining its aid in attempts to improve our condition. God acts according to an unchanging plan, established by Himself; and to disregard the rules of conduct which the study of that plan reveals to be His will when it shows that their observance is indispensable to our happiness, is as truly to rebel against His authority as if we were to act at variance with His written commandments.

To understand the operation of the external causes of

disease, we must have some acquaintance with the nature and conditions of the bodily functions. Without this knowledge, we shall often fail to detect aberrations from their healthy action, in time to prevent the mischief which is sure to ensue, and which, with it, might easily be obviated. Nothing is more common than for patients and parents to declare that no cause of any kind has been in operation, where the physician is able to trace one of a very influential kind. Nay, it occasionally happens that, from ignorance of the laws of the animal economy, the parents cannot comprehend the action of a cause when it is pointed out to them, and deliberately leave it unremoved, in the belief that it is nowise injurious.*

For this and other reasons, it is very desirable that every parent should possess some knowledge of the structure and laws of the animal economy, and that, in laying down rules for the improvement of health and the prevention of disease, every opportunity should be embraced by the medical attendant to explain the laws and functions on which those rules are based, and thus to inculcate the utility of a more accurate and timely attention to every circumstance likely to derange healthy action. Such shall be my aim in the following pages.

If we try to discover why the children of one family are almost always healthy, and those of another almost always ailing, we shall generally succeed in tracing the result either to the bodily constitution derived from the parents, or to a difference in the management or external circumstances of the families. Occasionally, indeed, we are entirely at a loss to assign any sufficient cause; but even in

* See APPENDIX E, for some account of the most prevalent diseases of infancy.

such cases, reason and analogy entitle us to assume that causes do exist, although we have not succeeded in discovering them. Sometimes they are hidden from view only because the medical attendant has not had sufficient opportunity to find them out, and the parents are too little acquainted with the animal economy to be able to tell when and in what respects their management is imperfect. I have sometimes been unable, when first called in, to fix upon any error of regimen or treatment to account for illness, but upon more familiar acquaintance with the circumstances of the family have found adequate causes in operation. In no circumstances, then, ought the medical practitioner to content himself with getting a few brief answers to questions, nor should he receive the same statement as always bearing precisely the same meaning in the mouths of different persons. Much erroneous practice arises from overlooking the latter source of error. Let the physician interpret with caution the statements he receives, and verify them as much as possible by personal observation. Let him also make sure that everything which he recommends is *understood in the sense in which he means it;* and from time to time investigate personally the general management of the child, without waiting till some glaring error has been committed, for the correcting of which his assistance is urgently required. Every sensible parent will duly appreciate such attention, and eagerly afford facilities for the necessary observation.

CHAPTER V.

ON THE CONSTITUTION OF THE INFANT AT BIRTH.

HAVING pointed out (Chap. I.) the conditions in the health of the parents which *indirectly* affect the health of the infant at birth, we have now to consider those causes which act *directly* on the infant after it has entered on an independent existence.

Before birth, the child may be considered as virtually a portion of the mother's organism, for its life and growth are wholly dependent on her. But when once it is ushered into the world, what a vast revolution takes place! In an instant it is transferred from unconscious repose, solitude, and darkness, to life, and light, and action. From being surrounded by a bland fluid of unvarying warmth, it passes to the rude contact of an ever-changing air of a lower temperature, and to a rougher touch from even the softest clothing, than it ever before sustained. Previously nourished by the mother's blood, it must now take in and digest its own food, and throw out its own waste. The blood, till now purified and restored through means of the mother's system, must henceforth be oxygenated in the lungs of the child itself. The animal heat, formerly derived from the mother, must now be elaborated by the

action of its own organs. Hitherto defended from injury by the mother's sensations and watchfulness, it must now receive external impressions through its own senses; through its smiles or its cries, it must now announce to her the fact of its safety or danger. Such are the changes which render the period of early infancy so full of peril when their nature is misunderstood and the treatment is not in harmony with the constitution of the infant. Let us inquire, then, what the peculiarities of its organism are, and how the changes are brought about.

NERVOUS ACTION and MUSCULAR MOTION are unquestionably the functions first excited at birth. From the moment when the infant ceases to be a part of its mother's system, the continuance of its life depends on *respiration* or breathing. If that were delayed or suspended for a few minutes, it would perish suffocated. But before it can begin to breathe, and to circulate its own blood, *the stimulus must be felt*, which renders breathing an imperative act. Accordingly, no sooner is the infant born than it is roused into action by the sudden and disagreeable contact of the colder air upon the sensitive nerves of the skin, and immediately begins to breathe. The excited sensibility of the nervous system is thus the primary source of the involuntary impulse which causes the lungs to play, though doubtless the peculiar stimulus arising from the presence of venous blood in the brain and lungs also contributes. In order to give the infant this keen sensibility, and excite immmediate reaction through the reflex system of nerves, the nervous filaments are well-developed from the first, and are copiously distributed to the tender skin. The manner in which they are instrumental in making respiration begin, will be easily understood if we

consider the suddenness of the infant's transition from a temperature of 98° or 100° to one of 60° or 65°, and recollect the panting and sighing, from irregular action of the respiratory muscles, which plunging into a cold bath produces in an adult, especially if delicate and excitable. So disagreeably vivid, indeed, is the impression made on the child by the cold air, that in most cases it immediately begins to *cry;* which act, as it consists in hurried and irregular breathing, has the advantage of more quickly and effectually expanding the lungs, and giving a wholesome stimulus to the circulation through their vessels. Hence, crying is always considered a satisfactory sign of a child's vigour at birth.

Another important purpose fulfilled by the acute sensibility of the skin in early infancy, is protection from external injury. The organism is then so feeble and delicate, that a very trivial cause is sufficient to disturb its health. A slight excess of cold or of heat, a little hardness or roughness of its clothing, any trifling neglect of cleanliness, or constraint of position, may induce general or local disease. Hence, if such sources of irritation were not immediately felt by the infant, and felt so acutely as to force it to sound the alarm for their removal, serious disease might be induced, or the child might perish, without any previous indication that mischief was going on. But let it never be forgotten that, while this great susceptibility of the nervous system is bestowed for the protection of the infant, it necessarily increases the danger when any morbific cause is allowed to act. Hence the rapid course, and frequently fatal termination, of many infantile diseases; and hence also the much greater efficacy, in early infancy, of preventive than of curative treatment.

Nervous sensibility and muscular motion being thus begun, the functions next called into action for the preservation of life are those performed by the lungs and heart —namely, RESPIRATION and CIRCULATION. Thus three important changes follow instantaneously on the birth of the infant: the excitement of the nervous system to action; the expansion of the lungs, and establishment of respiration; and an alteration in the course of the venous blood, which is now made to pass through the lungs, instead of going, as before, directly from the right to the left side of the heart. But there is yet another condition of independent life, formerly provided for by the parent, which must come into play at birth—the supply of ANIMAL HEAT.

A certain degree of heat is essential to the well-being of all warm-blooded animals. If it is either too high or too low, all the functions suffer, and, in extreme cases, death soon follows. To obviate these sources of danger, Nature has so constituted the human organism, that, within certain limits, it preserves an equality of temperature, whether the heat of the surrounding air be above or below its natural standard. This temperature in the healthy adult is about 98°, or about 50° above the average temperature in Great Britain; hence it is plain that, without some provision for producing heat, the body would quickly be cooled down, even in summer, to a fatal extent. What, then, is the provision actually made?

FOOD is the primary source of animal heat, and the development and diffusion of this heat are effected by means of *digestion, respiration,* and *circulation.* When the supply of food is sufficient, the rapidity with which animal heat is generated is (other circumstances being

alike) in proportion to the size of the lungs, and the freedom with which they play in a pure and temperate air. Now, we have only to look at the small chest and feebly developed lungs of the infant, and the comparative inactivity to which it is doomed in the early months of existence, to feel assured that in it this source of heat must be scanty indeed.

Nor is it more favourably situated in regard to the other source—a full and nourishing diet; for the mother's milk is at first watery and unstimulating, and conduces but little to the chemical changes by which heat is evolved.

It must be added, that the nervous system also exercises a marked, though indirect, influence on the generation of animal heat. Where a strong nervous stimulus is at work, there heat is always more freely evolved; during inaction, as in sleep, its generation is least rapid. Hence the fatal effect of yielding to drowsiness when we are exposed to intense cold; hence also the need of warmer coverings during sleep than we can bear while awake, and the frequency of colds induced by falling asleep in the open air, unprotected by additional clothing. Now, a much greater proportion of infantile than of adult life is spent in sleep.

If, then, ample nutrition, free respiration, and active nervous influence, are the chief sources of animal heat, we cannot expect its rapid evolution in infancy—the very period at which these functions are most imperfect. Notwithstanding this, however, it was once, or rather still is, a matter of popular belief, that infants have a great power of resisting cold. But Dr Edwards has demonstrated, that, as might be expected *a priori*, the power of generating

heat is at its minimum in all animals immediately after birth, and that it rises progressively as their development, strength, and internal activity increase. In prematurely born children the heat of the body is several degrees below the natural standard, and is very easily depressed still farther by exposure. In one instance of a seven-months' child, the thermometer stood at 89° Fahr., instead of 98°, the usual temperature in the adult.

The extreme care with which the lower animals protect their young from cold might have led sooner to the truth. Dr Edwards observed a very great and rapid diminution of temperature in the new-born offspring of most carnivorous animals when removed from the mother, but a loss of only 2° or 3° of heat when lying close to her body. Young sparrows have a temperature of 95° or 96° in the nest, a week after being hatched; but when removed from it, their temperature fell in a single hour to 66½°, that of the atmosphere at the time being as high as 62°.* Man is no exception to the rule; and as the power of generating heat is comparatively feeble in infancy, while a regular high temperature of the body is necessary for existence, it follows that whatever withdraws heat faster than it is generated must be injurious, in proportion to the weakness of the constitution, and to the extent and rapidity of the action of the cause.

As we shall afterwards see, the practical conclusions deducible from these facts are of great importance, and of very general application; but for the present it will be enough to bear in mind, that, so far from possessing a power of successfully resisting cold, infants, in common

* Müller's Elements of Physiology, translated by Dr William Baly, p. 76.

with the young of all warm-blooded animals, cannot even sustain their own temperature, and soon perish unless duly protected; and that the degree of animal heat which is indispensable to the continuance of life cannot be kept up until the three great processes of *respiration, circulation,* and *digestion,* are fully established. To the last of these the attention of the reader must now be directed.

After a short period of repose, sufficient to allow it to recover from the turmoil of birth, the infant awakes to demand, in obedience to a powerful instinct, the gratification of *appetite for food.* For the first time it receives food into its own stomach, and commences the process of digestion for its own sustenance. This function is necessary, not because life cannot exist without it, as in the case of respiration and circulation, but because growth and waste are the concomitants of life, and materials must be supplied for building up, and for the replacement of what is lost. Thus, the taking of food is not an immediate and pressing want like that of breathing, but may be delayed for several hours with perfect safety and propriety. At the end of this time, however, it must be begun, and continued at short intervals till life comes to an end.

The new-born infant being thus dependent on supplies of nourishment from without, which its own system must *digest* and *assimilate,* its organs of digestion are sufficiently developed to assume at once their now necessary office. From the simplicity of its natural food, and the small quantity taken in at a time, digestion goes on very actively, and the nutritive chyle is soon ready to be taken up by the absorbent vessels, the use of which is to imbibe it from the inner surface of the intestines as fast as it is

formed, and convey it to the right side of the heart to be mixed with the venous blood, and afterwards, by exposure to the air in the air-cells of the lungs, converted along with it into arterial or nutritive blood. But the lungs and chest being still small, and respiration feeble, —if the child is encouraged to suck too much or too frequently, so that chyle is brought to the lungs in larger quantity or faster than it can be easily converted into good blood, disturbance of health from the circulation of *imperfect* blood necessarily follows. Or, if stronger food, such as chicken-tea or beef-tea, be given too soon with the view of strengthening a weak child, the chyle formed may be imperfectly sanguified in the lungs, and feverish irritation may ensue. This is a frequent occurrence, and the consequences are often very serious.

Nutrition and growth being in this way provided for, it is clear that, without some regular outlet for the effete matter which has already served its purpose in the system, and some means of removing the indigestible part of the food, repletion and oppression would follow, and soon lead to disease and death. This danger is, however, effectually obviated by the *organs of excretion*, through which the effete particles, and the refuse of the food, are removed from the system.

The principal excretory organs are the Bowels, the Kidneys, the Skin, and the Lungs; and, as we proceed, we shall find that a proper balance between the organs of *nutrition* and those of *excretion*—between the supply and the waste—is an essential condition of health, not only in infancy, but at every stage of life. If the nutritive functions preponderate, disease from repletion will be the consequence; whereas, if the excreting organs exceed in

activity, the body will soon waste away and perish, unless a timely remedy be provided.

The function of excretion being so necessary an accompaniment or consequence of nutrition, we find its organs ready to start into activity soon after birth. The Bowels and the Kidneys are already in full working order, and require only the presence of their natural stimuli to make them act. Accordingly, the infant has not been many hours in the world before the then watery milk of the mother causes the discharge, from the bowels, of the dark and slimy secretion called *meconium*, which has accumulated in them. They are now ready for the assimilation of the richer milk which speedily takes the place of the early watery secretion. The supplies of milk required by the infant being very frequent, and the quantity of bile and other fluid secretions being very considerable, the bowels act frequently, and yield a more liquid discharge than in maturer life. The kidneys, stimulated in like manner by the watery nature of the food, become active, and secrete urine in small quantities, which also is frequently discharged—the bladder, like the bowels, being still of small capacity.

In addition to these channels of excretion, two still remain to be noticed—the *Skin* and the *Lungs*.

In certain states of the body and weather, the exhalation by the skin alone exceeds in weight the whole amount thrown out by the bowels and kidneys together—a fact which may convey some notion of its importance to health. In the ordinary state the exhalation is invisible, and is thence named insensible perspiration. During active exercise, or in hot weather, it appears in the form of sweat, or sensible perspiration.

The lungs constitute another important channel of excretion. In humid still weather, perspiration and pulmonary exhalation go on very imperfectly; and hence the dulness and discomfort so often experienced under a "leaden" sky. When the air is very dry and hot, these processes go on too fast, producing feverish irritability and thirst, which, if continued for some time, are sure to be succeeded by disease. On every account, then, constant attention should be given to the temperature, the moisture, and the purity of the air by which the young are surrounded. If, for example, we allow perspiration to be checked by prolonged exposure to cold and moist air, an effort will be made by some of the other excreting organs to get rid of the hurtful particles retained in the blood, and which ought to have been thrown out by the skin; but even when the effort proves successful, it is always at the risk of the over-activity thus induced terminating in disease. Hence the necessity of avoiding every cause likely to disturb the natural balance between the different excreting organs, and to throw the labour of one upon another which is not intended for it.

To understand more fully, however, the importance of a healthy state of the *functions of excretion*, it is necessary to be aware of the highly noxious influence exercised by animal matter which has already served its purpose, and is retained in the system contrary to the intentions of Nature. When respiration, for instance, is seriously impeded, the venous blood ceases to be oxygenated, and can no longer get rid of the carbonic acid and other matter which are usually thrown out in its passage through the lungs. The result is that for a short time it passes onwards unchanged; but as it is unfit in that state for the

support of life, death speedily ensues. In like manner, when the effluvia which ought to escape from the surface by perspiration are prevented from passing off, they tend to produce fever of a malignant character. When, again, the urine is not duly secreted, the corrupt animal matter which ought to have been eliminated by the kidneys remains in the blood, acts upon it as a poison, alters its natural composition, destroys the health, and, in extreme cases, soon causes death. The same thing holds good with the bowels. If they are not duly relieved, the excretion of the fæcal matter by the mucous membrane is impeded, and the blood is contaminated by its retention. At the same time the more fluid portion of their contents is absorbed into the system, whereby the residue acquires an unnatural hardness, and thus proves a direct source of irritation to the bowels, and increases their liability to disease.

The grand object to which all the various functions that we have just passed in review directly contribute, is the *preservation and continuance of life.* Without them, the body would soon become mere inanimate matter, and, as such, fall into decay. Beyond this, however, they provide for nothing; and were man limited to the possession of these functions, he would have a merely vegetative existence. They are called ORGANIC FUNCTIONS. Essential to the maintenance of life, they serve no other end. Their action being independent of the will, and unattended with consciousness, they go on whether we are awake or asleep, and whether we bestow a thought upon them or not. They are common to the whole animal kingdom, and, generally speaking, to the vegetable kingdom also—in short, to every substance possessed of *or-*

ganisation. Hence their distinctive appellation of *organic* functions.

But there is a higher class of functions, the ANIMAL FUNCTIONS. These have relation, not to the mere *life* of man, but to *the purposes for which conscious life was given;* and they, as well as those styled organic, require organs for their performance. The brain, the organs of sense, and the organs of voluntary motion, are the great organs of the *animal functions.* It is through their instrumentality that all the operations of intelligence and of emotion—acts *peculiar to animals*—are performed. By means of the brain and the organs of sense, the infant becomes *conscious* of his own existence, and perceives that of the beings who minister to his comfort and safety. By the same means he sees and smells, hears and touches, and gradually learns to distinguish one object from another: impressed agreeably by one object, he stretches his hand towards it by means of his muscles and bones—towards the light, for example, or towards his mother's breast; impressed disagreeably by another, he shrinks, by the same means, from its contact, and seeks for safety from injury. As he grows up, and his brain is developed and consolidated, his feelings acquire strength and permanency: he manifests kindness, and reciprocates affection; he resents and repels aggression, acquires a sense of property, seeks the love of those around him, imitates their actions, distinguishes what is just from what is unjust, and learns to clothe his feelings and ideas in words; and as his years increase, becoming gradually acquainted with his position in the great family of mankind, he at length comes to recognise the duties which society imposes on him, and the consequent necessity under which he lies to seek that knowledge, and exercise

that judgment, which shall best enable him to make his way in the world as an independent being. By the nobler of these powers and emotions, all of which act through the medium of the brain, is man distinguished from the beasts that perish; and to them he is indebted for the privilege of knowing and worshipping the one true God, the Author and Preserver of his being.

In consequence of a superiority of special organization, some of the animal functions are possessed by the lower creatures even in higher perfection than by man. Thus, there are animals distinguished by greater acuteness of smell and hearing, by greater reach of vision and vivacity of passion; but in strength and comprehensiveness of intellect, in moral energy, and, above all, in that profound devotional feeling which, more than any other, reveals to him the existence of, and connects him with, the Deity, man stands alone—at once the most privileged and only responsible of all earthly creatures. These high gifts are uniformly accompanied by a peculiar and ample development of brain, which none of the lower animals is ever found to possess.

From this short review of the higher or *animal* functions it will be evident that *they* constitute the really characteristic qualities of man, and that the *organic* functions are required merely to sustain the machinery through which the others operate. A man is not a man because he eats, digests, breathes, circulates blood, grows and decays; if he were, a sparrow or a fly might take rank along with him. He is a man because he *thinks, feels,* and *acts* in a certain way, and is the subject of moral responsibility; and he eats and digests *merely because he must possess organs by which to feel, think, and act, and these organs*

must be sustained in life and vigour. He must have eyes, because, without a structure arranged in due relation to the properties of light, no luminous impression could be received; to hear, he must have ears, placing him in due relation to the vibrations of the air; and to act, he must have nerves, muscles, and bones. Pursuing the principle a little further, we shall see that the *mind* itself to which impressions are conveyed, and from which the will emanates, must also be connected with organization during life; and the organ with which it is more immediately connected is ascertained, beyond all doubt, to be the Brain. Strictly speaking, therefore, it is the *mind*, and its instrument the *brain*, which constitute the distinguishing features of man; and eyes, ears, legs, and arms are required only because, placed as we are in a material world, the mind could not there act upon material objects, nor be acted on by them, unless it were associated with, and assisted by, material instruments.

Accordingly, there is nothing in the whole range of creation more wonderful, or more indicative of the omniscience and omnipotence of God, than the exquisite adaptation which everywhere subsists between the character of the individual organisms, and the instincts and powers by which animal life, in its various gradations, is characterised. Not only, indeed, is the organism of all kinds of animals peculiarly adapted to their wants and modes of life, but the modifications which it undergoes in the same individual, at different ages, are in admirable harmony with the position and circumstances of each. In the human being at birth, for example, how tender the organism, how soft the bones, how frail the muscles, how feeble the senses, how defective the mind; but on the other

hand, how active the nutrition, and how admirably in harmony with the constitution and wants of the infant! In beautiful accordance with the infant's mental state, Nature has, by the softness of its bones, and the feebleness of its muscles, denied it all power of self-regulation, and consigned it to the watchful care of maternal feeling; and only in proportion as it grows, and becomes acquainted with the external world, does it acquire the powers of motion and self-regulation—because then only can it enjoy them in safety, or apply them to use. Arranged as is the order of the development of the functions by the omniscient Creator, how admirably does each harmonise with the others, and how perfectly do all contribute to one common end, the preservation and welfare of the creature!

Ushered into a world where everything is new to it, and where its safety depends at every instant on its proper treatment, the infant is thrown at first entirely on its mother for support and protection; and these are secured to it by the strongest feeling which woman can experience —that devoted love of offspring which seldom fails even amid the agonies of death. Ignorant of its own nature, and of everything around it, the infant is wisely denied such power of motion as it could use only to its own detriment. And, unable as it is to act for itself, ripened consciousness has wisely been withheld from it; for this would have added misery to its lot, without a single compensating advantage. It passes its earlier days in sleep and dozing, and wakes up only for a moment to satisfy the predominating instinct—the appetite for food on which its future development depends.

Such is an outline of the peculiarities of the infant organism and functions. It is far from being complete,

because a full description of them would be out of place in a work like the present. But it will suffice to give the reader a general idea of the constitutional characteristics of the young; and, when afterwards laying down practical rules for their management, I shall take occasion further to explain, wherever it may seem necessary, the physiological principles on which the rules are founded.

CHAPTER VI.

THE MANAGEMENT OF THE INFANT IMMEDIATELY AFTER BIRTH.

THE new-born infant is so susceptible of cold as to be painfully roused by the sudden transition from the unvarying high temperature of the womb to the comparative coldness of even our summer atmosphere. Our first care, therefore, ought to be to envelope it in soft warm flannel, and in cold weather to take it near a good fire, but out of the line of its direct rays. If the infant is active, and breathes freely, it may forthwith be washed, to free it from the tenacious coating of unctuous mucus which served for its protection in the womb, but which now becomes a source of irritation, and a direct impediment to the healthy action of the skin. The removal of this coating is most conveniently effected by immersing the child in a small warm bath, while the head is supported by the left hand of the nurse. In this way every part of the body is effectually protected from cold, while the position of the infant is one best suited to the feebleness of its frame, and most easily admitting of the head and face being thoroughly washed, without any risk of the impure water running into its eyes. After being carefully washed, it

ought to be rubbed gently all over with a soft sponge, great care being taken not to chafe or injure the skin by too much friction. Treated in this manner, the mucus separates easily, and the use of soap or any oily substance in addition is rarely required. Part of the mucus is apt to adhere to the folds of the skin and joints, to the ears, eyelids, and other irregular surfaces, unless it be cleared away by very careful washing. But as the eyes are extremely delicate and easily injured at birth, great caution should be exercised not to touch them with the sponge which has been used to cleanse the rest of the skin, or to allow any of the water, now loaded with impurities, to drop upon the eyes or eyelids. Neglect of this precaution is one cause of a severe form of inflammation of the eyes, which is apt to come on within two or three days after birth, and often ends in blindness. To avoid all risk, perfectly clean water, and a clean sponge, should be used for washing the eyelids.

The temperature of the water used for washing the infant ought to be the same as that of the body—namely, from 96° to 98° Fahr. *Momentary* immersion in water two or three degrees warmer is sometimes very useful in rousing the vital energies of a feeble or languid infant.

Immediately on being taken out of the bath, the infant should be received on a large pillow covered with several soft warm napkins, laid across the nurse's knees. By this means it may be dried easily and quickly, and *gentle* rubbing may be continued with the hand over the whole surface till a genial glow is excited. To prevent any risk of cold, everything used should be comfortably warm. The room also ought to be warm, and free from draughts; but too near an approach to a large fire should be avoided.

If any part of the skin, after being gently but carefully

dried, is observed to be ruffled, it should be dusted with a little hair-powder.

The infant being now washed and dried, a thin and fine flannel bandage, five or six inches broad, and long enough to go once or twice round the body, should be applied, partly for warmth, and partly to protect the navel-string, and prevent the bowels from being forced outward at the opening of the navel during crying or other sudden effort.

In cold weather, flannel is the best material for such a bandage; but when the skin is unusually tender, or the weather hot, a fine cotton or linen roller may be substituted. Occasionally, flannel lined with thin cotton or linen is used, but in this climate flannel itself is rarely found to be oppressive. Whichever substance is employed, care must be taken not to make the bandage too tight, otherwise the breathing will be impeded.

Arrived at this stage of the proceedings, some merely wrap up the child loosely in a flannel shawl or blanket, and put it to sleep, the rest of the dressing being delayed till it awakes refreshed at the end of several hours. Others, again, complete the dressing before laying the child in its cradle. In determining which of these courses to follow, we may safely be guided by the state of the infant. If it is very feeble, or fatigued by the washing and drying, the former plan will be preferable. In either case it will drop asleep almost immediately on being laid down, and probably will not awake for some hours.

Dress.—The leading qualities required in the clothing of infants are lightness, softness, and warmth; and it must therefore vary according to the climate and season. In construction it ought to admit of being easily put on and

taken off; and while it affords ample protection to the body, it ought to admit the fullest expansion of the chest and abdomen, and perfect freedom of motion in the limbs. Provided it fulfil these ends, there will be no occasion for interfering with the mother's taste, or the fashion of the day. But whatever tends either to compress the body, or to restrain the arms or legs, ought to be unrelentingly forbidden; above all, every approach to the practice still prevalent in some parts of the Continent, of swaddling the infant like a mummy.

If the child is born prematurely or in winter, or has a weak constitution, flannel ought generally to be preferred for the whole of the dress in contact with the skin. From the protection which it affords, and also the gentle stimulus which it gives to the skin, it is extremely useful in warding off the internal congestions, and inflammatory and bowel complaints, to which weakly children are liable. But when, as sometimes happens from unusual sensibility or other causes, flannel irritates the skin or induces perspiration, cotton or fine linen should be preferred—care being taken never to put it on till it is made comfortably warm.

As to the other parts of dress, it is impossible to lay down rules applicable to every case. The chief things to keep in mind are, that perfect freedom of motion of the limbs, and the absence of all pressure on the chest or bowels from tightness of the dress, are indispensable to health; that the generation of animal heat is less active in infancy than at a later period of life; and that the dress ought to be such as to ensure due warmth at all seasons. But, however prejudicial exposure to cold may be in infancy, *excessive wrapping up*, or keeping the child *in too hot rooms*, is no less hurtful, and ought to be as scrupu-

lously avoided. For obvious reasons, tapes and buttons should be used, instead of pins, for fastening the dress.

The common practice of dressing infants in long flowing clothes during the first few months is advantageous, by protecting the body and lower extremities against cold air and draughts; and in cold weather the feet should be further protected by soft woollen socks or knitted worsted shoes, which retain their warmth without compressing them.

The head is very commonly kept too warm in infancy; but this, owing to the natural tendency to nervous excitement in early life, is an improper practice. In warm weather, the thinnest possible covering will be sufficient for its protection; and even in cold weather, a warmer cap will be required only in the open air. Within doors, the temperature is generally kept high enough by fires to render much wrapping up neither necessary nor safe. When colds are induced by wearing thin caps, it is generally in consequence of the infant being laid to sleep with the head immersed in a very soft warm pillow, whereby an unusual flow of blood towards the head takes place, accompanied by considerable perspiration on its surface. In such circumstances, the rational remedy is, not to put on a thicker covering by day, but, by the use of a proper pillow, to guard against overheating by night. When the head is kept very warm, the nervous excitability is greatly increased, so that the infant is easily affected by slight changes of temperature, and any accidental irritation is more likely to be followed by spasmodic or convulsive fits.

When, after the lapse of a few months, strength and activity become developed, along with that desire for

motion which naturally accompanies them, the dress must be so arranged as to leave the feet unencumbered. Soft warm stockings and easy comfortable shoes are then advisable, but no compression in any form should be permitted. Corns and derangement of the natural positions of the toes, are almost invariably the consequence of too tight and ill-made shoes, which press unequally, and do not admit the full expansion of the anterior part of the foot. In making the change to short clothes, regard must be had to the weather, and due care must be taken to keep the legs and feet warm when the child is carried out of doors.

Nearly akin to dress by day is the provision of proper bed-clothing during the night. If an infant is buried under a mass of bed-clothes when asleep, and dressed in the ordinary way when awake, the mere transition will be hurtful.

In arranging night-coverings, the soft feather-bed is very often estimated as nothing; that is to say, the same provision of blankets is considered equally indispensable whether the child is laid upon a firm mattress or immersed in down. The mother, looking only to the coverings laid *over* the child, is apt to forget those on which it lies, although, in reality, the latter may be the warmer of the two.

But, as already mentioned, the infant possesses a low power of generating heat, and therefore requires to be rather warmly clothed during sleep, as well as during its waking hours.* Yet here, as in everything, extremes ought to be carefully avoided, and while due warmth in

* From overlooking the necessity of having the under surface of the body kept warm in bed, a great error was committed in one of the Edin-

bed is provided for, excessive heat should be as scrupulously guarded against as debilitating cold.

burgh workhouses a few years ago. During a severe winter, a number of children slept in beds unprovided with mattresses, and with nothing but the canvas bottom and a single fold of blanket to lie on. The consequence was, that they lay shivering and sleepless, and most of them became seriously diseased.

CHAPTER VII.

FOOD OF THE INFANT.

For some weeks after birth, the whole time of the infant is passed in sleeping and feeding, and the predominant functions are those of digestion, nutrition, and excretion. Hence, the first and most imperative want, after the functions more immediately essential to life are fully in operation, is a regular supply of materials by means of which the nutrition and development of the body may be effected, and the continual waste of the system repaired.

Accordingly, no sooner does the infant awake out of its first sleep, than it manifests the activity of a powerful instinct, impelling it to supply the want. This instinct is the *appetite for food.* As soon, therefore, as the mother has sufficiently recovered from her fatigue — generally within eight or ten hours—the infant should be put to the breast. At first, the milk is secreted in small quantity, and, from its watery consistence, resembles whey more than milk; but during the next few days it gradually becomes more copious, rich, and nourishing. This arrangement is in admirable harmony with the state and wants of the infant. At birth the bowels are loaded with the dark and slimy *meconium* already mentioned, and the first

step towards the preparation of the digestive organs for their functions is the expulsion of this now useless, and if longer retained probably hurtful matter. For this purpose nothing is so suitable as the watery milk first secreted. It affords to the bowels the requisite stimulus to action, without the risk of unduly irritating them; consequently, when the infant is freely admitted to the mother's breast, the meconium is usually cleared out within a day or two. In proportion as the milk becomes richer and more nutritious, the stomach and bowels become fit for its reception and digestion.

From ignorance of the general sufficiency of the means thus provided by Nature for the expulsion of the meconium, it is still the practice with many nurses to withhold the breast till a purgative has been administered to the child, by way of preparing its stomach and bowels for the reception of the mother's milk. But in most instances this proceeding is wholly unnecessary, and in many it is injurious. Occasionally, no doubt, the aid of a mild laxative is required to avert a greater evil; but the medical attendant is the only judge of such a necessity, and unless by his direction none ought ever to be given. In the first milk of the mother, Nature has provided a laxative adapted to the delicate organism of the infant; and when we *unnecessarily* act in opposition to this arrangement we incur the double risk of irritating the bowels of the child by the needless purgative, and of giving the mother pain from the unrelieved distention of her breasts—a state which often terminates in acute inflammation and the formation of an abscess.

When several hours after birth have passed without any action of the bowels, and the child obviously suffers from

the delay, a few tea-spoonfuls of tepid sugar and water, or half a tea-spoonful of fresh-drawn castor oil, may be given. This will generally be sufficient, and more active medicines should not be administered without medical sanction.

Sometimes, from the imperfect health or constitution of the mother, the secretion of milk is delayed so long that other nourishment must be given to the child. Such retardation arises chiefly from previous inattention on her own part to the laws of health; and when it does occur, the child should be put to the breast from time to time, to solicit and aid the effort of Nature.

When, from the state of the mother, it becomes necessary to supply other food to the new-born infant, we should adhere as close as we can to Nature, and give that kind of nutriment which most nearly resembles the mother's milk. Were it possible to put the child to the breast of another woman also just delivered, it would be desirable to do so; but such an opportunity rarely occurs, unless in consequence of a previous arrangement. The next best thing is to substitute ass's milk, or cow's milk diluted with a half or more of water and slightly sweetened. A few tea-spoonfuls may be given at a time, and repeated at proper intervals, till the mother is able to nourish the infant herself; or still better, it may be given from a bottle properly fitted with an artificial nipple. Cow's milk given in this way is decidedly preferable to gruel, panada, arrow-root, chicken-tea, or any other preparation less analogous to the natural food of the child. At this early period, the digestive organs are unprepared for the reception of vegetable matter in any form, and, when given, it rarely fails to irritate the stomach and bowels. Cow's milk, properly diluted and

sweetened, is, on the other hand, nearly the same in composition as the mother's milk, and is therefore the best temporary substitute for it.* The greatest caution should be used not to exceed in quantity, and not to repeat the allowance oftener than about once in two or three hours. A single ounce of milk, well digested, will yield more nourishment than double the quantity when it oppresses the still feeble stomach.

In an ordinary state of health, and under ordinary circumstances, the flow of the mother's milk will be fully established within from one to three days after delivery; and, in exact proportion to the wants of the child, its nature will be changed from a watery to a more nourishing consistence. When this has taken place, and the mother continues in health, there is no reason whatever for giving the child any other food for several months.

The mother's milk being thus the natural and best food of the infant, the next point is to determine at what intervals to give it the breast. Here again it is indispensable to warn the mother against hurtful excess; for if the stomach is too frequently replenished, or too much distended, the digestion becomes deranged, and gripes and flatulence torment the child. The usual practice with the inexperienced and ignorant is to offer the breast whenever the child cries or shows the least indication of uneasiness, no matter from what cause; as if hunger were the only sensation which it could experience. From earliest infancy, *regular periods* should, as far as possible, be observed in giving nourishment; and it is surprising how very soon the infant accommodates itself to the practice. The quiet repose enjoyed during the intervals

* For the qualities of the milk of different animals, see APPENDIX F.

is beneficial alike to parent and child, and is an ample reward for the very small trouble required to establish the habit at first.

It is a great mistake to treat crying as an infallible sign of an empty stomach. New as the infant is to the surrounding world, it shrinks instinctively from every strong sensation, whether of heat or cold, of pressure or hardness, of hunger or repletion, and its only way of expressing *all* disagreeable feelings is by crying. If it is hungry, it cries; if it is over-fed, it cries; if it suffers from the prick of a pin, it cries; if it lies too long in the same position, so as to receive undue pressure on any one part, it cries; if it is exposed to cold, or any part of its dress is too tight, or it is held in an awkward position, or is exposed to too bright a light or too loud a sound, it can indicate its discomfort only by its cries; and yet the one remedy of ignorant nurses for so many different evils is, not to find out and remove the true cause of offence—but to offer the child the breast!

It is a mistake to be anxious always to put an immediate stop to crying. To a considerable extent, crying is an intentional provision of Nature, called into play by every unpleasant sensation. It is only when often repeated, long continued, and caused by real suffering, that it is detrimental to the child. In general the two kinds of crying are easily distinguishable, and very few mothers will long confound them and treat them as identical. As the infant has no other means of expressing any disagreeable sensation plainly enough to enforce immediate attention, crying ought to be considered simply as a signal of distress; and instead of constantly ascribing it to hunger alone, and perhaps filling to repletion a stomach already overbur-

dened with food, we should endeavour to discover the real exciting cause, and use the surest means of its immediate removal. But this kind of crying must never be confounded with the plaintive wail which characterises infantile disease, and which betokens suffering and sometimes danger.

The great principle (explained in my work on *Digestion and Diet*) of proportioning the supply of food to the quantity of material expended in growth and that carried away in waste, is no less applicable to infancy than to more advanced life. As, during the first weeks of existence, the infant does nothing but sleep, digest, and grow, it requires to be fed more frequently than at a later period. On an average, from two to three hours may be allowed to elapse between the times of feeding, and as it becomes older the interval should be gradually extended. If the breast be not habitually offered as the readiest means of silencing the child, there will seldom be any active desire for it at a shorter interval than two and a half or three hours. But if it be demanded *in an unequivocal manner*, the mother will be quite safe in yielding to the child's entreaties, only taking care that it does not overload its stomach. At all times, indeed, the indications of appetite may be implicitly followed as a guide in infancy; but the greatest care should be taken not to confound healthy appetite with the craving arising from listlessness or uneasiness.

During the night, as well as during the day, the infant requires to be fed, but not so frequently. At first it may demand the breast perhaps thrice in the course of the night, but afterwards twice or only once. Delicate mothers who wish to suckle their infants should have undisturbed

rest during the night, the child being fed once or twice by the nurse with a little cow's milk and water. This arrangement will tend to preserve the mother's health, and enable her to suckle her infant when she might otherwise fail, and perhaps injure both her own health and that of the child in the attempt to nurse. There are great differences of constitution in children; some require and digest double the quantity of milk which suffices for others. The quality of the milk also varies with the health of the mother, and according as it is more or less nutritious the demand for quantity will vary. Hence it is truly important for the mother to be able to read aright the significant language of the infant, and, while she avoids too frequent feeding, never to refuse it the breast *when its call is clearly expressed* and its health is benefited by gratifying it. But if she mistakes the mere expression of uneasiness for appetite, and gives suck when only freedom from pain is required, the consequences will be an increase of uneasiness and indigestion in the infant, and probably irritation of the breast in the mother. When the infant rouses himself and seems rejoiced at the sight of his nurse, it is almost a sure sign that he is hungry. But if he continues unmoved and careless, or vomits frequently, or is plagued by colicky pains or a tendency to bowel-complaint and especially if the evacuations are green and unhealthy and the skin is hot, it is clear that he is getting the breast too often, and that his diet should immediately be regulated accordingly. The nurse's diet should be inquired into at the same time, as it may require to be modified.

Jaundice is often induced in infancy by neglect of these indications, and it will be in vain to attempt its cure by medicines, unless the diet be speedily altered. Opiates

carminatives, and the other remedies usually resorted to, may lull pain or hide its expression, but they will never effect a cure without the removal of the cause.

Fatigue, vivid mental emotion, and all other causes of violent agitation of the mother's system, produce an immediate and injurious effect on the quality of the milk. Hence the propriety, which every rational mother will perceive, of preserving habitual equability of temper, and of refraining from offering the breast for some time after fatiguing bodily exertion, or, still more, after much excitement of mind. From neglect of this rule even fatal results have ensued, of which a striking instance will be found at page 113.

It is now generally agreed that, during the first six months, no kind of food is so congenial to the infant as its mother's milk. Between parent and child there is a natural relationship of blood and constitution, which, during health, adapts them to each other with a harmony and completeness that can scarcely exist between the infant and any other woman. The mother, therefore, is peculiarly bound, by every tie of duty and affection, to become the nurse of her child, and nothing but ill health and positive inability can excuse her for devolving this duty on another. Formerly, it was common in fashionable life to consign the tender infant, without any cause, to the breast of a stranger, to the injury alike of the mother and the child; but now, reason and the better feelings of our nature have so far obtained the ascendency, that, except when interdicted by professional authority, most mothers attempt to suckle their offspring, and generally with complete success.

It is true that, from feebleness of constitution or infirm

health, some mothers are incapable of nursing, and must resign the duty to others, however ardently they may long to fulfil it. But it is no less true that, in many instances, the inability arises entirely from the mode of life they choose to lead, and from the want of ordinary self-denial in their diet and general regimen. The amount and quality of the milk are greatly affected by changes in the health of the mother. It is copious and nourishing when her health is good, and becomes defective or altered when that is impaired, or her habits are improper. In the abstract, this is admitted by every one, but when we point out to an ignorant mother the necessity of regular attention to air, exercise, cheerful occupation, evenness of temper, early hours, and moderation of living, as the means whereby she may enjoy sound health and become a good nurse, we often find it very difficult to make more than a momentary impression upon her. Uninstructed in the laws of the animal economy, she cannot see the importance of any observances the good effects of which do not become palpable within a few hours; and when perseverance in a right course is recommended as an indispensable condition of future benefit, she may, indeed, assent for the moment, but too often gives way to the first fancy that flits across her mind, or the first random advice that is offered to her. Having no fixed principles by which to guide her judgment, she cannot discriminate between what is in accordance with, and what is in opposition to, the laws of Nature; and hence her conduct becomes capricious, inconsistent, and frequently injurious to the infant whose welfare she is anxious to promote.

Next to irregularities in diet, one of the most frequent causes of deranged health, affecting the qualities of the

milk, is the neglect of daily exercise in the open air. In the case of wet-nurses, this should be carefully attended to. The mother, unaware of the importance of regular exercise in sustaining the general tone of the system, is often guided by mere fancy or convenience in going out, and considers neither the selection of the best time of day, nor the length, kind, and regularity of exercise, as of the slightest consequence. Proper exercise in the open air is, however, an essential condition of health, and none of the bodily functions suffer sooner from its neglect than digestion and the various secretions. But as the special object of the present volume is the management of *infancy*, I must refer the mother to my other works for an exposition of those laws of exercise and digestion which apply to herself.

Except in the case of such delicacy of body or excitability of mind in the parent as ought to have prevented her from entering into the married state, or of the accidental attack of some serious disease, it very seldom happens that the mother who pays due attention to the laws of health is unable to suckle her child. This might indeed have been inferred from the experience of the peasantry, among whom it is rare to meet with a mother possessed of the ordinary comforts of life who cannot nurse her infant. But then such a mother is generally placed in circumstances favourable to health. She is employed all day in active exertion, is much in the open air, has a sufficiency of plain nourishing food without any temptation to excess in quantity or to the use of stimulants, observes early hours, and is free from the anxieties and restraints of fashion. Were the rich compelled to be equally observant of the laws of health, both

during gestation and after delivery, we are entitled to infer that they also would be excellent nurses.

The circumstances which, among the middle and higher classes, are most influential in impairing the fitness of the parent for the duties of a nurse, are precisely those which deteriorate the general health—namely, neglect of exercise; living in over-heated, ill-ventilated rooms during the day, and worse-ventilated rooms, often made still closer by drawn bed-curtains, during the night; the use of soft relaxing feather-beds; dissipation of mind, or the absence of any serious or healthful interest or occupation; indulgence in late hours night and morning, and giving way to passion and caprice of temper; eating more than the system requires, or the stomach can digest; drinking unseasonably or too largely of strong tea, malt liquors, or other beverages; living in an unhealthy situation; inattention to the state of the skin, and to proper and sufficient clothing; excessive novel-reading; and, in short, all the circumstances which I have elsewhere commented upon as destructive of health.* While such causes as these are left in operation, the mother has herself to blame, and not Nature, if she finds her bodily functions disordered to such an extent as to deprive her of the power and the pleasure of nursing her offspring.

Every mother who wishes to suckle her own child ought, of course, to adhere scrupulously to that mode of life which experience has proved to be most suitable to her constitution.

If any mother who may read these pages should still remain unconvinced of the propriety of restricting herself

* See the Author's works on "Physiology applied to Health and Education," and on "Digestion and Diet."

to a simple and unstimulating diet while acting as a nurse, I would earnestly direct her attention to the unquestionable fact, that the best and healthiest nurses are to be found among women belonging to the agricultural population, who, although actively employed, and much in the open air, scarcely ever taste solid animal food, or fermented liquors of any kind, but live principally on vegetable and farinaceous diet. Mothers so circumstanced rarely find any difficulty in nursing their children, provided they have a sufficient supply of their simple food, and are not over-worked.* This result is of itself sufficient to prove that the best supply of healthy milk is to be derived, not from a concentrated and highly nutritious diet, but rather from one consisting of a due proportion of mild vegetable, farinaceous, and liquid food, with a moderate allowance of meat, and without either wine or malt liquor. Even as regards the quality of the milk, there can be no doubt that a mild diet is of great advantage. The milk derived from the use of concentrated food is too rich and stimulating for most infants.

Supposing the health of both mother and child to continue good, and the supply of milk abundant, no reason whatever can exist for giving any other food till the child is six or seven months old, when the teeth usually begin to appear. Both medical men and mothers used to advise the addition of gruel, arrow-root or some other farinaceous food, almost from the first month; and the common results were, impaired digestion, and a greater liability to convulsions and other diseases of irritation, especially during the

* I do not allude to the miserably-fed and over-worked wives of the agricultural labourers in some districts of England, where the mothers have scarcely milk enough to suckle their children for three months.

time of teething. But now a better acquaintance with the laws of the animal economy, joined with a more implicit reliance on the wisdom and benevolence of the Creator, has taught us that the more closely we adhere to the path which He has marked out for us, the more successful shall we be in rearing the young.

Unfortunately, however, mothers are sometimes unable to supply a sufficiency of milk for the adequate nourishment of their infants, and it then becomes a question how the deficiency is to be supplied. Where the mother is healthy and the milk good, but too scanty to be the sole sustenance of the child, the balance is decidedly in favour of her continuing to suckle, and giving some mild supplementary food. But if the deficiency proceeds from impaired health in the mother, from her milk disagreeing with the child, or from any other cause likely to injure the nursling, the substitution of another breast is clearly indicated; and the sooner the change is made, the better for both mother and child.

Where additional nourishment is required, the principle for its right selection is, that the kind be procured which is most nearly allied in its nature to the mother's milk. Ass's milk, or cow's milk diluted with water according to the age of the child, and slightly sweetened, comes very near to the qualities of the mother's milk, and therefore forms the best addition to it, when such is required.* If it is found to agree, nothing else should be given till the appearance of the front teeth indicates the propriety of a change. But when, as occasionally happens, milk proves too heavy, and gives rise to frequent vomiting, acidity, flatulence, and gripes, advantage may be derived from

* See above, p. 75, and APPENDIX F.

diluting it with well-made barley-gruel, or arrow-root, instead of water. Sometimes, also, when diluted milk disagrees, the addition of a small quantity of rusk, or well-baked bread cut into slices and toasted almost to dryness, then boiled in a small quantity of water, to which milk is afterwards added, obviates every inconvenience, and restores the evacuations to their healthy state. But, as already remarked, these additions are seldom proper in the first months of infancy; and when the diluted milk is found to disagree, it behoves the physician to satisfy himself, by careful examination, that no error is committed in the mode of feeding, or in the frequency and quantity of the meals, before having recourse to a change which may itself become the source of new evils.

When supplementary food of any kind is found necessary, we must be careful to imitate Nature by giving it very slowly. The milk drawn from the breast does not flow rapidly, and therefore, when ass's or cow's milk is given, a sucking-bottle should be employed, through which the supply should be equally slow. The milk should, if possible, be used fresh from the cow, and be made tepid, or as near as may be to the temperature of the mother's milk. This is best done by placing the sucking-bottle in warm water for a short time before feeding the child. To facilitate swallowing, the infant ought to be supported in a reclining position while feeding, as the improper custom of laying it on its back exposes it to the risk of choking. The moment it indicates indifference to its food, not a particle more should be offered.

In healthy infants the first teeth appear about the sixth or seventh month, but in delicate children often not till the twelfth or fifteenth month In some families the late

appearance of the teeth appears hereditary. The ordinary rule is to continue the nursing till after the appearance of the teeth, provided the mother retains her health, and the milk is good and abundant, and agrees well with the child. It is the state of the health of both mother and child, and not the number of months since birth, that ought to regulate the diet. One child is as far advanced at four months as another is at six; and some additional food is usually given about the sixth or seventh month, not because it is the sixth or seventh month, but because at that age the incisor teeth are generally cut—a clear indication that the digestive organs are now prepared for other food. And, in like manner, children are usually weaned at the end of the ninth or tenth month, not because a certain time has elapsed, but because about that age certain changes in the system, indicating the propriety of an alteration of food, generally occur. When, therefore, those changes are delayed, the change of diet ought also to be delayed, even for months beyond the ordinary time, if the state of the child should render this necessary. It is, I repeat, the condition of the organism, and not the mere lapse of a certain number of months, which ought to determine the change of diet and the period of weaning.

About the time, then, when the front teeth appear, milk, sweetened, and thickened with a small proportion of arrow-root or barley-gruel, may be given twice a day, and the intervals between suckling be gradually lengthened. Where milk disagrees even when combined with farinaceous substances, let barley-gruel, or weak chicken or veal broth, thickened with some kind of farinaceous food, be substituted; care being taken to regulate the quantity according to the powers of the digestive organs of the

child, and to give the food slowly by means of a proper feeding-bottle. If the child is lively and excitable, the gruel will suit best; if he is soft, lymphatic, and inactive, the chicken or even beef tea will prove more congenial to the system. One kind of food, however, will sometimes agree for a week or two, and subsequently produce indigestion; a change must therefore be made as occasion requires, and no obstinate adherence to routine should be allowed to interfere with the welfare of the infant. When the bowels are confined, barley-gruel will suit better than anything else. When they are too open, boiled milk with arrow-root will be preferable.

The utmost care is necessary to keep the bottle with which the child is fed perfectly clean and free from all odour. The farinaceous food should never be added to the milk till the moment of feeding, and the bottle, immediately after it has been used, should be thoroughly washed and laid in a basin of cold water. The best artificial nipples are made of prepared India-rubber.

WEANING.

The next subject to be considered is the time and manner of *weaning*—a process which used to be much more formidable than it is now.

The time of weaning ought to be determined chiefly by two circumstances—the health and state of the mother, and the development and health of the child. When the health of the mother continues perfect, and the supply of milk abundant, weaning ought, as a rule, to take place about the ninth or tenth month, when the development of the teeth usually shows that a change of food is proper.

But in delicate children teething is often delayed several months later, and in such a case weaning ought also to be delayed, that the organism may be fully prepared for the change. Cases, however, occasionally happen, where the first teeth do not appear for a year, or sometimes two years, even when the children are not particularly delicate. This occurs as a peculiarity in some families. In most cases, the general development of the child must be more considered than the condition of the teeth.*

In weak scrofulous children the teeth are often very late in appearing, and this may generally be taken as a sure sign that the breast ought still to be the chief source of their nourishment, whatever their age may be. At the same time, if the child is not thriving, chicken-broth may be given once or twice a day, and its improvement under this treatment will be an indication that it may be gradually weaned.

If, before the expiration of the usual time of nursing, the supply of milk proves insufficient for the nourishment of the child, and the health of the mother begins to suffer, it may become necessary, for the sake of both, to wean it gradually before any indications of teething are seen. But in this case, weaning is recommended not as proper in itself, but merely as the smaller evil. To continue nursing under such circumstances would lead to more mischief than giving it up.

Weaning either too soon or too late is attended with almost equal disadvantages; and unless under peculiar circumstances, of which the physician is the best judge, the development of the teeth, together with the general

* For the indications afforded by the progress of teething, see APPENDIX G.

condition of the child, ought to determine the time of weaning. It is fortunate if weaning can be effected in fine weather, when the child can be much in the open air; as nothing tends more than such exposure to soothe the nervous irritability by which the process is so frequently accompanied.

The important rule in weaning is, *to accustom the child gradually to the use of other nourishment*, and to withdraw the breast from it by equally slow degrees. In former times the transition used to be made suddenly, to the direct injury of both mother and child. Now, however, it is accomplished in such a gradual manner that many sustain no inconvenience from it. If, when the front teeth begin to appear (about the sixth or seventh month, for example), some light food be given once or twice a-day, and the quantity be afterwards gradually increased and repeated so as to lessen the desire for the breast in an equally gradual manner, weaning will be found comparatively easy and safe for both mother and child. It ought never to be effected while the infant suffers under the irritation of teething or any active disease, as the risk of convulsions or serious intestinal disorder would thus be greatly increased.

After the child has been weaned, its principal nourishment ought still to consist of the liquid or semi-fluid substances which have for some time constituted its supplementary food; and no considerable change in this respect should be permitted until after the appearance of the eye-teeth. As growth advances, however, some addition may be made to the diet previously in use. But whatever modification of it is allowed, the utmost care should be taken to guard against too full and

nourishing a diet soon after the weaning has been accomplished.

One of the chief sources of danger at the time of weaning, is the tendency of the mother or nurse to consider every cry of the child as a sign of hunger, which she must hasten to satisfy. By yielding to this impulse she often unwittingly increases the natural irritability of the infant constitution, till, by the indigestion arising from too frequent feeding, mere irritability passes into disease. It is, no doubt, painful to a mother's feelings to witness apparent suffering in her child; but it is still more painful to her to discover that she has been the instrument of converting a temporary evil into a source of serious danger to life. Rightly managed, the child soon becomes reconciled to the change in its diet, and resumes its natural placidity.

When a striking increase of appetite, amounting to craving, shows itself soon after weaning, and especially when it is accompanied by evident fulness in the abdominal region, it ought at once to arrest attention. Generally speaking, these symptoms are the result of over-feeding or of too rich a diet; and if the errors be persevered in, the child's health will infallibly suffer from intestinal irritation and its usual consequence, glandular enlargement.*

Abuse of Medicine.—Before concluding this branch of the subject, I must caution mothers and nurses very

* Some of the best remarks on artificial nursing and weaning are taken from a work by Dr Von Ammon, physician to the King of Saxony. Rearing by the hand is much more common in some parts of Germany than in this country; and as his opportunities of superintending it seem to have been numerous, his opinions are entitled to more than usual consideration. ("Die ersten Mutterpflichten und die erste Kindespflege." 3d edit. Leipzig, 1839.)

earnestly against having recourse to medicine in order to remedy every little ailment which may appear during the time of nursing or weaning. Unfortunately, there is a common tendency to consider disease as an extraneous something thrust into the system, which must be expelled by force before health can be restored, and with which the mode of management has little or nothing to do: whereas disease is merely an aberration from the regular mode of action of the organism, generally caused by errors in regimen, and often to be put an end to by returning to a right course. The consequence of the error is, that, on the first symptom of disease, medicine is resorted to for its expulsion, while the cause is left to operate undisturbed. The evil is consequently aggravated instead of being removed, and many children are thus destroyed by medicine who might have been restored to health by patient and well-directed care without the aid of the apothecary. It is the commonest of all declarations in the nursery, that "the child was uneasy, or griped, or feverish, and *I gave it so and so*," without the most distant allusion being made to *why* it was uneasy or feverish, or whether anything was done to remove the cause. There is no more pernicious habit than that of resorting to medicine in every ailment of the child, and the mother or nurse who makes frequent use of it without advice is unfit for the duties imposed on her.

CHAPTER VIII.

CLEANLINESS, EXERCISE, AND SLEEP, IN EARLY INFANCY.

In infancy, Cleanliness is of the first importance to health. Not only is the skin extremely delicate, sensitive, and easily injured, but it is, as already described, the seat of a continual *excretion* or *exhalation* of waste matter in the form of perspiration. The perspired fluid holds in solution some animal matter and various saline substances; besides which there is a secretion of an oily matter from the cutaneous surface, to keep the skin soft and pliable, and also, in some degree, to protect it from injury. This secretion is most abundant on the scalp, in the arm-pits and folds of the joints, and on the forehead and nose. It is this oily matter which prevents the hair from becoming dry, and causes water applied to the skin to gather into globules. In the folds of the skin it prevents the contiguous surfaces from irritating each other, as, by their mutual friction, they would otherwise be apt to do.

In infancy, this oily secretion rarely exceeds in quantity what is absolutely required to preserve the softness and pliability of the skin; and during health, unless allowed improperly to accumulate, it never gives rise to any unpleasant odour.

When the impurities thrown out by perspiration are allowed to remain long in contact with the skin, they become a source of irritation, and, by obstructing its pores, impede farther exhalation. The consequence is, that the waste matter either is partly and hurtfully retained in the system, or escapes through some other channel, such as the bowels, kidneys, or lungs, at the risk of deranging these organs by over-tasking their powers. At other times the skin itself suffers, and becomes the seat of troublesome and obstinate eruptions.

Keeping in view the composition of the perspired matter, we must provide, in the first place, for the ready escape of the invisible vapour which forms so large a portion of it, and, secondly, for the frequent removal of the solid saline residue left in contact with the skin. The former purpose will be completely effected by using a light porous dress not too tightly fitted to the body, and by frequently changing it. The latter purpose will be best accomplished by frequent and regular ablution with tepid water. Some recommend the use of soap; but as the saline particles are soluble, and easily removed by water alone, and as the soap serves only to combine with and remove the oily secretion, I consider such an addition as in general unnecessary, and frequently hurtful, in early infancy. For removing any *external* or accidental impurity from the hands, face, or arms, soap is useful, and even necessary. But applied habitually to the whole body, it is injurious; for the removal which it effects of the protecting oily secretion leaves the yet tender skin dry, harsh, and subject to cracking and painful excoriations, and in every way more susceptible of injury than before. I have noticed this result even in adults who were in the habit of wash-

ing the body with soap when in the warm bath. For a time I could not discover why many of them took cold after it, and it was only after continued experience that I found reason to ascribe it to the above-mentioned cause. On all ordinary occasions, then, ablution with pure soft water is to be preferred.

The safest and most convenient way of washing the infant in warm water is unquestionably by immersion in a bath comfortably arranged for the purpose, as recommended in Chapter VI. By this means its wet body is exposed to the air but for a moment, when about to be dried; whereas, when the child is placed in a small tub, with the greater part of the body out of the water, and is washed by laving the water over it with the hand or a sponge, the continued and repeated exposure of its delicate skin to the warm water and cold air alternately is very apt to be followed by chills or other bad consequences. The bath, therefore, ought always to be preferred; and, while the child remains in it, the whole surface of the body, and especially the folds of the skin and joints, should be carefully rubbed with a soft sponge, so that every vestige of impurity may be removed. The infant should then be quickly but gently rubbed dry with soft napkins, and afterwards with the hand, and be carefully dressed.

The best time for washing it is in the morning as soon as it is taken out of bed; and for bathing, the evening, after its last meal, and before being put to sleep. If, from the delicacy of the child, or any other cause, there arises a necessity to give it the breast immediately on awaking in the morning, it is better to delay the washing and dressing for an hour or more, till digestion be advanced. This pre-

caution is important especially in the earlier weeks of life, when the exertion would be likely to prove injurious if the washing or bath were used with a full stomach.

On account of the great susceptibility to cold which exists in infancy, and the difficulty with which the system resists the influence of any sudden change, the temperature of the water ought, at first, to be nearly the same as that of the body—namely, from 96° to 98° Fahr., and always to be regulated by a thermometer as the only sure test. If the nurse judge by the hand alone, she will often commit an error of several degrees, according to the varying state of her own sensations. The younger the infant, the more rigidly should this standard be adhered to, as it is not till growth and strength have made some progress that it becomes safe to reduce the temperature by a few degrees. The reason of this has already been sufficiently explained.

In addition to the regular morning ablution, the tepid bath should be repeated every evening for a few minutes. Properly managed, and of the right temperature, it has the double advantage of soothing the nervous system and promoting an equable circulation of the blood towards the surface. To restless and irritable children, also, the evening bath is often of the greatest advantage, from the quiet and refreshing sleep which it rarely fails to induce. It ought not, however, to be either too long continued or used in a cold room, or immediately after nursing or feeding. With these precautions, the most unequivocal advantage often results from its use, especially in scrofulous and delicate subjects. But when used too warm, or continued too long, it is apt to excite undue perspiration, and to increase the liability to cold.

We sometimes, though rarely, meet with children who, from mismanagement or some other cause, are frightened by immersion in water, and others with whom the bath decidedly disagrees. In such instances, of course, it ought to be given up, and simple washing or sponging with tepid water should be substituted. But in all circumstances, the greatest care must be taken never to allow an infant to be exposed to the air with the skin even partially wet; for imprudent exposure may be productive of some serious inflammatory affection. Many of the complaints made against the use of the bath arise entirely from injudicious management, and the neglect of the most obvious precautions.

Some physicians and parents prefer the cold to the tepid bath, even from birth; but reason and experience concur in condemning it, and it is only when the infant is strongly constituted that it escapes unhurt from the use of the cold bath. After the lapse of a few months, however, the temperature of the water used for the morning ablution should be gradually reduced, provided the child continue healthy and the season of the year be warm. I need scarcely add, that when sufficient reaction and warmth do not speedily ensue after the use of cold bathing, it ought to be immediately abandoned, and the tepid bath substituted in its stead.*

At whatever temperature ablution and the bath are used, gentle friction of the whole body afterwards, with a soft dry towel or flannel, will be both useful and agreeable. In warm weather the child may, before being bathed, be allowed to play about for a few minutes undressed, and to

* For farther information on this subject, see the author's work on "Physiology applied to Health and Education," chap. v.

enjoy the luxury of what Franklin calls an air-bath. In this respect its own pleasure may be consulted. If it is strong enough to bear the exposure with advantage, it will seek it. If not, it will shun the contact with the air, and of its own accord seek for shelter. In the country, the children of the peasantry may often be seen, of a summer morning, disporting themselves with infinite glee *in puris naturalibus* at the cottage door.

Another important element of cleanliness in infancy is the immediate removal of every soiled or damp portion of the dress, and the careful washing from the skin of every vestige of impurity arising from either of the natural evacuations. In early infancy the discharges from the bowels and bladder are frequent and involuntary; but after a short time, an attentive nurse can generally discover some indications of what is about to happen, and take measures accordingly. It is surprising how early regularity in this respect may be introduced, by a little care and attention on the part of the nurse.

Exercise.—In infancy motion of the body is as essential to health, and the desire for it is as unequivocally manifested, as at any period of life. To regulate it properly, we have only to keep in view the state of the infant organism, and the laws under which the principal functions are performed; so that neither the bones nor the muscles, while in their soft and feeble condition, shall be required to do duty beyond their strength. At first, the exercise of the infant ought to consist simply in being carried about the nursery or in the open air, in a horizontal or slightly reclining position on the nurse's arm,—and in gentle friction with the hand over the whole surface of the body

and limbs after the bath, an operation which is no less agreeable to the infant than beneficial in promoting a free and equable circulation. Those parents are greatly to be blamed, who, for their own amusement, excite their infants to muscular exertion long before the organism is fit for its beneficial performance. But while active exercise is incompatible with the condition of the infant, the passive exercise implied in being carried in the nurse's arms and exposed to the wholesome and invigorating influence of the open air, is eminently favourable to its health, and should be given to a much greater extent than it generally is. In a climate like that of Britain, prudence is of course required to protect the infant with clothing suitable to the season, and never to expose it needlessly in harsh damp weather. When the child is born in summer or late in spring, its exercise should be confined to the limits of the nursery and adjoining room, well ventilated for the purpose, for about ten or fourteen days; after which it may be cautiously carried into the open air for fifteen or twenty minutes at a time. But when it is born in winter or late in autumn, it ought not to be taken out till after the lapse of four or six weeks, and then only in fine mild weather and for a short time, till it becomes habituated to the air.

Whatever the season of the year may be, much caution is required to avoid injury from thoughtless exposure to the strong light of day, and more especially to bright sunshine. For several weeks the eye is extremely delicate and susceptible of injury, and vision very imperfect. If, therefore, the infant be suddenly or rashly exposed to the rays of the summer sun, or even to strong day-light, the structure of the eye may be injured, and the sight weakened or even destroyed.

In fine summer weather, a child can scarcely be too much in the open air, if the morning and evening dews and chill be avoided; and therefore the daily exercise out of doors should be gradually and cautiously extended, from fifteen or twenty minutes at first, to an hour or two, and at last to several hours a day, in proportion as it can be borne. Most infants naturally delight in the open air, when they are sufficiently protected; but in winter and spring much caution is required on account of the great and dangerous susceptibility of cold at that age, when the power of generating heat is, as we have seen, so low. This beneficial influence of moderate heat and injurious effect of cold are exhibited on a large scale in the relative mortality in infancy in temperate and cold climates. Children thrive remarkably well in warm countries up to a certain age; whereas in cold countries, and even in temperate regions during the winter, they die in considerable numbers. In an inquiry which was instituted by Dr Milne Edwards to discover the cause of the greater mortality of infants in France during winter than during summer, and in the northern than in the southern departments of that country, this was proved to be owing chiefly to premature exposure to cold, in carrying the infants to the office of the *Maire* within a few days after birth, for the purpose of being registered in legal form. Ordinary medical experience confirms the inference deducible from these facts; for careful investigations have shown that many children perish annually from inflammation of the lungs and other inflammatory diseases, caused by imprudent exposure to cold, especially when the clothing is inadequate.

Influenced, then, both by experience and by knowledge of the infant constitution, we ought to beware of exposing

very young or delicate children to the full force of the cold in winter or spring. After the first month, healthy infants, if properly protected from the weather, may be advantageously taken out in fine days even in winter; but the early part of the day, and the most sheltered situations and purest air, should be chosen for the purpose. If, notwithstanding every precaution, the child give indications of suffering, or of being depressed by the cold, we should abstain for a time from sending it out, and give it the necessary exercise in a large well-aired room.

When an infant is taken out for exercise, the nurse should be careful never to carry it *in a sitting posture*, during, at least, the first four or five months. If this precaution be neglected, its large and heavy head will be observed to hang over on one side, in such a way as to impede the breathing. Hufeland mentions a case in which even death was caused by a sudden jerk of the head to one side in a very young infant. The mother ought, therefore, to have a watchful eye over the nurse while exercising the child, unless she feels assured, from knowledge of her character, that implicit confidence can be placed in her. When the child is carried out in the nurse's arms, the arm on which it rests should from time to time be changed; this alternation will be equally advantageous to nurse and infant. After the fourth or fifth month, the sitting posture may be allowed for a few minutes at a time, if the child seems to like it.

In *lifting* young children, the nurse should be very careful always to place her hands, one on each side of the chest, immediately below the arm-pits, and never to lay hold of the child by the arms, as is sometimes thoughtlessly done. In infancy, the sockets of the joints are so

shallow, and the bones so feebly connected with each other, that dislocation of the arms, and even fracture of the collar-bone, may easily be produced by neglecting this rule.

The common custom of dandling, swinging, and jolting very young infants, is highly improper. In a very moderate degree such exercises seem to be agreeable to them, and need not be prohibited; but in the rough way in which they are sometimes administered, they cannot but be prejudicial.

When an infant is strong enough to be placed in a sitting posture, exercise in a child's carriage is preferable to being carried in the nurse's arms; but in cold weather, great care must be taken to protect the child by proper clothing from being chilled. That these little carriages are often so improperly used, is no reason against their proper and judicious employment.

When a certain degree of strength has been acquired, a desire for more extended and independent motion gradually shows itself, which many nurses are in the habit of gratifying by fostering premature attempts at walking. The best way, however, of indulging this new craving, is to place the child on the carpet, and allow it to move and extend its limbs, crawl on all-fours, or tumble about at its own pleasure—putting, at the same time, a few playthings within its reach. To facilitate this, the ordinary long dress ought to be curtailed about the fifth or sixth month, or as soon as the power of self-exercise shows itself. If the weather be cold, a longer and warmer dress can easily be put on when the child is carried into the open air.

By exercise thus adapted to the state of the system, the infant will be strengthened, and learn to walk much sooner,

and with a more firm and erect carriage, than if too early set on its feet and supported either by the arm or by leading-strings. The chest also will be more fully developed, and the whole system consequently benefited. With moderate caution on the part of the attendant, there is nothing to fear in thus indulging the child; for it is even amusing to see how careful it generally is about its own safety when left to itself. When a mother takes entire charge of the exercise of an infant, and judges of its risks by her own anxious feelings, she is sure to err. But remove all external means of injury, and leave the child to its own direction, and it will very rarely hurt itself. It will crawl till its bones become firm enough to bear the weight of the body, and its muscles powerful enough to move them.

The next stage of exercise is WALKING; and here again, provided we do not stimulate the infant to premature efforts, we may safely trust to itself. After a child has acquired a certain degree of vigour and command over its muscles by crawling about, it will begin of its own accord to try to stand and walk, by laying hold of chairs, or seeking a little support from the nurse. But we should be careful not to accustom it to rely too much on the guidance and assistance of others. If we entice it to walk before the bones and muscles are adequate to the exertion, the consequences cannot fail to be bad. When support is given by leading-strings, it is at the risk of compressing and deforming the chest; when, on the other hand, the child is upheld by one arm, the immediate effect is to twist the spine and trunk of the body; while, in both cases, the lower limbs are apt to bend, and the child, by constantly trusting to its conductor's guidance and protection, acquires a heedlessness in its exertions which is

prejudicial alike to body and mind. The strong effort of the will required to execute every movement gracefully and successfully is withdrawn, and gives place to an indifference which is fatal to unity of action in the delicate muscles. A child trained to walk independently may, no doubt, get a few falls; but on the supposition that all hard bodies have been removed out of its way, and that it is practising on a carpet or a lawn under the superintendence of a watchful nurse, it runs far less risk of sustaining injury from falls than it is certain to do if leading-strings and other artificial supports are substituted, which tempt it into fallacious estimates of its strength, and expose it to worse dangers from the carelessness of its attendant. It is a great error to be so anxious about an infant's safety as to watch its every movement, and be ready to sound the alarm at every trifling risk. The personal experience of a fall teaches the child much more effectually how to avoid future accidents than a thousand exclamations of caution from its nurse, which are calculated to foster timidity and irresolution far more than reasonable prudence and presence of mind. In infancy, as in later life, the grand principle of education ought to be to promote SELF-REGULATED ACTION, whether of body or of mind, and to guide inexperience to the mode in which Nature intends the action to be performed. So long as we continue to be machines moved by the will and defended by the prudence of others, we cannot acquire that strength of body or that degree of mental endowment of which our constitution is naturally susceptible: even from early infancy this principle holds good. In our own country we sometimes see poor children but two or three years old acting as guardians to infants little younger than themselves, and displaying

in that capacity a degree of intelligence, steadiness, and presence of mind, hardly to be expected at so early an age.

SLEEP.—During the first month or two of life the powers of the system are wholly occupied in carrying on digestion, nutrition, and growth, and the time of the infant is divided between sleeping and feeding. Indeed, it can scarcely be said ever to be awake; and only after the lapse of several weeks do sensation and consciousness become sufficiently active and distinct to constitute intervals of real wakefulness. At this period, then, it is not so much the length of sleep, or the best time for it, that requires our attention, as the situations and conditions under which sleep ought to be allowed.

From the first the infant should sleep in its own bed or cot, care being taken to have it sufficiently covered, particularly in cold weather. An excellent addition to the usual coverings of a child's cot will be found in a small *duvet;* it is at once the lightest and warmest of coverings, and may be used or omitted according to the temperature of the room.

After the first month the bed should be without curtains. These exclude air as well as light; and therefore, when the child goes to sleep, it is far better to darken the room by means of window-shutters, than to attach curtains to the cradle. When, again, a nursery is so badly constructed that the cradle must be exposed to a draught wherever it is placed, a screen will afford a necessary protection. The modern suspended cot is an improvement on the old-fashioned cradle, and its additional height from the floor is useful in allowing greater accessibility to the mother's bed.

As to the length of time to be allowed for sleep in infancy, it has been already remarked that, for three months after birth, nutrition and sleep constitute nearly the whole sum of existence. The infant awakes to feed, and presently goes to sleep again. In proportion as the organism develops, the desire for activity will increase, and that for frequent sleep diminish; and it is our business to follow in the footsteps of Nature, and merely remove any impediments which accident may throw in her way.

Regularity also ought, as far as possible, to be observed in the hours of wakefulness and sleep. In the animal economy, there is a periodicity, adapted to that of the physical world, which tends to bring about the same state of the system at regular intervals, and which it is important to cultivate. Unless regularity of sleep be established and adhered to, neither mother nor child can enjoy during the night that undisturbed repose which is so essential to health. If the infant be encouraged to start up at any moment of the day or night and demand the breast, or if this be constantly offered to it as a means of soothing its cries whether it be hungry or not, perpetual restlessness and discontent must ensue; and these once established as a habit, the mother's peace and enjoyment, along with the child's health and welfare, are sure to be sacrificed. The infant may be quieted for the moment in this way, but at the expense of tenfold trouble and disappointment afterwards.

While endeavouring to accustom the child to regular hours or eating, sleeping, and all other natural operations, we should, especially as it grows older and stronger, bear in mind that night is peculiarly the season for sleep, and that no arrangement should be permitted to interfere with

the natural tendency to it at that time. Guided by this principle, we should endeavour to regulate the habits of the child in such a manner as to appropriate an hour or two in the middle of the day to that sleep which, more or less, all children then require till after two or three years of age. Their activity may not be entirely expended, but under a judicious system of management they will be perfectly ready at this time for an interval of rest; whereas if they be excited to activity, and sleep be deferred to a later part of the day, it will always be at the risk of producing restlessness in the early part of the night. To nervous, excitable children, the mid-day sleep is very beneficial, and in their case, it may often be continued with great advantage for the first three or four years, and even longer.

When a child is put to sleep, whether by night or by day, *light and noise ought to be carefully excluded.* Even when these do not prevent sleep, they tend to render it troubled and unrefreshing, and, by rousing nervous sensibility, render the infant liable to spasmodic and convulsive attacks from any accidental irritation. Many persons act in opposition to this rule, and think it of no consequence what talking or noise goes on in the nursery, provided the infant be not roused up broad awake. This is a pernicious mistake.

When the stomach is distended, and digestion just beginning, sleep is apt to be uneasy and disturbed. The infant, therefore, ought not, as a general rule, to be put to rest immediately after a full meal. During the first month, no doubt, it goes to sleep directly after having the breast; but at that early age it takes little at a time. It is at a later period that the precaution requires attention.

So much must always depend on individual constitution, health, and management, that no fixed hours can be named at which the infant should be put to rest. If it sleeps tranquilly, and when awake is active and cheerful, and if its various bodily functions are executed with regularity, we may rest assured that no great error is committed, and need not concern ourselves whether it sleeps an hour more or an hour less than another child of the same age. Where, on the contrary, it sleeps heavily or uneasily, and when awake is either dull or fretful, and the other functions are perverted, we may be certain that some error is committed, and that the child is either rocked to sleep immediately after a full meal, or otherwise mismanaged by the attendant.

There are few things which distress an anxious mother, or annoy an impatient nurse, more than sleeplessness in her infant charge, and there is nothing which both are so desirous to remove by the readiest means that present themselves. A healthy child, properly treated and not unduly excited, will always be ready for sleep at the usual time; and when it appears excited or restless, we may infer with certainty that some active cause has made it so, and should try to find this out and remove it. If no adequate external cause can be discovered, we may infer with equal certainty that its health has in some way suffered, and that it is sleepless because it is ill. In this case, the proper course is to seek professional advice, and to employ the means best adapted to restore the health; after which, sleep will return as before. From overlooking the true origin of the restlessness, however, and regarding it merely as a state troublesome to all concerned, many mothers and nurses are in the habit of resorting

immediately to laudanum, sedative drops, poppy syrup, spirits, and other means of forcing sleep, without regard to their effects on the disease and on the system; and are quite satisfied if they succeed in bringing on the appearance of slumber, no matter whether the reality be sleep, stupor, or apoplectic depression. The mischief done in this way is inconceivably great; in the Reports on the Health of Towns which have been laid before Parliament, as well as in the Registrar-General's returns of Births, Marriages, and Deaths in England, we find ample evidence that enormous quantities of quack "cordials," "anodynes," and even spirits, are recklessly given to produce quiet and sleep, and are the causes of many deaths of young children.

Flowers and strong-smelling perfumes ought to be excluded from the sleeping-apartments of infants, as they act injuriously on their delicate nervous system.

In infancy as in adult age, it is highly conducive to health and sound sleep that the night and bed clothes should be thoroughly purified by several hours' exposure to the air every day, immediately after the child is taken up. The effect of perfectly fresh coverings is soothing and healthful in a high degree.

CHAPTER IX.

ON THE CHOICE AND REGIMEN OF A NURSE.

It sometimes happens that, notwithstanding every attention, the inability of the mother to nurse her child becomes so decided as to compel her to desist from the attempt, and to procure a substitute. I shall now, therefore, consider the qualities by which the choice of a nurse ought to be determined.

From the exposition already given of the intimate relation which subsists between the constitution of the mother and that of her infant, the reflecting reader will judge that, in the healthy state, her own milk is that which is best adapted for the support and nourishment of the child; and that, when a nurse is required, care should be taken to select one resembling the mother as closely as possible in all essential points. As a general principle, this is unquestionably true. But in practice it often happens, that the very circumstances which force us to employ a nurse, are those which also oblige us to depart from this principle, and prefer a woman of an entirely different constitution. Before entering on the consideration of these exceptions, however, we shall first briefly direct attention to several conditions, in regard to which it is important to

the infant that the nurse should approximate more or less closely to the mother.

In all ordinary cases it is an advantage that the mother and nurse should be nearly of the same age. By this I do not mean that, when a delicate young woman becomes a mother at the premature age of seventeen or eighteen, we should take pains to procure a nurse equally immature in constitution; or that, when a woman at the extreme verge of the child-bearing period gives birth to an infant, we ought to consign it to the charge of one equally advanced in years. Neither of these extravagances is required; all that is wanted is, that the offspring of a young mother should be suckled by a young in preference to an old nurse, and that the child of a woman in middle life should be suckled by a nurse arrived at least at maturity. This reasonable degree of adaptation between the nurse and child is required simply because the quality of the milk is influenced by the time of life, and the milk of a woman of forty years of age is found not to be suitable for the infant of a woman of twenty. In like manner it is desirable that both mother and nurse should have been delivered nearly about the same date, because the quality of the milk alters with the lapse of time. Some resemblance, moreover, between mother and nurse in the general form and proportions of the body is advantageous, as experience has shown that the children of thin, tall mothers rarely thrive on the milk of short, thick-set nurses. In selecting a nurse, special regard ought also to be had to the general constitution of the mother, whether our object be to counteract or to develope the peculiarities which the infant has derived from her.

The causes which disqualify a mother for nursing may

be divided into two kinds. Under the first head may be included the comparatively rare cases in which a well-constituted and previously healthy mother is rendered incapable of nursing, either by a sudden attack of illness, or by some unforeseen accident, not admitting of an immediate remedy. In such cases, the general principle applies almost without modification; and if it were possible to procure a nurse resembling the mother in all respects, there cannot be a doubt that she would be the fittest substitute. Where, however, as most frequently happens, a nurse becomes indispensable from the mother's constitutional delicacy,—instead of seeking points of resemblance to the parent, our chief object is to find a nurse free from the constitutional debility, and liberally endowed with all the properties in which the mother is defective. It is only thus that the infant can be preserved from the injurious influence of the impaired constitution of the parent. Experience has amply proved that the greatest benefit may result from transferring the feeble child of a delicate mother to the breast of a healthy and vigorous nurse,—to one, in short, whose superiority lies in the very qualities in which the parental constitution is most defective. At the same time, the *general character* of the nurse's constitution, however healthy, must not deviate too far from that of the mother, otherwise the milk will not suit the child.

I have already observed that, in all cases, regard should be had to the relative dates of delivery of the mother and nurse. This caution is required because the milk secreted immediately after the birth of the infant is very different in its properties from that which is secreted a month or six weeks later. The inconvenience can be remedied in a great degree by putting the nurse upon a light, cooling,

and rather fluid diet for the first few weeks; and this should always be done when her milk is older than that of the mother. During the whole period of suckling, the diet of the nurse should be strictly regulated. A tranquil mind and even temper are particularly desirable in a nurse, and care should be taken to inquire into this point.

The pernicious influence of passion in the nurse on the system of the child is strikingly illustrated by a case mentioned in the excellent little work of Dr Von Ammon, already referred to.* "A carpenter fell into a quarrel with a soldier billeted in his house, and was set upon by him with his drawn sword. The wife of the carpenter at first trembled with fear and terror, and then suddenly threw herself furiously between the combatants, wrested the sword from the soldier's hand, broke it in pieces, and threw it away. During the tumult some neighbours came in and separated the men. While in this state of strong excitement, the mother took up her child from the cradle, where it lay playing, and in the most perfect health, never having had a moment's illness; she gave it the breast, and by so doing sealed its fate. In a few minutes the infant left off sucking, became restless, panted, and *sank dead on its mother's bosom.* The physician, who was instantly called in, found the child lying in the cradle as if asleep, and with its features undisturbed; but all his resources were fruitless; it was irrecoverably gone." Cases so remarkable seldom occur in private life; but, unhappily, there are many instances in which perpetually recurring fits of bad temper, especially near or during the time of suckling, produce similar effects in a more slow and gradual manner, but with almost equal certainty—and if anything

* Die ersten Mutterpflichten und die erste Kindespflege, p. 102.

can exert a salutary influence on mothers who are prone to the indulgence of passion, it must be the contemplation of such a case as that of the carpenter's wife.

Another strong reason for rejecting a nurse characterised by a bad temper, or other moral disqualifications, is the general system of mismanagement and concealment which cannot fail to ensue, and which it is sometimes so difficult for the mother to detect, that the health of the child may be ruined without any one being able to discover why it is suffering at all. The character of the nurse, indeed, makes such a difference in the manner of doing a thing, and consequently exercises so direct an influence on the welfare of her charge, that the infant will sometimes be observed to pine under treatment which appears, to a superficial observer, the same as that under which it formerly throve. We may be unable to point out a single omission in the treatment required, yet, *in the manner* of conducting it, enlightened maternal affection may, on careful inquiry, discover a difference amply sufficient to account for the difference of effect. No watching or exhortation by the parent can remedy a deficiency like this; the only security against it lies in a right choice at the first.

When a mother suckles her own child, she takes the alarm at once, and seeks an immediate remedy when she finds the supply of milk insufficient for its support. But it is otherwise with an ill-chosen nurse. Not feeling the same strong interest in the well-being of the infant, and afraid of losing her situation by confessing that her milk is deficient, she is often tempted to conceal the fact, and give the child in secret some unsuitable food, in the hope that the deficiency will not be discovered. From the very concealment which is practised, it is in the highest degree

improbable that the food so provided will be either proper for the child, or given at proper times and in a proper manner; and hence may arise indigestion and bowel-complaints, the true sources of which, if entire confidence is placed in the nurse, may never be suspected. We cannot, therefore, attach too great importance to moral character in the selection of a nurse, especially as every change is attended with serious inconvenience.

The choice of a nurse ought never to be finally decided upon without the sanction of a well-qualified physician, whose duty it is to inquire and examine carefully into the state of her health. We have reason, however, to know that this very important and responsible duty is often performed in a very careless manner. External appearances are sometimes deceitful, and a healthy looking nurse may in reality be very unfit for the purpose. At the same time, there are certain requisites which afford a strong presumption of fitness, and which ought therefore to influence our decision. Among these may be mentioned sound health, a good constitution, and freedom from any hereditary taint; moderate plumpness, a fresh and clear complexion, clear cheerful eyes, with well-conditioned eyelids, deep red-coloured lips without crack or scurf, sound white teeth, and well-formed moderately firm breasts, with nipples free from soreness or eruption. But even with such indications, we should still inquire into the state of the principal bodily functions, and make sure that there is a sufficiently copious secretion of good milk. Of both the quantity and the quality of the milk we may form an opinion by examining the condition of the nurse's own child—whether it is plump and healthy, or the reverse. Of the good quality of the milk we may judge also by its

bluish white colour, somewhat watery consistence, slightly sweetish taste, and the absence of smell. Dropped into water it should have a light cloudy appearance, and not sink at once to the bottom in thick drops. But, upon the whole, the surest test is that afforded by the state of the nurse's child. If we find it healthy, active, good-natured, and neatly kept, we have one of the surest tests of the qualities of the nurse.

When a nurse is installed, it is advisable that the mother should for a time watchfully superintend her proceedings, and assure herself, by frequent and unexpected visits to the nursery, that everything is attended to with due regularity and in a right spirit. If it be found that the nurse is, of her own accord, regular in suckling the child, scrupulously attentive to cleanliness, gentle, patient, kind, and never put out of humour by fretfulness or by being roused in the night, and that she is habitually contented, cheerful, and active, the mother may then lay aside anxiety, and be thankful for her good fortune. But if, on looking into the nursery unexpectedly, she find the child hungry, fretful, or dirty, the room damp, badly-aired, or over-heated, and the nurse sullen, indifferent, or slothful, she may at once decide that the woman is unfit for her charge. When a good nurse is once secured, the mother can scarcely overrate her value, or be too careful to attach her to herself and the infant, by treating her habitually with considerate kindness and regard. But no excellence in the nurse can absolve the mother from the duty of watching over the health of her child in all essential points. By doing this carefully in the case of her first child, the intelligent young mother will understand the management of her future children (we speak from obser-

vation) much better than most nurses who may have had the charge of numerous children, and consider themselves experienced. Nurses are not sufficiently educated to profit by their experience, and, for the same reason, they are generally presumptuous and full of prejudices.

Of all the vices to which nurses are liable, one of the most injurious is intemperance, whether open or clandestine, and the similar practice of taking opiates or other stimulants, by way of procuring rest and supporting the strength. Even the too liberal use of porter or ale, so common with mothers and nurses, is not unattended with permanent danger, and ought to be scrupulously guarded against. Many women, acting on the notion that extraordinary support is required during the time of suckling, have sunk by degrees into the lowest state of degradation, from imprudent, and what they considered necessary, indulgence in fermented liquors. We have already seen that, when necessary, Nature provides for the demand by a moderate increase of appetite and digestive power, which ought to be gratified by ordinary wholesome food, but not excited still further by the use of fermented liquors of any kind. Occasionally, no doubt, wine or malt liquor is plainly required to keep up the health and strength, but in such cases its use ought to be cautiously regulated according to the necessities of the system. The custom which prevails too much in England, of allowing nurses large quantities of strong malt liquor, is injurious to the health and temper of the nurse, and still more so to the infant whom she is suckling. The best nurses require none; and the quantity allowed should in all cases be moderate, and sanctioned by the medical attendant.

But perhaps the worst of all the bad practices of which

a nurse can be guilty, and certainly the one most directly destructive of infant life, is the habit in which many mothers, as well as nurses, indulge, of administering, of their own accord, strong and dangerous medicines to children. Not to mention the thousands of cases in which health is injured by the injudicious use of medicines in infancy, it appears from a Return printed by order of the House of Commons, of all inquests held in England and Wales in 1837 and 1838, in cases of death from poison, that 72, or nearly one-seventh of the whole number, resulted from the carelessness of mothers and nurses in administering medicines, with the properties of which they were unacquainted, in doses far beyond those in which they are ever prescribed by medical men. The Return shows, for example, that the deaths of very young children (*most of them at the breast*) from opium or its preparations, were 52; and from opium or laudanum, given by mistake for other medicine, 20 more.

In addition to such cases of absolute poisoning, and to those so prevalent of late years among the manufacturing population, from the habitual drugging of infants with laudanum to keep them quiet or asleep during their mothers' absence at the mill, it is well known to practitioners that much havoc is made among young children by the abuse of calomel and other medicines, which may procure momentary relief, but often cause incurable disease in the end; and I have been astonished to see how recklessly remedies of this kind are had recourse to, on the most trifling occasions, by mothers and nurses, who would be horrified if they knew the potency of the drugs they were giving, and the extent of injury they were inflicting. Whenever a child shows any symptoms of

uneasiness, instead of inquiring whether it may not have been caused by some error of regimen which only requires to be avoided to remove the suffering, many mothers and nurses act as if it were indispensably necessary to interfere immediately and forcibly with the operations of Nature, by giving some powerful medicine to remove the uneasiness, and, if relief does not soon ensue, by repeating the dose. In this way it is not uncommon for a medical man to be sent for in alarm, and told that the child began to complain at such a time,—that, *notwithstanding* that a large dose of calomel, or laudanum, or tincture of rhubarb, was immediately given, and repeated several times, it is still very ill, and becoming hourly worse,—and that, if he cannot *do something* instantly, it will soon be beyond recovery. Whereas it may appear, on examination, that there was at first only a slight indisposition, which required no active treatment at all, and that the urgent symptoms were caused solely by the intended remedies.

That there are cases of disease in which active means must be promptly used to save the child, is perfectly true; but these are cases that no mother or nurse ought to attempt the treatment of. As a rule, indeed, where the child is well managed, medicine of any kind is very rarely required; and if disease were more generally regarded in its true light, simply as an aberration, produced by some external cause, from a natural mode of action, we should be in less haste to attack it by medicine, and more watchful, and therefore more successful, in preventing and removing it. Where a constant demand for medicine exists in the nursery, the mother may be sure that there is something essentially wrong in the management of her children.

It sometimes happens that the quality of the milk becomes deteriorated by the unexpected renewal of the monthly period in the nurse; and if the fact be concealed the child may suffer, without any suspicion of the true cause being excited. Occasionally it becomes necessary, in such circumstances, to change the nurse; though in other cases, if the nurse be really healthy, the child will continue to thrive as well as before, especially if assisted at intervals by a little suitable food. The possibility of such a change taking place ought therefore to be kept in mind, and a remedy provided when it does occur and is attended with bad effects. It is in the earlier months of infancy that serious mischief is most likely to arise from this cause. When the change takes place after the sixth or seventh month, it is usually of less consequence.

CHAPTER X.

ARTIFICIAL NURSING.

ALTHOUGH the infant ought, if possible, to be brought up at the breast as already described, it sometimes happens that the mother is utterly unable for the duty, and that a suitable nurse is not to be had. In such circumstances no resource is left but to rear the child by the hand, as it is called, or artificial nursing.

This, of course, ought never to be resorted to where it can be avoided. Strong healthy children may thrive under careful management although denied the breast; but few delicate children, and still fewer of those prematurely born, survive when brought up by the hand. Where the stomach and bowels are very irritable, as they almost always are in feeble children, the difficulty is greatly increased. The character of the climate, and the season of the year, also affect the result in a marked degree. But at all times, and under all circumstances, artificial nursing requires the most watchful attention and the greatest sacrifice of time on the part of the mother, as it is only by the most unremitting management and judicious care that the disadvantages inseparable from it can be successfully overcome. Under favourable circumstances, how-

ever, many children grow up in health and strength although reared entirely by the hand. In the south of Germany, according to Von Ammon, this plan is followed to a great extent where the mother is unable or unwilling to suckle the child—and with a considerable degree of success; but in the north of Germany a nurse is almost always preferred.

When a child is to be reared by the hand, we have to determine, first, the *kind* of nourishment fittest to supply the place of the mother's milk; and secondly, the manner in which that nourishment *ought to be given.*

Taking into consideration the imperfectly developed state of the digestive organs at birth, and the simple and harmless nature of the milk then secreted by the maternal breast, we may safely infer that the most suitable nourishment for the new-born infant will be that which makes the nearest approach to its natural food. For this reason ass's milk deserves the preference over every other kind of food; but when this cannot be obtained, cow's or goat's milk, properly diluted and sweetened, may be substituted. At first about one-third of water should be added to cow's milk, and a still larger proportion to goat's milk; but after a week or two the proportion may be gradually diminished. Much, however, depends on the food which the animal is taking. As a rule, it is safer to dilute rather freely, provided the supply to the infant is abundant, as the superfluous water readily passes off by the kidneys.*

The food of the infant ought to be given at the same temperature as that of the mother's milk (96° or 98° Fahr.), because that is the heat most suited to the organism of the child. In general, this condition is little attended to by

* For a full account of the composition of the milk of different animals compared with that of woman, see APPENDIX F.

nurses; and yet the temperature might easily be determined, and all possibility of mistake prevented, by means of a thermometer. In preparing the milk and water, it is better to heat the water and pour it upon the milk, than the reverse. Both ingredients should be perfectly fresh and sweet, and on no account should any remaining portion be set aside and heated again for a subsequent meal. The infringement of this rule is a frequent cause of severe and troublesome indigestion.

The manner in which food is given is also of importance, and we should follow Nature by supplying it very slowly. For this purpose a glass sucking-bottle, provided with a tube of prepared india-rubber, which passes through the stopper into the bottle, and is fitted at its free extremity with an artificial nipple pierced with one or several small holes, is generally used, and answers much better than feeding by the spoon. The best artificial nipples are made of caoutchouc; but whatever material is used, great care must be taken not to have the holes too large, else the milk will flow too fast. An additional precaution against this result will be found in the proper adaptation of the hole in the stopper through which the air passes to replace the abstracted fluid. The utmost cleanliness, too, is indispensable; neither the bottle nor the tube should ever be laid aside after use without being thoroughly washed with hot water, and afterwards laid in cold water to prevent any sour smell arising from the fermentation of the milk adhering to it. Neglect of this precaution, and especially allowing the milk to remain in the bottle for hours, cannot fail to do harm, as the want of perfect cleanliness and sweetness in the food, or in the vessels used in giving it, tends strongly to derange digestion. When an artificial nipple is employed,

care must be taken not to have it of too great length; otherwise the child may compress its sides in the act of sucking, and prevent the milk from flowing at all.

The indispensable necessity of cleanliness, and the propriety of always using fresh milk, and never reserving any portion of it for a subsequent meal, will be readily understood by those who have observed the rapidity with which milk becomes acid, and imparts to the bottle a sour, disagreeable smell, which it is extremely difficult to destroy.

The next points for consideration are the *intervals* at which a child brought up by the hand should be fed, and the *quantity* that should be given at a time; and here, again, we cannot do better than take Nature for our guide.

We have already seen that, for two or three weeks after birth, the infant sleeps almost continually; it wakes up now and then for a moment to suck a little, and again goes to sleep. The stomach being small and unaccustomed to its functions, can bear only a little food at a time. In accordance with this natural arrangement, similar intervals should be observed in artificial feeding as in ordinary nursing; and the first sign of indifference may be safely relied upon as an indication that the child has had enough. As a rule, six or eight table-spoonfuls will be sufficient at one time for the first two or three weeks; and it should be remembered that rearing by the hand frequently fails solely from injudicious and too frequent feeding. Many nurses, acting under the erroneous notion that liquid food contains little nourishment, administer it often, and thus oppress the stomach and excite vomiting. Observing, again, that immediate relief follows the emptying of the stomach, they fancy that vomiting is a sign of health, and are led to persevere in a course of positive mischief to the child.

If the infant is observed to thrive well and sleep quietly, and its bowels continue in a regular state, the proportion of water added to the milk may be gradually diminished after the first three or four weeks; and about the fourth or fifth month the milk may be given almost undiluted, provided the child is lively and active, and no counter-indication appears. Care should be taken to select the milk of a healthy cow, as a large proportion of the cows confined in cities become the subjects of tubercular disease.

In general, the mode of artificial nursing above described will be found to answer better than any other which can be followed. When successful, it ought to be persevered in, as in natural nursing, till after the appearance of the front teeth, when the same change in diet will be required as if the child had been brought up at the breast. But in both instances we should be careful not to anticipate Nature by making the change before the advance in the organism indicates its propriety.

In some constitutions, cow's milk does not agree when merely diluted and sweetened, but answers perfectly well when a large proportion of water and a small quantity of any well-prepared farinaceous substance are added. When, therefore, after the first month or two, diluted milk does not agree, a small proportion of farinaceous food, such as arrow-root, sago, barley-gruel, and, after these, rusks well boiled, may be added to the milk—the water being first strained off. The *bouillie* commonly used in France as the first food of infants, is made by gently roasting the best wheat-flour in an oven, then boiling it for a considerable time, either in water or in milk and water, and adding sugar to it. When carefully made, not too thick, and free from knots, it is an excellent food, especially when the

use of milk excites a tendency to diarrhœa or colicky pains. On changing to the *bouillie*, digestion often improves, and the evacuations become healthy and painless.

In some instances, especially when the bowels are sluggish, thin barley-gruel, with or without the addition of weak chicken-tea or beef-tea, answers well. The grand rule ought to be, to follow what seems best suited to the individual constitution. With soft, flabby children, the chicken or beef tea is often most useful; while with thin, active, and irritable infants, the milk and farinaceous diet answers best. But in trying the effect of any alteration, we must not conclude that, because no advantage is apparent within a day or two, therefore it will not agree. Often the effects of a partial change of diet show themselves so gradually, that it is only after a week or two, or even longer, that we can decide whether it is beneficial or not.

In some children of a lymphatic constitution and low vitality, it is necessary to begin the use of chicken-tea, mutton-broth perfectly freed from fat, or beef-tea, earlier than usual, as any less animalised food does not agree with them. In general, however, it will be soon enough to have recourse to animal broths some time after the incisor teeth have appeared. But if the milk and farinaceous diet already recommended shall be found to disagree, chicken-tea or weak mutton-broth, to which a little arrow-root, or ground rice, or rusk is added, ought immediately to be tried, provided we make sure beforehand that the indigestion proceeds from the nature, and not from the quantity, of the food previously in use. In general, *excess in quantity, or too frequent feeding, is the real cause*, although the blame is always laid upon the *quality* of the food.

The great difference between farinaceous food and ani-

mal broths is, that the former nourishes without exciting, while the latter are always more or less stimulating. As in infancy the natural tendency is to excitement, milk and farinaceous substances are in ordinary cases most suitable; but occasionally we meet with infants so defective in constitution as to require some stimulus. In such cases, chicken-tea, or even beef-tea, may be used with advantage, provided due caution be exercised to avoid making it too strong or giving too much, and to leave it off the moment any indication of harm is perceived. It is in foundling hospitals, and other receptacles for poor and weakly children, that the greatest benefit is obtained from the temporary use of animal broths, just because it is such infants who require and bear the stimulus which attends their use. But it would be a great mistake to infer that the healthy, well-constituted infants of the middle and higher classes require, or will not suffer from, the premature use of animal food, even in its mildest form.

In whatever way the infant is brought up, *its treatment after being nursed or fed* is far from being a matter of indifference. During the first weeks after birth, it will fall asleep immediately after having the breast; and this, as being the order of nature, ought rather to be encouraged. If, from thoughtless gaiety or activity in the nurse, it be dandled or carried to the window, or otherwise excited, indigestion will be apt to follow, probably accompanied by nervous irritation and colicky pains or bowel-complaint. Even when so much sleep is no longer required, quietude for some time after feeding should be encouraged, as much excitement or motion immediately after meals is unfavourable to digestion, particularly when the child is delicate.

CHAPTER XI.

THE NURSERY, AND CONDITIONS REQUIRED IN IT.

HAVING considered the peculiarities of the infantile constitution, and its management at birth, during the period of nursing, and at that of weaning, let us now advert to the external circumstances and appliances which experience has shown to be most conducive to the full and regular development of the organism, and the preservation of health in infancy. Some of these, such as the locality in which we live, and the purity of the air we breathe, are so invariable and so decided in their action on the infant constitution, that, with regard to them, it is easy to lay down rules which admit of universal application. Others, again, such as food, clothing, and exercise, vary so much in their effects, according to the age and constitution, &c., that we require to exercise much discrimination in modifying them to suit the circumstances of the case in hand; and it is here that the counsel of the medical attendant comes in with marked advantage. As most of what may be called the general conditions of infant health are more or less directly connected with the NURSERY, it will be convenient to treat of them all under that head.

A well-situated, well-arranged, and well-managed nursery

is more important to the health of the infant than most parents are aware of, because it combines within its range various agents which are constantly though silently affecting the constitution, and exerts an influence for good or for evil on the whole animal economy. If it be borne in mind that, from the nature of the climate of this country, infants of the middle and higher classes spend, during a great part of the year, twenty of the twenty-four hours within doors, the importance of attending to the purity of the air of the nursery will appear evident. Where, from an unsuitable situation or imperfect house-accommodation, the local influences are unfavourable, the infant too often falls a sacrifice. Where they are favourable, on the other hand, even children of a delicate constitution will sometimes grow up strong and healthy. Of this general truth the Government inquiries into the sanitary condition of towns and villages furnish manifold and most instructive proofs.

It may however be objected, that among the poor, and even among the less wealthy of the middle ranks, necessity and not suitableness often determines the choice of a residence, and the appropriation of the rooms. But admitting this to be the case, it is still an advantage to be acquainted with the local conditions and domestic arrangements most conducive to health. Even among the working classes, there are few indeed who, when once convinced of the existence of an evil, will not or cannot do something to mitigate the disadvantages under which they suffer, and at least choose between a greater and a smaller evil. If they *must* reside within a certain distance from their work, they may nevertheless have it in their power to prefer a better to a worse locality, and a better to a worse house.

But before they can attach any importance to such a choice, they must be made aware of the influence of surrounding circumstances upon their own and their children's health; and hence it is nearly as much for *their* advantage as for that of the rich, that they should be made acquainted with the facts required for the guidance of their judgment.

SITE OF THE HOUSE.—The first and most essential requisite in a nursery is *a constant supply of pure air.* To obtain this, a house should be selected in a dry and rather elevated situation, removed from all sources of contamination, and sheltered from the violence of the wind. When a choice can be made, *the country* should be preferred to the town; as one of the clearest results for which we are indebted to the late statistical returns and sanitary reports is the fact of its superior healthiness, especially for the young. The close vicinity of trees or thick shrubbery, of ponds, undrained meadows, or sluggish water-courses, ought to be scrupulously avoided; for, however ornamental they may be, they are invariably prejudicial to health, not only from the humidity and in many cases the impurities which they diffuse through the air, especially at night, but also from the obstruction which trees present to free ventilation. For the same reason, narrow valleys, and localities shut in by thick woods or overhung by hills, ought never to be chosen as the site of houses or villages. From overlooking the unfavourable influence of a stagnant humid air, families going to the country in pursuit of health often sustain serious injury by settling in situations which a little acquaintance with the laws of the animal economy would have shewn them to be very ill suited to the infant constitution.

For those who are obliged to reside in towns, it is of great importance to secure the best situation within their reach. Even in point of economy, not to mention the suffering and anxiety attendant on illness, it will be cheaper to pay more for a suitable house in a dry, well-aired quarter, than a smaller sum for one in a low-lying or crowded part of a town.

In addition to a dry and airy situation, *a good exposure* is well worthy of attention in the selection of a residence for the young. In a cloudy and uncertain climate like that of Britain, a southern aspect is extremely desirable, not only because it is warmer and more cheerful, and allows of a more free admission of air, but because the agency of sun-light, as a gentle and wholesome stimulus, is scarcely less necessary for animal than for vegetable life. Deprived of this, the child becomes pale and sickly in appearance, its blood is imperfectly oxygenated, and a proneness to diseases of debility is induced.

A situation *with a gay and cheerful prospect* is also particularly desirable, because it is one of those silent but constantly operating agents which certainly, though gradually, influence both the health and character of a child. And it ought never to be forgotten, that in exact proportion to the susceptibility of the infant organism is the importance of attending to all these apparently minute points. A dull and confined prospect is a source of dulness and ennui to the naturally active mind of a child, which cannot feel dispirited or gloomy without suffering in its health and its development; so that, whether we regard its bodily strength or its mental character, we should be equally solicitous to provide for it an enlivening prospect.

The *nature of the soil* on which a house stands, and the degree of efficiency of the *drainage*, also exert no small influence on the salubrity of the dwelling. A dry, gravelly soil, or at least one thoroughly drained to some depth, ought always to be preferred. A damp soil necessarily imparts humidity to the lower part of a house, and seriously affects its salubrity. An elevated site is no guarantee of dryness of soil; on some hills moisture abounds as much as in a level marsh. From overlooking this fact great errors are often committed in selecting sites for country-houses.

Position of Nursery.—In selecting rooms for a nursery, those which have a southern exposure should be preferred for the reasons already mentioned when treating of the locality. That a nursery ought also to be *large, airy, easily warmed, and easily ventilated*, will, I think, be readily admitted; for without such conditions, it is evidently impossible to surround the infant with that pure and renovating air which is indispensable to health. In one respect, indeed, pure air is even more essential to the formation of good blood than proper food. The influence of the air we breathe *never ceases for a single moment of our lives.* By night and by day respiration goes on; and every time we breathe we take in an influence *necessarily* good or bad, according to the quality of the air around us. No wonder, then, that a cause thus incessantly operating should, after a lapse of time, produce great changes on the health. Of all the injurious influences by which childhood is surrounded, none operates more certainly or extensively than the constant breathing of a vitiated air; while, on the contrary, few things have such

an immediate and decided effect in renovating the health of a feeble child as change from an impure to a pure atmosphere.

Vitiated air and bad food are the two grand sources of that hydra-headed scourge of infancy and youth in this country—*scrofula;* and either of them, in a concentrated state, is sufficient to produce it without the co-operation of the other. But when both are combined, as they often are among the poor in the lanes and cellars of our larger towns, then scrofula in its worst form is the result. In the lower animals, we can produce scrofula at will, simply by confining them in vitiated air, and restricting them to an impoverished diet.

PURITY OF AIR OF NURSERY.—Scrofula, in one or other of its numerous forms or complications, is acknowledged to be in this country one of the most prevalent and fatal diseases which afflict the earlier years of life. It is estimated that tubercular disease, in all its forms, including pulmonary phthisis, destroys on an average 65,000 persons annually in England. So powerful is the continued breathing of a cold, damp, and vitiated air in producing it, that the most favourable combination of other conditions will often prove insufficient to ward off the evil. Baudelocque even goes so far as to insist that impure air is "the true cause, the only cause perhaps, of scrofulous disease: . . wherever we find scrofula, that cause exists; where it exists we find scrofula; and where it is absent, scrofula is not known." I agree with Sir James Clark, by whom this passage is quoted, in thinking that Baudelocque's conclusion is rather overstrained; but the opinion which it embodies is nevertheless instructive, as an additional testi-

mony to the highly deteriorating influence of vitiated air. Sir James himself, indeed, remarks, that were he to select the two circumstances which more than any others influence health during the growth of the body, "they would be, the proper adaptation of food to difference of age and constitution, and the constant supply of pure air for respiration."* In another place he expresses the conviction that living in impure air is even more influential than defective food in deteriorating health, and that the immense mortality among children reared in workhouses is ascribable even more to the former than to the latter cause.

I have already noticed the very great mortality which occurred year after year among the infants in the Dublin Lying-in Hospital, till its cause, vitiated air, was at last discovered and obviated, and the mortality consequently reduced from one in every *six* to one in every *twenty* children, within the first nine days, on an average of five years.† In 1859, the mortality was only one in *forty*. That, notwithstanding all our boasted improvements, impure air is still a very frequent source of disease in infancy, may be safely inferred from the great mortality in early life which takes place in most of the larger towns as compared with that in country districts. "The occupations in cities," says Dr Farr, "are not more laborious than agriculture, and the great mass of the town population have constant exercise and employment; their wages are higher; their dwellings as good, their clothing as warm, and their food certainly as substantial, as that of the agricultural labourer. The Poor-Law Inquiry and successive Parliamentary Committees have shown that the families

* On Consumption and Scrofula, p. 233.

† See above, p. 37.

of agricultural labourers subsist upon a minimum of animal food, and an inadequate supply of bread and potatoes. *The source of the higher mortality in cities is therefore the insalubrity of the atmosphere.*"* In accordance with this conclusion, Dr Farr, after a careful investigation of the returns from a great variety of localities, affirms that "it will be found, *cæteris paribus*, that the mortality increases as the density of the population increases; and when the density and the affluence are the same, that the rate of mortality depends upon the efficiency of ventilation, and of the means which are employed for the removal of impurities."† As all subsequent investigations tend to confirm these inferences, the reader will feel no surprise at the earnestness with which I insist upon purity of air as essential to the preservation of health in infancy.

It may be said that, to prove the effects of habitually breathing vitiated air, I have referred only to extreme cases. This is quite true; for it is by well-marked cases that the nature and extent of the evil can be most clearly demonstrated. But the same principle applies to every degree of impurity. The only difference is in the intensity of the result, and this is a point that parents should ponder well. If breathing a very vitiated air so deteriorates the blood as to cut short life by convulsions within nine days, as was the case with every *sixth* infant in the Dublin Hospital, the less vitiated atmosphere of an ill-ventilated nursery will impair the quality of the blood in precisely the same way, and with equal certainty, but only less rapidly. The chief difference is, that in the one case the

* Registrar-General's First Report, p. 78.

† *Ibid.*, p. 79.

fatal consequences follow in a very short time, whereas in the other the health is more slowly undermined, and a foundation is laid for diseases which may not prove fatal till after the lapse of years.

It is obvious, then, that rooms appropriated for nurseries should be in the higher part of the house, large, cheerful, not overcrowded with furniture, and provided with the means of ample ventilation without exposing their inmates to currents of cold or damp air. No mother ought to be satisfied with herself until, in obedience to the demands of the infant constitution, she has provided for her children the most suitable and best-aired nursery within her power, and strictly prohibited every kind of operation by which its air can be vitiated, or its cleanliness impaired. If the size of the house will admit of it, the day-nursery should be entirely separate from the sleeping-room. If there is only one room, it is almost impossible to secure adequate ventilation, because, even in summer, the draught from open windows is attended with risk, and, during at least two-thirds of the year in this country, the cold and damp atmosphere of our climate renders it unsafe to keep them open long enough, and sufficiently often. But the case is different when there is a day-room in addition.

Closely-drawn curtains and other appliances by which a free supply of air is systematically cut off from the young, are highly prejudicial.

A very common source of impure air is the burning of gas. Experience shows that plants and birds speedily die when kept in a room where gas is habitually used; and there can be no doubt that children, and even adults, especially those of delicate constitution, are injuriously affected by breathing air mixed with the products of its

combustion, among which are commonly certain compounds of sulphur and other noxious substances. Indeed, there is reason to think that the extensive use of gas is the unsuspected cause of much ill-health. It is therefore of great importance that the use of this light should be forbidden in nurseries, or permitted only when efficient means are employed to carry off the products of combustion. While counselling that the nursery should be in the higher part of the house, we must also direct attention to the fact that impure air finds its way through ceilings and floors from lower to upper rooms. On this account the upper houses in common stairs are apt to be unhealthy; and even in the best houses it will be prudent to avoid placing the nursery immediately over rooms in which gas is largely burned.

In the exposition of the peculiarities of the infant constitution given in a preceding chapter, it was shown that nervous sensibility predominates in early life, and modifies every infantile disease; hence, whatever tends to moderate its excess is, to a certain extent, a promoter of health. In this respect the importance of pure air cannot be overestimated; it is one of the safest and most powerful nervous sedatives and tonics. Among country children who are constantly in the open air, we very seldom find that morbid nervous excitability which afflicts so many of the children in populous towns, and those of the higher ranks who are brought up in close rooms. Pure air is thus an invaluable means of diminishing the irritability attendant on teething.

However suitable in size and situation the nursery may be, adequate VENTILATION—*i.e.*, a *frequent*, and, still better, a *continuous renewal* of the air contained in it—is indis-

pensable to health. Caution must however be exercised in effecting this, especially in winter. Before the windows and doors are thrown open for a thorough purification in the morning, the children should be removed into another room; and at all times they should be kept out of the way of draughts from open windows or doors, dust from sweeping, and damp from washing the floors. It is for this reason that two rooms are so desirable for the nursery.

When the weather is cold and the air moist, the windows ought never to be thrown open till the children are removed and the sun has been for some time above the horizon. The bed-clothes should be turned down as soon as the child is taken up, and should be exposed to the air for several hours, that they may be entirely freed from the effluvia accumulated during the night. This point is in general too little attended to.

TEMPERATURE OF THE NURSERY.—Pure air being provided for, the next point demanding attention is the due regulation of the temperature of the nursery. This also is of much importance, because, like the quality of the air, it is in almost continual operation. The atmosphere of the nursery ought, during the first few weeks, to be kept comfortably and equably warm, and never allowed to fall below 65°. For the first few days the temperature may be raised with propriety to 70°, if ventilation be duly attended to; but excessive heat and closeness must be rigorously guarded against.

In this country, open fire-places are in general use in nurseries, and they have the advantage of ensuring a certain degree of ventilation; but they are also the causes of many and serious inconveniences. By the constant rush

of air to the fire, cold draughts from the doors and windows are necessarily produced, and it is often almost impossible to prevent mischief from the chills they occasion. A large screen, placed behind the door to intercept the current of cold air, and diffuse it through the room, affords some protection. In winter this is especially necessary, as every time the door is opened a blast of cold air enters, quite sufficient to cause illness in a delicate child directly exposed to it. Cross draughts of air also ought to be guarded against by some similar contrivance.

In nurseries the fire-place should be fenced with an iron or wire grating, as the surest protection against accidents; and care should be taken at all times to avoid exposing the infant to the glare and heat of a bright fire, and to prevent the older children from habitually placing themselves too near it. Inflammation of the eyes, and even convulsions, are sometimes induced in infants by neglect of this precaution—the great delicacy of the organism rendering it peculiarly susceptible of injury, even from causes which exercise very little influence upon adults.

But, while due care is taken to protect the infant from cold, every approach to overheating must be no less scrupulously avoided. When the temperature of the nursery is habitually too high, a degree of general relaxation, and of excitability of the nervous system, is induced, which greatly favours the development of the irritative and convulsive diseases to which infants are naturally liable, and which are so often the causes of premature death. Another important consideration is the additional risk incurred by the transition to the cold external air, when the child is taken out for exercise. The frequency

of pneumonia, or inflammation of the lungs, in infancy, arises chiefly from this cause.*

As the system always endeavours to accommodate itself to the circumstances in which we live, it is clear that, if a child spend twenty-three hours out of every twenty-four in a heated atmosphere, its own power of generating heat will be impaired, so that when it is suddenly exposed, during the twenty-fourth hour, to the colder open air, it will be more liable to suffer from the transition than if it had previously been habituated to a mild temperature.

* For some details regarding this very fatal disease in infancy, see APPENDIX E.

CHAPTER XII.

MANAGEMENT OF THE INFANT DURING TEETHING.

During the earlier months of infancy, the child is intended to draw its whole nourishment from its mother's breast; the power of suction alone is required, and for this the action of the tongue, lips, and cheeks is amply sufficient. Accordingly, for some time after birth, the jaws are short, shallow, and toothless; and the muscles which put them in motion are small, feeble, and delicate in structure.

But in the course of a few months, as the infant slowly advances towards a state of development in which a more consistent and nutritive food becomes necessary for its support, a corresponding change is observed to take place in the organism. The bones of the face gradually expand; the jaws increase in length, depth, and firmness of structure; the gums become more elevated and resisting on their upper edge; the cavity of the mouth enlarges; the muscles which move the jaw increase in size and power; and, in proportion to these changes, the infant manifests an increased tendency to carry to its mouth every object it can lay hold of, thus evidently contributing to develop still farther the bones and muscles concerned in mastication.

About the seventh month, however, a still more remarkable change begins, which does not terminate till after the end of the second year. This is the successive cutting of the first set of teeth—a process on the right management of which the immediate safety and future welfare of the infant very closely depend.

Teething, being a natural process, is not necessarily attended with danger, and under proper management a healthy child generally passes through it without much actual suffering. But in delicate or mismanaged children, teething is often the cause of danger, and consequently of much anxiety to the parents. The possession of sound views in regard to it is therefore important.

The condition of the bodily organs will, as a rule, be found exactly adapted, at every period of life, to the wants of the individual. From the infant at the breast, for example, teeth are withheld, because they would be not only useless, but an encumbrance, by interfering with its sucking. At a later period, however, when the infant's natural food is no longer fluid, but firm and consistent, teeth are given; because without them such food could not be broken down, or formed into a soft mass with the saliva, to fit it for being easily swallowed and perfectly digested. So also, when, from weakness of constitution or the effects of disease, the development of the system goes on with unusual slowness, and solid food is not so soon required, the appearance of the teeth is also delayed; thus affording another proof that weaning, and the change of diet connected with it, ought to be regulated by the progress of the organism, and not merely by the number of months which have elapsed since the child was born.

The TEMPORARY or MILK TEETH—twenty in number—

consist of eight *front, incisor*, or *cutting* teeth, four *canine* or *eye* teeth, and eight *molar* teeth or *grinders*. They begin to appear about the sixth or seventh month, and are generally all developed at the age of from two to two-and-a-half years. About the seventh year these temporary teeth begin to fall out, and gradually they are succeeded by the permanent teeth, the last four of which, because they sometimes do not appear before twenty or twenty-five years of age, are called the *wisdom-teeth*.

The PERMANENT TEETH—thirty-two in number, sixteen in each jaw—are divided into eight *front* or *cutting* teeth, four *canine* or *eye* teeth, and twenty *molar* teeth or *grinders*.

Although even the first teeth are not cut earlier than the sixth or seventh month, the rudiments of both sets exist in the jaw long before birth. As it would be out of place to trace their progress in a work like this, I shall merely state that the ossification of many of the milk teeth is far advanced even at birth, and that a certain degree of regularity is observed in the order of their appearance. The middle two incisors of the lower jaw are generally the first cut, and are commonly soon followed by those of the upper jaw. After an uncertain interval, these are succeeded by the *lateral* incisors in both jaws. After another interval, which brings the child to about the fifteenth or sixteenth month, sometimes the anterior molar, and sometimes the canine teeth, come next in order; and between the twentieth and thirtieth months the posterior molar generally also appear, and thus complete the whole of the milk teeth.

Generally speaking, teething has two distinct stages. In the first, the capsule of the tooth seems to swell and press upon the neighbouring parts; while, in the second

stage, the tooth rises upwards, presses against, and then passes through the gum. The second process does not always follow the other immediately; on the contrary, a considerable interval may elapse between them, during which all goes on quietly. Active symptoms of teething are thus often experienced withont any teeth making their appearance; but, perhaps a few days, or a week or two later, the work is resumed, or, as now and then happens, the tooth has appeared without the system having undergone any additional disturbance.

"The first stage of teething is indicated by symptoms of general irritation in the mouth, and of some constitutional disturbance. The child becomes restless, and the saliva begins to flow in quantities from the mouth, and on the least uneasiness the infant cries, but in a little while smiles again with its wonted placidity. Tears and smiles thus succeed each other at intervals. The eyes and cheeks become red, the appetite capricious, and thirst frequently considerable. Sleep is disturbed or interrupted by dreams, and a general expression of uneasiness pervades the frame. The gums, which were at first unaltered, begin to swell, and become inflamed and painful. The child now carries everything to the mouth, and is evidently relieved by rubbing the gums. The bowels at this time are in general unusually open; and as a certain degree of bowel-complaint is beneficial during teething, its occurrence need not excite any uneasiness. After going on for a longer or shorter time, these symptoms gradually abate, and are followed by an interval of comfort and repose."

"The second stage of teething soon follows. Instead of regularly carrying everything to the mouth, the child now often shows a fear of allowing anything to touch it, and

often cries when he happens to bite unwarily. The gums and mouth become hot; a pale or bright-red elevated spot appears on the gums, which become very painful when pressed upon. The child changes colour, the cheeks being frequently flushed; he is restless, wishes to be laid down, and is no sooner down than he is as anxious to be again in the nurse's arms. Nothing pleases him. At one moment he will demand the breast, and at the next abruptly turn away from it. He snatches at everything, and retains nothing. In short, he appears to be driven about by successive and sudden impulses, without being able to find rest in any position; and with these appearances slight fever and bowel-complaints are often combined. When once the teeth are fairly cut, however, all these symptoms vanish."* But many children, and especially those who are well constituted and judiciously managed, pass through the period of teething with scarcely any detriment.

The incisor are generally more easily cut than the eye teeth. The appearance of the latter, indeed, is often preceded by much constitutional disturbance, though their pointed form seems to indicate a facility in making their way.

Dentition, as I have said, being a natural process, is not necessarily a source of danger. But a slighter cause is apt to give rise to disease during the period of teething than at any other time; and when disease does occur, it is aggravated and rendered more dangerous. The increased irritability is indeed the real source of the constitutional disturbance so often attendant on teething; and, consequently, the best method of carrying the child in safety

* Von Ammon, *op. cit.* p. 182.

through that troublesome and sometimes perilous process, is the adoption, from the day of its birth onwards, of *a proper system of general management.* Daily experience shows that, while the symptoms of teething are generally severe in children much confined to the house and subjected to irregularities of diet, they are almost always mild in well-constituted children who have never been overfed, and whose exercise in the open air and general management have been conducted in accordance with the dictates of physiology.

Having already explained the general principles of infant management, I need not recapitulate them here. But much as I have, on several occasions, insisted on the importance of *pure air* as a condition of health, I cannot refrain from again urging it on mothers as one of the surest preservatives against the dangers of dentition. Nothing tends so directly as the constant breathing of pure air to counteract and subdue that nervous irritability which is the characteristic of infancy, and the source of so many of its diseases. If a child spends some hours daily in the open air, occupies a large and thoroughly-ventilated apartment within doors, and is not overfed, it rarely suffers much from teething. Whereas, when it is taken out to exercise only at distant and irregular intervals, and is cooped up in a warm or ill-ventilated nursery, it is placed in the situation of all others the most likely to render dentition a process of difficulty and danger, because such are precisely the circumstances most calculated to increase the child's already predominant irritability.

But although the infant can scarcely be too much in the open air in temperate or fine weather and when it is properly protected, the unusual susceptibility of the system

during teething demands that great care be taken *not to expose it when the weather is harsh and cold.* If, from an ill-directed desire to strengthen the child, it be rashly exposed, during teething, to cold or damp, or to partial currents of air, inflammatory disease in the windpipe or chest may easily be excited.* The same result may ensue if the clothing be insufficient to keep up the natural warmth of the surface and extremities.

The *tepid bath* is the only other part of the *general* or preservative treatment which it is necessary to notice here. From its power of allaying nervous excitement and promoting sleep, it is often a valuable resource before and during the irritation of teething; and it may then be safely continued for a longer time than when used merely for the purposes of cleanliness. Gentle and repeated friction over the surface of the body, also exerts a salutary and sedative influence on the nervous system, and should not be neglected.

A light cooling diet should be strictly observed during the acute stage of dentition, and even the ordinary food be considerably diluted. For the same reason, if teething commences before weaning takes place, the mother or nurse should adopt a mild and cooling diet, and carefully avoid all heavy and indigestible articles. The quality of the milk will thus become better adapted to the condition of the child, and tend to moderate the excitement to which the child is at this time peculiarly liable. The mother, also, should be doubly careful to avoid every source of disturbance to her own health, such as vivid emotional excitement, fatigue, and anxiety, as these directly affect the state of the child.

* See APPENDIX E.

During the active stage of teething, there is a considerable tendency to *congestion of the brain*, which often becomes a source of danger from the facility with which convulsions may then be induced, or mere irritation be converted into inflammation of the brain. Hence the propriety of keeping the head cool, and avoiding every kind of excitement. Even too much anxiety to amuse the child may become a cause of morbid irritation. A quiet, soothing, and cheerful manner is by far the most suitable, and tends much to comfort the child. The unusual flow of saliva from the mouth acts beneficially in preventing and allaying undue excitement in the head, and ought on no account to be checked. The bowel-complaint, also, that frequently accompanies teething, is so useful in withdrawing the blood from the head and lungs that it ought not to excite anxiety, unless it is excessive and threatens danger as a distinct disease. When, from rash exposure or improper interference, the flow of saliva or the bowel-complaint is arrested, convulsions and other serious forms of disease are of frequent occurrence.

It is very judiciously remarked by Dr Evanson, that, while we abstain from exciting alarm about the general disorder attendant on teething, we must, however, be watchful not to allow dangerous disease to advance unchecked, in the belief that the symptoms arise merely from dentition, and will cease with the cutting of the teeth. Both errors are sometimes committed; and the only way to avoid them is, never to allow our judgment to be carried away by undue reliance on the universal truth of a general proposition. We ought strictly to consider each case on its own merits, and endeavour to distinguish between the symptoms produced solely by teething, and those

arising from co-existing and probably more serious disease.*

When the child suffers much from the swollen and inflamed state of the gums, or when any uncertainty or complication of unusual symptoms arises, the duty of the mother is obviously not to trust to her own judgment or to chance, but at once to call in professional aid, without waiting till active mischief has gone so far as to endanger life. This is the only way to assist the child effectually, and perhaps to save the mother from the bitterness of lasting regret and self-reproach. When, however, the infant is uneasy merely, and no serious pain is complained of, she may often administer relief in the earlier stage, by rubbing the gum gently with the finger. When the gum is much inflamed, as it is in the later stage, pressure will be hurtful; but the time at which rubbing becomes agreeable can always be detected by observing the behaviour of the child. If there is not much tenderness, the use of a piece of smooth coral promotes the passage of the tooth; but a crust of bread answers better when the gum is inflamed, and at the same time it relieves the irritation by increasing the flow of saliva.

When there is much pain and redness of the gum, and the constitutional disturbance is considerable, relief may be speedily obtained by dividing the gum over the tooth with a lancet, and allowing it to bleed freely. Even in the first stage of dentition this may be done with propriety, although there is no expectation of the tooth immediately

* For some excellent practical remarks connected with this subject, I refer the medical reader to a chapter on dentition in the valuable treatise of Drs Maunsell and Evanson *On the Management and Diseases of Children*, a work which embodies the most accurate information on this as on most of the other important topics of which it treats.

following. In the second stage, when the tooth is about to appear, incision of the gum is often imperatively called for, as the only means of putting an end to severe suffering and averting danger. Even then, however, the tooth may not appear for several days. But as this part of the treatment is purely professional, I need not pursue the subject.*

The *second dentition* is seldom attended with constitutional disturbance; but the progress of the teeth should be carefully watched, to see that they come in their proper places and advance in the right direction, and also that they are not so crowded as to press injuriously on each other, or endanger their permanent regularity. Not only the form and expression of the mouth, but the beauty and preservation of the teeth themselves, depend greatly on the watchful attention paid to them, and on their being judiciously managed, during the progress of the second dentition.

The importance of *preserving the teeth* should be impressed on children from an early age; they should be taught to clean them carefully with a proper brush night and morning, and if after every meal, still better. The formation of tartar on the teeth not only taints the breath, but separates the gums from the teeth, to the injury of both.

* For some interesting physiological observations on the process of dentition considered as an indication of the constitution and future development of the infant, by Dr Whitehead of Manchester, see APPENDIX G.

CHAPTER XIII.

MANAGEMENT OF THE CHILD FROM WEANING TO THE END OF THE SECOND YEAR.

THE period of infancy may be divided into two distinct portions—the first extending from birth to the time of weaning, and the second from weaning to the full development of the temporary teeth. In the great majority of cases, weaning takes place between the ninth and twelfth months, and the cutting of the first set of teeth is completed about the twenty-fourth month or soon afterwards. In a general way, therefore, the two periods may be accurately enough spoken of as *the first and the second years of infancy*. In using these terms, however, I mean to express not the mere lapse of time, but the constitutional or physiological states which usually characterise the infant at these different stages of its life.

The subjects discussed in the preceding chapters refer chiefly to the first of these divisions; but the second also demands no small share of our attention. During this later stage the rate of mortality is indeed greatly reduced from what it was during the first year; but it still so far exceeds the average of any other period of life, as to force the conviction upon every reflecting mind that there must be, in the constitution or external circumstances of the

child, during the evolution of the milk teeth, some peculiarity which renders it unusually susceptible of disease, and which we must therefore carefully take into account in regulating its treatment. In the third and subsequent years, the mortality declines so rapidly as to prove that some of its causes must have been peculiar to infancy, while others must at least have lost a portion of their power. The object of the present chapter is to inquire what those causes are, and how they may be most successfully counteracted.

Causes of Mortality during the Second Year.—Many of the perils of the first year have already been shown to arise partly from the very delicate state of the organism, and partly from defects of management. The dangers incidental to the second year admit of a similar classification. Growth continues to be rapid, and there is still the same predominance of the nervous and circulating systems which marks the earlier period. The functions principally concerned in nutrition and growth are consequently kept in that state of high activity which any accidental irritation may convert into disease. The important process of teething also goes on during the whole of the second year, and, from the excitability which accompanies it, considerably increases the risk from exposure to cold, errors of diet, &c. To the infant, moreover, everything is new and exciting. At the commencement of the second year, the senses are scarcely more than beginning to convey distinct and durable impressions to the mind. The mind itself is becoming conscious of new feelings and desires, and takes pleasure in the examination of surrounding objects. The will now assumes a more definite expres-

sion, and with increasing vigour and precision directs the bodily movements in the fulfilment of its wishes. By and by the power of speech and social intercourse becomes an additional source of interest and constantly recurring excitement. The whole system, in short, is not only excitable, but continually under the influence of new stimuli; and in the now very delicate state of the organism it is not wonderful that disease, often terminating fatally, should result from mismanagement and other causes which might be successfully withstood at a maturer age. Under such circumstances, a few remarks, applicable more especially to the treatment required during the second year, will not be useless.

During the second year, the state of the constitution differs only in degree from what it was toward the end of the first; and the same principles by which our treatment was regulated at the commencement of dentition continue applicable, with only such slight and obvious modifications as the change of circumstances may require. I shall therefore content myself at present with again urging the important practical fact, that the adoption, from the very first, of a mode of management in accordance with the nature and wants of the infantile constitution, is by far the most effectual way to diminish the dangers of teething, and of all other infantile diseases. It is thus that feebly constituted children are often carried in safety through every obstacle, while, from mismanagement or neglect, the strong and healthy are cut down.

Diet.—A large proportion of the diseases which destroy life in early infancy are more or less directly connected with the state of the digestive organs, and one of their

principal sources is unquestionably *errors in diet.* On this point, perhaps more than on any other, parents are apt to be misled—partly by their feelings, and partly by their ignorance; and hence a word or two of caution may be required.

From a natural wish to strengthen the child, mothers are prone to give too much or too strong food, and to give it too frequently. If an infant is allowed to eat too fast, it is almost certain to eat too much; and, on the other hand, if it is not duly exercised or amused, it will desire food too often—not because it really stands in need of nourishment, but because it dislikes to be idle, and must be doing something. The common practice of soothing children by giving them cake or sweetmeats is not less pernicious to health, than injurious to their moral welfare; and the child cannot be too early accustomed to abstain entirely from eating during the intervals between meals. The stomach, like other organs, requires a period of repose to regain its tone after being engaged in digestion; and if the child be allowed to eat at its own will and pleasure, indigestion will assuredly follow, and lead to general disorder of health.

During the second year of life, as at the earlier stage, mischief is often done through over-anxiety to strengthen the child by strong food and the use of stimulants. This is a great error. It is true that a healthy child who has been weakened by accidental starvation may be rapidly strengthened in this way: but in debility arising either from imperfect digestion or assimilation, or from an irritable nervous constitution, the milder the food, the more nourishment it will afford; and the stronger and more stimulating it is, the less likely will it be to restore the child to health.

It is certain that, as a general fact, much more injury is done by giving animal food too soon than by delaying it too long. After the incisor and the anterior molar teeth have appeared, the child may be gradually accustomed to more solid food. At first chicken-broth, or weak mutton-broth, freed from fat, may be given in small quantity along with farinaceous food, and afterwards a little soft-boiled egg, or light pudding, as an intermediate step towards solid meat. When the teeth are somewhat grown and able to masticate the food, a small bit of tender chicken may be tried—at first once in two or three days, and by and by repeated oftener, when found to be relished and easily digested.

A small quantity of any light and well-cooked vegetable will also be allowable after the appearance of the teeth. Cauliflower, carrot, or stewed fruit will be highly relished and easily digested, provided the quantity be not too large.

When too rich food is given at an early age with the view of strengthening a delicate constitution, the child generally becomes thin, excitable, and feverish; and its health improves only when a change is made to milder nourishment. It is not the quality or quantity of food taken into the stomach which indicates the amount of support which it will afford. *Only that portion of it which is digested and assimilated* proves useful; and hence, the surest way to impart strength is to give the kind of food that abounds most in those elements in which the system is deficient, and to administer it in such quantity as is best suited to the state of the constitution.

In childhood, the predominance of the nervous and vascular systems renders the common use of fermented liquors, tea, coffee, and other stimulants, decidedly injurious,

and it is only in cases of low vitality or disease (of which none but a medical man can judge) that any advantage is to be derived from their use.

To give a connected view of the kind of diet required towards the end of the second year, I cannot do better than subjoin an extract from the very judicious work of Drs Maunsell and Evanson already referred to. "A healthy child of two or three years old, commonly awakes hungry and thirsty at five or six o'clock in the morning, sometimes even earlier. Immediately after waking, a little bread and sweet milk should be given to it, or (when the child is too young to eat bread) a little bread-pap. The latter should be warm; but in the former case the bread may be eaten from the hand, and the milk allowed to be drunk cold, as it is as well, at this meal, to furnish no inducement for eating beyond that of hunger. After eating, the child will generally sleep again for an hour or two; and about nine o'clock it should get its second meal of bread softened in hot water, which latter is to be drained off, and fresh milk and a little sugar added to the bread. Between one and two the child may have dinner, consisting, at the younger ages, of beef, mutton, or chicken broth (deprived of all fat), and bread. When a sufficient number of teeth are developed to admit of chewing being performed, a little animal food, as chicken, roast or boiled mutton or beef, not too much dressed, should be allowed, with a potato or bread, and some fresh well-dressed vegetables, as turnips or cauliflower. After dinner some drink will be requisite; and a healthy child requires, or indeed wishes for, nothing but water. . . . Between six and seven o'clock, the child may have its last meal of bread, steeped in water, &c., as at nine o'clock in the morning.

A healthy child who has been in the open air during the greater part of the day, will be ready for bed shortly after this last-mentioned supply, and will require nothing further till morning. Similar regimen and hours may be adopted throughout the whole period of childhood; only, as the fourth or fifth year approaches, giving, for breakfast and supper, bread and milk without water, and either warm or cold, according to the weather or the child's inclination. The supply of food upon first waking in the morning may also be gradually discontinued, and breakfast given somewhat earlier."

Before taking leave of the subject of infant diet, I would again urge the necessity of paying much attention to *regularity* in the time of meals. There is a natural tendency in all the operations of the animal economy to the observance of fixed periods, which greatly facilitates the formation of habits of order and regularity, more especially in early life, and which, under the guidance of good sense, may be turned to excellent account even in the first months of infancy.* When regularity and method have once been introduced, it is difficult to say whether the child or the parent derives the greatest advantage from them. If they promote in a high degree the health and comfort of the child, they also relieve the parent from a thraldom which is as severe as it is incessant; for nothing can exceed the slavish subjection in which a mother is held when her child is once assured that by crying lustily it may procure any indulgence or amount of attention it pleases. Whereas, when an infant has discovered that it is not to be the dictator, that its appetite is to be indulged only at the right time, and that, while every kind and

* See the author's work on "Digestion and Diet," p. 69.

proper concession will be cheerfully made, nothing that is really wrong will be conceded to mere importunity, it instinctively yields the point, and enjoys in consequence a far happier life than if it were allowed to gratify, hurtfully, its every whim, and reign the sole despot of the nursery.

The proper regulation of the *quantity* of the food is also of much practical importance. From ill-judged kindness, it is not unusual to coax a child to eat more than it desires. This is, I believe, a frequent source of the indigestion and bowel-complaints so prevalent and fatal in early infancy. While avoiding excess, however, we must be careful not to go to the other extreme, and give an insufficient allowance of nourishing food—an error sometimes fallen into from a wish to render the child abstemious and hardy in after-life. The true way to fortify the constitution against future hardships and unavoidable privations, is to secure in infancy and youth every advantage which can be obtained by a well-conducted general regimen, and *a regular and ample, but not excessive, supply* of wholesome and nourishing food. The mistake of administering inadequately to the wants of childhood is not unknown even among intelligent people, although much less frequent than the contrary error.*

But while regularity and quantity are thus attended to in arranging the meals of the young, it ought also to be kept in mind that some *variety* is as advantageous in early as in later life, and that to continue day after day the

* The reader is referred to a Memoir of the late James Hope, M.D., Physician to St George's Hospital, p. 4 (London, 1843), for an instance, in his father's family, of the injurious effects of inadequate nourishment and exposure to cold.

same food, prepared in the very same way, tends to weaken the stomach. With a little ingenuity, some slight variation either in the substance or the mode of preparation of a meal may easily be made, which will give a wholesome stimulus to digestion. If, for instance, farinaceous food and milk are at the time the proper kind of diet, it is easy to make a little variety by occasionally substituting arrow-root, soft-boiled rice, sago, bread-crumb, &c., for each other; or, when soup is allowed, by alternating chicken-broth, mutton-broth, beef-tea, &c. A similar plan may be followed with eggs, meat, and vegetables. A change managed in this way, from one article to another of a similar nature, is both agreeable and heathful.

Many parents are in the habit of having their children brought to table at the end of their own dinner, and of giving them wine, fruit, and confections. Nothing but mischief can follow from this indulgence. The practice ought to be scrupulously avoided, and we ought never to bring a child into a place where we are partaking of any delicacy, unless we intend also to gratify its desires. The mere sight of food or drink is an infallible stimulant to the infant appetite, just as light is to the eye, or a suffering object to the feeling of compassion. Even the principle of imitation comes into play with peculiar force: the child can see no good reason why it should be debarred from doing as others do, and becomes fretful and discontented when denied the gratification.

Cleanliness.—For many reasons, most of which will occur to the reader who has carefully perused the preceding pages, cleanliness should hold the same prominent place in the treatment of the second as it did in that of

the first year of infancy. But in accordance with the increased development and greater powers of reaction of the organism, the temperature of the water used for washing the child in the morning should, during summer, be gradually reduced from 80° to 75°, or even lower, in proportion as the increasing energies of the child render it safe and advantageous to do so. When the weather is warm, and the child vigorous and active, water at the temperature of the room may be safely used. During winter, however, or when the child is delicate and does not seem to rally easily from the shock, we must be careful not to lower the temperature too much. As a rule, the water used for the morning ablution, after the first year or fifteen months, should impart a feeling of coolness rather than of warmth to the skin.

When, as is generally the case, the morning ablution is merely for the sake of cleanliness, the immersion should be continued only long enough to have the child thoroughly washed, and well but gently rubbed while in the water with the hand or a soft sponge, and it should be quickly and thoroughly dried.

It is to the influence of the bath in equalising the circulation through all parts of the body, that the experienced Hufeland ascribes the great advantages derived from its judicious and systematic use in infancy, in preventing undue congestion or irritation in any one organ or set of organs, such as the lungs, the heart, the brain, the stomach, or the bowels. For the same reason, he considers it as a most valuable auxiliary in the treatment of disease. At present, almost all our remedial agents, whatever the organs upon which they are specially intended to act, are applied directly to the stomach and bowels, so that *any*

internal irritation already existing, is often increased by the very remedy administered for its removal. From this inconvenience the bath is entirely free. Properly managed, it soothes but never increases internal irritation, and often enables us to dispense with the use of drugs.

DRESS.—Dress is another subject for serious consideration in the management of infancy, as it acts upon the skin and the general system either for good or for evil, according to the judgment with which it is regulated. In early life the skin is the seat of free and often copious perspiration, which always soils it more or less, so that a frequent change of the dress is as essential to cleanliness and health as the use of ablution and bathing. As the functions of the skin are easily repressed by anything approaching to a chill, the dress ought to be such as to afford adequate protection. In winter, soft flannel should be worn next the skin, if the child be at all delicate or show any difficulty in maintaining its warmth. In summer, and in the case of robust children, it is less necessary, and sometimes even oppressive. The rule to be followed is, to use the material which ensures sufficient warmth without oppressing. This quality may easily be determined by a little attention to the feeling and comfort of the child. In many constitutions, soft warm cotton is preferable to flannel; but when the skin appears dry, rough, and of a bluish-white colour, this is a clear indication of its insufficient action, and flannel should at once be substituted. The covering during the night also, as well as in the day, requires to be carefully adapted to the season.

Except in the first months of infancy and in winter,

when ample protection against cold is certainly required, feather-beds and very soft pillows ought to give place to well-made hair or cotton-wool mattresses, sufficiently firm to afford a certain amount of resistance without allowing the body to sink into them; or if feather-beds are used, they should be so well filled as to have a moderate degree of hardness. A soft feather-bed is equivalent to an excess of warm clothing on the side of the body immersed in it, and its bad effects are of the same nature, only increased by the application being partial instead of general. Some people imagine the warmth to be due only to the coverings above them, and in consequence are apt to over-heat one side of the body, while the other may be suffering from cold.

The employment of insufficient clothing during the day, along with the use of soft, warm feather-beds, pillows, and blankets during the night, is one of the most hurtful forms in which the inconsistency of parents is displayed. Many of the unhappy children whose cold blue legs and anxious looks used, a few years ago, to excite public compassion during winter, in our streets and squares, lay during the night pillowed on down, sunk in feather-beds, and covered with the warmest and softest blankets; and the consequences were often deplorable. In health, the sleep of childhood is too prompt, sound, and refreshing, to require such appliances to solicit its approach; and their use serves only to relax the skin, and increase its susceptibility to cold and disease.

In this country, a considerable improvement in the dress of children has taken place. Long warm worsted gaiters now envelop knees and limbs formerly blue and pinched from exposure to the wintry blast.

At all times, the dress of the young should be sufficient

to protect them from every *abiding* sensation of cold or chill however slight, but not sufficient to overheat them or render exercise unpleasant. It should be light in material, and fit easily, so as to admit of the utmost freedom of motion and attitude. It should cover completely, but not tightly, the upper part of the chest and arms, especially in winter. Many delicate children suffer severely from the common custom of leaving the chest and shoulders almost uncovered when within doors, and heaping on warm clothing when going out. The risks of both extremes are thus encountered, and great susceptibility of cold is established where it might easily be prevented.

But while recommending adequate protection by clothing against an *abiding feeling of cold*, I am very far from advising that children should be brought up under a regulated uniformity of temperature. On the contrary, I believe too great uniformity to be almost as injurious to healthy children, and indeed to adults too, as sudden exposure to extremes of heat and cold. Under constant uniformity, whether of temperature, diet, employment, or exercise, the system loses the cheerful spring which is the surest sign and best blessing of sound health, and becomes a prey to slight influences which would otherwise have been resisted, not only with ease, but with delight.

Exercise and Pure Air.—Sufficient exercise and pure air are indispensable conditions of health, and, as already mentioned, both greatly conduce to the safety of the child during the irritation of teething. In fine weather, the child cannot be too much in the open air, exercising his muscles in his own way, and at his own pleasure. During the summer, in perfectly dry weather, he may be allowed

to crawl on the grass, or on a cloth spread over it. By self-exercise of this description, he will not only amuse himself better, but develop his muscular strength, and acquire the power of standing and walking sooner and more securely than if taught exclusively by another. Premature endeavours to walk by the aid of an attendant ought to be strictly forbidden. When the child feels himself able, he will lose no time in exercising his powers; and it is better that he should gain strength by crawling for a week or two longer on all-fours, than that his limbs or spine should become bent by premature exertion. Parents and nurses often act very injudiciously in exciting children to walk before their limbs are sufficiently strong. It should be borne in mind that the bones of the infant contain a much larger proportion of animal matter than those of adults, and are consequently soft and yielding. As age advances, the proportion of earthy matter in the bones gradually increases, bearing a certain relation to the progress of teething, the quick or slow progress of which may, as a rule, be considered as indicative of the degree of development of the osseous system of the child.*

In winter, from ten till one o'clock is generally the warmest and driest part of the day, and ought never to be lost—as at that season the continuance of favourable weather for two or three hours together can never be relied upon, and children soon suffer if they are shut up even for a day or two.

But while inculcating the importance of abundant exposure to the open air as a means of fortifying the constitution of the young, I would again caution parents against sending their children out inadequately clothed,

* See APPENDIX G.

or when really unseasonable weather or existing indisposition indicates the propriety of keeping them at home. As long as a child retains its natural warmth, either from exercise or clothing, it may be regarded as safe under almost any exposure; but if, from deficient clothing, it becomes chilled, or even is kept long cool, it will almost certainly suffer. In this, as in other things, reason must be taken as our guide.

SLEEP.—The due regulation of sleep is another important consideration in early infancy, and, as such, has been discussed at some length above (Chap. VIII.) But here it remains for me to point out the propriety of weaning the child from sleep during the day, as soon as he is sufficiently developed and vigorous to bear the change. This generally happens at from two to three years of age; but in the case of feeble children, and of such as are nervous and excitable, the mid-day sleep requires to be continued, and even encouraged, much longer. In winter, the period of sleep may be so arranged as to admit of the child being taken out in the best part of the day.

As a rule, the infant should not be left in bed after it is thoroughly awake. It is far better to have him taken up and dressed, even if it should be afterwards necessary to lay him down for a time on the top of the bed. In infancy as well as maturity, it is relaxing and enervating to lie in bed when nature no longer requires the refreshment of sleep; and the mother should be on her guard against encouraging such a habit in her child, merely to suit her own temporary convenience. The sleep of a healthy child is so sound and refreshing, that on awakening he almost demands activity as a necessary of life; and

the shorter the time spent in bed after awakening, the better for health and comfort.

As connected with this part of the subject, I may here advert to the common practice of two or more children sleeping in one bed. For many reasons it is desirable that this should be avoided. It is far more conducive to health that children should sleep in separate beds, a little apart from each other. By this means every child will breathe a purer air than if they are placed together. Another obvious advantage is the smaller probability of partial exposure to cold from the bed-clothes being inadvertently pulled over to one side. After the age of four or five years, it becomes, from moral considerations, still more desirable that every child should sleep alone; and certainly bad habits have often originated in the contrary practice, both in families and schools. But as this remark applies much more to a later period of life, not now under consideration, I shall not pursue the subject.

There is another custom, which cannot be too soon given up after the first few weeks are over. I allude to the practice of hushing the infant to sleep in the nurse's arms or on her knee, before it is placed in its cradle or bed. When a child is fretful or excited, it may be put to sleep perhaps a few minutes sooner by this practice; but the advantage is purchased at a much greater cost than it is worth, and is often the first step to the loss, not only of its own, but of its parent's health and comfort. Once let the habit be established that the child is not to go to sleep except on its mother's knee, and every time it awakes in the night or in the day it will compel her to get up, no matter at what cost, and hush it to sleep again; and perhaps in the very act of laying it in its cradle it once more

awakes, and the whole process of crying and hushing must be gone over again, and a similar risk once more incurred. The infant is thus converted into an uneasy and restless tyrant, and the mother or nurse into its almost sleepless slave, and all for no advantage whatever, even to itself. For, after all, the sleep so induced is not so sound and refreshing as that which soon ensues when a child is laid quietly in its bed and resigned to the influence of its natural wants.

Injurious, however, as this practice unquestionably is, it is one of the most difficult for an over-anxious mother to discontinue. When once accustomed to it, the child necessarily remains sleepless and cries, for a short time, when it is first broken off; and few mothers are able to resist the cry of apparent distress thus sounded in their ears, even when convinced that nothing serious is the matter. The fear of irritating the child, and bringing on convulsions by continued crying, too often overpowers all other considerations; and yet the change, when firmly carried out, is much more easily accomplished than many would expect, and, with a little management and patience, is not only unattended with risk, but so soon followed by the best results as to convince even the most sensitive mother of its propriety.

MANAGEMENT DURING ILLNESS. — The occurrence of measles, hooping-cough, and other infantile diseases, is a source of great mortality during the second year. I shall say nothing here as to the medical treatment of these diseases, because that ought never to be conducted by the parent or nurse. I refer to it merely to add, that the previous good or bad management of the child has an

important influence on the progress and result of all infantile diseases. Even in the worst epidemics, a large proportion of the children are restored to health; and experience proves beyond a doubt that the recoveries occur chiefly among those who are rationally treated, and favourably situated as to external circumstances. So that, from whatever point of view we regard the subject, everything tends to demonstrate the paramount influence of the ordinary management.*

Domestic mismanagement during illness is a very frequent cause of death in infancy. It takes a variety of forms, according to the dispositions and circumstances of the parents. Many mothers and nurses are continually administering medicines of one kind or another, and thus deranging the healthy operations of the system. Instead of looking on the animal economy as an organism constituted to work well under certain conditions, and having, in virtue of that constitution, a natural tendency to rectify temporary disorders if the requisite conditions of restorative action be fulfilled, they seem to regard it as a machine acting upon no fixed principles, and requiring now and then to be driven by some foreign impulse in the shape of medicine. It the child is convulsed, they do not inquire whether the convulsions proceed from teething, indigestion, or worms, but forthwith administer a remedy *to check the convulsions;* and as the medicine used is most probably inapplicable to the individual case, both the disease and the cause are left in full operation, and so the danger is increased.

This is no imaginary case, but one of too frequent

* See observations on the preventible and other diseases of infants, in APPENDIX E.

occurrence. Viewing disease as something lodged in the system, the uninformed and anxious mother hastens to expel it, and in so doing often perils the life of her child. When the truth comes to be more generally known, that disease is but *an aberration from the natural state of an organ or function*, proceeding from some active cause, and not to be remedied till the diseased organ is placed under the conditions essential to its healthy action, then will more attention be paid to seeking the co-operation of Nature in our curative treatment, and much less mischief be done by rash attempts to expel disease by force. The true physician is "the *servant and interpreter* of Nature," not her ruler or opponent; and so ought the mother to be. It is my conviction, that a child cannot encounter many greater dangers than that of being subjected to the vigorous discipline of a medicine-giving mother or nurse. Wherever the mother of a family is observed to be ready with doses of calomel, cordials, anodynes, and other active drugs, the likelihood is, that one-half of her children will be found to have passed to another world.

Even when the child is under the care of a professional adviser, it is by no means safe from the risk arising from the giving of heterogeneous medicines. Whenever a child is seriously ill, there is not only great anxiety on the part of the mother, but much sympathy on the part of friends and neighbours, each of whom has her own story of what was done with such another child in the same situation, and the great good obtained from such and such medicines. In vain the mother may urge that the physician has seen the patient, and already prescribed a different course. Entreaties are poured in with an earnestness proportioned to the danger, just *to try* the vaunted remedy, *without*

telling the doctor or interrupting the use of his medicines. Anxious for the relief of her child, the mother often yields, before her better judgment can come into play to prevent her, and in a short time the child suffers from this abuse of perhaps incompatible or dangerous remedies, which aggravate the original disease. Those who are accustomed to reflect before they act, would be amazed if they were to witness the perilous follies sometimes perpetrated in this way, and the self-complacency with which the promised results are expected from the different medicines, no matter how much they may counteract each other. Even if the consequences are fatal, the self-satisfaction is scarcely impaired, because supported by a false notion that *everything has been done which could be done* to avert the catastrophe. It would be a great mistake to suppose that such conduct is to be met with only among the uneducated poor. Even the middle and higher classes are as yet so little instructed on the subject of the human constitution, that although, from greater general intelligence, they act more habitually under the direction of a qualified professional adviser, still, even among them, not a few instances occur in which the child falls a sacrifice to the multiplicity of ignorant counsellors and excessive use of drugs.

The habit of concealment from the family physician, into which the following of "every body's" advice is so apt to lead, is itself an evil of the first magnitude. By inducing him to ascribe effects to wrong causes, it tends to mislead his judgment, and may thus render him unwittingly an instrument of mischief. The maternal anxiety which lies at the root of the error is highly natural, and every sensible practitioner will make allowance for its

impulses, even where they are ill-directed, and annoying to himself. But the fair and proper way for the mother is, not to act upon the suggestions of others without the knowledge of the medical attendant, but to state simply, and in an honest spirit, that certain suggestions have been made, and inquire whether they meet with his approbation or not. If they do, then the measures recommended will be adapted by him to the necessities and peculiarities of the case, and the different parts of the treatment be carried on consistently and safely. If, on the contrary, they do not, he will have an opportunity of assigning a reason for his disapproval, and of pointing out the greater fitness of the means already employed. Should the mother be dissatisfied with this explanation, and still insist on the suggestion being tried, he can then either decline further responsibility, or take care that the trial be made with as much safety and prospect of advantage as possible.

So far from blaming the parents for calling the attention of the physician to any reasonable suggestion made by another, I acknowledge that even the most experienced may occasionally derive advantage from a hint thrown out by a casual observer. Something may escape notice during a short professional visit, which may be easily remarked at another time by a less skilful person, and by which some modification of treatment, not previously thought of, may be rendered suitable. In like manner, useful practical suggestions may be thrown out, by which any medical man may profit without reproach to his skill. All, therefore, that I contend for is, that the physician in charge of the child should be consulted before remedies unauthorised by him are tried; and that, where any are given against his advice, he should not be kept in ignorance of

the fact, but be left to decide whether to insist on his own opinion being followed, or to give up his charge of the patient.

When a child becomes seriously indisposed, it should, if practicable, be at once removed to a quiet well-aired room, away from the noise and bustle of the nursery. By this means the other children will be more likely to escape if the disease should prove to be infectious, and the patient will be benefited by the change. The natural excitability of the infant constitution being always held in view, it is obvious that the sick-room should be kept quiet, and nothing be allowed to lessen the purity of its air. In a nursery, quiet and order ought to be particularly enforced, and no one should be allowed to remain in it except the child and its nurse. Every unnecessary visitor serves only to vitiate the atmosphere and disturb the patient.* Pure fresh air, always important, becomes doubly so during disease: hence, the close overheated air which some parents insist upon from a morbid apprehension of cold,

* In a small pamphlet by Dr West, senior physician to the London Hospital for Sick Children—entitled "How to Nurse Sick Children"—will be found excellent directions for nursing children. And no family should be unprovided with Miss Nightingale's comprehensive and very judicious "Notes on Nursing," which apply even more to children than to patients in general, and both to health and to sickness, to the private dwelling as well as to the hospital. The work, indeed, forms a handbook of Household Hygiène and of Nursing. It should be found on the table of every sick-room and of every hospital ward. The work may also be read with great advantage by the medical profession, more especially the section on Ventilation. No error in the treatment of the sick is so general,—none more injurious,—than the neglect of ventilation. Indeed, it is very seldom that one enters a sick-room in a well-ventilated state,—scarcely less rare, according to my experience, to find a medical man, of any class, who attaches sufficient importance to thorough ventilation. If such apathy exists among professional men, what can we expect of nurses?—Ed.

is often productive of worse effects, especially in the febrile complaints of childhood, than the evil which it is sought to prevent. The same remark is applicable to closely drawn curtains, and the enervating quantity of bed-clothes sometimes heaped on the young.

But it is in the mismanagement of diet during the diseases of infancy that the physician meets with the greatest obstacles to recovery, and in regard to which he requires to be constantly on his guard, not only to specify what he wishes to be given, but to make sure that his wishes are understood and complied with. Almost all the disorders of infancy, as might be inferred from the predominance of the nervous and vascular systems at that age, are attended with more or less of fever; as a rule, therefore, a mild and moderate diet is required, even when the strength is much reduced. Stimulating or highly nutritive food increases debility by aggravating the febrile action; but, looking to the debility alone, many persons think they cannot give too strong or too much nourishment. This is the source of no little mischief, and sometimes of the inefficacy of the best-devised and most suitable treatment.

Another source of infant mortality is delay in sending for professional assistance, in the hope that some domestic remedy will afford relief or effect a cure. Some of the most serious diseases of infancy begin in a very insidious manner, and can be effectually checked only at their outset. When, therefore, a child complains without any obvious cause, the sooner advice is sent for the better. If this plan were generally followed, many children would be saved who are now lost, and much professional attendance be avoided which is now incurred to little purpose.

There are one or two other points which I would here earnestly impress upon mothers. The first is—when the child is really ill, to send for the physician *as early in the day as possible,* instead of waiting, as is so often done through a spirit of procrastination, till the darkness and solitude of night work upon the mother's fears, and then sending in haste at a very late hour, when the difficulty of procuring the needful remedies is greatly increased, and the whole household is thrown into commotion. Timeously warned, the physician would make his visit at a seasonable hour, not only with more benefit to the patient, but at far less expense of time, trouble, and anxiety to all concerned; whereas at night he is probably exhausted by the labours of the day, and less fit for active usefulness. In cases of acute disease, above all, this rule should be scrupulously followed. To prevent mistakes from the neglect or bad memory of servants, or from the physician's having more than one patient of the same name, a *written note* should invariably be sent, and the *address* be given. It should state also the *supposed seat and nature of the ailment;* for this information will enable him, as he goes along, to reflect on the constitutional peculiarities of the patient and the probable influence of prevailing epidemics, and to consider the precautions which his knowledge of these may suggest in directing the treatment. This is especially of importance when he is sent for in the night; because, from having some previous notion of the case, he may carry remedies with him and give relief on the spot. But in all cases it is useful, by preparing the mind of the adviser in some degree for the investigation of the disease.

The last point which I would strictly enforce is, that the medical attendant should never be made an object of

terror to the child, for the purpose of quieting it or forcing it to submit to disagreeable remedies, or the ordinary restraints required during both health and illness. The usefulness of the family physician depends in no small degree on his being on the very best terms with the children, and approached and welcomed by them as their steady friend. When he is viewed in this light, his presence soothes and tranquillises them during illness, influences them to take the necessary remedies, and not only greatly promotes recovery, but even induces them to submit cheerfully to painful and disagreeable operations. Ignorant and thoughtless mothers employ threats of what "the doctor will do" if the child will not take medicine or submit to some other offensive prescription; till the very sight of him is sufficient to neutralise the effects of the best-devised treatment. The result of this folly is, that when the child is really ill, it is thrown into such agitation by his approach, that he cannot distinguish accurately how much of the disturbance is due to fright, and how much to disease, while at the same time it raises a powerful moral obstacle to recovery.

Occasionally the same ready method of reducing the child to submission is resorted to by the attendants, without the knowledge of the parents; and my chief object in now directing attention to it, is to put mothers on their guard, that they may not only strictly prohibit all such proceedings, but take care, by their own watchfulness, that their orders be fulfilled. By neither parents nor attendants ought the physician ever to be spoken of in the presence of the young but with kindness and respect. If he is a man in whose character and skill the parents have confidence, he deserves this at their hands. If he is not, the

sooner they change him for another the better. But under no circumstances can they be justified, even from a selfish point of view, in converting him into an object of terror to those whose health and well-being are intrusted to his care. By judicious conduct on the part of the parent, and a kind soothing manner on that of the physician, the child will come to regard him as its best friend, and the only one who can relieve its suffering.

CHAPTER XIV.

THE MENTAL CONSTITUTION, AND PRINCIPLES OF TRAINING, IN INFANCY.

HAVING discussed the physical management of infancy, I come now to consider the principles which bear on the not less important subject of the moral and intellectual training at this early stage of life.

Man, as he exists in this world, is a compound being. We cannot conceive of him as either mind alone or body alone. Living as he does in a material world, surrounded by other organised beings like himself, and depending for his existence on material things, he would be as entirely out of harmony with the rest of creation were his mind unprovided with material organs, as an organised body would be without a mind to direct its movements. To enable man, then, to fulfil the purposes for which he was sent into the world, his education ought to have reference to *his whole nature*,—to take for its aim the *development of a sound mind in a sound and vigorous body*. In whatever manner, and to whatever degree, physical, moral, or intellectual education falls short of the attainment of this aim, to that extent it is defective. To restrict it, as is usually done, to the cultivation of a few—and these not

the highest—of the intellectual faculties, to the exclusion both of the physical system and of the moral and the higher intellectual powers, is to renounce the most important advantages which education is capable of conferring. Not a year passes in which examples of this error do not occur in our universities—of some highly-gifted but overstrained mind breaking down in the hour of its greatest promise, and forfeiting, when almost within its grasp, that prize for which it has sacrificed everything, and which it has, perhaps, the mortification of seeing carried off by some competitor more remarkable for healthy, industrious, and prudent mediocrity, than for either genius or extent of acquirements.

In infancy the mental constitution presents the rudiments of the same powers which characterise the human being in mature age. The senses of sight, hearing, taste, smell, and touch, and the faculties of emotion, perception, and thought, are all essentially the same; but some are developed much sooner than others. At birth, only the powers of sensation are actively manifested, and even they are at first very imperfect; for during the first week or two the infant seems to have no distinct consciousness of any kind. Light may strike upon the eye, or sound upon the ear, and yet no clear impression seems to be conveyed to the infant—unless, indeed, the impulse be of sufficient intensity to excite pain, in which case it will give unequivocal indications of uneasiness. As yet, one only of its actions seems to have a determinate end—that of turning the mouth to the mother's breast in search of the nipple, and of sucking it when found; but even this is unattended with consciousness.

THE EXTERNAL SENSES.—A week or two after birth the eye begins to follow the light, and sudden sounds give rise to a start as if of surprise. By degrees the organ of the senses become capable of receiving and transmitting to the mind distinct impressions; but it is not till after the lapse of years that they attain their fullest vigour and capacity. In this respect man is remarkably different from many of the lower animals, which see and hear distinctly from the first, and not only at once distinguish and pick up the grain or insects which are their natural food, but move and act with almost as much unerring freedom and decision as at any subsequent period of their lives.

When we inquire into the cause of this striking difference, we have no difficulty in finding an explanation. In animals which are born with the different senses ready to start into action, we invariably find the corresponding organs of sense developed in a proportionate degree; whereas in man, and those other animals whose senses are very imperfect at birth, the organs are still immature or inperfect in structure—and each sense acquires power and facility of action, only as its organ becomes developed, and is duly exercised on the objects with which Nature has placed it in relation.

From this dependence of each of the senses on the condition of its special organ, two results necessarily follow, which should be kept in view in attempting to educate or improve them. The first is, that, the different senses being connected with different organs, one or more of them *may be developed before the others*—seeing before hearing, for instance, and taste before smell. The second is, that when we wish to call any one of them into exercise, *we must present to it its appropriate object or stimulus.*

If we wish to improve vision, we must admit light, and present visible objects to the eye, in a manner adapted to the nature and delicacy of the organ. In the case of the ear, if we either exclude sounds altogether, or subject it to the impulse of loud and sudden noises before its structure is matured, we may impair or even destroy the sense of hearing; whereas, when we adapt the exercise of the organ to its structural delicacy, we promote its development and increase its power. The same principle applies to smell, taste, and touch.

Hence it is that among some savage tribes the senses of hearing, seeing, and smelling acquire, through well-regulated systematic exercise, an intensity of action which would be incredible if the facts were not authenticated beyond the possibility of cavil. Taught by early practice, the savage can distinguish the tread and track the route of an enemy or an animal, when no sound or trace is perceptible to the civilised man. In our own pastoral districts, the shepherd can distinguish the individuals of a numerous flock of sheep, while to an unpractised observer all seem to be perfectly alike. From a similar training, the senses of touch and hearing become remarkably acute in intelligent and active-minded blind persons, many of whom have been known to acquire, by constant practice, such a delicacy of touch, as enabled them to distinguish by its means cloths of marked shades of colour, and even true from false coins, in the appearance of which there was so little difference as almost to defy the scrutiny of an experienced eye. The general quickness of hearing among the blind, and their correct appreciation of sound, are too well known to be dwelt upon.

For the production of this extraordinary acuteness the

method simply is, to exercise, from the earliest youth, each organ of sense systematically, habitually, and energetically upon its appropriate objects, till acuteness is gained by dint of frequent and attentive repetition. When a sound is made, the ear is acted on whether we will or not; when light strikes upon the eye, we cannot but see; and when the air is impregnated with strong perfumes, smell takes cognisance of their presence and qualities without any exercise of volition. But when these natural means of excitement are excluded, the organs of the senses languish and become feeble from want of exercise, and differences in impressions made on them are unnoticed, which, in a more cultivated state of the senses, would have been instantly and accurately recognised. The infant acts from an early period in almost instinctive obedience to this principle; for it delights to exercise its eyes on brilliant objects and colours, to train its ear to the discrimination of sounds by every variety of noise, and to educate the sense of touch by feeling and handling everything within its reach; and if it does not seek the exercise and gratification of smell in the same way, it is only because the organ is still comparatively unfit for its function. So entirely, however, do many parents and nurses overlook the object and beneficial tendency of this employment of the senses, that when the child makes a noise in the nursery, amuses itself in the playful exercise of its voice, or lays hold of any object to examine it, they are apt to regard only the disturbance to themselves, and to enforce silence and order—as if the child were guilty of some mischievous folly, instead of really performing a most useful and improving act of self-education, which requires only to be well directed to prove the source of important

benefits. Even among thinking and educated persons, the external senses of the infant are treated with neglect. Notwithstanding their extreme value as inlets to the storehouse of the mind, very little regard is paid to their cultivation, or even to their preservation from injury. At birth the eye is often exposed to the bright glare of day with as little consideration as if it were not a most delicate organ. The ear is subjected to loud and sudden sounds, which, in extreme cases, go far to destroy its delicate nervous structure, and induce deafness for life; while no pains are bestowed in training the sense to finer and finer perception by well-graduated exercise, according to the condition and development of its organ. Blindness and deafness are sometimes thus produced at the very dawn of existence, when a little knowledge and prudence would not only have preserved the sight and hearing, but have improved both in a remarkable degree.

As the senses are bestowed on us for use, and are so susceptible of cultivation, and as without them man would be shut out from every source of active and social enjoyment, it is surely worth while to devote some attention to their preservation and improvement in infancy, when their organs are still delicate, and easily modified by the manner in which they are exercised. The very prevalence of short-sightedness among the young of the middle and higher classes may be received as a proof that some error in hygienic management gives rise to this defect. Many reasons concur to render it probable that the long confinement of the young within doors, at school and at home, has no small influence here. The eye, like every other organ, adapts itself in a great degree to its circumstances. While that of the seaman or wandering Indian is accustomed

to scan distant as well as near objects, and so becomes adapted by exercise for its varied duties, the eye of the boy or girl confined within the four walls of a house or the narrow streets of a city, is exercised only on objects at hand, and becomes unfit for the perception of those more distant —in other words, is rendered *short-sighted.* It is true that the original structure of the organ has a large share in the result; but it is equally true, that exercise upon near objects exclusively, tends greatly to aggravate the defect. This warning should be carefully attended to in exercising the eyes of children of parents who are short-sighted.

To derive benefit from the exercise of any sense, the strength and continuance of the stimulus must be suited to the health, maturity, and condition of the organ upon which it acts.

THE MENTAL FACULTIES.—We come now to treat of what may be called the internal faculties of the mind—namely, those included under the heads of INCLINATION, EMOTION, OBSERVATION, and THOUGHT; constituting the basis of the moral, religious, and intellectual character. To the exercise of these, we shall find that the same principles apply as to that of the external senses. Those principles will thus afford us a valuable guide in training the infant mind.

At birth the brain is so imperfectly developed, and so delicately constituted, as to be unfit for active mental manifestations; and accordingly we observe none, except perhaps signs of the consciousness of bodily pain, and the desire for food. Beyond these, no trace of activity of mind can be detected; nearly the whole time is spent in sleep, which is the negation of mental action. The structure of

the infant brain being thus extremely delicate, it is very easily disordered, and even permanently injured; and injuries sustained by it may, as in the similar instances of the eye and the ear, impair the efficiency of its functions to the end of life—may even induce idiocy or imbecility.

Such is the state of the brain and mind for some time after birth. By degrees, however, cases of extended mental action begin to show themselves, and the appetite for food is no longer the only instinct which seeks for gratification. The infant, by its looks and smiles, gives indications of awakening consciousness, long before it can conceive the nature of the cause by which it is excited. In this way it exhibits, even at a very early age, movements which neither sensation nor experience can explain, and which, as is happily remarked by an acute and elegant writer, are in truth the signs of its dawning affections. "Even at the early age of six weeks, when the infant is still a stranger to the world, and perceives external objects so indistinctly as to make no effort either to obtain or avoid them, he is nevertheless accessible to the influence of human expression. Although no material object possesses any attraction for him, sympathy, or the action of a feeling in his mind corresponding to the expression of the same feeling in the mind of another, is already at work. A smile, a caressing accent, raises a smile on his lips; pleasing emotions already animate this little being; and we, recognising their expression, are delighted in our turn. Who, then, has told this infant that a certain expression of the features indicates tenderness for him? How could he, to whom his own physiognomy is unknown, imitate that of another, unless a corresponding feeling in his own mind impressed the same characters on his features? That

person near his cradle is perhaps not his nurse; perhaps she has only disturbed him, or subjected him to some unpleasant operation. No matter, she has smiled affectionately on him; *he feels* that he is loved, and he loves in return."*

Here, then, is the true key to the right training of the infant mind. The internal emotions, like the external senses, being distinct from each other, and independent in their action—let the appropriate object of any one of them, the organ of which is already sufficiently developed, be presented to it, and it will start into activity, just as the eye does when the rays of light impinge on the retina. Look, for example, at an infant six months old, and observe the extent to which it responds to every variety of stimulus addressed to its feelings. If we wish to soothe it in a moment of fretful disappointment, do we not succeed by gentle fondling, and singing to it in a soft affectionate voice? If our aim is to rouse it to activity, are not our movements and tones at once changed to the lively and spirited? When an acrimonious dialogue occurs between the nurse and any other person in the presence of an infant, is it not common for the child to become as uneasy as if the angry expressions were addressed to itself, and forthwith begin to cry? If, on the other hand, an affectionate and gentle mother enters a nursery, and, imagining the infant to be asleep, merely addresses the nurse in the soft tones characteristic of her mind, do we not see the infant waken up, and with a placid smile look around to solicit the notice of its parent? Or, to use one more example, if a disagreeable, coarse-looking person happens

* L'Education Progressive, ou Etude du Cours de la Vie, par Mme. Necker de Saussure, vol. i. p. 144; Paris, 1836.

suddenly to approach an infant, are not the instantaneous results an exclamation of terror, and a clinging to the mother for protection? In short, to call out and give healthy development to the kindly and affectionate feelings of an infant, we must habitually treat it, and every person in its presence, with kindliness and affection—the display of the natural stimulants to the organs of such feelings. If, on the contrary, we present to an infant the stimulus of grief, discontent, or bad temper, we call up in its mind, not kindliness or affection, but the disagreeable feelings which we exhibit; and by the habitual exercise of the portions of the brain with which these are connected, we promote their development, and thus run the risk of giving permanence to such unamiable feelings for life.

It is astonishing, indeed, from what an early age the mental faculties will respond to their respective stimuli, whether these be direct or only from sympathy. Madame Necker de Saussure gives an affecting example of this truth, which she witnessed in a child nine months old. "The infant was gaily playing on its mother's knees, when a woman, whose physiognomy expressed deep but calm sadness, entered the room. From that moment the child's attention was wholly fixed on the woman, whom it knew, but for whom it had no particular affection. By degrees its features became discomposed; its playthings dropped from its hands, and at length it threw itself sobbing violently upon its mother's bosom. It felt neither fear nor pity; it knew not why it suffered, but it sought for relief in tears."* Facts like these show how careful we should be to regulate duly the moral as well as the physical influences by which infancy is surrounded.

* Op. cit., vol. i. p. 179.

The bearing and importance of these truths would be at once perceived were parents acquainted with the laws of the animal economy, and with the fact that the mind acts through the medium of bodily organs, and is influenced by the state of these during the whole course of life. The mind can see only by means of the eye; and when the eye is injured by too strong or too weak a stimulus—namely, by being exposed to a dazzling light, or kept in utter darkness—vision is no longer distinct. We can hear only through the medium of the ear; and if that organ is either deranged by the impulse of too violent sounds, or rendered obtuse by want of exercise, we lose the power of hearing and discriminating sounds. When, on the contrary, the eyes and ears are suitably exercised, in the degree and with the attention which their delicacy requires, the senses of seeing and hearing become acute and active, and are ever ready at call; because their organs, strengthened by exercise, become fully developed, and prompt to respond to their respective stimuli. And nobody ever dreams of attempting to strengthen any one sense by exercising the organs of another. In training these faculties each must be exercised on the objects related to it; we cannot improve vision by reasoning, or educate the ear to the nice discrimination of sounds by scholastic precepts or metaphysical theories. We have no choice in the matter; our only course is to exercise the eye in actual seeing, and the ear in actual listening, or to remain contented with the possession of imperfect senses. Our Maker has assigned a distinct organ for the operations of each; and if that organ be injured or destroyed, no effort of ours will be successful in conveying to the mind the impressions which it alone was specially constituted to transmit.

Now, if it has been proved, as I believe it to have bee by Dr Gall,* that the various propensities, affections, and powers of observation and reflection are no less independent of each other than the external senses are; that each of them acts through the medium of an appropriate portion of the brain, commonly called its *organ;* and that each is, by its natural constitution, related to a certain class of objects, and starts into activity when those objects are presented to it,—some of the most formidabled ifficulties hitherto impeding the work of the educator are diminished or removed. By many parents, I am aware, the application of the physiology of the brain (or Phrenology) to the purposes of education will be regarded with suspicion, because the doctrine of the dependence of the mental faculties for their power to act in this life is regarded as hostile to religion. But no *truth* can have any such tendency; and so far as Phrenology is true, it will necessarily be found to support and harmonize with every religious truth whatsoever.

To rouse, then, any of the emotional or intellectual powers into healthful action, the surest and most successful way is to bring it *within the immediate influence of the objects to which it is specially related.* If we wish to train the sense of sight to quicker perception, we employ the eye in the careful and rapid scrutiny of surrounding objects, of colours, magnitudes, and distances; if we wish to train the sense of hearing to a nicer discrimination of sounds, we exercise the ear in listening to and distinguishing them; and our success is in proportion to the degree

* Sur les Fonctions du Cerveau, et sur celles de chacune de ses Parties, par F. J. Gall. 6 vols. Paris, 1825.—An English translation, by Dr Winslow Lewis, jun., was published at Boston, Massachusetts, in 1835.

in which we have received from Nature the endowment of the sense, and to the perseverance and judgment with which we pursue its cultivation. Precisely on the same principle, if, in our endeavours to give improved action to the *sentiment* of justice, we merely address to the *intellect* the precept "Be just," we shall succeed no better than we should do in trying to improve vision by the employment of the ear in discriminating sounds. To cultivate feelings of pity and devotion, it is not enough to address the intellect by eulogiums on their excellence, which can act only on the reason. We must also directly *address the feelings themselves*, by showing sympathy and respect, and by bringing them into contact with suffering, which is ever too abundant around us. If the *natural stimulant* to the feeling be presented, the child will have no choice in the matter. The feeling will start into activity, precisely as vision does when the eye is penetrated by rays of light. As we cannot by an effort of the will cease to see or hear while light and sound reach the eye and ear, so is it impossible to suppress the emotion when its object is present.

Of this truth I had a touching example many years ago when in Italy, and in bad health. On calling one forenoon at a friend's house which I was in the habit of frequenting, I felt seriously unwell just as I reached the door. My friends were not at home, but I walked in and lay down on a sofa. Shortly a young girl, eighteen months old, came tottering into the room with a mirthful smile on her face. On seeing me in that unusual position, she at once became grave, and gradually approaching me with a fixed look of sympathy, exclaimed, "*Cocore malato, cocore malato?*" "Is the doctor sick, is the doctor sick?" On my

answering that I was, she looked at me compassionately for a moment, and then suddenly ran away. A moment afterwards she re-entered the room with a slice of bread in her hand, which she presented to me, saying affectionately, "*Pane, cocore, pane; cocore malato!*" "Bread, doctor, bread; the doctor is sick!" On my eating a little of it, she semed quite delighted, and remained beside me till I was well enough to go home. This strong sympathy at so early an age struck me forcibly at the time—and it does so still after many years—as a beautiful example of the ready response of the moral emotions on the sudden presentment of their stimulus. At an age when reason could scarcely exercise any guiding influence on conduct—when, in fact, the child could not pronounce the words she used—the feeling of benevolence was instantly roused into activity by the mere appearance of suffering, and operated with all the force of an instinct, in ministering to my relief by *bringing me something to eat*—the only remedy of uneasiness she yet knew. The gratification that it obviously gave her to see me eat and gradually recover, afforded as clear an indication of pity and affection as if she had been able to express them in the most eloquent words that ever were uttered. The whole occurrence showed also how erroneous is the opinion so commonly entertained, or at least acted on, that reason is the sole source of our conduct, and that hence it is useless to begin even domestic education till reason has developed itself sufficiently to understand all that is said. Whether we heed it or not, education—by which I mean the formation of character, as well as intellectual instruction—commences for us *with the very dawn of life.* If we delay systematic education and training till the age of five or six, Nature will not

remain idle till we are ready to begin. An unsystematic, irrational, and often hurtful education—namely, that arising out of the influences and circumstances by which every child is surrounded, and which never cease to act, for good or for evil, for a single hour of its life—will have taken the precedence, and raised up obstacles which may then render our best efforts fruitless. For it is not at school alone that a child can be educated: habits of indolence and vice may be learned from companions in the streets and highways, and from immoral example in a vicious home, quite as readily and certainly as habits of order, activity, and virtue, may be acquired in our best-conducted schools.

Impressed by this great truth, Mr Stow, in his excellent work on education,* insists strongly on the necessity of beginning moral—not intellectual—training at the very earliest age; and he says that eighteen years' experience has proved most conclusively the advantages of doing so, and has demonstrated that "you increase geometrically in power as you descend in age, for if *training* at twelve years of age be as *one*—at nine it is as *two*—at seven as *four*—at five as *eight*—and at three years of age as *sixteen*."† I am convinced that the same principle would apply at a still earlier age; but no children being received by Mr Stow under three years old, he of

* On the Training System of Education, Religious, Intellectual, and Moral, as established in the Glasgow Normal Training Seminary. Eleventh Edition.—Although Mr Stow makes no express reference to Phrenology as having afforded him any assistance, it is impossible for any reflecting person who is acquainted with it, not to recognise its guiding spirit in almost every page of his work; and it would have been equally impossible for Mr Stow himself to devise a system of training so consistent in all its parts, and so strikingly in harmony with nature, unless he had extensively availed himself of this aid.

† Page 6.

course could speak only of his experience from that age upwards.

The PHYSIOLOGICAL LAW OF EXERCISE being the great principle by which all our educational efforts ought to be directed in the cultivation of the affections, and the moral and religious feelings, as well as of the intellect, it is important that it should be rightly understood by parents and teachers. In my *Physiology applied to Health and Education,* I have entered fully into its exposition, and need only say here, that regular, suitable, and repeated exercise is the appointed means by which to obtain development, strength, and readiness of action of the *internal* mental faculties, as well as of the *external* senses. But to succeed in this to the utmost possible extent, it is clear that we must know the nature of the different internal faculties, and the objects or qualities to which they are respectively related, so that we may call each into action by the stimulus of its own objects with the same precision as is done in the case of the external senses.

It would be out of place, in a work like this, to point out in what manner Phrenology has removed many of the difficulties which have hitherto impeded the progress and success of our educational training. For detailed information, I must refer to the principal works on the subject.*

* Gall, "Sur les Fonctions du Cerveau;" Spurzheim's "Phrenology," "Philosophical Principles of Phrenology," "Phrenology in connection with the study of Physiognomy," and "Elementary Principles of Education;" George Combe's "System" and "Elements of Phrenology;" "The Phrenological Journal," 20 vols., &c.

In the Author's own editions of this work, an outline of the elementary mental faculties was given in the text. But it was so brief as to be of little use to those who had not already studied Phrenology, and it has therefore been omitted. Those who desire to understand Phrenology

In regard to the mental faculties which it considers to be elementary, the important thing to remark here is, that in so far as they really possess that character, they may co-exist in different degrees of relative strength, and may also be called into action either separately or together, as is the case with the external senses. Thus, a man may be benevolent, and yet have a defective sense of justice; precisely as one may hear acutely, and yet have indifferent eye-sight. So we may have lively sentiments of hope and veneration, while benevolence remains unmoved; just as we may smell without seeing. In like manner, a person may be a quick and accurate observer of facts or phenomena, and yet a bad reasoner upon them; or an excellent reasoner, but an inaccurate observer. And one gifted with high talent for geometry, or drawing, or languages, may be incapable of learning music, and even of appreciating it when performed in his hearing.

From the similarity of constitution, which, in this respect, exists between the external senses and the internal faculties of the mind, the sentiment of cautiousness, for

should study it in the works of Gall, Spurzheim, and George Combe. The Author's earnest appeal in favour of Phrenology rested on a deep conviction of its being the only well-founded philosophy of mind, and on its paramount utility, notwithstanding its yet imperfect state, as a guide in education. This conviction he arrived at after studying the work of Gall, and comparing the doctrine of that physiologist with the result of his own observations. See his "Life and Correspondence," by George Combe, 1850. In the Appendix to that volume, there is a list of his numerous contributions to the "Phrenological Journal," among which are an essay on the question, "Does phrenology afford a satisfactory explanation of the moral and intellectual faculties of man?" (vol. i. p. 337); and "Phrenology, its Nature and Uses; an address to the students of Anderson's University, Glasgow" (vol. xix. p. 97). Dr Combe published, in 1831, "Observations on Mental Derangement, being an Application of the Principles of Phrenology to the Elucidation of the Causes, Symptoms, Nature, and Treatment of Insanity." It has long been out of print —Ed.

example, may start singly into action at the sight of danger; benevolence, at the appearance of suffering; and attachment, at the approach of a friend. Consequently, in cultivating the internal faculties of the mind we ought to act upon the principle which proves so successful in the education of the external senses—namely, that of *exercising each faculty on the objects directly related to it.* And when we wish to weaken or repress any mental faculty, we must endeavour to remove it from the influence of all objects that naturally excite it; in other words, we must be careful to "*lead it not into temptation.*" If we act on this principle, we shall succeed in so far as the nature of the original constitution will permit. If we disregard it, failure and disappointment will follow our best exertions in education, simply because we shall then be labouring in opposition to the laws of the Creator. Except, indeed, for the ready response of the faculty to the stimulus of its objects, *temptation* would be a word devoid of meaning; but the object being presented, the faculty starts into action even against the efforts of the will.

CHAPTER XV.

MORAL EDUCATION IN INFANCY AND CHILDHOOD.

ASSUMING, as I may now venture to do, that whatever tends to modify the corporeal or mental constitution of man, tends to have a permanent influence upon him for good or for evil, it follows that although education, technically so called, is generally delayed till the age of five or six years, real education, or the influence of surrounding circumstances, begins at birth, and often lays a durable foundation for the future bodily and mental character, even before the dawn of distinct consciousness. From the moment that the child can express a want, and derive enjoyment from its gratification—from the moment that its bodily comfort is visibly increased or impaired by judicious or injudicious treatment—from that moment, although the intellect may still slumber in comparative inactivity, and be unable to generate one well-defined idea, intellectual and moral education has commenced, and, whether recognised as such or not, will continue to impress its effects on the constitution through life.

If, bearing this important truth constantly in mind, the mother be careful to direct her training in harmony with

the laws of nature, she will reap her reward in the continued improvement and happiness of her child. But if she act otherwise, much mischief may be done, not only before the child can think or reason, but even before it can speak. It is a common excuse with over-indulgent mothers for omitting to correct even glaring improprieties of feeling or of conduct, that the child is still "too young to listen to reason," and that it will be time enough to check such aberrations afterwards. This is a great mistake. In infancy we are governed not by reason, but by the well-directed affection and kindness of our guardians; and to wait till the development of a child's understanding before we commence its moral training, is to wait till years of unregulated indulgence shall have strengthened its more selfish and powerful appetites and passions—to wait, in short, till the weed has ripened and shed its seed, before attempting to extirpate it from the soil.

So entirely is the infant under the influence of this natural parental ascendency, that it seems almost as if intuitively aware that its safety and well-being lie in its very dependence; for, powerless in itself, it is ever ready to yield implicit obedience where it has experienced consistent sympathy and kindness. This is so true, that when a child *habitually* disputes or rebels against the authority of its guardian, we may be sure that it is either suffering from physical discomfort, or fretted by injudicious management. At that early age, habitual peevishness and discontent indicate the existence of some real grievance, and not of mere wilful perversity; and whatever the evil may be, every means should be used for its removal before it shall have taken root, and have left in the system traces which may never be effaced.

As, then, the feelings or emotions come into play long before the intellect is sufficiently developed or enlightened to direct or control them, it is obvious that if their proper regulation by the parent be unduly delayed by waiting for the dawn of reason, the character and happiness of the child must remain meanwhile very much at the mercy of accident. In highly favourable circumstances, comparatively little mischief may ensue. But if, besides wanting proper guidance, the child should be exposed to the contaminating influence of ill-tempered, selfish, or vicious guardians or companions, its character may sustain more serious injury than years of subsequent care can compensate. It is from the lasting impression which may thus be made on the infant constitution, even at a very early age, that the influence of the mother and nurse on the dispositions of the child is more powerful than any other single cause.

Of the errors committed in the management of early childhood, the two which are perhaps the most common may be said to arise from the tendency of human nature to go to one extreme while seeking to avoid the other. One of them consists in allowing the will of the child to have almost unlimited sway, and consequently permitting the unregulated and unlimited indulgence of every wish. The other consists in substituting, on all occasions, the mother's feelings, inclinations, and judgment for those of the child, and regulating even the most unimportant details by a rigid adherence to rules, which is not less at variance with their spirit than destructive of the comfort and good dispositions of the child. By the former of these methods, selfishness is so directly and systematically cultivated, that in most instances the child becomes thoroughly

"spoiled." By the second, the child finds itself so continually thwarted, that its spirit is broken, and it is made to lead a life of fretting and wretchedness. A third error, far from uncommon among weak-minded over-anxious mothers, consists in asking and acting upon the advice of every visitor who happens to cross the threshold. The parent's only safety in all these circumstances is to be found in making herself acquainted with the nature of the infant constitution. Were the guardians of the young more deeply impressed with the advantages to be derived from assuming this standard for their rule of action in regard to the details of infant management, they would be more doubtful of the wisdom of substituting the blind prejudices of the nurse or of bystanders for the rational advice of the experienced and enlightened physician.

In early childhood, as well as in maturer age, spontaneous, varied, and harmonious activity of mind and body, elicited by objects calculated to rouse without exhausting our faculties, constitutes our highest enjoyment, and indolent inactivity about the lowest. Sprightly animation and idiotic apathy thus represent the two extremes; the one accompanied by a pleasing consciousness of happiness, and the other by a dull and gloomy dissatisfaction. As a natural consequence of this part of our mental constitution, the highest and purest enjoyment which we experience is that springing from the gratified activity of our higher sentiments—benevolence, veneration, conscientiousness, hope, wonder, and ideality—regulated by a well-trained and well-furnished understanding. Whereas, when it is chiefly the lower and more selfish propensities that are roused into action, and the moral and intellectual powers are either outraged or left in abeyance,

the pleasure experienced is not only inferior in kind and degree, but also greatly impaired by the consciousness of wrongdoing which, in a well-constituted mind, never fails to accompany it.

Here, then, we have three distinct principles for our guidance in promoting the health and happiness of the young. The first is, that the system of management shall be such as to afford ample opportunity for the due and appropriate exercise of *all* the bodily and mental functions. The second is, that, while fulfilling this aim, we shall not allow the mental activity to be carried to such excess as to exhaust or weaken the faculties exercised. The third is, that, while affording due scope for the gratification of the propensities and affections which fit us for the domestic relations of life, we shall carefully prohibit every indulgence at variance with the dictates of the moral sentiments and intellect.

In all cases, adaptation to the wants, feelings, and nature of the infant—so different in many respects from those of the adult—ought to be made the leading principle of our management; and accordingly the child ought, as far as possible, to be allowed the choice of its own occupations and amusements, and to become the chief agent in the development and formation of its own character. So long as it manifests feelings, desires, or intellectual wants, which are in themselves right and proper, we cannot in any way contribute to its welfare and happiness so much as by allowing it due scope for their gratification. In this respect the lower animals teach us a valuable lesson. The young kitten gradually developes its muscular powers, and peculiar instincts and qualities, by their free and playful exercise according to its own wishes; but it does

so under a vigilant maternal guardianship, which, while leaving it ample liberty of locomotion and amusement, is yet ever ready to interfere in case of danger. If, however, the cat were to insist on prescribing to the kitten in what manner it should amuse itself, and when it should begin and when leave off its frolics, the harmony and affection between them would speedily come to an end. Under the guidance of an instinct which supplies the place of reason, the cat allows the kitten to pursue its frolic in its own way; and if she does not always take an active share in it, she at least never puts a stop to it unless her interference is required by an adequate cause.

Precisely the same principle ought to be followed with the child. Let it be left free to feel and act according to its own inspirations, so long as its feelings and conduct are physically harmless and morally proper. But let the parent be at all times watchful and ready either to check or to give a better direction to its activity when prudence requires it. Improper conduct and unreasonable demands should at once be curbed with a kind and gentle but firm hand, and the child be made to feel that the denial, being dictated by love, is unalterable by entreaty. In this way implicit obedience will soon be secured. To the young, the harsh or vacillating exercise of mere authority, unguided by reason, and uninfluenced by kindly affections, is as grating and disagreeable, and as provocative of resistance, as it is to the adult. Even in its earliest months the infant learns to distinguish and appreciate genuine and rational kindness, and, when managed with a little tact and good sense, yields willingly to the benignant influence. In most cases, therefore, it is the parent rather than the child that is in fault, when irrational and vacil-

lating over-indulgence brings forth the natural fruit of selfishness, peevishness, and caprice.

From the preceding view of the sources of enjoyment in infancy, it is obvious that the best thing we can do is, to afford the child all due facilities for the wholesome exercise of its various functions and faculties according to their actual state of development, and to encourage rather than supersede its efforts to entertain itself. It would serve no good purpose, even if we were able, to convert the infant into a puppet moved only by our will. A child thus trained, and discouraged from the free exercise of its own faculties, and from placing the slightest reliance on its own caution and foresight, by being taught to trust to another's prudence for its security and direction, may seem at first sight to be less wilful and more amiable than other children of the same age who have been more independently trained. But in after life, especially when the temperament is sluggish, the child thus trained to act only at the bidding of another will be found to display a feebleness and indecision of character, strongly in contrast with the promptitude and energy manifestsd by those who have been trained, from an early age, to think and act for themselves, under the superintendence and correction, but not the dictation, of their natural guardians.

From the difference between these two modes of training not being generally understood, the young are often treated as if it were as advantageous to render them the *passive* instruments of another's feelings and ideas, as to enable them to become the *active* agents in their own guidance by the exercise of their own faculties. But no reflecting person can have much experience in observing and directing the youthful mind without becoming fully

alive to the superiority of the latter method. Indeed, the greatest improvements effected of late years in scholastic education have mainly proceeded from acting on the principle of direct exercise to a much greater extent than formerly, and making the pupil the active instrument in the development of his own mind, and in the acquisition of his stores of knowledge; and it is the extension of this principle to the *nursery*, in common with the school, that I now earnestly advocate. Common sense itself may teach us that if, from misplaced and ill-judged tenderness, we contrive with over-watchful care to forestall every wish and gratify every feeling of the child, without allowing it the satisfaction of actively contributing to its own gratification—if we try at every moment to draw its attention from what pleases itself to what we consider a better source of enjoyment—we not only deprive it of the higher pleasure of gratifying its spontaneous activity according to its natural wants and inclinations, but deprive it of the proper incitement to the very form of mental exercise which is best calculated to develop and improve its powers. The instinctive readiness with which a child, on seeing anything done, cries out, "Let me do it too!" suggests to us the propriety of making a more extensive use of the same tendency in conducting its education.

Another evil inseparable from the method of doing everything for a child, instead of allowing him, to the greatest possible extent, and even at the occasional cost of a little temporary suffering, to be the agent in his own education, is, that when trained to act only under surveillance, he becomes useless and bewildered, or falls into mischief, whenever the watchful eye is withdrawn, as sooner or later it must be. He is trained to regulate his

conduct by the uncertain will and feelings of another, and not by a standard which is at once known and always accessible to him. In other words, he is trained to *moral slavery;* and the more perfect the discipline, the more will his mind partake either of the feebleness consequent on entire subjection, or of the rebellious perversity which fits him for becoming a tyrant in his turn.

In the moral management of infancy, then, the great aim of the mother ought to be, to call into due activity the various feelings or emotions, as well as intellectual powers; since it is chiefly on the well-regulated and harmonious operation of all the mental faculties that the future character, usefulness, and happiness of the child depend. But although the infant, even from its earliest days, should be induced to minister, as far as possible, to the gratification of its own wants, this by no means implies that it should be encouraged or allowed to follow every whim, whether right or wrong, well or ill timed. On the contrary, *obedience* and *self-denial* ought to be among the earliest of its lessons; but the requisite discipline should be enforced by giving *insensibly* and *kindly* a right direction to the impulses and desires, rather than by meeting them with a rude denial.

CHAPTER XVI.

FURTHER REMARKS ON THE MORAL MANAGEMENT OF INFANCY AND CHILDHOOD.

HAVING stated my views of the mental constitution in infancy, and expounded some of the principles by which I think we should be guided in our endeavours to promote the welfare and improvement of the young, I now proceed to offer some additional remarks, illustrative of the application of those principles to the ordinary management of the nursery and domestic circle.

From the many examples which are continually to be met with of the mother's influence over the mental condition of her offspring, it has often been affirmed that bad temper, strong passions, and even intellectual peculiarities, are communicated to the infant *through the medium of the mother's or nurse's milk*, and that hence it is of great consequence, in choosing a nurse, to select one of a cheerful and amiable character. But in all the cases of this kind which have come under my observation, the supposed influence of the milk on the dispositions of the nursling, was much less evident than that of the moral infirmities and defects of temper in the parent, in exciting, and educating to frequent and vigorous action, the correspond-

ing passions in the child. Many sensible people imagine that they may say or do anything in the presence of an infant, because it is too young to observe or to be affected by it. But, according to the principle explained in a previous chapter, this is a great mistake. It is true that an infant is unable to form a sound intellectual opinion of any occurrence; but it is not less true that from a very early age, as shown by the case quoted from Madame Necker de Saussure,* its feelings respond to the calls made upon them, and thus give a bias to the mind long before the child can exercise any act of judgment. From the natural relation which exists between the different mental faculties and their stimuli, it is thus most important that the circumstances in which the young are placed during the impressible period of infancy, should be such as tend to call into fit and habitual action the best feelings and faculties of our nature. Since the best cultivation we can give to the moral and intellectual powers is that which secures their regular and frequent exercise, it follows that the character and dispositions of the child will in no small degree be influenced by the character and dispositions of those to whose care it is confided, and in whose society it spends the earliest years of its existence.

It is, moreover, a common and pernicious error in modern education, to imagine that the passions and moral emotions *are the results of intellectual cultivation,* and that intellectual discipline, and storing the mind with precepts, will suffice to regulate them. Parents are often disappointed and displeased with a child, when, after a full explanation of the impropriety of the feeling or passion, it still, on the recurrence of the temptation, gives way to it as much as before.

* See above, p. 186.

Fortunately for mankind, however, morality and religion have a much more solid foundation than this; they are based on feelings implanted in the nature of man, which mere intellectual cultivation or neglect can neither generate nor destroy, and the real strength and authority of which will not be fully recognised till they are cherished and developed in more strict accordance with their natural constitution. Like the external senses, the mental faculties must be habitually exercised on their appropriate subjects, before they can attain their due influence over the character and conduct. Almost from birth this principle should be systematically acted on, and the utmost care be taken to secure at all times a healthy moral atmosphere around the young. To do perfect justice to the infant, there is required, on the part of the mother, a combination of cheerfulness, good sense, knowledge, readiness of resource, and unfailing kindness and impartiality, which is not often to be met with. But by aiming at a high standard we shall make a nearer approach to what is required, than if we quietly rest satisfied with whatever occurs. It is lamentable how many mothers there are, who, from indolence or other causes, leave the entire control of their offspring to unqualified attendants, and even themselves indulge in displays of anger or caprice, which never fail to act injuriously upon the infant.

Let us, then, not deceive ourselves, but ever bear in mind that *what we desire our children to become, we must endeavour to be before them.* If we wish them to grow up kind, gentle, affectionate, just, and truthful, we must habitually exhibit the same qualities as regulating principles of our conduct, not only towards them, but towards all; because these qualities act as so many stimulants to

the corresponding faculties of the child, just as light to vision, and odours to the sense of smell. If we cannot restrain our own passions, but at one time overwhelm the young with kindness, and at another surprise and confound them by our caprice or deceit, we may with as much reason expect to gather grapes from thistles, or figs from thorns, as to develop moral purity and simplicity of character in children. It is in vain to argue that, because the intellect is feeble, it cannot detect the inconsistency of our conduct. The feelings and reasoning faculties, being perfectly distinct from each other, may, and sometimes do, act independently;—the feelings may at once condemn, although the judgment may be unable to assign a reason. In many instances, indeed, we are impelled to act before having time to think deeply about the best course to be pursued. In such cases, it is feeling which takes the lead, and in a well-constituted mind it rarely prompts to a course which reason would have refused to sanction. In this result we have another example of the admirable harmony which prevails in the moral as in the physical world, and which renders it impossible to pursue a right course without doing collateral as well as direct good, or to pursue a wrong course without producing collateral evil. If the mother, for example, moved by affection for her children, endeavours to keep any infirmity of her temper in subjection, and ultimately succeeds in placing herself under the habitual guidance of her higher feelings in her conduct, the good which results is not limited to the improvement of the child. She herself becomes healthier and happier, and every day adds to her influence. If, on the other hand, she give way to fits of passion, selfishness, caprice, and injustice, the evil is by no

means limited to the suffering which she brings upon herself. Her child also suffers both in disposition and in happiness; and while, in the one case, she secures the love and regard of all with whom she has to do, in the other she rouses only their fear or dislike.

It is a grave mistake to imagine that it matters little whether the person to whose guidance the infant is entrusted be an active-minded and amiable woman, or one whose good-nature is the passive product of a vacant and indolent mind. If the mother be a right-minded woman, and acquainted with the nature of the being committed to her charge, she will understand how important it is that during infancy her child should be surrounded by persons of intelligence, refinement, and morality, and will see that it is a gross dereliction of duty to devolve her trust on incompetent substitutes. The mother is the natural guardian of her infant's happiness; and if *she*, when able, is neglectful of her duties, is it to be expected that any substitute, however well qualified, can fully supply her place?

In thus attaching a high value to the mother's influence, in preference to, or along with, that of even the best-qualified attendants, I have no wish to speak lightly of the services of a kind, intelligent, upright, and experienced nurse. So far from this, I have great pleasure in stating that I have met with some whom I have considered better qualified for their duties, by temper and knowledge, than the mothers whose place they supplied; and that I have often witnessed as much self-denying and unwearied devotion on the part of nurses to the welfare of their little charges, as it is possible for any human being to manifest towards the offspring of another. The deficiencies with which many of them are chargeable are almost inseparable

from their position in society, and imperfect education; and if, in their ignorance of the laws of the human constitution, they sometimes do mischief when their aim is good, this is what happens almost as frequently with the mothers whom they serve. In pointing out errors, therefore, my object is simply to secure the welfare of the child, and not to throw blame on the nurse for inevitable defects.

But while the behaviour of the mother and attendants *to the child itself* ought to be under the habitual influence of our best feelings, it is equally important that the behaviour of the attendants *to each other* should be in a like spirit. I have already instanced the effect, upon the child, of an angry scold conducted in its presence, although not addressed to itself. The harsh tones grate upon its feelings, and are direct stimulants to its fears, even when it knows not to whom the scold is directed.

Infant-schools have been strongly objected to, because two years of age is considered too early for commencing the business of education. But as practical education and emotional training really begin at the dawn of consciousness, the true question is, whether the child will derive more advantage from the education of chance, or from an education adapted to its natural constitution. Nobody has condemned more strongly than I, the establishment, under the name of infant-schools, of places of confinement, and intellectual and theological cramming; nor can anybody have a clearer perception of the evils they inflict on the young. But such establishments are mere abuses of a thing really good in itself. A fitter instrument for the physical, moral, and religious training of infancy can scarcely be imagined, than a seminary in which the young are brought together, and their affections and finer feelings

called into habitual and pleasing exercise in the regulation of their conduct towards each other in their sports and general conduct, while their physical energies are developed and strengthened by inspiriting and social exercise. In a well-conducted infant-school, intellectual tasks and close confinement are unknown, while the senses and the observing powers are agreeably employed in the gratification of the strong curiosity so natural to that period of life. Objects, or representations of them, should be placed before the child, and its attention be directed to their colours, forms, properties, and uses; exactly on the principle, already so strongly insisted on, of presenting every faculty of the mind with its direct stimulus when we wish to excite it to activity.* But if, instead of thus following the footsteps of Nature, we attempt to convey instruction by language merely, we must beware of regarding the accurate and ready repetition of a sound, as a proof that the thing represented by it is understood. The quick imitative faculty of a child may seize in a moment the sound made by its teacher or companions, and yet its mind may be wandering during all the time of the lesson. I have again and again seen this exemplified in infant-schools, where the proper word was uttered in a sing-song tone at the right place by a child in the act of dropping from its seat asleep; and I have satisfied myself, by varying the question a little, that few even of those who were wide awake and ready with their answers had the slightest conception of the meaning. When children so taught are

* By means of cheap but elegant pictorial and other works of art, the sentiment of the beautiful may be usefully cultivated in schools. When well-directed, this feeling promotes refinement and purity in its possessor. Its ameliorating influence is not sufficiently attended to in the education of the young.

examined out of the routine, their readiness and self-possession forsake them, and their stock of ideas is found to be much smaller than the sample educed by the teacher would lead us to expect. All this, however, is no proof that a proper system of infant training is bad. It only shows that many things which are done in so-called infant training are at variance with sound principles, and that even when a right system is professedly adopted, it is not always carried fully into practice. It shows also the necessity of attending to the state of mind of each individual child, and that teachers must themselves be trained for teaching before their services can be productive of every possible advantage to the pupil.

The public mind has been so long accustomed to associate education exclusively with the idea of intellectual *teaching*, and parents in general attach so little value comparatively to the influence of good *training* in the formation of character, that I cannot, even at the risk of being tedious, abstain from repeating once more that infant-schools, and the habitual society of other children, are, in my opinion, to be prized chiefly for the advantages which they afford for the development and due regulation of the emotional part of our nature. Our affections and moral emotions have direct reference to other human beings, and in solitude cannot find objects to excite or gratify them. We must feel attachment *to some one*, act justly or kindly *to some one*, fear *some one*, be angry *with some one*, and seek the esteem *of some one*. To develop the powers which God has given us, and turn them to purposes conducive to our happiness, we must therefore associate with our fellows, and in our intercourse with them practise habitually justice, kindness, affection, and forbearance.

In solitude, on the other hand, the various faculties have *self* alone for their object; the beings on whom we should pour out kindness and affection, and towards whom we should exercise patient forbearance and justice, being absent, the higher and more disinterested faculties, which contribute so largely to our happiness, are necessarily deprived of their legitimate exercise and enjoyment. And this forms one of the most serious objections to private education.

Before taking leave of the subject of infant-schools, I must refer briefly to a serious mistake which threatens to convert many of them into sources of positive injury to the young. I allude to the subordinate importance which their managers attach to that physical and moral training which ought to be their primary object, and to the prevailing tendency to convert them into ordinary seminaries for scholastic teaching, and for the inculcation of abstruse points of faith which no infant can comprehend. I am quite aware that, in most instances, these changes have been made under the influence of the highest motives. But the course pursued is too palpably in opposition to the natural order of development of the human faculties, to succeed in effecting its aim—that of early implanting a sense of religion in the infant mind. Were the subject to be inculcated any other than religion, should we not act very differently? Suppose that the happiness of a man's life were to depend, not on his religious character, but on the extent of his mathematical knowledge, and on his success in applying it to the regulation of his conduct. The question would then be, How shall we educate him so as to secure, to the greatest possible extent, the knowledge so indispensable to his welfare? Ought we to begin in

infancy by drilling him to repeat the rules of arithmetic, and by teaching him the propositions of Euclid? Should we not rather follow the more rational course of first promoting the healthful development of his bodily and mental constitution, and cultivating his senses and perceptive faculties in the observation of the things around him; and proceed to the study of numbers and mathematical relations and proportions, only when the corresponding intellectual faculties had become sufficiently developed to appreciate them and their applications? Every one will agree that the latter would be the proper course, and that to trouble a very young child with rules of arithmetic and propositions from Euclid would only weary and disgust him. The words of the rules might, indeed, be impressed on the memory, and for a time be repeated with parrot-like accuracy; but not being understood, they would prove utterly barren, and soon be forgotten. If, however, following the order of Nature, we let the earlier years of the child be employed in gaining an extensive and accurate acquaintance with the objects around him, and their properties and phenomena, we shall thereby lay the surest foundation for his future success in receiving instruction in arithmetic and geometry; because then not only will he possess the facts to which the scientific principles are to be applied, but his maturer faculties will be more able to trace the relations among them, and to appreciate the practical value of the knowledge he has gained.

Now, the same principle applies to the religious education of the young. Believing, as I do, that no form of human happiness can be relied upon which does not rest on a sound religious foundation, I am as desirous as any one can be to imprint on the youthful mind, at the earliest

possible age, such a sense of our immediate dependence on God as it is capable of receiving. But, considering the feeble development of the *intellect*, and the activity of the *feelings*, in childhood, it seems to me as hopeless a task to attempt to render a child religious by teaching him to repeat theological dogmas which he cannot understand, as to make him a mathematician by teaching him to repeat the rules of arithmetic, or the terms of a geometrical proposition. But the result will be widely different, if, again following the order of Nature, we *begin* with the careful training of the *feelings* and *affections*, and the direction of the *observing faculties*, which are early in activity; and delay till a maturer age the inculcation of creeds and dogmas, which address themselves to the *intellect*. In this way we may succeed in gradually forming those pure and virtuous habits which constitute the best ground-work for the superstructure of a true and improving religion. If religion consisted wholly in certain outward forms of worship, and in the belief of certain abstruse doctrines, there might indeed be an excuse, although still an unsatisfactory one, for attempting to reverse the order of Nature. But, however important creeds and dogmas may be for guidance in maturer years, or for holding men together in ecclesiastical societies, knowledge of them is far from constituting the most essential part of personal religion, and they are precisely those portions which are least applicable to the period of infancy and childhood. Instead of promoting peace and good-will among men, they have been in all ages the chief sources of that fierce and bitter strife which has so often disgraced the Christian profession—and they will, I fear, continue to be subjects of contention as long as religion shall be made the arena for displays of intellectual

gladiatorship, and matter of deep and abstruse speculation. True religion addresses itself to our highest and purest emotions; in the teachings of Jesus it is always the keeping of "*the heart*" that is emphatically spoken of as its vital essence, and at no period of life can that object be more successfully prosecuted than in infancy. Religion, then, not only may, but ought to be taught even from early infancy; but it is with the religion of the heart or affections that we must begin. The obligations to honour father and mother, to do justly and love mercy, to forgive injuries, to do good to those who hate us, and to abstain from envy and uncharitableness, are as integral parts of true religion as the duty to worship the only true and living God. The habitual fulfilment of most of these obligations depends, however, much more on the proper discipline and regulation of our moral nature, than on intellectual eminence or attainments; and hence, our success in performing them in mature life will depend, in no small degree, on the extent to which we have been trained to practise them in childhood, when the feelings can easily be bent in a right direction. We have the assurance that if we "train up a child in the way he should go, when he is old he will not depart from it;" but the promised result is to be consequent on *training the child*, and not on merely teaching him either doctrines or forms. Let us not, then, be alarmed by the frivolous and yet common objection, that religion would be endangered if infant-schools were limited to their proper objects of physical and moral training. The very reverse is the truth; for the surest basis on which religion can rest in early life, is the lively influence of its practical spirit in the love and affections of the child. For fostering this spirit, there can scarcely be a fitter means

than a well-conducted infant-school—except, indeed, the habitual and varied intercourse of a large and well-regulated family and social circle, in which the young are brought together, and their affections and nobler feelings are called into frequent and pleasing exercise, both by the habitual example of their parents and associates, and by their own direct training for the duties of social life. In childhood the domestic example exhibited in the habitual regulation of the feelings, character, and conduct of all around, in accordance with the dictates of a pure and elevated religion, will, when occasionally accompanied with a simple explanatory remark or anecdote, do more to stamp a similar character on the impressible mind of a child, than the learning by rote of the whole creed and doctrines of the Church. All experience shows that the infant is easily touched by a simple and direct appeal to its feelings, but remains unmoved if addressed only through the medium of words which its unformed mind is incapable of understanding or appreciating.

From the exposition which has been given in the preceding pages, it will now, I trust, be evident that whatever acts upon the senses of a child, interests its feelings, or attracts its observation, must influence its mental state, or, in other words, become a means of education. Even the locality and climate in which a child lives, the objects by which it is surrounded, the ordinary occurrences of the nursery, the spirit which they exhibit, and the very toys with which it amuses itself, exert an influence on its constitution, and, under the direction of an enlightened mother, become a means of educating its feelings and its intellect. "In caressing a dog or a cat in the presence of

a child," says the acute observer already frequently quoted, "we develop that sympathy which the young so easily experience for animals; by showing him a beautiful object, and getting him to look at it in detail, we both strengthen his attention, and excite in him admiration, which is one of the most exalted movements of the soul; by placing imitations or pictures before him, we awaken his imagination; and so in a thousand different ways we may appeal to his dawning faculties. When once the mind has been put in play by some impression, he associates it with himself, and acquires clearness and precision of perception by occupying himself with it. It is thus that he exercises and forms himself. To vary, without excess, the sensations of the infant, always embracing his moral nature at the same time to the utmost possible extent, constitutes the real education of the intellect in early infancy. It is also the best education for the moral feelings, which at that age ought to be most assiduously cultivated."*

In the preceding pages I have dwelt much on the greater facility with which the mental faculties are called into action by presenting to them their own direct objects than by any other means. But obvious as this principle is when broadly stated, and beautifully as its influence in strengthening the faculties, by exciting them to lively activity, is illustrated in the above quotation, it is surprising how little it is generally appreciated or intentionally applied by parents, or even by professional educators. Thus, I have seen parents deliberately encourage the pigmy passion of an infant against some animal or plaything, because it amused them to contrast

* Necker de Saussure de l'Education Progressive, vol. i. p. 158.

the violence of his rage with the impotence of his efforts to give effect to it—without entertaining a suspicion that in so doing they were assiduously cultivating his worst passions.

Another rule arising out of the natural constitution of man, and which is important in the moral and intellectual management of infancy, is, *to give due exercise to all the faculties, and not to cultivate any to excess, while others are allowed to languish from inaction.* It is the more important to bear this rule in mind, because it points to an error very frequently committed. If the moral faculties were as assiduously exercised in infancy as the feelings of vanity, self-esteem, cautiouness, secretiveness, and wonder, there would be a much more rapid advance than there is in the morality of mankind.* In infancy, the moral feelings respond readily to any call made upon them; and if children were not so habitually perplexed by the contrast between the *precepts* and the *conduct* of those around them, those feelings would become daily more influential over them, and at last gain paramount power in regulating the ordinary actions of life. Of this ruth the works of Wilderspin, Stow, Barwell, and others, on infant education and training, afford numerous instructive examples; and I

* The sentiment of justice (conscientiousness) is active in many children at an early age, but is often blunted before maturity by the outrages to which it is exposed in ordinary life, more frequently from its nature not being recognised by the parent than from any intentional breach of morality. Hence the prevalence of fraud, falsification, and deceit in every trade and profession, notwithstanding the checks imposed by municipal inspectors, and by all the custom-house, excise, and other regulations which have ever been, or ever will be, devised. This sentiment stands more in need of improved domestic and social training than any other.

regret that my limits preclude me from doing more than referring to the pages of these writers.* To most parents, their perusal and study will be highly instructive. It is gratifying to see sound educational principles at last applied so intelligently and successfully to moral and religious, as well as to intellectual training. The former, although the more important of the two, was long unaccountably overlooked; and it is one of the many services rendered by Phrenology to the cause of human improvement, that it places the necessity of moral and religious training, and the means of conducting it, in a clearer light than they were ever placed before.

It is of much importance to begin the moral training of the young by suitable exercise of the different feelings and emotions *from their earliest dawn;* and not to allow any of the propensities to gain an undue ascendency by habitual indulgence, while the kindlier feelings remain weak from inactivity. Knowing from experience how susceptible the infant is of mental as well as physical impressions, we ought to be more careful about the proper treatment of its moral nature; for just as certainly as the sight or hearing may be cultivated, by reiterated exercise, to the nicest and quickest sensibility, or be enfeebled and blunted by inaction, so may the feelings be modified in strength, rapidity, and precision of action by habitual use or disuse.

Variety of occupation is another important means of success in infant education. In early life, the nervous

* Wilderspin's "Infant Education."—"The Training System of Education, Religious, Intellectual, and Moral, as established in the Glasgow Normal Training Seminary. By David Stow, Esq."—Mrs Barwell's "Nursery Government."—Bray's "Education of the Feelings."—Simpson's "Philosophy of Education."—Warne's "Phrenology in the Family."

system is too mobile and excitable to admit of long-sustained effort in any one direction—a fact of special moment in the education of children in whom the mental powers are feeble. The very restlessness and impatience which ensue when we attempt to fix the attention of a child for a long time on one subject, afford a clear indication that variety of occupation and amusement is the means intended by the Creator for ensuring due scope and exercise for all the faculties. Even so early as the fifth or sixth month, the child, when awake, is always looking, listening, feeling, moving, and giving expression on its ever-changing features to a variety of mental emotions. At one moment we see the smile of affectionate recognition on the entrance of its mother; at another, the playful enjoyment of muscular motion in its limbs; at a third the delight of gratified wonder and curiosity, arising from the handling or tasting of some new object; at a fourth, peevish dissatisfaction from being thwarted in some wish; at a fifth, gratified affection, roused by the unexpected appearance of a little brother or sister; and at a sixth, the fear of some unprepossessing stranger, from whose approach it shrinks in alarm. True, it cannot express its feelings in words, but to the intelligent mother every motion is as perceptible as if uttered in the plainest language. And if it be granted that such is the variety of active feelings in the infant mind, can any one maintain that the right or wrong direction of these feelings, or the means by which a right direction may be most certainly given, is a matter of little importance to the future happiness of the child? It ought, I repeat, to be constantly borne in mind, that the due exercise, upon their appropriate objects, of all the affections and moral emotions, is as indispensable to their development and

strength, as exercise of the intellectual powers is to intellectual proficiency; and that harm must result when the mode of life or management is such as to keep a few only of the mental faculties in preponderating activity, to the repression of those which are not exercised. This result is most likely to ensue where a child has no companions, and is without variety in its daily life; care should therefore be taken to guard against these evils, particularly when the tuition is private.

PROGRESSIVE DEVELOPMENT OF THE MENTAL FACULTIES.—In exercising the different powers of the mind, we should attend to the *degree* in which they are respectively developed at the different stages of infancy and childhood, and adapt their management to their relative maturity. Every one is familiar with the fact that the external senses are not all equally developed at the same time, but appear in succession. The same thing holds with the mental faculties; they also are developed in succession, and arrive at maturity at different ages. This is too much overlooked in practical education.

In the case of the *external senses* the power of sensation is observed to be directly proportioned to the degree of maturity of their respective organs. Such animals as both see and hear perfectly at birth, do so simply because the organs of both senses are already fully developed. Others remain blind for several days, and acquire by slow degrees the power of distinguishing objects. So also the human infant feels before he sees or hears, and both sees and hears before he seems to smell. These results are always in harmony with the state of the respective organs. The nerves of feeling are well developed before the eye or ear is

matured; and the eye and ear are already well organised while the nose remains flat and small, and the nostrils are of limited extent. If, however, light were shut out from the eyes, and the other senses were never exercised, the development of their organs would be greatly retarded, and their vigour considerably impaired. Hence, both conditions must be taken into account, and the exercise of the sense ought always to bear a relation to the condition of its organ.

On observing the operation of the *mental faculties* generally, we find that they also are developed in succession, and that the organs of those of them which are manifested earliest arrive at maturity sooner than the others. The child observes long before it compares and reasons, because the organs of the perceptive are matured before those of the reflecting faculties. For a similar reason, it feels and appreciates affection and kindness before it experiences the sense of justice, the love of praise, or the desire of gain. From a very early age the infant shows an irresistible tendency to *imitation*, or to do as those around it do; and if this be not rightly directed, it becomes as active an instrument in the formation of bad, as it may be made one of good habits.

As pleasure always accompanies the legitimate exercise of a faculty, the natural way to procure healthy enjoyment for a child, is to allow the different faculties to work upon their appropriate objects. Not aware of the real constitution of the human mind, many parents act in opposition to this principle, and seek to amuse the infant at one time by exciting its external senses, at another by dandling, and at a third by some vivid appeal to its wonder. As already remarked, most parents are too little alive to the value of

self-action and *self-regulation* as the grand means in the formation of character. They are apt to be too officious. They generally do too much, and cannot make up their minds to leave Nature to do her part. "I believe that we often agitate infants too much," remarks, most justly, Madame Necker de Saussure: "we ought not to let them weary, it is true; ennui is a lethargy of the soul; but what constantly brings on this malady is the very excess of distractions with which we think it right to overwhelm the infant. The contrasts are reproduced by each other; and the less excited state is the only one which can be indefinitely prolonged. The more serenity an infant has enjoyed, the more will he afterwards have. That disposition may be rendered permanent, but it is far otherwise with excited gaiety. Even with the children who are fondest of it, gaiety is but a fleeting visitor. It ought always to be welcomed, and sometimes gently invited; but, once present, it ought not to be continued to excess. Immoderate, it is followed by tears, and shakes the delicate nerves, which soon oscillate in the opposite direction."

These judicious remarks are particularly applicable to the case of children of a nervous, excitable temperament. I have often observed the injury inflicted by the restless over-anxiety of parents to excite and amuse very young children, and am convinced that it is a frequent cause of that nervous susceptibility which forms a prominent feature of the constitution, being often continued through the remainder of life, and ultimately becoming the source of great distress of both mind and body. Morally, also, it inflicts an injury, by cultivating the selfish feelings. When a child finds itself unceasingly the object of the exclusive attention of those around it, it comes, in time, to rely

wholly upon them for its comfort and entertainment, and to regard them as present for no other purpose than to gratify its desires and devote themselves to its caprices. Its self-esteem, thus early and assiduously fostered, becomes daily more dominant and exacting; and, in proportion as the infant feels its power, it becomes a tyrant in its own petty sphere. The mother who, in the mean time, lavishes all her affection upon its gratification, in the hope of a rich return of love and regard, is wounded and disappointed in reaping only coldness and indifference. And yet, upon the principle that every faculty is strengthened by exercise on its proper objects, what other result could reasonably be hoped for? The practice of yielding everything to the wishes of the child, is naturally a source of future unhappiness, and not of enjoyment. It cultivates self-esteem and love of power, and blights rather than fosters affection. No wonder, then, that the selfishness of pampered pride, instead of the expected beaming of affection, should be eminently the characteristic of spoiled children. The sentiment of self-esteem, in due proportion, is essential to dignity of character—pride and arrogance are its abuses. In some children it is so weak that they need to be encouraged and brought forward, but in general it requires judicious training rather than cultivation.

When, again, in our whole intercourse with children, we occupy ourselves exclusively with their feelings and doings, their dress and appearance, but make little or no effort to draw forth their kindness and good feeling towards others, or to teach them the pleasure of fulfilling duties even at the cost of present self-denial, what can we expect but that they should become the constant subjects of their own thoughts, and the slaves of a contemptible vanity?

We educate them to selfishness, self-conceit, and a passion for admiration, and are disappointed at the success of our efforts!* By nature, however, a child is by no means exacting and selfish. It feels its dependence from an early age, and, rightly treated, it will not only repay kindness with kindness and gratitude, but be ready to sacrifice its own wishes to gratify those who have established a claim upon its affection. But where the good feelings of an infant are not called into play by genuine maternal benignity, and its will is yielded to simply from weakness and in order to obviate discontent, the amiable emotions necessarily languish for want of exercise. Here, then, we have the selfish feelings actually strengthened, and the higher feelings indirectly weakened;—and what can be the fruit of such treatment but general deterioration of the infant's dispositions, and that perversity of character of which we hear the parents, whose conduct has fostered it, so pathetically complain?

Contrasting such management with that of an infant treated from the first with the same kind intentions, but with greater intelligence and higher moral principle, how

* Most young children are peculiarly sensitive to praise and blame, and this feeling may be made the means of much good, as well as of much harm, according to the good or bad training of the child. In domestic management the sentiment of love of approbation is more abused, because more easily acted on by the means at hand, than almost any other faculty we possess. When well directed, it gives a desire for the *deserved* good opinion of others. When in excess, it leads to vanity and an insatiable love of distinction, without much regard to merit, or the honesty of the means employed to attain it. In schools and families it is greatly abused in the shape of a vicious emulation in the former, and the lavish praise of dress, personal beauty, cleverness, or accomplishments in the latter. The natural consequence is the tendency now so prevalent, to consider *what people will say or think* of our conduct, rather than *what is in itself right and proper*.

different do we find the result! Let the mother exercise a salutary control over the selfish desires, and steadily oppose what she feels to be wrong, while every means of legitimate gratification is kindly, cheerfully, and ungrudgingly bestowed; and the child will display in return, not only affection, but a *confidence* in its parent's kindness, which is never shown in the other case, and which affords a striking indication of the accuracy with which even an infant can discriminate the natural language of human feeling.

LAWS OF MENTAL DEVELOPMENT.—The only other principle in the education of infancy to be noticed at present, is one upon which I shall touch very briefly, both because it is in some measure implied in those already considered, and because I have treated of it more at large elsewhere.* It is simply, that *the development of the human faculties, and the formation of human character, take place according to fixed laws,* imposed by the Creator for the regulation of both mind and body; and that, to be successful, our endeavours to modify either must be made in conformity with the Divine arrangements. By attending to the conditions under which any organ or function is fitted to act, we may modify or improve its action; but in no case can we alter the nature of the function itself. We may modify, but we can neither annul nor create. Accordingly, it is indispensable to success in education that we adapt our means in such a manner to the nature of the being to be educated, as that they may be in perfect harmony with

* See my work on "Physiology applied to Health and Education," where I have entered more deeply into the general subject of the training of the young than I could properly do in the present volume.

the laws of its constitution, so that these laws may themselves become the instruments, as it were, of attaining the desired result.

In ordinary life, this principle, chiefly from ignorance of the human constitution, is often wholly overlooked, and we hear even sensible men talking as if they could implant or eradicate any mental quality at pleasure, while at the same time they employ the most heterogeneous methods to accomplish their purpose.

Each of our faculties is implanted in us by the Creator, with a definite constitution and a definite function; and we can no more add a new feeling or a new power by education or other means, than we can cause apples to grow on one branch of a fig-tree and plums on another. Man will never stand in a right position towards God or towards his fellow-creatures, till he regard himself and the world around him as placed from the beginning in definite relations to each other, and governed by laws emanating from a Wisdom and Beneficence which, though it is impossible for him fully to scan it, he ought humbly to study, and gratefully to venerate, admire, and obey. If he do this, and seek, in the simple spirit of faith and truth, to fulfil the plan marked out in legible characters by the finger of Providence in the laws of the animal economy, he will assuredly reap comfort and improvement from his endeavours. But if he presumptuously step beyond this, and attempt to fashion himself or others according to laws and fancies of his own, he will not less assuredly and deservedly reap pain and trouble for his reward.

To enter fully into the subject of the moral and intellectual management of infancy and childhood would require

an extent of detail sufficient to fill a volume. All that I have been able to do here is to direct attention to *principles* by which those may profit who are engaged in this most interesting and important occupation. If these principles are kept in view, intelligent parents and teachers who know something of the constitution of the human mind, will experience many facilities in soliciting the activity of the different faculties, and directing them in their natural channel, and will soon, by repeated observation, discover the appropriate stimulus to each.

Before concluding, I ought perhaps to apologise for some repetitions into which I have been led by an earnest desire to render this work available to parents as a practical guide in the discharge of their important but difficult duties. In some places I have insisted with perhaps wearisome iteration upon truths and principles which, when broadly stated, meet with almost universal assent, and which therefore may seem to be familiar to everybody. But I have done so intentionally, from having often observed with pain, how wide a difference there is between *knowing* a thing as a fact, and being impressed with the importance of *turning it to practical account* in the affairs of life. By a common error in education, we are led to estimate the mere possession of knowledge as all that is required of us, and to overlook the still higher interest attaching to its *uses* and *applications*. Hence, in one sense, we may be said to be familiar with many things which, strictly speaking, we know but very imperfectly; because, looking upon them as isolated objects, we remain blind to the reality of their influence. In practice, examples of this are of daily or hourly occurrence; and it is with the

hope of rousing the attention of my readers to the necessity of a more comprehensive study of the subject, that I have ventured upon repetitions which I should otherwise have considered unnecessary. In a work not merely to be read and thrown aside, but to become the nursery companion of the mother, a degree of completeness in its separate parts was required, which occasionally called for repetition of what had gone before. But as utility has been my aim throughout, and everything was to be risked to secure it, I trust that the fault will be excused if in any instance repetition has been carried to excess.

APPENDIX.

APPENDIX A, p. x.

Medical Opinion on the Importance of teaching Physiology and the Laws of Health in Common Schools.

In order to remove doubts as to the usefulness of an elementary knowledge of physiology and the laws of health being made a part of general education, and as to the possibility of its being taught "with the utmost facility and propriety in ordinary schools," the following document, signed by sixty-five of the most eminent physicians and surgeons in London, including the professors of Anatomy and Physiology, was addressed in the year 1853 to Lord Granville, as Lord President of the Privy Council, with the object of inducing his lordship to require the teachers of schools under Government inspection to possess such a knowledge of physiology as would enable them to communicate it to their pupils :—

"LONDON, *March* 1853.

"Our opinion having been requested as to the advantage of making the elements of human physiology, or a general knowledge of the laws of health, a part of the education of youth, we the undersigned have no hesitation in giving it strongly in the affirmative. We are satisfied that much of the sickness from which the working-classes at present suffer might be avoided; and we know that the best-directed efforts to benefit them by medical treatment are often greatly impeded, and sometimes entirely frustrated, by their ignorance and their neglect of the conditions upon which health necessarily depends. We are therefore of opinion, that it would greatly tend to

prevent sickness, and to promote soundness of body and mind, were the elements of physiology, in its application to the preservation of health, made a part of general education; and we are convinced that such instruction may be rendered most interesting to the young, and may be communicated to them with the utmost facility and propriety in the ordinary schools, by properly instructed schoolmasters."—Here follow the signatures.

Appendix B, p. 9.

Marriages of Consanguinity.

Some late writers in this country, as well as in France, Germany, and the United States, have called in question the sufficiency of the proof of the generally received opinion that the marriage of near relations is in itself—*i.e.*, independently of weakness or morbid taint in the common stock—a source of degeneracy in the offspring. Prominent among these is Dr Gilbert W. Child, who has written ably on the subject in the *British and Foreign Medico-Chirurgical Review* for April 1862, p. 461, and more fully in the *Westminster Review* for July 1863, p. 88. The later article is reprinted in his *Essays on Physiological Subjects*, London, 1868, with a Note in which he quotes confirmatory observations by Dr John Davy, and an opinion to the like effect expressed in 1861 by Von Baer at a scientific congress in Gottingen. Another advocate on the same side is Mr William Adam, in the *Fortnightly Review*, vol. ii. p. 710, and vol. iii. p. 74. But the careful and extensive investigations of Dr Arthur Mitchell, published in the *Edin. Med. Jour.*, March, April, and June 1865, and in *Mem. of the Anthrop. Soc. of London*, vol. ii., tend rather in the opposite direction. However this controversy may end, the wisdom of avoiding such marriages will remain manifest from the frequency with which weakness or morbid taint, either obvious or latent, occurs in families, and the admitted tendency of close breeding to intensify these and other peculiarities of the race.

Appendix C, p. 35.

Mortality in Infancy.

In the returns mentioned in the text the deaths in infancy are compared with the total deaths at all ages, and as the proportion of children to adults varies very much in different communities this is a fluctuating standard. To estimate fairly the actual rate of mortality in infancy, the number of children dying must be compared with the total number alive, at the same age. This is done in the following table, which has been kindly constructed for us by Dr Farr, of the Registrar-General's Office, and in which he compares the numbers born alive with the numbers dying, in each of the first five years of life, in all England, in 63 healthy districts of England, and in Manchester :—

Of 100,000 *Children born alive, the numbers alive and the numbers dying, in each of Five subsequent years, in England, in Sixty-three healthy Districts of England, and in Manchester, are as follows :—*

Ages.	In England, from 1838–44.		In Sixty-three healthy districts of England, from 1849–53.		In Manchester, from 1838–44.	
	Out of 100,000 children born, the numbers living at each age under 5 years.	Numbers dying in each year of age.	Out of 100,000 children born, the numbers living at each age under 5 years.	Numbers dying in each year of age.	Out of 100,000 children born, the numbers living at each age under 5 years.	Numbers dying in each year of age.
Year.						
0	100,000	14,588	100,000	10,295	100,000	26,892
1	85,412	5,378	89,705	3,005	73,118	11,486
2	80,034	2,914	86,700	1,885	61,632	4,680
3	77,120	1,944	84,815	1,305	56,952	3,236
4	75,176	1,407	83,510	1,051	53,716	2,267
Total No. dying in the first five years of age,		26,231	Total No. dying in the first five yrs. of age,	17,541	Total No. dying in the first five yrs. of age,	48,561

Thus, supposing 100,000 of the children belonging to 1838, born in England on the 1st of January of that year, it will be seen, by reference to the table, that on the 1st of January 1839 only 85,412, and on the 1st of January 1840 only 80,034, would be alive; so that, in the first year 14,588, and in the second year 5,378, must have died. Again, of 100,000 children born in sixty-three healthy districts of England on the 1st of January 1849, only 89,705 would be alive on the 1st of January 1850, and only 86,700 on the 1st of January 1851; so that in the first of these two years 10,295, and in the second year 3,005, of the children had perished. In Manchester, matters are far worse. Of 100,000 born in that populous city on the 1st of January 1838, the table shows that, at the end of that year, only 73,118 would be alive, and at the end of the second year only 61,632 would be living. So, throughout the five years, the rate of mortality may be compared. The general result may be thus stated:—Of all the children born alive in England, 14½ per cent. die in the first year, and nearly 20 per cent., or one-fifth, within the first two years; while in Manchester, more than 26½ per cent. die within the first, and upwards of 38 per cent. within the first two years. Comparing the whole period of the first five years of age in England and Manchester, it will be seen that of all the children born alive throughout England, 26 per cent., or more than one-fourth, and in Manchester, upwards of 48½ per cent., or nearly one-half, die within the first five years; while in sixty-three healthy districts in England not more than 17½ per cent. die in the same period.

The following table is extracted from a paper by Dr Farr on the Mortality of Children, in the "Journal of the Statistical Society," part I. vol. xxix., March 1866:—

Average Annual Rates of Mortality, per 1000 *living, of Children in the Principal European States.*

European States.	Years.	Under one year of age.		Under five years of age.	
		Males.	Females.	Males.	Females.
Norway	10 years, 1851–60	...	...	43·2	38·4
Sweden	2 „ 1860–61	152·8	130·4	54·8	48·0
Denmark . . .	5 „ 1855–59	151·4	123·1	56·2	49·1
England . . .	10 „ 1851–60	203·4	161·5	72·4	62·7
Belgium	10 „ 1851–60	...	...	80·0	69·8
France	5 „ 1856–60	242·1	203·6	83·7	74·6
Prussia	3 „ 1859–61	...	...	87·3	77·5
Netherlands . .	4 „ 1858–61	258·7	216·0	96·5	85·8
Austria	2 „ 1856–57	...	...	110·9	97·0
Spain	5 „ 1858–62	249·6		...	...
Italy	1 year, 1863	294·8	251·4	119·5	107·4

Appendix D, p. 37.

Effect of Sanitary Measures in lowering Death-Rates.

The value of sanitary measures in improving the health of those towns which have availed themselves of the Public Health Act, is shown in a striking manner by the following table :*—

Name of Towns.	Death Rates per 1000		Number of Lives saved per 1000 per Annum.
	Before application of Public Health Act.	After application of Public Health Act.	
Alnwick	35·2	28·3	6·9
Barnard Castle . .	33·3	25·9	7·4
Berwick	28·5	21·2	7·3
Bangor	35·1	30·9	4·2
Durham	26·0	22·7	3·3
Ely	25·6	19·3	6·3
Salisbury . . .	32·2	27·0	5·2
St Thomas's . .	26·9	23·0	3·9

* Practical Results of Sanitary Legislation in England; in "Companion to the British Almanac," published by the Society for the Diffusion of Useful Knowledge, 1859; Art. iii. p. 67.

The preservative effects, in early life, of improved treatment and greater attention to sanitary arrangements are nowhere more evident than in the city of London. In M'Culloch's "Statistics of the British Empire,"* we find a table quoted from Mr Edmunds, "showing the total births and the deaths under five years of age, according to the 'London Bills of Mortality,' for 100 years, in five periods of twenty years each; also, showing the number dying under five years out of 100 born;" the results of which, obtained, according to Dr Farr, by an unexceptionable method, "demonstrate that, for the last century, the mortality of children in London has been constantly on the decline." The table is as follows :—

	1730–49.	1750–69.	1770–89.	1790–1809.	1810–29.
Total births . . .	315,456	307,395	349,477	386,393	477,910
Total deaths under 5 years . . .	235,087	193,694	180,058	159,571	151,794
Dying per cent. under 5 years . .	74·5	63·0	51·5	41·3	31·8

Here it will be observed that the deaths under five years of age have fallen gradually from 74·5 to 31·8 per 100, and we find from the Registrar-General's returns, that a further decrease has taken place, and that the deaths are now so few as 29·41 per 100. This will be seen by the following table for LONDON, within the Registrar-General's limits :—

Registered births and deaths under five years of age, and proportion dying under five years out of 100 born.†	1845–49.	1850–54.	1855–59.	1860–64.	1865–67.
Total births regist.	348,089	401,253	444,460	493,072	328,159
Total deaths under 5 years of age .	111,387	118,329	129,363	149,117	96,521
Dying per cent. under 5 years . .	32·0	29·5	29·10	30·24	29·41

* Fourth Edition, vol. ii. p. 543.

† *Vide* the Registrar-General's Annual Reports.

Appendix E, pp. 48, 140, 147, 168.

Preventible Diseases.

Although it is true that the great mortality of children under five years of age is mainly owing to the deteriorating influences of crowded unhealthy localities and ill-ventilated dwellings, together with the injudicious management of their parents, the immediate cause of death is often acute disease. It is of great consequence, therefore, that parents should be made acquainted with the exciting causes and nature of those diseases which prove most fatal in infancy and early childhood, in order that they may adopt measures for their prevention; and, when these fail, that they may have their attention directed to the disease at its outset, the time when remedial measures are most likely to be efficient.

Mr Simon states that the deaths which occur in excess within five years of birth are mainly due to two classes of diseases:—

1. To the common infectious diseases of childhood,—measles, scarlatina, hooping-cough, and small-pox,—prevailing with unusual fatality.

2. To the endemic prevalence of convulsive disorders, bowel-complaints, and inflammatory diseases of the lungs.

We shall notice only the second class.

How much yet remains to be done in the management of children, appears from the fact that *convulsive diseases, diarrhœa, and inflammatory diseases of the lungs,*—which are all preventible diseases—destroy by their conjoint operation 72,000 children a year, thus causing about a sixth part of the total annual mortality of England!

Nervous Diseases.—Two-thirds of the mortality just stated are registered as *convulsions.* The most powerful cause of this class of diseases in infancy has been shown in the text to be breathing a confined and vitiated air; and accordingly, on the slightest threatenings of the disease, no time should be lost in

improving the ventilation of the nursery and bedroom of the child. This constitutes the most essential part of the treatment; and without attention to it, remedies will prove of little avail in the cure of disease. Even in health, it is during the night that the greatest care is necessary to maintain a pure state of air in the nurseries and bedrooms of children, but this is more especially called for when they are labouring under diseases of the nervous system.

Diseases of the Bowels.—*Diarrhœa and Dysentery.*—More than 11,000 children die annually in England of bowel-complaints. Where these diseases prevail with unusual severity or frequency, we are almost sure to find the house drainage bad, or the removal of animal refuse from the vicinity of the dwellings and the sources of water supply not properly attended to. "Cases of infantile dysentery," observes Dr West, "are most numerous and severe wherever these noxious influences are most abundant."* The same causes are found to exist also where diarrhœa prevails among adults. Until these silent but continuously active sources of disease are removed, or the patients withdrawn from their influence, medical treatment will be powerless. The medical attendant, under such circumstances, may do much good by impressing this truth on the minds of the parents, who will be more ready to listen to him while suffering under anxiety for their sick children.

Diseases of the Lungs.—*Pneumonia, Bronchitis, Croup.*—According to the returns of the Registrar-General for 1856, the deaths of children under five years of age from these diseases amounted to 28,763. The immediate or exciting cause of inflammatory diseases of the respiratory organs is exposure to a cold or damp atmosphere. It is not so much, however, the breathing of the cold or damp air, as the chill produced on the sensitive and feeble system of the child by exposure to a current of cold air, which acts rapidly in lowering the temperature. But although exposure to cold air is the exciting cause of the inflammatory attacks on the lungs, pernicious in-door influences give

* Diseases of Infancy and Childhood, edit. 1859.

the predisposition to these diseases, and are the chief obstacles to their successful treatment. The child is too often in a feeble unhealthy state when attacked by the malady, and easily sinks under it, from the powers of the system being at the lowest ebb.—The period of infant life at which pulmonary diseases are most frequent is during dentition, when, as Dr West well remarks, the susceptibility of all the mucous membranes is at its highest point, and when, moreover, diseases of the nervous system are most easily excited. During the first six months of infant life, the mucous membrane of the air passages is endowed with but little susceptibility, and therefore diseases of the lungs are less frequent at this early age than during the succeeding eighteen months; while after the second year, and the completion of dentition, they continue to diminish in frequency and fatality up to puberty. "We are thus taught," Dr West observes, "that a catarrh is a much more serious thing in infancy than in adult age, and also that it is a more serious thing at one period of infancy than at another. They warn us to guard a child, during the time that the process of teething is going on, with double care against all causes that are likely to excite inflammation of the respiratory organs." He further observes, that the susceptibility of the respiratory organs appears to increase in exact proportion to the frequency with which they have already suffered by previous attacks. It must also be borne in mind that bronchitis is apt to occur in the progress of other diseases of childhood, such as *measles* and the *hooping-cough*, and adds greatly to the danger. This is more especially the case in the latter disease, the chief danger of which arises from this complication. To prevent such an untoward occurrence, the child, when it first exhibits symptoms of hooping-cough, should be kept in the house, and as quiet as possible, both mentally and physically, for the first week or ten days, even in summer, and much longer in winter. The diet also should be of the mildest kind. By judicious management in this way, hooping-cough may be rendered much milder and of shorter duration than it is by the usual treatment. Should

the disease occur during dentition, the utmost vigilance and care will be required in the management of the child.

For the greater part of the statistical information contained in this note, we are indebted to the introductory Report of Mr Simon, and to Dr Greenhow's Papers on the Sanitary State of the People of England, referred to on page 42. That Report and those Papers contain much valuable information on our most prevalent and fatal diseases, more especially on the causes and means of prevention of *preventible diseases*—that is, of diseases producing nearly one-half of the mortality of this country.

Appendix F, pp. 76, 85, 122.*

Composition of Milk and other Substances used for Food.

To enable the reader more fully to understand the principles laid down in the text for regulating the diet of infants, it may be useful to append a few details on the composition of substances used for food, especially milk.

All aliment capable of permanently supporting life must contain elements fit to supply the waste of the tissues, and to maintain the temperature of the body. With reference to this double object, food is considered as *nutritive* or as *calorific* aliment, according as its sole or chief use is the nourishment of the tissues, or the support of the temperature.

Heat is a result of the combination of oxygen with hydrogen and with carbon; and hence, any substance containing hydrogen and carbon, in conditions in which they are capable of combining with oxygen in the body, may serve as calorific aliment. Accordingly, sugar, starch, and fat, which are so constituted, combine, when used as aliment, with the oxygen inhaled in respiration; and the products—water and carbonic

* This Note was appended by Sir James Coxe to the eighth edition, which was edited by him.

acid—pass off almost entirely by the skin and lungs, without having entered into the composition of the solid tissues of the body. Their sole office is the generation of heat.

For the nutrition and growth of the tissues of the body, more complex material is needed. The muscles, and animal tissues generally, are composed of oxygen, hydrogen, carbon, and nitrogen; to supply their growth and waste, therefore, substances containing all these elements are required. Starch, sugar, and fat, cannot nourish the muscles—for the simple reason that they are altogether deficient in the important element nitrogen; which, on the other hand, is abundant in albumen, glutin, and fibrin, and in all other animal and vegetable principles capable of repairing muscular waste. It is a remarkable fact that all these principles, wherever found, and whether of animal or vegetable nature, are almost identical in their ultimate chemical composition. Thus the gluten of wheat, the legumin of peas, the fibrin of muscles, the casein of milk, and the albumen of eggs, contain very nearly the same proportions of oxygen, hydrogen, carbon, and nitrogen.

	Carbon.	Hydrogen.	Nitrogen.	Oxygen, &c.
Animal fibrin contains, . . .	52·5	7·	16·5	24·0
Vegetable fibrin, ...	53·23	7·01	16·41	23·35
Albumen (white of egg), . .	53·14	7·10	15·77	23·99
Vegetable albumen, ...	57·74	7·11	15·65	25·50
Casein of Cow, ...	53·50	7·05	15·77	23·68
Vegetable casein, ...	53·46	7·13	16·04	23·37

On the other hand, substances containing these elements in other proportions are incapable of repairing the waste of the tissues, and of permanently supporting life. From this it appears, that the complex nutritive principles must be ready-formed in the food, from which, by the process of digestion, they are extracted and conveyed to the fluids and tissues, where they undergo those changes on the occurrence of which the continuation of vitality depends, and which consist in the gradual

resolution of complex organic atoms into the more simple atoms of the inorganic kingdom.

The term *albuminated aliment* is frequently applied to all the varieties of food capable of repairing waste, albumen being considered as the representative of nutritive material; and the same aliment is also sometimes termed *plastic*, from its giving form to the body. It must not, however, be supposed that albuminated aliment nowise contributes to the support of the temperature of the body. Although calorific (called also *respiratory*) aliment, being destitute of nitrogen, assists only indirectly in nutrition, albuminated aliment, from containing carbon and hydrogen in a condition capable of uniting with oxygen, undergoes oxygenation in the body, and thus heat is evolved.

The food of man unites calorific and albuminated principles; and these we naturally expect to find associated in MILK, from its constituting for several months the sole food of the infant. In this fluid the curd forms the albuminated aliment, while the sugar of milk, and butter, are the calorific principles.* According to the analyses of MM. Vernois and Becquerel, the mean composition of human milk is—

Water,	889·08
Solids,	110·92
	1000·00

These solids are composed of—

Sugar and soluble salts,	43·64
Casein and extractive matter,†	39·24
Butter,	26·66
Salts,	1·38
	110·92

Thus the quantity of respiratory aliment it contains is nearly double that of the plastic aliment.

* Fat, though in one sense a plastic element, is in fact merely calorific aliment, which is stored up in the body when the supply is greater than the demand.

† The term "extractive matter" is applied to some ill-defined animal principles, which, in minute quantity, are associated with the casein.

We must, however, observe that this result is the mean obtained from 89 observations. In individual specimens the amount of solid constituents varies greatly, as well as the proportion which these constituents bear to each other. Thus the maximum of solids found was 147·70, and the minimum 83·33, in 1000 parts; while the quantity of sugar varied between 59·55 and 25·22, that of casein between 70·92 and 19·32, and that of butter between 56·42 and 6·66.

The following table presents a comparison of the average composition of human milk with that of several of the lower animals, and shows at a glance the modifications of composition which would be necessary to assimilate the milk of the latter to that of the human female, supposing the average composition given by MM. Vernois and Becquerel to be the normal composition:—

Animals.	Water.	Solids.	Sugar.	Casein and Extractive Matter.	Butter.	Salts by incineration.
Woman, ...	889·08	110·92	43·64	39·24	26·66	1·38
Cow, ...	864·06	135·94	38·03	55·15	36·12	6·64
Ass, ...	890·12	109·88	50·46	35·65	18·53	5·24
Goat, ...	844·90	155·10	36·91	55·14	56·87	6·18
Mare, ...	904·30	95·70	32·76	33·35	24·36	5·23
Bitch, ...	772·08	227·92	15·29	116·88	87·95	7·80
Ewe, ...	832·32	167·68	39·43	69·78	51·31	7·16

According to Dumas, the milk of carnivorous animals is totally deficient in sugar, and this opinion is probably correct when animal food constitutes the sole aliment. When this is not the case, however, the milk of the carnivora contains also sugar, though in quantity much inferior to that contained in the milk of the herbivora, as appears on comparing, in the above table, the quantity in the milk of the bitch with that in the milk of the other animals. Upon the whole, the milk of the ass approaches

nearest in composition to that of woman; but it is evident from what has already been said as to the varying quantity of the solids, and especially as to the disappearance of sugar from the milk of the carnivora, that the composition of the milk does not so much depend upon the species of the animal as upon the diet on which it is fed. This fact MM. Vernois and Becquerel further illustrate by analyses of different specimens of human milk, which show a great difference in composition between the milk of mothers who were well nourished, and that of mothers who were ill nourished; the latter being more watery, and containing considerably less than the normal proportion of curd and butter.

In practice, it is sometimes found that the milk of a perfectly healthy nurse disagrees with the infant. In such a case, when there is no urgent necessity to change the milk, it is probable that a radical alteration in the diet of the nurse, by either increasing or diminishing her allowance of animal or vegetable aliment, and by changing the hours of meals and exercise, will be followed by the best results; but where the health of the infant will not allow of any delay, the milk should at once be changed. The effect of diet in altering the composition of the milk will be evident from the following example. The milk of a goat, fed on straw and lucerne, was found to contain—

Water,	824·67
Solids,	175·33

the solids being composed of—

Butter,	76·01
Casein and Extractive Matter,	57·50
Sugar,	35·98
Salts,	5·84

When fed on beet-root the composition was—

Water,	887·74
Solids,	112·26

the latter being composed of—

Butter,	31·60
Casein and Extractive Matter,	36·26
Sugar,	38·35
Salts,	6·05

The investigations of MM. Vernois and Becquerel lead them to think that the most frequent cause of the milk of a healthy woman disagreeing with the infant is an excess of solid matter, arising principally from an augmentation of butter, and, in a minor degree, from an increase of casein. It is not, however, asserted that an excess of butter must of necessity operate injuriously on the child; they merely maintain that when an infant does not thrive, an excess of butter will generally be found in the milk. In normal milk, the average quantity of butter is 26·66 parts in 1000; in the milk of nurses whose infants did not thrive, it amounted, on an average, to 33·22 parts. Guided by these indications, we should, in such cases, place the nurse upon a less nutritious diet, by substituting vegetable for animal aliment, and thus seek to supply the infant with a watery but digestible milk, in the place of one which, from its richness, proves too heavy for its digestive organs. In this way a mother whose milk disagreed with her first infant, may be enabled, on future occasions, to nurse with perfect success.

In the text, reference is made to cases in which angry passions or distress of mind produce a change in the milk, most prejudicial to the infant. Whether this effect is due simply to an alteration in the proportions of the constituents of milk, or whether some peculiar poisonous animal matter is generated, cannot easily be determined. However, there is no doubt that the constitution of the milk is, on such occasions, greatly modified, and this fact was demonstrated by chemical analysis in a case which fell under the observation of MM. Vernois and Becquerel. A nurse in the hospital St Antoine lost her only infant by an attack of pneumonia. Before its death her milk was analysed, and found to consist of—

Water,	889·49
Solids,	110·51

the solids containing—

Sugar,	41·52
Casein and Extractive Matter,	44·02
Butter,	23·79
Salts,	1·18

At the moment of its death she was attacked with violent hysterical symptoms, followed in a few hours by intense fever. The milk rapidly diminished, and was found on analysis to be composed of—

Water,	908·93
Solids,	91·07

the solids containing—

Sugar,	34·92
Casein and Extractive Matter,	50·00
Butter,	5·14
Salts,	1·01

It is, of course, impossible to say what effect this altered milk would have produced upon the infant; nor, had symptoms of disease followed, could we with certainty have affirmed that the alteration of composition was their cause. Still, as the alteration proves that the quality of the milk is affected by the condition of the nervous system of the mother, the prudent course, in cases of anger or mental distress, is to abstain from offering the breast to the infant for a day or two, until the milk has had time to regain its normal composition.

In the adult, the functions of digestion are carried on by the action of the salivary, gastric, and intestinal juices. During mastication the saliva is mixed with the alimentary bodies, and it exercises an important influence on the digestion of farinaceous substances. The investigations of MM. Bidder and Schmidt have, however, shown that the salivary secretion of infants, during the first months, acts very feebly, if at all, on farinaceous substances. Hence, when these form part of the diet of the infant, they are received into the stomach in a condition unprepared for undergoing the digestive process, and are consequently very apt to produce unpleasant symptoms. During the first

period of life, then, the digestive organs are adapted for the perfect digestion of milk only, and all deviations from the natural food of the infant are calculated, on physiological grounds, to produce indigestion.

When, from any cause, it becomes necessary to substitute the milk of one of the lower animals for that of the mother, care should be taken not to supply the infant exclusively with the milk which is first or last drawn. In the udder of the cow, for instance, the milk is not of homogeneous composition; for, exactly as in a dish, the cream rises to the top, so that the milk last drawn is always the richest. The difference in the quantity of butter in the first and last portions was found by MM. Vernois and Becquerel to be in the cow as 25 to 60, and in the ass as 6 to 36; while the proportions of sugar and casein scarcely underwent any variation. In woman, from the position of the breasts, the first and last portions of the milk show no difference of composition; but the caution just given may be useful when the milk is supplied to the infant directly from the animal.

The following tabular statements exhibit more distinctly than those already given the relative amount of each ingredient in woman's milk, as well as in that of those animals whose milk is sometimes used as a substitute for human milk. The ingredients are arranged in the order of their relative abundance :—

1. Woman.		2. Ass.	
Sugar	43·64	Sugar	50·46
Casein	39·24	Casein	35·65
Butter	26·66	Butter	18·53
Salts	1·38	Salts	5·24
3. Cow.		**4. Mare.**	
Casein	55·15	Casein	33·35
Sugar	38·03	Sugar	32·76
Butter	36·12	Butter	24·36
Salts	6·64	Salts	5·23
5. Goat.		**6. Ewe.**	
Butter	56·87	Casein	69·78
Casein	53·14	Butter	51·31
Sugar	36·91	Sugar	39·43
Salts	6·18	Salts	7·16

As a general rule, the solids of the milk increase in quantity from the first to the fifteenth day. They are at their maximum during the first two months, and then slightly decrease.

The occurrence of pregnancy or menstruation does not, unless in exceptional cases, interfere with the quality of the milk. Neither does the age of the nurse appear in any particular way to modify its composition. The best age, however, is, on general physiological grounds, between twenty and thirty.

The milk of brunettes contains a greater quantity of solids than that of blondes, and is in general to be preferred. It is also worthy of remark, that when the milk is abundant and flows easily, it is richer in solids than when it is scanty and flows with difficulty. In conclusion, MM. Vernois and Becquerel remark that it is only by chemical analysis that the composition of milk can be ascertained. The determination of the specific gravity leaves the proportion of the different ingredients uncertain, while the microscope is here equally at fault.

We pass over the modifications produced in milk by disease in the mother, as in all cases of illness nursing should at once cease. The medical reader may consult the work of MM. Vernois and Becquerel, *Du Lait chez la Femme*, Paris, 1853.

Appendix G, pp. 89, 150.

Indications afforded by Dentition, of the Constitutional Development of the Child.

The period and progress of dentition demands our attention, not only as regards its influence on the immediate health of the child, but as a visible indication of the child's present constitutional development, and even of its future constitution.

Dr Whitehead of Manchester, who has evidently devoted much attention to this subject, and by whom statistical data on a large scale have been collected, has arrived at the following important conclusions:*—

* Third Report of the Clinical Hospital, Manchester, 1859, by James Whitehead, M.D.

"That in children possessing the advantages of mature intra-uterine growth, untainted parentage, proper nourishment, and healthy locality, the teething process ought to commence at from five to eight months.

"That at the age of fourteen months a child should have ten teeth or more, and that six teeth are the minimum number compatible with good development and favourable prospects at that age.

"That the teething process should, as a rule, be completed in healthy children at the age of two years.

"That *precocious dentition*—that is, the irruption of the *first* teeth before the fifth month—has not in every case a favourable significance, but that, on the contrary, the *precocious irruption* of *all* the twenty teeth is the constant attribute of an excellent state of development. Not a few children who accomplish the teething process at sixteen or eighteen months, or earlier, are able to walk freely at nine months, and are exceedingly strong in all their physical faculties." (Pp. 25, 26.)

The inference drawn by Dr Whitehead from his observations is, that the retardation of teething, and its concomitant ailments, depend more upon the faulty state of the developmental processes generally, than upon local irritation.

Another indication of good or bad development having a close relation to dentition, is the progress of the ossification of the *fontanelle*.

"As a rule, a child of good development, with closure of the fontanelle at fourteen and a half months, has usually at the same time (or ought to have) about fourteen teeth, and has been able to walk firmly several weeks or months; while in one having at this age the fontanelle largely open, it frequently happens that not more than two to six teeth have appeared, and he is unable to walk; and even at the age of two years, when the teething process should be completed, the fontanelle being still open, there are generally not more than eight to twelve teeth.

"The closure of the fontanelle, therefore, gives a fair indica-

tion of the state of the developmental processes, being accompanied generally, with the exception of a few cases of irregularity, by a corresponding condition of dentition, of the faculty of walking, and of the whole physical frame." (Pp. 30, 31.)

"Deviations from the general rule do not unfrequently occur in children of good development, but without a bad significance. The most frequent of these irregularities is retardation of the teething process, sometimes to a considerable extent; but, in such cases, if the fontanelle be early closed, and the faculty of walking duly advanced, there is no need to fear about the after progress." (Pp. 50, 51.)

These observations of Dr Whitehead are very valuable, both in a physiological and therapeutic point of view, and deserve the attentive consideration of the medical practitioner called on to direct the management of infancy. The whole Report merits a careful perusal, on account of both its practical and its suggestive bearings.

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