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A TREATISE

ON THE

PHYSIOLOGICAL AND MORAL MANAGEMENT OF INFANCY.

FOR THE USE OF PARENTS.

MASS. MEDICAL COLLEGE

BY

ANDREW COMBE, M.D.

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PREFACE.

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 their perusal by non-professional persons not unfrequently 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 rules and admonitions as so many abstract and individual opinions, and omitting to connect them with the physiological laws or principles on which they are based, and according to which their effects are produced.

Sensible of these imperfections as detracting from the usefulness, as guides for the non-professional read-

er, of many works in others respects of great merit, I had almost resolved several years ago 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 on 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 now submitted to the public. But how far I have been successful in fulfilling the purposes in view I must leave to others to determine.

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 former writings, to allow as little as possible to rest on mere human opinion, but to show a foundation for every rule, precept, 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 we once succeed in the discovery or elucidation of a truth, that truth will ever afterwards be regarded as an emanation of the Divine will, and the practical conclusions deducible from it 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 we shall often be led to form a very erroneous estimate of its value, and be beset with difficulties in applying it with promptness 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 principles under which it acts, to a traveller who, without a map or a guide, wanders over a new country in search of some particular object or place. By some lucky chance, he may stumble at once upon the locality he is in search of, or reach it at length by some very circuitous route. But the probability is greater 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 adopts the guidance of 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 minor 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 very error caused by its own imperfections.

It is then in the habitual *application of principle* to the inculcation and advancement of knowledge, more than in any absolute novelty of detail, that the present volume will, I hope, be found not altogether unworthy of notice. If I have been even partially successful in establishing the utility of principle in conducting inquiry, I shall not only have assisted in giving a more profitable direction to the labours of others in the

same field must have provided the best means for speedily detecting and rectifying errors inadvertently committed by either them or myself.

In the following pages I have addressed myself chiefly to parents and to the younger and more inexperienced 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, altogether apart from the duties which it imposes on the proper guardians of the young, abounds in interest, and is fertile in truths of the highest practical value and importance. In this point of view, it can scarcely fail to arrest the attention of any thinking and intelligent mind which is once directed to its pursuit.

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CHAPTER I.

INTRODUCTORY EXPLANATION.

Objects of the present publication—to exhibit the principles of Infant Management.—Treatment ought to be adapted to the nature and laws of the infant constitution—this admitted in the abstract, but neglected in practice—exemplified in the race-horse and grey-hound—application to Man.

To those who are conscious of having derived some useful principles of action, applicable to their own guidance, from the perusal of my former works on Health, Education, and Diet, and to those parents whose feelings are naturally much interested in the welfare and happiness of their young families, and who are ready to welcome instruction from whatever quarter it may come—no explanation may seem to be required why I should add another to the many existing treatises on the management of Infancy; and, so far as regards the mere gratification of curiosity, I might, perhaps, have safely entered upon my subject without a word of prefatory remark. But the utility and interest of an exposition of the kind now proposed are greatly enhanced when the reader is made acquainted from the first with the general aim which the author has in view, and with the principles under the guidance of which he attempts its accomplishment. Possessed of this preliminary information, the reader is enabled to fix his attention more readily on the prominent points of the discussion, and is better qualified to estimate, as he goes along, the value of every fact and argument adduced in their elucidation: Whereas, when not provided with any such guidance, he is apt unconsciously to pass over, comparatively unheeded, many things worthy of his very serious consideration, and to fail in perceiving the full meaning or true bearing of others,

on the correct appreciation of which, the safety and soundness of many of their practical applications may wholly or partially depend.

Actuated, accordingly, by reasons of this description, I think it right to state in the outset, that my chief aim in preparing the present treatise, is to present the reader with a more comprehensive and systematic view than we usually meet with, of the *principles* by which infant management ought to be directed. If these be rightly understood, not only will the details of rules and of general advice be attended to with greater punctuality, but the rules themselves will be fulfilled with more intelligence, and with a deeper sense of the responsibility involved in their neglect. When the principles of treatment are traced back to their true and only solid foundation in *the nature and laws of the infant constitution*, the rules of conduct deducible from them come before us stamped with more than human authority. In so far as they are accurately observed and truly recorded, they assume the dignity of positive, though indirect, intimations of the Divine will, and claim from us the same reverential obedience as all the other acknowledged commands of the Almighty. By His omniscience and creative power, every structure has been arranged in the order in which we find it, and by His beneficent wisdom have its laws of action been adapted for our welfare and advantage. If, instead of studying what He has done, and the laws which He has appointed, we prefer groping in the dark, and inventing rules from *our own* notions of what ought to be, we can scarcely fail to wander from the right path, and to bring disease and suffering upon our children and ourselves: Whereas, if, in a simple and truthful spirit, we try to discover the laws written in the very nature of the infant organization, and expressed in the modes of action of its component parts, every step we make will bring us nearer and nearer to our object, and will tend to disclose the mode of treatment best calculated to

secure the safety and promote the permanent welfare of the young.

While thus expressing a conviction that benefit will result from a constant reference to the laws of the in fant constitution, I am quite ready to admit that an immense improvement in the treatment of the young has taken place within the last fifty years, and that, as a consequence, the rate of mortality in infancy has been greatly reduced. But it is equally true that this mortality, although much smaller than formerly, still continues so excessive in amount as to demonstrate the necessity of still farther improvements And the more we consider the past, the more evident will it appear that the chief obstacle to our progress arises from trusting too much to random observation, and neglecting the aid and guidance of principle, by which alone observation can be profitably directed and brought to yield its full harvest of results. Accordingly, among the numerous works now in the hands of the profession and of mothers, I am not acquainted with one which attempts systematically to base its rules of conduct on the laws of the infant constitution, or which gives sufficient prominence to the principle which alone can guide us through the difficulties which beset our path

In the abstract, the proposition on which I insist will meet with almost universal assent. It seems so plain and natural, that every living being ought to be treated according to its own nature, that we should look with amazement on any one who, on receiving the charge of a new and valuable plant or animal, should proceed to treat it according to his own notions of what is right for plants in general, without previously exhausting every possible means of discovering its individual properties and mode of management from persons already acquainted with them, and verifying the opinions of such persons by observation of its habits and structure. And yet, as regards children, this common-

sense mode of proceeding is so indifferently adhered to in practice, that, instead of invariably consulting Nature as the highest authority, we often neglect her dictates altogether, and prefer the mere opinion of the first adviser whom chance throws in our way, although he may be able to give no better reason for the advice he recommends, than that "he thinks so;" and may never have dreamed of inquiring whether it is in harmony with the laws of organization or not. Of this way of proceeding, we have rather an amusing example in the treatment of the grey-hound. In training the race-horse and hunter, a liberal allowance of hard nourishing food is given, and the animals are covered with warm clothing, taken out to exercise, and freely sweated to carry off the soft and juicy parts of the food which would otherwise clog the system. With the horse, this plan succeeds very well; because Nature has adapted its skin for easy and free perspiration when overheated by exercise, and the treatment is, therefore, in harmony with its constitution. But when we apply the same proceeding to the grey-hound, whose skin scarcely perspires at all, and whose tongue and throat are the great outlets of its system, the result is very different. Being unfitted for free prespiration by the skin, the poor animals thus clothed may be seen, in piteous guise, wondering at, but by no means delighting in, their own transformation; and they never seem happy till relieved from the thraldom of their vestments. A horse, on the other hand, will often look pleased and go along as spiritedly and gracefully with his clothing as without it; and very certainly he obtains, from its use under certain circumstances, a comfort and relief which the grey-hound never knows. Here the difference of nature or constitution has been lost sight of; and, merely because both are quadrupeds, have hairy skins, and are made for running, the conclusion has been jumped to, that what is good for the horse must also be good for the dog. But, on the same principle,

the parallel should have been carried farther: and the dog should be fed upon oats and hay, because these rejoice the stomach of the horse.

If we could once bring ourselves to believe, that in man as well as in other animals, adaptation to the laws of the original constitution is the proper standard by which to regulate our treatment of the young, we should derive as much advantage from adhering to it in his instance as we do in that of horses. We acknowledge that the dray and the race horse are different in constitution, and, by treating each according to its own nature, we succeed in adapting both to their true purposes. Let us follow the same method with the offspring of man, and similar success will assuredly reward our pains. Such, accordingly, shall be my aim in the following pages, so far as the extent of our knowledge will permit; and where I shall fall short in attaining it, I shall at least have the satisfaction of having done my best to facilitate and render more profitable the exertions of others.

CHAPTER II.

EXTENT OF MORTALITY IN INFANCY.

Infant mortality great among civilized as well as savage nations—its precise amount shown by statistical returns.—This mortality arises from secondary causes, over which we have control—not from necessity.—Chief causes, ignorance and mismanagement—proofs of this—examples of great mortality, and its different causes—proofs of diminished mortality from improved treatment.—Foundling and Orphan children.—Many causes of bad health existing even in the higher classes.—Necessity of a knowledge of the infant constitution forming a part of the education of females—social position and duties of the parents compared.—Evils of present system, and advantages from supplying the above omission in female education.

I HAVE stated in the preceding chapter, that the successful rearing of every living being depends chiefly on the proper adaptation of its treatment to the laws of its

constitution. Where these are in harmony, the failures will be few and unimportant, and arise chiefly from those unavoidable accidents and exposures to which all created beings are, and will continue to be, more or less subjected. But where the treatment and laws are not in harmony, failure, disease, and untimely death, may be expected as the most frequent and certain results.

Assuming this standard as tolerably fair in its indications, what are we to think of the fitness of a mode of management, under which between a third and a half of all the children born die within the first five years of their lives? Does not a strong presumption thence arise, that some great errors must be committed, to entail such a frightful result? especially when we discover no similar fatality among the young of the animals whose structure most nearly resembles that of man, and which are guided in the treatment of their offspring by an unerring instinct which ensures their safety. If it were only in wild and barbarous regions that this extraordinary mortality occurred, it might seem quite in accordance with the hardships by which even infancy is there surrounded; but the startling circumstance is, that it happens in the midst of comfort and civilization, precisely where knowledge and the means of protection are supposed most to abound; and it is only from our being so much accustomed to its occurrence that it occasions so little surprise, and comes, in fact, to be virtually considered as a part of the established order of Nature, which we can neither alter nor avert.

The first efficient step towards preventing or providing a remedy for an evil, is undoubtedly to obtain a clear idea of its existence and nature. Accordingly, I shall begin by requesting attention to the rate of infant mortality now going on in England, as exhibited in the first and second "*Annual Reports of the Registrar General of Births, Deaths, and Marriages in England,*"

lately presented to Parliament, the authenticity and accuracy of which cannot for a moment be doubted: as the first refers to the year ending June 30, 1838, and the second to that ending June 30, 1839, they possess the additional recommendation of supplying the latest possible data.

It would be out of place in a treatise of this kind, to enter into any detailed analysis of the general results embodied in these very valuable reports. For our present purpose, it will be sufficient to mention that, on making out an average from the returns of the whole of England and Wales, it appears that rather more than ONE-THIRD OF THE TOTAL DEATHS OCCUR UNDER TWO YEARS OF AGE, the exact proportion being 342.54 per 1000 of the deaths registered. (*First Report*, p. 45.)

In Belgium, where also the returns are made with great accuracy, and where the population is in possession of a high degree of domestic comfort and general intelligence, the mortality in infancy is ascertained to be nearly equally great. According to M. Quetelet, 22,472 in every 100,000 die within twelve months after birth; and 29,464 in every 100,000, or more than two in every seven, die within the first two years.

From the Belgian tables, it further appears that *one* in every *ten* infants born alive is cut off *within the first month;* and that, among male children born in towns, only 5738 in every 10,000, or little more than one-half, are alive at the end of five years?* In Manchester, indeed, matters are still worse, for it appears that out of every 1000 deaths of males, no less than 496 are of children under THREE years of age. (*Registrar's Second Report*, p. 9.)

The statistical returns from other countries show similar or worse results. In England, in the year ending June 30, 1839, the mortality within the first twelve months was 218.5 per 1000 of deaths. In Prussia, in

* Quetelet sur l'homme et le developpement de ses facultés.—Paris, 1835. Vol. i. pp. 161–7.

the period from 1820 to 1828, it was in the proportion of 26,944 in 100,000. In France, in 1802, it was 21,457. In Amsterdam, in the period from 1818 to 1829, it amounted to 22,735. In Sweden, in 1821–25, it was 22,453.

It thus appears, that taking the average of the various countries of civilized Europe, where science has made the greatest advances, and the comforts of life are most abundant, and where the treatment of the young is considered the most rational, *two out of every nine* infants ushered into the world die within the first year! Assuming seventy years as the natural term of life, we may form some faint conception from the preceding facts, how many elements of destruction must still be left in full activity, when, as is the case in England, one-third of the race is cut off within the first two years of existence.

Having exhibited the rate of infant mortality on a large scale, and in different countries, it may be not without interest to show its minuter features in a single locality; and for this purpose I shall select the town of Manchester and its suburb Salford. According to the Registrar's Second Report (page 19,) the total number of deaths registered in the year ending 30th June, 1839, was 9276. Of these occurred—

Under 1 month,	467
1 and under 2 months,	248
2 " 3 "	205
3 " 6 "	486
6 " 9 "	443
9 " 12 "	535
Total under one year	2384
1 year and under 2,	1296
2 " 3,	733
3 " 4,	446
4 " 5,	286
Total under 5 years.	5145

In other words, we find that, out of 9276 deaths, 2384, or about *one-fourth*, occurred under one year of

age; 3680, or more than *one-third*, under two years; and 5145, or considerably more than *a half*, under five years of age:

Here, then, is unquestionable evidence of the fact, that a great mortality prevails in infancy, even among the most civilized communities, and under what are considered the most favourable circumstances; and the question naturally presents itself, Whether this mortality constitutes a necessary part of the arrangements of Divine Providence which man can do nothing to modify; or, on the contrary, proceeds chiefly from secondary causes purposely left, to a considerable extent, under our own control, and which we may partially obviate or render innocuous by making ourselves acquainted with the nature of the infant constitution, and carefully adapting our conduct to the laws or conditions under which its different functions are intended to act? The following considerations will enable the reader to answer the question for himself.

If we consult the past history of mankind, there will, I think, be little difficulty in finding the true reply, and proving that the appalling waste of infant life is not a necessary and intentional result of the Divine arrangements, but is produced *chiefly*, though not by any means wholly, by our own ignorance and mismanagement, and consequently may be expected to diminish in proportion as our knowledge and treatment improve, or, in other words, in proportion as we shall discover and fulfil the laws which the Creator has established for our guidance and preservation. But, as the consequences flowing from this proposition are of great interest and importance in a practical point of view, I shall venture into some detail in its farther elucidation.

If the prevalent destruction of life in early infancy is a part of the established order of Nature, and is merely such as may be expected to result from the accidents and vicissitudes inseparable from human existence, it is plain that we shall never be able to diminish it by any

exertions of our own, and consequently, that it can be of little use to inquire into its causes or attempt their removal. If, on the other hand, it be true that ignorance of, and disobedience to, the laws of God are the principal sources of the fatality, and we can succeed in impressing that truth on the minds of parents as well as of professional men, our prospects will then be of a far more encouraging kind. Under the former belief, we must remain inactive, and humbly submit to an infliction from which we cannot hope to escape. Under the latter, on the contrary, it will be impossible for us to rest satisfied without doing our utmost to discover and remove the hitherto neglected sources of danger, and to place every organ of the body, as far as possible, under those conditions which reason and observation shall have proved to be most advantageous for its healthy development and action. Let us now see which of these conclusions is best supported by the evidence within our reach

If it can be shown that the preservation or destruction of life in infancy is not of invariable extent, but bears a marked and direct relation to the nature of the treatment and external influence to which the young being is subjected, the question at issue will be solved beyond the possibility of doubt. If the infant mortality be the result of an unalterable dispensation of Providence without respect to good or bad management, we may expect to find it nearly the same in all ages and states of civilization, and bearing no relation whatever to the conduct of others; whereas, if it be chiefly owing to secondary causes, many of which it is in our power to guard against, it will necessarily be found to vary in amount, and in direct relation, to the favourable or unfavourable circumstances in which the child is placed, and the good or bad treatment to which it is subjected. Although few of my readers will be at a loss to decide which of these two conclusions is the right one; yet, in order that nothing may be left to uncertainty or conjecture, let us first contemplate th

extent to which, in past times, infant life *has fallen* a sacrifice to ignorance and bad treatment, so that we may afterwards contrast it with the comparatively excellent results of a mode of management of a more enlightened though still far from perfect kind.

We have already seen that the *average* mortality of infants among rich and poor is about 1 in every 4½ before the end of the first year of existence. So directly, however, is infant life influenced by good or bad management, that, about a century ago, the work-houses of London 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 beyond the reach of human remedy. But when at last an improved system of management was adopted, in consequence of a parliamentary inquiry having taken place, the proportion of deaths was speedily reduced from 2600 to 450 a-year. Here, then, was a total of 2150 instances of loss of life, occurring yearly in a single institution, chargeable, not against any unalterable decrees of Providence, as some are disposed to contend as an excuse for their own negligence, but against the ignorance, indifference, or cruelty of man! And what a lesson of vigilance and inquiry ought not such occurrences to convey, when even now, with all our boasted improvements, *every tenth infant still perishes within a month of its birth?*

We do not require, indeed, to go so far back as a century ago, for such a deplorable example of the deadly results of ignorance: we may find one equally striking in Mr. Maclean's recent account of his "Visit to St. Kilda in 1838." After remarking that the population of St Kilda is diminishing rather than increasing, Mr. Maclean states, that this unusual result is partly owing to the prevalence of epidemics, but chiefly to the excessive mortality which is at all times going on in infancy. "EIGHT OUT OF EVERY TEN *children*," he says, "*die between the eighth and twelfth day of their existence!*"

Admitting the truth of this statement, the reader will naturally be disposed to wonder what poisonous quality can infect the air or soil of St. Kilda, to cause such a tremendous destruction of life; and will infer that here, at least, there must be some powerfully deleterious influence at work, which human means cannot successfully cope with. So far, however, from this being the case, Mr. Maclean expressly states, that "the air of the island is good, and the water excellent;" that "there is *no visible defect on the part of Nature;*" and that, on the contrary, "the great, if not the only, cause is the filth amidst which they live, and the noxious effluvia which pervade their houses." In proof of this, he refers to "the clergyman, who lives exactly as those around him do in every respect, except as regards the condition of his house, and who has a family of four children, *the whole of whom are well and healthy;*"* whereas, according to the average mortality around him, at least three out of the four would have been dead within the first fortnight. When it is added, that the huts of the natives are small, low-roofed, and without windows, and are used during the winter as *stores for the collection of manure*, which is carefully laid out upon the floor and trodden under foot, till it accumulates to the depth of several feet, the reader will not hesitate to concur in opinion with Mr. Maclean, and admit that, had the clergyman's children been subjected to the same mismanagement as those of the other islanders, the probability is, that not one of them would have survived; and that, on the other hand, had the children of the islanders been attended to with the same care and good sense as the clergyman's, they might have been equally protected from the inroads of disease and death.

To obtain additional evidence, of a very convincing kind, that ignorance, neglect, and prejudice, are the grand causes of the destruction of infant health and life, and that knowledge, watchfulness, and judicious care,

* Chambers's Edinburgh Journal, Nov. 1838.

are really of more avail in preserving both than is generally believed, we have only to contrast the mortality in infancy among the poor with that among the rich; the mortality in densely peopled manufacturing towns with that in the open country; that 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 shortly make.

The first circumstance which effects the mortality of infants, is the degree of health and comfort enjoyed by the mother during pregnancy. Where these conditions are united in the highest degree, the offspring also is the most healthy and capable of resisting the agency of hurtful influences; and, on the contrary, where bad health and misery predominate during pregnancy, the greatest risk is run by the child. So influential, indeed, is this principle, that it shows itself strikingly even at birth, in the much larger proportion of children *born dead*, when the parents have been exposed to physical or mental sufferings. Thus, it cannot be denied that the mothers of illegitimate children are the most exposed to privation of every kind; and, accordingly, it is precisely among them that the proportion of still-born children is by far the greatest. At Berlin, for example, it appears that "the still-born out of 100 illegitimate births were, during the half of the preceding century, *three times* more numerous than the still-born out of 100 legitimate births, and this state of matters is not yet improved."* Here, then, is ample evidence of the state of the parent directly influencing the fate of the child even prior to birth, and we have only to pursue the inquiry to trace the same influence upon the constitution of the child subsequently to birth. According to the

* Quetelet sur l'homme, &c. vol. i. p. 129.

existing constitution of society, many of the comforts, and some of even the necessaries of life, are beyond the reach of the poorer and working classes; and this circumstance will be found to operate unfavourably in diminishing the chances of infant life amongst them Thus, while, according to the Belgian returns, the average mortality under two years of age is at the rate of 295½ in every 1000, it appears from Dr Granville's tables of the mortality *among the poor* of London, that no less than 458, or nearly double the number, in every 1000, perish within the same period! In Paris, in Liverpool, and in several manufacturing towns where accurate returns have been compiled, similar results have been obtained, unequivocally showing, that infant existence is cut short much more by a want of the comforts of life, and of rational management, than by necessary or unavoidable causes.

The same general truth is established by a "Table showing the proportion out of 1000 registered deaths which have occurred at various ages in the whole of England and Wales, and in each of its 25 divisions," given in the Registrar's First Report already quoted. From this table it appears, that, "in the mining parts of Staffordshire and Shropshire, in Leeds and its suburbs, and in Cambridgeshire, Huntingdonshire, and the low-land parts of Lincolnshire, the deaths of infants *under one year* have been more than 270 out of 1000 deaths at all ages; while in the northern counties of England, in Wiltshire, Dorsetshire, and Devonshire, in Herefordshire, and Monmouthshire, and in Wales, the deaths at that age, out of 1000 of all ages, scarcely exceed 180," (p. 15;) or, in other words, the deaths under one year in the last-mentioned counties, where the population is scattered and the air pure, are only as *two or three* compared with those in the first-named places, where the population is living either in the midst of crowded manufactories, or on a flat and marshy soil. It is true, that, to obtain a perfectly accurate proportion, the

amount of population in each of these two great divisions requires to be also taken into account; but, even without this, the difference is so great, as to establish the marked influence of external causes in affecting infant mortality. In Manchester, Salford, and suburbs, the number of deaths under two years of age was, according to the same returns, 429.98 per 1000; whereas in the healthier region of Westmoreland and Cumberland, it amounted only to 276.35 per 1000, (pp. 44-5;) thus again showing the destructive influence of bad air, and a want of the comforts of life, in towns and in the manufacturing districts, compared with the healthier rural localities.

In the Registrar's Second Report, the same great truth is demonstrated with equal clearness. After stating that the mortality of children for the last year appears as usual to have been greatest in towns, the Registrar continues, "and among those towns respecting which I can exhibit separate returns, the greatest is at Manchester, where it appears that, out of every 1000 deaths of males, 496 *were of children under three years of age.* The mean deaths of children under three years in Manchester and Salford and suburbs were 475 out of 1000 deaths; in Leeds and its suburbs the proportion was 447; in Birmingham 440; in Liverpool and West Derby 437; while in Dorsetshire and Wiltshire it was 281, in Devonshire 296; in the North Riding of Yorkshire, with Durham (except the mining parts) and the northern part of the West Riding 282; and in the northern part of Lancashire, Westmoreland, Cumberland, and Northumberland (except the mining portion of the latter,) not more than 253. In the whole of England and Wales, the mean mortality under 3 years was 343 out of 1000 deaths at all ages," (p. 9;) or, as nearly as possible, one-third of the whole.

Here, however, it may be proper to remark that the very high rate of infant mortality in the manufacturing districts is not owing exclusively to bad air and a want of the comforts of life, but partly also to want of pa-

rental attention. "Sufficient care is not taken either of the mother during gestation, or of the children after birth. The mothers remain at the factories to the latest possible moment, and at the earliest after their recovery they return to the mills, leaving the children in charge to incompetent persons, older children, or wretchedly paid nurses. Not less striking is the proof of parental neglect, afforded by the number of children found straying through the streets and restored to their parents by the exertions of the police; from recent investigations, it appears that in Manchester these amount to 3600 annually, or about 10 a-day."* With such causes in operation, it would be strange indeed if infant life were not to fall a sacrifice.

An instructive example of the extent to which it is in our power, on the other hand, to diminish infant mortality 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. Clake to be caused chiefly by the great impurity of the air in the wards, and, accordingly, by adopting means calculated to ensure thorough ventilation, the number of deaths was speedily reduced to only 419 out of 8033, or about one in 19½, instead of one in every six. To show still more clearly how much of the mortality was the result of mismanagement, I may add, that, during the seven years when Dr. Collins was master of the 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, where, in 1782, they caused nineteen-twentieths of the whole deaths.†

The same principle is illustrated on a still larger scale in Willan's account of the mortality in the Lying-

* Athenæum, 1st Aug., 1840. Article "on Juvenile Delinquency."
† Collins's Practical Treatise on Midwifery. London 1836, p. 513

in-Hospital of London, where nearly 5000 women are admitted yearly. In proportion as the treatment of both parent and child has been improved and simplified, the deaths among both have progressively diminished, and there can be no doubt that they will continue to diminish as we advance in knowledge, and still farther fufil the laws of health. During the last century, the rate of mortality was as follows :—

		Mothers.	Children.
From 1749 to	1758,	1 in 42	1 in 15
1759	1768,	1 " 50	1 " 20
1769	1778,	1 " 55	1 " 42
1779	1788,	1 " 60	1 " 44
1789	1798,	1 " 288	1 " 77

Thus in the last ten years only one infant perished, where in the first ten years FIVE were carried off!

The preservative effects of improved treatment are no where more evident than in the city of London. In Part VII., p. 523, of the second edition of MacCulloch's Statistics of the British Empire, we find a table quoted from Mr. Edwards, "showing the births and 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 Mr. MacCulloch, 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,	315,156	307,395	349,477	386,393	477,910
Total deaths under five years,	235,087	195,094	180,058	159,571	151,794
Dying per cent. under five years.	74.5	63.0	51.5	41.5	31-8

Having thus shown on a large scale, and through a long series of years, how much infant mortality may be reduced by good management, we have only to turn to the experience of Foundling Hospitals for demonstrative evidence of the fearfully destructive influence of defective treatment, where the unhappy outcasts are deprived of a mother's care, and subjected to many of the inconveniences by which health is most easily affected and life destroyed. Thus, while the average proportion of deaths under the age of one year is, according to the registrar's report, 214.54 per 1000 for the whole of England and Wales, that of foundlings was no less than 67 per cent. in Madrid in 1817; 92 per cent. in Vienna in 1811; and 79 per cent. at Brussels from 1812 to 1817: or, in other words, at the periods above mentioned, the mortality among infants deprived of maternal protection was in Brussels more than *three times*, and in Vienna more than *four times*, greater than the average in private life! Facts like these speak with an authority which no one can venture to reject, and show how entirely infant health and life are made to depend on our fulfilment or neglect of the laws which the Creator has assigned for the regulation of the human constitution.

Next to foundlings, *orphan* children are the most unfortunately circumstanced for the preservation and enjoyment of life; and consequently, all other conditions being equal, the mortality is much greater among them than among children who are tended with all a mother's care, and cherished with all a mother's affection. And yet it is not less instructive than cheering, to observe how much it is in our power 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, which was opened in the end of 1829 with about 70 children; but in which the average up to August 1836, subsequently amounted to 80. During the first three years, when an imperfect mode of manage-

ment was in operation, from four to six children were constantly on the sick list, and sometimes more; one or two assistant-nurses were necessary; a physician was in regular attendance twice or thrice a-week; and *the deaths amounted in all to between thirty and forty*, or about one every month. At the end of this time, an improved system of treatment was begun, 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."*

Here, then, is the most convincing evidence that it really is in the power of man to prevent and mitigate human suffering by knowledge and the enlightened exercise of reason. When we contrast the health and comfort enjoyed by the poor orphans under one system of treatment, with the sickness, sorrow, and loss of life, entailed upon 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 discharge of the duties involved in it. I am anxious to impress this upon the

* Alcott on Vegetable Diet. Boston, 1838, p. 217.

reader at the very outset; because it is only under a conviction that it *is* in our power to avert many of the evils which afflict the young, that an active interest can be felt in investigating their origin, 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 is to be accomplished; because nothing can justify neglect where its consequences are so evidently serious.

It may be argued, that the examples already given are extreme cases, and that no such mismanagement or fatality occurs in strictly private life. Most of them, certainly, are extreme cases; but I select them on that very account, because they show *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 fearful results of bad treatment occur, we must not infer that the records of family practice are altogether unstained with errors of a similar nature, and that, among the wealthier classes at least, nothing more can be done for the preservation of infant health and life. On the contrary, we have too good reason to believe that, even among the best educated classes, many lives are cut short by mismanagement in infancy, which might be saved if the parents only possessed in time a portion of that knowledge and practical sense which dire experience sometimes impresses upon them when too late.

The influence of good or bad treatment is sometimes exemplified in the families of the rich in a way which ought to make some impression on their minds. Nobody will deny that, on starting in the race of life, the chances

are greatly in favour of the well-constituted and healthy, and against the badly constituted and infirm child. And yet we not unfrequently see the delicate and sickly child, under good management, turn out a healthy and vigorous adult; while its more promising companion has either disappeared from the scene, or become enfeebled in health, and unfit for the business of life. If a weak child can in some instances be thus strengthened, and a vigorous child lost, what stronger proof can be required that health is, to a considerable extent, influenced by our own conduct and management? Surely the same good treatment which restored the feeble should have been equally efficacious in preserving the strong, if duly adapted to its constitution.

The grand principle, then, 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, when it is so extinguished, this is always from the operation of previously existing causes, some of which might have been discovered and removed, while others, if not entirely counteracted, at least might have been partially subdued. This being the case, the first duty of the parents is obviously to make themselves acquainted with the general nature and treatment of the infant constitution, that they may not unnecessarily risk the welfare of their child, and their own peace of mind, upon the mere chance of finding a well qualified substitute in a lower and still more imperfectly educated class than their own. In many places, however, nurses are now much better educated for their peculiar duties than mothers are, and, as a class, consequently they have become entitled to increased confidence and respect. In some of the continental countries a course of professional instruction is rendered imperative on them; and, in Edinburgh and other large towns, many of the more intelligent nurses voluntarily attend regular courses of lectures and practice before entering upon their vocation. Thus prepared,

their assistance becomes truly valuable to both mother and child. But when a nurse trusts to experience alone, without previous knowledge for her guidance, she rarely, if ever, escapes the contamination of hurtful prejudices and superstitious observances. Hence it is, that ignorant nurses so generally make the same rule apply to all cases, and insist on having their own way, even when warned by the medical attendant of the hurtful consequences which may be expected to follow; and hence the deceit which is often practised upon the latter, in assuring him that his instructions have been fulfilled, where they have been either entirely disregarded, or perhaps so much modified by the nurse as to produce an opposite effect to what was intended.

In no point of view, therefore, is it possible to defend the prevailing error of leaving out what ought to constitute an essential part of female domestic education. Till that defect be remedied, thousands of young beings who might have been preserved, will continue to be cut off in the very outset of existence, to the lasting grief of those who would have been delighted to guard them against every danger, had they only known how to set about it. 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. The parent, in fact, enters upon the important charge entrusted to her care with less previous preparation for its proper fulfilment, than if it were a plant or flower which God had committed to her management, instead of a living being in whose existence and happiness her whole soul is centered. If a rare or curious flower is presented to her, she will inquire minutely about its natural habits, the time and manner of watering it, the best exposure in which to place it, and the admission or exclusion of the external air; and she will act upon the information. But when a human

being is confided to her, the same person will often unhesitatingly accept of the trust, without asking a single question about the necessary treatment, and will rely implicitly on the misty experience of an uninformed nurse for guidance in her most difficult and deeply interesting duty. It is true that there are some nurses well qualified by strong natural sense and much experience to direct the mother in her arduous undertaking; but these are, unhappily, the rare exceptions to a very general rule, and can never justify the parent for neglect of a duty imposed upon her, not less by her own maternal feelings, than by the laws of the Divine Creator.

In making these remarks, my wish is not to throw unmerited blame upon mothers, who suffer merely from the defects of their own education, and cannot help themselves. My only object is, to draw attention to the fact that such defects not only exist, but exert a most injurious influence on happiness, and that they may be easily and effectually remedied. All that is required is, first, to ascertain what are the social duties which belong peculiarly to woman; and then to give her when young that kind of education which, besides elevating and enlightening her general character, shall best qualify her for their ready fulfilment.

On examining the social position of woman with this view, we cannot fail to perceive that the domestic circle is her peculiar province. While the husband and father is toiling abroad for the means of comfortable subsistence, on her devolve, in an especial manner, the duties connected with the family at home. To her exclusively the infant looks for that cherishing and affectionate care which its tender and delicate frame requires; and to her the child directs every appeal, whether of kindness or suffering, in the full confidence that she will be ever watchful for its happiness and relief, and that from her a look or a cry will procure the requisite sympathy or aid. She alone it is who provides its

nourishment, regulates its exercise, and watches over its slumbers. But when we inquire to what extent her previous education has fitted her for the intelligent discharge of the duties which thus constitute the chief objects of her social existence, we find that, perhaps in the majority of instances, on no one point relating to them has she received even a tittle of instruction; and that she enters upon the married state, and becomes a mother, without a suspicion of her deficiency in even the most ordinary information concerning the nature and functions of the infant being 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 own helplessness, and earnestly wishes she knew how to afford it succour. But not being aware that much of the difficulty and danger proceeds from defective education in herself, and an ignorance of her peculiar duties, which would be culpable if it were voluntary, she grieves over her present affliction without its once occurring to her that those who come after must, in their turn, go through the same painful and profitless experience with *their* children; unless, by a rational exercise of foresight, they be previously prepared, by the acquisition of the requisite knowledge and training, for that sphere in which they are afterwards to move.

It is true that all women are not destined, in the course of nature, to become mothers; but how very small is the number of those who are unconnected by family ties, friendship, or sympathy, with the children of others! how very few are there who, at some time or other 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! and how important it is to the mother herself, that her efforts should be seconded by intelligent instead of ignorant assistants! Sickness or other duties

may withdraw her from her sphere for a time, and if she leaves no one behind in whose judgment, knowledge, and watchfulness, she can confide, how miserable for both herself and her offspring! In all points of view, every right-minded woman has an interest in the present inquiry, and in removing the ignorance in which the subject has been involved

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. As society is at present constituted, however, professional men are rarely consulted till the evil is done, and health is broken; and even if they were, it requires intelligence and information in the mother to fulfil their instructions in a rational and beneficial spirit. Circumstances are continually changing; and were the orders given to-day to be acted upon to the letter a month hence, without regard to what had happened in the interval, it is just as likely that harm would be done as that benefit would result. On the mother therefore, aided, at most, by the nurse, devolves in reality the chief responsibility. She alone is always on the spot, and can act and direct with the certainty of being obeyed. If she be thoroughly acquainted with her duties, her spirit will pervade every movement, even when she is necessarily absent;—whereas, if she be ignorant or contradictory in her notions, the more constant and watchful her superintendence, the more mischief will be done, and the more open will she be to the influence of prejudice and quackery.

This is no over-drawn picture. I have seen examples of both kinds of mothers. The enlightened are, unhappily, the more rare: but under their management a nursery is like a paradise upon earth, compared to one under the more ordinary guidance. In one of the latter kind, I lately saw a strong and naturally healthy infant literally gasping for breath, and in a state border-

ing on convulsions, from extreme anxiety on the part of the parent to exclude every breath of air from a nursery overheated by a large fire as a precaution against cold, which she supposed to have been the chief cause of the death of a former child. So dexterously were the windows papered up, and every key-hole and chink obstructed, that air enough could not find admittance to keep up a current through the chimney, and volumes of smoke fell down where smoke had never before been seen. The poor mother was distressed at this new accession of danger; and when I pointed out its source, and insisted on the admission of fresh air as all that was wanted to cure the smoke and restore the child, she remonstrated with all the earnestness of the most tender affection. With difficulty I carried the point, and remained to prevent the too speedy termination of the experiment, and to witness the result. In a very few minutes the uneasy twitching and contraction of the features ceased, and in a quarter of an hour a smile of contentment and cheerfulness took their place, and encouraged the mother to allow the continued entrance of some small portion of air, although still with not a little of anxious apprehension for the cold which she expected ere long to make its dreaded appearance. The child, however, took no cold, and required only fresh air, moderate diet, and exercise, to restore it to perfect health.

I mention this case, because it is the most striking which I have seen of ignorance of a few important truths utterly defeating all the watchful but ill-directed care of the most devoted affection. The mother was in every other respect a sensible and right-minded woman, and had received what is called a good education; but, from not possessing any conception of the nature of the human constitution, or the laws by which its most important functions are regulated, the very strength of her feelings on everything in which her child was concerned laid her judgment so completely open to the influence

of every prejudice and antiquated superstition, as to endanger its existence by the very measures which she adopted for its benefit.

From these considerations, then, it seems to me to be urgently necessary that female education should be placed on such a footing as should tend 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 fashionrble amusement—and that, while every effort is made to refine and elevate the mind, the solid substratum of useful knowledge and gratified affection should not be neglected.

Admitting, then, that every mother should possess a general acquaintance with the nature and functions of the infant constitution, and with the conditions required for their healthy performance, it may be asked, Where is the necessary information to be obtained seeing that none such is taught to her at school or at home, and that very few treatises fitted for her perusal are any where to be met with? This difficulty is not without force. The desirableness of constituting such knowledge a part of female education, and the possibility of communicating it in an intelligible form, have as yet been strongly perceived only by a few, and consequently little has been done to supply the want. Now, however, the omission is becoming every day more apparent, and several works, more or less adapted for the purpose, have accordingly made their appearance. But as none of them embraces all that I conceive to be required, I have ventured upon the present attempt to supply the necessary information in a plain and intelligible manner, not with the view of superseding other works, but of adding to their utility. Encouraged by the facility with which the principles unfolded in my former publications on health, education, and diet,*

* The Principles of Physiology applied to the Preservation of Health, and to the Improvement of Physical and Mental Education;

have been apprehended and acted upon by many parents in the general management of themselves and their families, I shall now endeavour to convey to the reader such an account of the infant constitution, and of the chief conditions by which its health is influenced, as shall not only be intelligible to, but 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 bearing upon infant health, and to avoid offending even the most sensitive delicacy; and wherever I may fall short of attaining my aim, I shall rely on the indulgent forbearance of the reader, in the full assurance that ample allowance will be made for the difficulties inseparable from the subject.

CHAPTER III.

SOURCES OF DISEASE IN INFANCY

Importance of attention to laws of health.—Disease arises from their infringement—examples.—Utility of this knowledge in discovering and obviating the causes of disease—success in this greatly dependent on a knowledge of the healthy functions.—Disease results from fixed laws, not from chance or miraculous agency.—Objections answered, and operation of Divine Providence explained and shown to be consistent.—Sources of bad health in infancy—hereditary—direct.—Every facility to be given by parents for their discovery.

From the evidence adduced in the preceding chapter, the conclusion is irresistible, that infant health and life depend essentially on the kind of management to which the young being is subjected, and the nature of the circumstances by which it is surrounded. Where these are both favourable, the child will enjoy the highest degree of health of which its natural constitution is

eighth edition, 1840. The Physiology of Digestion, considered with Reference to the Principles of Dietetics; second edition. Simpkin & Co., London; Maclachlan & Co., Edinburgh.

susceptible; and where the management is bad, or the child's situation unfavourable, the health will always be proportionally precarious, and death premature.

In practice, the principle implied in the foregoing propositions admits of many most useful applications; and it is on this account that I am so anxious to impress it on the mind of the reader. It alone explains the progress which has been already made in diminishing infant mortality, and encourages us to renewed exertion, in the full assurance that disease and death will be averted from infancy in exact proportion as we shall succeed in bringing the treatment of the young into harmony with the laws of the human constitution, or, in other words, *with the laws of the Creator*. Much as the management of infancy has been improved of late years, a great deal still remains to be done; and when we consider how little regard has been paid in past times to the discovery or fulfilment of the conditions required for the healthy action of the different animal functions, and how much of bad health has thence arisen, we cannot but look forward with hope to the time when a general knowledge of physiology shall constitute a part of early education, and become a living guide to the parent in 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 the infringement of the *conditions* on which God has decreed the welfare of the various organs of the body to depend, and the implied requirement to observe which has therefore been appropriately named the *organic law*. When these conditions are fulfilled, health is preserved. When they are neglected or infringed, the action of the organ is impeded or disordered, or in other words, *disease* begins. In the case of the lungs, for example, it is essential for their healthy action that the child should be surrounded by a pure air, of a proper degree of temperature and

dryness; that the chest should be left free and uncompressed, so as to admit of the full expansion of the lungs, and of the easy access of the air into their air-cells; and, lastly, that there should be a free supply to them of properly constituted blood and of nervous influence. If any of these conditions fail; if the air is too impure, too cold, too warm, too dry, or too moist; or if the chest is compressed by improper clothing, so as to prevent the due dilatation of the lungs, and the ready admission of air into them; if the blood is defective in quality, from inadequate supplies of nutritive food, or from impaired digestion; or if the proper circulation of the blood through the lungs is impeded and deranged by sudden exposure to cold or partial currents of air, or by the interruption of the nervous influence; the necessary and unavoidable result is, to derange the function of respiration by inducing morbid action in its organ. Fulfilment of these conditions is, therefore, appropriately enough called *obedience to the laws of health of the lungs.* If they are fulfilled, the lungs act healthily; if they are not fulfilled, disease, attended with disturbance of the function of respiration, immediately follows, and does not admit of cure so long as the causes which gave rise to it continue in operation.

The manner in which all other causes of bad health act upon the human body is essentially the same. Thus, when a fit of indigestion is occasioned by excessive eating or drinking, the disease is caused by the infringement of that law which requires, as a pre-requisite of healthy digestion, that the food and drink be adapted in quantity and quality to the state of the constitution and mode of life. And, in like manner, when inflammation of the eye is excited by exposure to a very bright or concentrated light, the disturbance arises from transgressing that organic law which requires light to bear a certain relation to the natural constitution of the eye. If, in defiance of this law, we exercise the eye with a light either too intense or too feeble, or if we

look continuously through glasses calculated either to concentrate or disperse the rays of light in a higher degree than that for which the structure of the eye is adapted, disorder of its organization, or, in other words, disease of the eye, is sure to follow; and so long as the deranging cause is allowed to remain in operation, we may use the best devised treatment for the cure of the disease without the smallest benefit. But, on the other hand, the moment we adapt the light and the exercise to the altered state of the organ, so as to give due effect to the preservative powers of Nature, the very same treatment may be followed with success, because now the laws of the function are fulfilled. Hence, too, the uselessness of attempting to cure indigestion, for instance, by medicine alone, without fulfilling the conditions of health of the stomach by the due adaptation of the diet, &c., to its altered state.

From these considerations, it is evidently a matter of importance to ascertain, in every instance, what the cause of bad health is, and upon what organs its chief effect is produced. In infancy, for example, convulsions are of frequent occurrence, and attended with much danger; but if we neglect to discover their exciting cause, and prescribe merely for the convulsions themselves, we shall not only often fail to put a stop to them, but may actually leave their causes in full operation, where it is easy to remove them, and thereby prevent the occurrence of the fits. Thus, one cause of convulsions is breathing impure air, another is the irritation of teething, and a third is improper diet. Of the first we have already mentioned several instances, and, among others, those which occurred in the Dublin Lying-in Hospital. For many years the disease was treated in that institution without any reference to the particular cause which produced it, and the result was, as we have seen, the annual loss of several hundred lives. When at last the impurity of the air arrested attention, and means were resorted to for its correction, the frequency

of convulsive disease diminished to a surprising extent. Here, then, was one powerful cause (consisting in the infringement of the *laws of respiration*,) which might have been avoided with ease from the very beginning, had its real influence been sooner discovered.

In other cases which have come under my observation, the exciting cause was an equally avoidable infringement of the *laws of digestion*, in taking food either inappropriate in quality, or defective or excessive in quantity. In general, the error lies in excess; but occasionally, from the weak constitution of the mother, the milk is too deficient in the principles of nutriment to afford adequate support. In these cases it is plain that, however pure may be the atmosphere in which the infant breathes, and however appropriate the treatment may be in other respects, a cure cannot be obtained without previously remedying the defect in diet. Precisely the same reasoning applies to teething as an exciting cause of convulsions; and it is impossible to examine carefully any case of infantile disease, without perceiving how very much the safety of the young being depends upon a timely discovery and removal of every circumstance calculated to derange the healthy action of any especially important organ, and how dangerous it is to content ourselves with direct treatment only, while an active cause is left unnoticed and in full operation.

In the same way all the causes of disease operate by infringing the conditions of health of some organ or organs of the body; and if it were possible to discover the whole of these conditions as affecting *all* the organs, and we had it in our power to fulfil them scrupulously, we should thereby ward off disease altogether, and ensure the continuance of life till the natural term of existence. But, partly from the hereditary imperfections of organization caused by the abuses of our ancestors, and transmitted to us from them, and partly from the extent of our ignorance, and our limited power over external circumstances, we are very far from having reached, and

probably never shall reach, this pitch of perfection in the preservation of health. Still, however, whether we shall succeed in actually attaining the object, or shall only approximate to it, the mode of pursuing it, and the desirableness of making the nearest possible approach to it, remain precisely the same. The grand aim, consequently, 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 and functions depends.

Two excellent practical results will follow from fixing our attention steadily upon this guiding principle. The first is, that we shall never be able to witness the development of suffering or disease, without being instantly stimulated to the discovery, removal, and future avoidance, of the cause by which it has been produced; and the second is, that we shall constantly be kept alive to the real influence of surrounding agents and present treatment, and thus led to the earliest detection of errors which might be fraught with destruction if left long unremedied. Whereas, if we believe bad health to be the offspring of chance, and without relation to the actual management, or to fixed laws, we shall be able neither to foresee and prevent mischief by timely watchfulness, nor to contribute intelligently or effectively to its removal when discovered.

To this view of the general origin of disease, it has been objected that it must be erroneous and dangerous, because it is at variance with the doctrine inculcated by some divines, that diseases are specially sent by a kind Providence exclusively for spiritual purposes, and have no reference to any merely physical errors or omissions on our part. But this objection seems to me to arise from too narrow a conception of the workings of God's providence, and to be itself contradicted by daily and hourly experience, and by the habitual conduct of mankind. If we adopt the principle that disease is altogether independent of physical care, and is sent for exclusively

moral ends, it unavoidably follows that physical exposure or protection must be without influence on health; and that wet or cold, gluttony and starvation, temperance and dissipation, care and neglect, will act injuriously or beneficially, not according to any fixed laws, but simply according to the spiritual necessities of the individual. On this view, any attempt to improve human health by regular attention to cleanliness, temperance, exercise, and pure air, must be futile, as the result will in no way be affected by such attention, but depend on moral conditions alone. On this theory, vaccination itself must be regarded as an absurdity, and those must be the most healthy whose whole minds are devoted most exclusively to religious and moral duties and contemplations, without regard to any physical observances.

If this theory be correct, by what laws is the health of the countless multitudes regulated who never heard of Christianity, and who cannot, by possibility, be aware of any spiritual object in sickness? Do the bodily functions of the Hindoo and the New Zealander, for example, obey different laws from those of the Christianized European? Or can we say that, by the process of conversion to our faith, the bodily health is freed from the dominion of the laws of organization, and comes under the sole influence of the moral law? If we answer in the affirmative, we must farther believe that the laws of the Almighty are not universal, eternal, and unchangeable, but differ widely in the different regions of that globe, the whole of which is to Him a mere speck in the immensity of creation!

The very notion of such changeableness carries with it its own refutation; for of all the characteristics of the Divine Being, none is more striking and wonderful than the harmony, consistency, and stability, so deeply imprinted on all his arrangements. Universal experience, accordingly, demonstrates that health *is* affected by our own conduct, and *is* under the influence of fixed laws; and there is not a living being who does not act

habitually and instinctively on the faith of this being the case. Without the assumption of this truth, indeed, medicine and surgery would have no foundation whatever, because there would be no proper distinction between diseases; no general regularity in their course; and no indications for treatment.

It is perfectly 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, except under a miraculous interposition, the Divine will acts through secondary causes, and according to established laws, to which we, as created beings, are expressly required to conform. We can neither take from, nor add a single property to, either external objects or the human constitution; and it is therefore our direct duty to study the nature and relations of both, and to place ourselves in harmony with the circumstances under which we are destined to live. If we pursue this object in a right spirit, not only shall we have ample opportunities for the highest exercise of intellect, and the noblest use of our moral powers, but every step made will throw additional light upon our path, and render our practical duties more plain and easy of fulfilment; whereas, if we deliberately *neglect the means* through which Providence fulfils its designs, we shall have ourselves to blame for our consequent disappointment.

In practice, it is really far from indifferent which of these principles we assume as a guide. We shall suppose, for example, that a child, previously in excellent health, is left alone for a few minutes, and that, soon after the return of its attendant, it is taken ill and dies. No *apparent* cause for the sudden transition being known, the event will, on the one view, be regarded as simply a dispensation of Providence, probably for the chastisement of the parents for allowing their affections

to be too exclusively absorbed by the child; and no precautions against the repetition of such an occurrence will be thought of. Every duty will be considered as fulfilled, if the sin which drew down the punishment be felt, and the affections be thenceforth centered on higher things. But, on the other principle, that God always acts through regular means, attention is naturally roused to the discovery of the particular cause which was in operation. On careful inquiry, it turns out that, in the momentary absence of the nurse, the child has swallowed some sugar of lead imprudently left within its reach. This discovery, it will be observed, alters the whole complexion of the case, so far as regards our conduct. It may still, as before, be regarded as a dispensation; but it is no longer a dispensation of a special or miraculous kind, but one according to fixed and known laws, and dependent on the known poisonous qualities of the substance. We can no longer say that it was a dispensation unconnected with our own conduct; for every one will admit that, if the poison had not been left within reach, the child would have been alive and well. It is the same in cases of ordinary disease. A cause exists whether we can see it or not. In general, we can discover it by careful examination; but sometimes we cannot. It, therefore, becomes a direct duty to study the nature of the infant economy, and discover the causes of the diseases by which life is endangered. If we shall succeed in the discovery, and be able to remove these causes, we shall have the unchangeableness of the great Creator for a guarantee that the safety of the child will thereby be infallibly secured: Whereas, if we shall continue to look upon the accident as a purely spiritual warning, unconnected with conduct, and *neglect the means* of future safety, a second accident may occur as readily as the first—seeing that the properties of the poison, and of all other external objects, always have been, and will for ever remain, the same as they now are; and that the human

body will continue to be acted upon by them in precisely the same way. The question thus just comes to be, Whether it is more humble and respectful in us to study what are really the decrees of the Divine will, and endeavour to act in accordance with them, as the surest way to obtain God's blessing on our efforts; or to shut our eyes to the means by which He acts and manifests His will, and, while paying him a well-meant but blind homage, to disregard or even run counter to his instructions, in the vain hope that, in compassion for our weakness, He will alter the order of nature in our favour? If the former be the more correct view, we must begin by making ourselves acquainted with the properties of substances and their effects on the human frame; and after modifying our own conduct to the utmost of our power in accordance with these, we may then with propriety humble ourselves before God, and beseech him to bless our efforts, and overlook the imperfections inseparable from our obedience. But so long as we show practical contempt for His will, *by the neglect of the conditions on which alone He offers safety*, it seems to me more akin to presumption than to reverence, to expect a special interference of His providence, to avert the consequences of our deliberate disobedience.

In ordinary disease, the principle is precisely the same as in the supposed case of poisoning. One person is seized with a violent inflammation: On inquiry, we find that he sat chilled and wet on the top of a coach for some hours, and, on alighting, suddenly warmed himself at a large fire, and took a highly stimulating meal by way of driving out the cold Here the cause is obvious and admitted by every one, because, like the poison, *it is seen*. But another individual falls into bad health, and, on inquiry, no cause known to or believed by himself to be sufficient, can be found out; and the conclusion is hastily formed, that no cause existed, and that the disease is simply a dispensation of Providence, unconnected with his own conduct. But here the ex-

planation is, in truth, the same as in the case of the child swallowing the poison unobserved. A *cause exists*, although it has not yet been detected; and its being hidden from view ought to prompt us to more careful observation and increased exertion to find it out, rather than to ascribe the result to a special and direct interposition of Providence. If we act on the former principle, we shall most likely succeed in discovering the cause, and in future be able to guard against it; whereas, if we adopt the latter, we shall have no motive for increased watchfulness, and may not only remain in ignorance, but leave the injurious influence in full and undisturbed activity.

In inculcating the necessity, therefore, of making ourselves acquainted with the laws of the infant organization, and in mentioning the certainty of deriving advantage by acting in accordance with them, I am so far from setting aside the influence of Divine Providence, 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 all our attempts at improving our own condition. And it is the grossest perversion of the truth to say, that because we insist on the use of the means which God himself has appointed, we therefore deny or set aside the operation of His will. In every instance, except in that of a miraculous interposition, God acts according to fixed general laws, which He has foreseen to be sufficient for every exigency; and to disregard these His decrees, is as truly to rebel against His will as it would be to act in the face of any of His written commandments.

As, then, the external causes of disease disorder the organization, by infringing some one or other of the laws or conditions of its *normal* (from *norma*, a rule) or *healthy* action, it naturally follows, that, to understand thoroughly their mode of operation, we must be acquainted with the nature and principal conditions of

the healthy functions;—without this knowledge, we shall often fail in detecting aberrations from them in time to prevent the mischief which is sure to ensue, and which might otherwise easily be obviated And, accordingly, nothing is more common than for patients and parents to declare, from ignorance alone, that no cause of any kind has been in operation, where the practitioner is able to trace one of a very influential kind. Nay, it occasionally happens, that, from knowing nothing of the laws of the animal economy, the parents cannot comprehend the action of a cause when pointed out to them; and, confiding in their own judgment, deliberately leave it in full play, under the false belief that it is no way injurious.

For this and other reasons, it is very desirable, not only that every parent should possess some knowledge of the structure and laws of the animal economy, but that, in laying down rules for the improvement of health and the prevention of disease, every opportunity should be embraced by the practitioner, to explain the laws and functions to which they have reference, and thus to fix attention on the more accurate and timely observance of every circumstance likely to derange healthy action; and such, accordingly, shall be my aim in the following pages. Mere abstract rules are either not fulfilled, or obeyed in a spirit which deprives them of much of their usefulness; but when they are inculcated in connexion with the principle on which their applicability depends, they become comparatively easy of practice, and fruitful in results; and, moreover, impart a calmness to the mind, which can be derived from no other source, and which, as arising from implicit faith in the wisdom and beneficence of the Divine arrangements, can scarcely ever be shaken.

When, in accordance with the principle just laid down, that illness always results from the infringement of some one or other of the laws which regulate the various animal functions, we look around us and try to disco-

er why the children of one family are almost always healthy, and those of another almost always ailing, we generally succeed in tracing the result to one of two causes—either to the kind of bodily constitution derived from the parents, or to a difference in the management and external situation of the families. Occasionally, indeed, we are entirely at a loss to assign any sufficient cause; but even then it would, as already shown, be erroneous to infer that one of an active nature does not exist. Reason and analogy entitle us to assume, that a cause is always in operation in such cases, though it is not found out. Sometimes it is hidden from our view, only because the medical attendant has not sufficient opportunity of discovering its existence, and the parents are too little acquainted with the various functions and their laws of action, to be able to tell when, and in what respects, the management is imperfect. I have, in several instances, experienced this truth, and been unable, when first called in, to fix upon any error of regimen or treatment to account for the illness; and yet, upon more familiar acquaintance with the circumstances of the family, have found an active cause in full, and previously unsuspected, operation. In no circumstances, then, ought either the practitioner or the parents to content themselves with a few brief answers to general questions; nor should they receive the same statement as always bearing precisely the same meaning. Much erroneous practice arises from overlooking the latter source of fallacy. Nurses and mothers, in common with other persons, use language not in reference to a fixed standard of meaning, but according to their own conceptions of things, and to the relative importance which they are accustomed to attach to them. One is naturally disposed to exaggeration; another to over-anxiety; a third to cheerful confidence. One is observant, and notices the minutest changes in her charge; while another is struck only by marked alterations. The result is, that each uses language un

der modifications peculiar to herself. In inquiring into the state of the bowels, for example, how various would be the answers of different nurses founded on the very same observations, where yet no one intended to mislead! The same thing would happen in regard to any other inquiry; and hence the necessity for the exercise of caution by the physician in the interpretation of such information, and for verifying it to the utmost possible extent by *personal observation*. For the same reason, he should make sure that everything which he recommends is understood in the light in which he means it; and, from time to time, examine personally the general management of the child, without waiting till some glaring error has been committed, for which his assistance is specially required. Every sensible parent will duly appreciate this attention, and eagerly afford every facility for the necessary observation.

Here, however, I must remark, that truth and candour on the part of the parents and nurse are indispensable, if they have any real regard either for the welfare of their children, or for their own character. In many families, sometimes from a positive desire of concealment, and sometimes from not perceiving the harm of a partial suppression of the truth, or being themselves unconsciously blinded by their too eager wishes to suppose every thing to be right, the representations given to the medical adviser in regard to diet, cleanliness, exercise, and general management, are so far from correct in the full sense of the term, that were he to rely implicitly upon them, the consequences would often be very serious; and no little discrimination is sometimes required to discover the real state of the case. It is not uncommon to hear it avowed, that "the doctor had ordered so and so, but that something else had been done;" or that "such a thing had happened to the child, but they took care not to say a word about it to the doctor." Even mothers of much good sense in other respects, sometimes fall into this error, perhaps from a fear of

displeasing the practitioner; and unintentionally cause serious misapprehension, by making him believe that his treatment has failed, where, in fact, it has never been tried; and inducing him, on this false belief, to resort to other means which may in themselves be much less appropriate. Every one conversant with nursery government must be aware, that these are not pictures drawn from fancy, but correct representations of what happens often where one would least expect it. I know one instance, indeed, where, from casual offence taken by the nurse against the medical adviser, the latter, although in daily attendance, was kept ignorant of what was really going on, and was led to prescribe and give directions accordingly, not one of which was ever fulfilled, although listened to with apparent deference and attention. The child was of course the sufferer in this case, as in all others of a similar kind; and had the nurse not chanced to possess some experience and skill, which prevented her going very far wrong before she became alarmed and sought for other advice, its life might have fallen a sacrifice to her pique.

Supposing, then, that the parents have some general notion of the structure and functions of the human body, and of the peculiarities of the infant constitution, and that the medical adviser enjoys proper opportunities of observation, there will occur very few cases of bad health in infancy, of which, if the constitution was originally good, some sufficient exciting cause cannot be detected, and very often be removed; and where none can be traced, we may rest assured, that it is our ignorance alone which prevents its discovery.

Speaking in a general sense, the various causes by which health is undermined in infancy, will be found to resolve themselves into two distinct classes, viz., those which have reference to the state of the parent before the birth of the child, and those which act directly upon the latter after the commencement of its independent existence. In the following chapter we shall

consider those which have reference to the state of the parent.

CHAPTER IV.

DELICACY OF CONSTITUTION IN INFANCY.

Causes of delicacy in infancy.—Hereditary qualities have much influence.—Conditions in the parents which affect the health of the offspring—original constitution of the child very important—effects of intermarriage with predisposed relations—advantages of being aware of these effects—age of parents influences infant health—early marriages produce infirm offspring—disparity of years in the parents has a similar effect—influence of the state of the parents.

On looking abroad upon society, we perceive some families apparently surrounded by every external advantage, yet in which it is found difficult to rear any of the children to maturity. Either from scrofula, consumption, or some other form of bad health, one after another is carried off; and those who survive are characterized by great delicacy of constitution, and require the most assiduous care for their preservation. As a contrast to this, we meet with other families seemingly much less fortunate in their outward circumstances, but in which one child grows up after another as if no such thing as disease existed; or as if the ordinary disorders of infancy were merely mysterious processes for the farther development of the bodily organization. That such remarkable differences exist, must have been observed by all who notice what is passing around them; and granting them to exist, 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 susceptibiiity of disease in the one case, and the immunity from it in the other, arise from no peculiarity of treatment or external situation, and must, therefore, depend on some inherent dif-

ference of constitution derived from one or other, or from both, of the parents. Such, accordingly, is the truth; and so manifest is the influence of hereditary constitution upon the organization and qualities of the offspring, that, from the earliest ages, the attention of mankind has been directed to its observation. Where interest does not blind the judgment, there is thus an almost instinctive preference of a sound and morally respectable stock over one which is either unhealthy or remarkable for any moral or personal peculiarity. Apparent exceptions occur in cases where the children differ widely from their progenitors; but they are so few in number, and usually so easily explained, that the general principle remains unshaken.

Admitting, then, the reality of hereditary influence, the next point of practical importance is to discover what are the conditions in the parents which affect most powerfully the future welfare of the child. The following are perhaps the most deserving of notice:

1*st*, Natural infirmities of constitution derived from their own parents.

2*dly*, Premature marriages, especially of delicate females, and persons strongly predisposed to hereditary disease.

3*dly*, Marriages between parties too nearly allied in blood, particularly where either of them is descended from an unhealthy race.

4*thly*, Great disproportion in age between the parents.

5*thly*, The state of the parents at the time of conception; and, lastly, The state of health and conduct of the mother during pregnancy. Of these I shall speak in succession.

It may be said, that, in a work like the present, destined chiefly for the guidance of parents and young practitioners, it is altogether superfluous to treat of any of the first four 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 a well or ill assorted marriage, or infirm constitution. But this objection does not apply with much force; for the more delicate the infant is the more necessary does it become to detect the true source of the delicacy, that the means of remedying it may be applied with that discrimination which is essential to success. The same treatment, for example, which is suitable for an infant whose infirm health arises from its inheriting the constitutional tendencies of the race of either parent, may not be equally suitable for 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 to discriminate between them in every individual case.

But even supposing, what is not the case, that the children already born are beyond the reach of benefit from the inquiry, it is quite certain that, by improving the health of the parents, the *future* offspring will participate in the increased vigour, and more easily escape the evils which assail the earlier born. Nor is this the only consideration, important though it be; for parents have an advising and controlling power over the marriages of their children, and by convincing the understandings of the latter, may call into operation in early life, before the passions become enlisted in the decision, a guiding influence which shall 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 good deal of influence in this respect; and if the young were accustomed to see their parents and guardians acting habitually and consistently under the guidance of principle, they would be much less apt than at present to follow heedlessly the bent of their own 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 money, should be more important considerations in forming alliances, 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.

The influence of original constitution on the qualities and health of the progeny, is remarkably shown in the families of some of the reigning princes of Europe, and of our own aristocracy; and is exemplified in the histories of long-lived persons, almost all of whom are found to have been descended from long-lived ancestors; indeed, nothing is more certain than that, other circumstances being favourable, robust and healthy parents have robust and healthy children. The same law, indeed, holds good throughout animated nature. In the vegetable world, for example, quite as much importance is attached to the quality of the seed as to a good soil and good cultivation, and the highest prices are offered to obtain it. Among the lower animals the same principle equally operates. In horses, purity of race is prized above all other conditions, and so entire is the dependence placed upon the transmission of qualities by hereditary descent, that the genealogy of the race-horse, of the hunter, and even of the farm-horse, is looked upon 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, also, we calculate, with perfect certainty, on the re-appearance of the qualities of the parents in their young. Man himself, as an organized being, constitutes no exception to the general law, and it is a false and injurious delicacy which would try to divert attention from a truth so influential on happiness, and which has long forced itself upon the notice of physiologists and physicians. In alluding to this subject, the great Haller mentions that he knew "a very remarkable instance of two noble ladies, who got hus-

bands on account of their wealth, although they were nearly idiots, and from whom this mental defect has extended for a century into several families, so that some of all their descendants still continue idiots in the fourth, and even the fifth generation."* The late Dr. Gregory also graphically describes the same influence of the parental stock, when he says, "Parents 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."† In further confirmation of the same fact, I may refer to the case of a clergyman in the south of England, who, on lately paying a visit to an old mansion in Cornwall, which had formerly belonged to his ancestors, was much surprised to meet with a striking likeness of himself, arrayed in armour, and some centuries old. In another portrait, he discovered an equally ancient and remarkable likeness of his eldest son, a boy of thirteen. Dr. Gregory used to mention in his lectures an amusing instance of the same kind which occurred to himself; but as similar facts are not rare, and their counterpart may be observed in a more or less marked degree in ordinary society, it is needless to adduce them.

We are perfectly warranted, then, both by experience and reason, in maintaining that the possession on the part of the parents of a sound and vigorous bodily constitution, and an active well-balanced mind, exerts an important influence in securing similar advantages for the offspring. If either parent inherits the feeble delicacy or mental peculiarities of an unhealthy or eccentric

* Elem. Physiol., lib. xxix., sect. 2, 8.
† Conspectus Medic. Theor., cap. 1, sec. 16.

race, the chances are, as we have already seen, very great, that the offspring will be characterized by precisely similar tendencies. But, in compensation for this, the very same law by which the liability to gout, insanity 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 intermarrying with individuals who are either feeble in constitution or strongly predisposed to any very serious disease, such as insanity, scrofula, cancer, or consumption; and above all, the *greatest care should be taken against the union of the same morbid pre-disposition in both father and mother.* Where any peculiarity of constitution is confined to one parent, and is not very strong, it may be kept in abeyance by a judicious marriage; but where its influence is aggravated by being common to both parents, the children can scarcely be expected to escape. I am acquainted with families in which the consequences of acting in opposition to this principle have been not less deplorable than manifest—where several of the children have fallen victims to scrofula and consumption, and others survived in idiocy, induced solely by the imprudent intermarriage 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 to the law of hereditary predisposition, I do not mean that the actual disease which afflicted the parent will certainly reappear in every one of the offspring; but only that the children of such parents will be much more liable to its invasion than those belonging to a healthier stock, and consequently will require unusual care and good management to protect them against it. One of the chief advantages, indeed, of being aware of the nature and extent of the influence, is the power

which it gives us of diminishing its operation 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 of its parents, and is brought up under the same circumstances which induced or kept up the disease in them, there is next to a certainty that it will fall a victim to some form or other of scrofulous affection, or will escape only after a long and severe struggle. But if timely precaution is exercised, and the child is transferred for a few years to a drier and warmer climate, put on a proper regimen, and kept much in the open air, it may altogether escape the disease, and even enjoy permanently a higher degree of good health than either of its parents ever experienced.

A precisely similar result will follow in other cases of family predisposition. The excitable and capricious children of parents who have been insane or are strongly predisposed to become so, will run great risk of lapsing into the same state, if brought up under circumstances tending to increase the irritability of the nervous system, and to call their feelings or passions into strong and irregular activity. Of this description are excessive intellectual exertion, keen competition at school, over-indulgence, capricious contradiction, and confinement in close warm rooms at home. Whereas, if subjected from the first to a mode of treatment calculated to allay nervous irritability, and give tone to the bodily organization and composure to the mind, the danger in after life may be greatly diminished, and a degree of security enjoyed which it would otherwise have been impossible to obtain.

It is then the *predisposition* or *unusual liability*, and not the actual disease, which is thus transmitted from parent to child, and against which we cannot too carefully guard. When we see individual features reappear with striking accuracy in the offspring, we can scarcely doubt that other qualities of a less obvious kind descend with equal regularity.

Next to the direct inheritance of a family predisposition, the constitutional tendencies *derived from the union of parents too nearly allied in blood*, are perhaps the most prejudicial to infant health, and their baneful effects are nowhere more strikingly shown than in the deteriorated offspring of some of the royal families of Europe, whose matrimonial choice is greatly more circumscribed than that of their subjects. They are, however, often observed in private life also, and especially among the Jews. In allusion to this Dr. Elliotson remarks, that "the rich Jews in this country 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."* Where very near relations marry who are themselves infirm, there is usually either no progeny, or one characterized by unusual delicacy of constitution.

The *period of life at which the parents marry*, exercises a great influence on the health and qualities of the offspring. If the parents have married at a very early age, and before the full development and maturity of their own organization, the children are generally more deficient in stamina than those born subsequently and under more favourable circumstances. This, indeed, is one of the reasons why the children of the same family often present considerable differences of constitution and character, and why the first-born is occasionally puny in an otherwise vigorous race. Marriage, therefore, ought never to take place before maturity; because the system is not sufficiently consolidated for the labour of reproduction, and, as a consequence, both parent and child suffer from anticipating the order of nature. In this country, it may be stated as the general rule, that females do not attain their full development before from twenty to twenty-five years of age, and

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

males between twenty-five and thirty. But, in defiance of this fact, it is not uncommon to encourage a precocious and delicate creature to marry at sixteen or seventeen years of age, at the manifest risk, not only of entailing infirm health upon herself and her future offspring, but of throwing away the best chance of her own permanent happiness. I am acquainted with more than one instance of this kind, in which the mothers died worn out by successive child-births, and the progeny was almost without exception infirm In the case of lower animals the principle is perfectly well known, and, money being there at stake, special care is taken to prevent similar errors being committed.

Another cause of infirm health in children, which ought not to be overlooked, is *great disparity of years* in the two parents. When one of the parents is very young and the other already advanced in life, the constitution of the offspring is very rarely sound; but it is sufficient to call attention to the fact.

The next circumstance which permanently influences the health of the offspring is *the state of the parents at the time of conception.* 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. The 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. After the evidence already given, 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 or unusual depression of spirits in the father have been found imprinted in ineffaceable characters on the organization of the child; and instances are known in which idiocy in the offspring has been the result of accidental intoxication on the part of a generally temperate father. I have lately heard of an unequivocal case of this kind;

and a stronger motive to regularity of living, and moderation in passion, can scarcely be presented to a right-minded parent, than the simple statement of their permanent influence on his future offspring. Many a father has grieved over, and perhaps resented, the distressing and irreclaimable follies of a wayward son, without suspecting that they actually derived their origin from some forgotten irregularity of his own.

Another and very influential source of delicacy in children is, a *habitually deteriorated state of health in the parents*, not exactly amounting to active disease, but arising chiefly from mismanagement or neglect, and showing itself in a lowered tone of all the animal functions, and a general feeling of not being well. Of all the causes of this description, perhaps the most frequent and deteriorating to the offspring is habitual indigestion. Sir James Clark has shown very clearly, in his admirable work on Consumption, that the appearance of scrofula in the families of persons not themselves tainted by it, is generally owing to the hurtful influence of dyspepsia in the parent, brought on and kept in activity by mental indolence and irregularities of regimen. It is in this way that many persons pass years of their lives in a constant state of suffering from "bilious" and "stomach" complaints, induced solely by inattention to diet, exercise, pure air, cleanliness, or other equally removable causes, and unthinkingly turn over a part of the penalty upon their innocent offspring. Not aware of the real consequences of their conduct, they cannot summon resolution to give up the indulgences to which they have accustomed themselves, or to take the little trouble required for the preservation of their own health; and they are surprised when assured that, while thus trifling with their own comfort, they are sporting with the welfare and fate of those on whom their whole affections are one day to be centered;—yet such is the fact!

It is a very common saying, that clever men have

generally stupid children, and that those of men of genius are little better than fools; and the inference is drawn that the constitution of the father has very little influence on that of the children. I admit the fact that the families of men of genius are rarely remarkable for talent; but deduce from it a directly opposite conclusion, and maintain that these very cases are proofs of the reality of the father's influence on the constitution of his descendants, and consequently direct warnings for our own guidance. If we consider for a moment the state of health and general mode of life of men of genius, what can be farther removed from the standard of nature? Are they not, as a race, enthusiastic, excitable, irregular, the sports of every passing emotion, and, almost without exception, martyrs to indigestion and often to 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 the highly-gifted of the opposite sex for their partners through life, and then say, whether high talent can reasonably be expected to emanate from parents, one of whom—the mother—rises at best only to mediocrity, and the other—the father—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, the genius were to descend in unabated splendour even to the first line of the posterity? It is not from such materials that living genius has sprung, and never will be; for even were the child to inherit all the father's fire, he would receive along with it a morbid delicacy and irritability of temperament, which would render it impossible for him to survive the period of early infancy A genius might, in some favourable moment, be *born* to such a father; but he would die before the world could tell that a genius had lived. The circumstances in which the highest order of minds most frequently ap

pears are, where the father is healthy and active, and the mother unites an energetic character with vigorous bodily health, or with some high and sustaining excitement animating all her mental and bodily functions. The mother of Bonaparte was of this description, and the mothers of most of our celebrated men will be found to have been more or less distinguished for similar characteristics; and, accordingly, how often in the biographies of men of genius, do we remark that it was the mother who first perceived and fanned the flame which burst into after brightness! Taking the whole circumstances, then, into consideration, the influence of the father, although often less strong, because much less permanent than that of the mother, remains unquestionable, and the exception in the case of men of genius is not real, but only apparent from being imperfectly understood.

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

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

CHAPTER V.

CONDITIONS IN THE MOTHER AFFECTING THE HEALTH OF THE CHILD.

Influence of the mother on her offspring—examples of this influence—effects of longings.—Timidity of Hobbes and James I. arose from agitation in the mothers.—Singular illustrations from siege of Landau.—Mothers ought to be doubly careful of health during the time of pregnancy—apparent exceptions to their influence explained.—Diet during pregnancy.—Causes and treatment of longings.—Dress and its defects.—Evils to the infant from errors of dress in the mother.—Exercise and general mode of life.

The only circumstance which can explain or excuse the indifference shown by many mothers to the state of their own health during pregnancy, is their entire ignorance of the injury which they thereby inflict on their future 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 the temptation, if her reason was fully convinced that every transgression which she commits diminishes, in so far, the chances of health of the being whom she carries in her bosom. Yet such is unquestionably fact.

Many proofs of the reality of the mother's influence upon the constitution of her unborn child have already been laid before the reader, and, where it necessary, many more might easily be added. In one sense, indeed, popular belief has gone beyond the reality, and ascribed the moles or purple stains with which some children are born, entirely to the workings of the mother's imagination. From the same principle, the notion has arisen, that, if the longings of a pregnant woman are not gratified, the image of the object longed for will be imprinted on the skin of the infant. Hence, too, the story gravely told in Sir W. Scott's Tales of a Grandfather, of the child of Lady Cromarty being born with the mark of an axe on its neck, from the painful appre-

hension under which she long laboured of seeing her husband brought to the block. And hence, the far more authentic histories of mothers, agitated by distressing anxieties during pregnancy, giving birth to children who continued through life a prey to nervous, convulsive, or epileptic disease, or displayed a morbid timidity of character which no subsequent care could counteract.

Times of public danger and sudden alarm are prolific of examples of this latter kind; and if similar results in private life have attracted less notice, it has not been from their non-occurrence, but from their being less strongly marked. 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 and continued excitement during pregnancy, are sometimes observed to imprint a distinct character on a single member of a family, which cannot otherwise be accounted for. So natural, indeed, did this connection between the mother's state and the constitution of the future child seem to the philosopher Hobbes, that he unhesitatingly ascribed his own excessive timidity and nervous sensibility to the fright in which his mother lived before he was born, on account of the threatened invasion by the Spanish armada, and which increased to such a pitch on the news of its actual approach, as to bring on premature delivery. In like manner, the constitutional aversion to the very 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 have demonstrative evidence 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 suckling infant. If, in the child already born, and in so far independent of its parent, the relation between the two is

thus strong, is it unreasonable to suppose that it should be yet stronger when the infant lies in its mother's womb, is nourished indirectly by its mother's blood and is, to all intents and purposes, a part of her own body? If a sudden and powerful emotion of her own mind exerts such an influence upon her stomach as to excite immediate vomiting, and upon her heart as almost to arrest its motion and induce fainting, can we believe that it will have no effect on her womb and the fragile being contained within it? Facts and reason, then, alike demonstrate the reality of the 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 it was never doubted that the mother's imagination was the true and sole cause of all the local peculiarities and imperfections with which some children are born; but more accurate inquiry has now shown, that a real coincidence between the object longed for and the nature 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 latter occurs where no particular longing was ever experienced by the mother. Cases are no doubt mentioned in which deformity in the infant has occurred apparently in consequence of a strong impression made by some mutilated object upon the mother during gestation. But we have only to consider how numerous such objects are, and how rarely the supposed consequence follows, to perceive that the true cause is of a deeper kind.

The circumstances under which the best authenticated instances of marks or other local peculiarities of organization have occurred, go far to prove that the influence of the mother's srate is really very great in the earliest period of pregnancy. Where, for example, any peculiarity in the father has raised a strong feeling of repugnance and continued apprehension in the mind of

the mother, a corresponding peculiarity has occasionally followed in the organization of the child. Children have thus been born deficient in one arm, where the mother's feelings had been much excited by the loss of an arm in the father. But while such cases are so rare that the preponderance of evidence is decidedly against the probability of *local* deformities in the infant being generally the results of an accidental shock given to the feelings of the mother, there is more than enough to establisn the existence of a direct relation between the *general* state 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 necessarily affect *all* its component parts; and the child in the mother's womb being, for the time, virtually a part of her own body, it is natural to suppose that it should be subjected to nearly the same influences as the rest of her organization. If her digestion is impaired, and the quality of her blood deteriorated by anxiety of mind or continued neglect of her health, how can the infant be otherwise than injured, seeing that it must be nourished by essentially the same blood which proves insufficient for her own healthy nutrition?

Hobbes and James the First have been referred to as examples of the influence of mental anxiety in the mother upon the general constitution of the offspring; and similar cases are not of rare occurrence. A late able French accoucheur, Mauriceau, mentions, that a relation of his own, in the eighth month of pregnancy, was abruptly informed of the death of her husband who had just been killed. Premature labour came on, and the child survived; but it retained during its whole life a trembling exactly like that which the mother experienced on receiving the intelligence. Pinel and many other authors mention similar cases; but the most extraordinary, and, if strictly correct, the most conclusive of all—from their dependence on the same cause—are

those mentioned by Baron Percy, an eminent French military surgeon and professor, as having occurred after the siege of Landau, in 1793. In addition to a violent cannonading, which kept the women for some time in a constant state of alarm, the arsenal blew up with a terrific explosion which few could listen to with unshaken nerves. Out of 92 children born in that district within a few months afterwards, Baron Percy states, that SIXTEEN died at the instant of birth; THIRTY-THREE languished for from eight to ten months, and then died; EIGHT became *idiotic*, and died before the age of five years; and TWO came into the world with numerous fractures of the bones of the limbs, caused by the cannonading and explosion! Here, then, is a total of 59 children out of 92, or within a trifle of TWO out of every THREE actually killed through the medium of the mother's alarm, and its natural consequences upon her own organization.*

On first perusing this statement, one is tempted to reject it as wholly incredible; and yet, on a fair examination, it becomes difficult to assign any good reason for denying its truth. The results are extraordinary, no doubt, but so were the circumstances from which they are alleged to have sprung. Baron Percy was a man of unquestionable eminence and character; and it is improbable that he would deliberately publish as realities fictions which many of his colleagues present with him at the time must have been able to contradict. The probability of the substantial accuracy of the statement seems to me increased by the fact, that all the effects described are such as must have arisen from the influence of the mother upon the general system of the child. It is nowhere alleged that one child, in other respects healthy, was born with the mark of an exploding cannon or bomb-shell on its skin, and another with that of a sword or musket, or any other object likely to have

* Dictionnaire des Sciences Medicales, article Detonnation, as quoted by Lachaise.

been strongly impressed on the mother's mind. In *every* instance, the effect was on the general system, and therefore in strict accordance with all that is accurately known of the organic relation between parent and child.

Vivid mental emotion in the mother during pregnancy being thus shown to exert, in extreme cases, a marked effect on the constitution and health of the child, it only remains for me to add on this branch of the subject, that the *habitual state* of mind and body, whether it be that of excitement or inactivity, of good or bad temper, or of sound or broken health, exerts an equally positive and constant influence on the offspring, although necessarily less marked in degree. In this way the temper and turn of mind in the child are often a legible transcript of the mother's condition and feelings during pregnancy; and here, as already remarked, is one of the sources of the variety of character observed in children of the same family. The latest born often differ materially both in mental and bodily constitution from the earlier progeny; but then how great also the change between the feelings, passions, and bodily qualities of the parent of twenty or twenty-five years, and those of the same parent at forty years of age, after fifteen or twenty year's experience of the turmoil and vicissitudes of life!

The extent of the modifying power exercised by the mother is shown, again, in the fact already referred to, of almost all great men being descended from mothers who were remarkable for their mental endowments and activity. Few distinguished men, on the other hand, have been blessed with talented children; partly because they very rarely marry women of superior minds, and partly because few of them are themselves robust, and still fewer live in such a way as the laws of health require. From the peculiar province of the mother, her influence is as direct as, and much more continued than, that of the father, and hence her 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 organization of that of a delicate mother living in the midst of the enervating dissipations of a capital, can we imagine for a moment that *chance* alone has given health to the one and infirmity to the other, and that the mode of life of the parent has had no share in the result? If we cannot, does not that mother incur a heavy responsibility who thus, whether from ignorance, or from the selfish pursuit of immediate pleasure, perils the safety and permanent happiness of her offspring? From the moment of conception, indeed, if there is one duty more paramount than another, it is the obligation on the part of the mother to secure for herself, by every possible means, the highest state of mental and bodily health of which her constitution is susceptible; and this is the more binding upon her, that its performance involves no sacrifice which is worthy of the name, and none which is not amply compensated to her by its favourable results.

By many women pregnancy is regarded with alarm, as a period full of danger, and worse than doubtful in its result. But it is a consolation to know that this period is not naturally fraught with danger, but is rendered perilous only, or chiefly, by neglect or mismanagement. If, regardless of the future, a woman so situated neglects, as many do, the ordinary laws of health, or gives way to indolent inactivity, to the excitement of passion and the indulgence of appetite, it can scarcely surprise any one that she should suffer more seriously than if she were not pregnant; and if, by violent exercise, excess in dancing, or any other avoidable cause, she disorders her bodily functions, and unduly agitates her nervous system, and, in consequence, finds herself and the being within her exposed to unexpected danger, she cannot, with any show of justice, blame Nature or any one but herself. In many instances miscarriage has been induced, and in many

more the infant has been rendered a sufferer for life, by such imprudence on the part of the mother. But as the parent often errs from ignorance alone, it becomes of the greatest importance that she should be made acquainted with the true relation between her own conduct and health and the fate of her offspring, that she may better secure the welfare of both by an intelligent observance of the organic laws.

It is true that apparent exceptions 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 admitting them in their broadest aspect, are very far from neutralizing the much more frequent instances of an opposite kind. There are individuals in whom severe and fatal disease of a local nature exerts comparatively little effect on the general system. There are others in which 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 that is effected, the malady regains its force, and even hurries faster than before to a fatal termination. This happens not unfrequently in consumption. The infant may then be, and sometimes is, comparatively healthy, or grows up so when carefully treated and put to a very healthy nurse. But, instead of disproving the mother's influence, such cases establish it more clearly than ever. 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 its commencement, what stronger proof can there be of the reality of her influence on the unborn child, than that the latter should participate in her renewed health and strength, and come into the world with a far better chance for life than if the mother's disease had never been suspended? True, the mother soon sinks exhausted by the effort she has made; but the infant, once ushered into the world, is no longer so

closely dependent upon her aid, and, by sucking the breast of a healthy stranger, it may grow up, and, in favourable circumstances, survive for many years.

There is another class of cases, which are sometimes, but also incorrectly, regarded as exceptions to the general rule. It is to them that Dr. Eberle alludes when he says, that, "although the new-born infant may appear to enjoy a good state of health, it frequently happens that the disease or predisposition contracted during gestation remains latent or dormant for months, or even years, after birth before it is developed; and thus there may be the appearance of a sound and healthful state of the constitution during infancy, although the seeds of disease may be deeply deposited in the system."* Every experienced practitioner can bear testimony to the truth of this explanation, as it is a matter of frequent occurrence to meet with strictly hereditary disease showing itself for the first time in mature life, and yet without any doubt of its true origin being entertained. Gout, which rarely attacks the very young, is a familiar instance in point.

The condition of the mother being thus influential, the importance of contributing in every possible way to her health, comfort, and cheerfulness, especially during pregnancy, becomes 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 every whim, or by surrounding her with every luxury and enjoyment. Every gloomy, painful, or harassing impression ought to be guarded against, and good-natured equanimity and cheerfulness to be cultivated by all around her. During pregnancy, the nervous susceptibility is unusually acute, and hence greater tact and forbearance are requisite than at any other time. For the same reason, it should be the constant aim of every mother to engage in healthful and invigorating occupation, which shall

* Eberle on the Diseases and Physical Education of Children, p. 3

afford a wholesome stimulus to her intellectual and moral faculties, and withdraw her attention from herself. In her leisure hours she should seek some rational and invigorating exercise of mind and body, and be careful of giving way to caprice of temper, to the inspirations of indolence, to the unhealthy and exhausting excitement of the card-table, or to any other 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 are proved by experience to be healthful. Among the circumstances which require to be attended to during pregnancy, even more than at any other time, may be mentioned breathing a free, pure air; sleeping in a large and well-aired room, on a bed neither so soft as to induce relaxation, nor so hard as to be hurtful, and either without curtains, or with curtains never closely drawn; regular exercise in the open air; and great attention to cleanliness, dress, diet, and all the ordinary conditions of health. But, as I have 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, to which it is desirable that sound principle should be more constantly applied than it generally is.

A notion is very prevalent, that an unusual supply of nourishing food is required during pregnancy on account of the rapid development of the new being in the maternal womb. In some instances in which the general health, digestive powers, and appetite, improve during gestation, an increased allowance of food becomes necessary, and is productive of much advantage. 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 increased eating.

It is true that substance is expended on the development of the infant being in the mother's womb; but

Nature herself has provided for that demand by the suppression of the periodical discharge to which women are at other times subject, and which ceases altogether when the age of child-bearing is past; and, therefore, when during pregnancy the health is good and the appetite natural, there is no need whatever of increasing the quanttiy or altering the quality of the food which is found by experience to agree with the constitution, and nothing but harm can result 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 when the usual exercise is at the same time diminished, a state of fulness, not 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, disagreeable breath and perspiration, and other symptoms well known to mothers as incapable of cure till the period of gestation is at an end. Where digestion continues unimpaired, and the superfluity of nourishment is taken into the system, a fulness and sense of oppression ensue, which infallibly lead 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, blood is purposely drawn from a vein to avert it; but now and then it happens that Nature seeks relief by attempting to re-establish the customary discharge from the womb; and if she is aided in her efforts by any accidental imprudence on the part of the parent, the attempt will be successful, and accompanied, probably, by a miscarriage and a risk of life. In short, the fulness of system thus imprudently induced must have vent somewhere, and it will depend on the existence of any local weakness or other accident, in what organ and in what way that vent shall be effected, and with what extent of danger it shall

be accompanied. To the child, not less than to the parent, its consequences are injurious, not only as endangering premature birth, but as affecting the future soundness of its organization; and it therefore becomes a solemn moral duty of the mother not to place herself voluntarily in circumstances which may not only defeat her fondest hopes of happiness, and leave her a prey to broken health and enduring regret, but also permanently impair the constitution of the offspring.

But, while avoiding one error, we must be careful not to run headlong into the opposite extreme, and sanction an insufficient diet. Many of the lower order suffer grievously in this way, and, from absolute inability to procure nourishing food in due quantity, give birth to feeble and unhealthy children, whose whole life is a scene of suffering—although, fortunately, they do not survive long. This is, in truth, one cause of the physical inferiority of, and greater mortality among, the working classes; and as it almost necessarily leads to moral inferiority as its result, it is one of the points which eminently deserve the attention of the philanthropic and enlightened statesman. As soon may we expect fine fruit and rich harvests from an improverished soil, as well-constituted children from parents exhausted by physical exertion and insufficiently fed. It is in workhouses that the evil is seen in its most glaring form. These are peopled by the children of the lowest, most sickly, or most improvident parents. From birth they are the worst fed and the most miserably clothed, and, in consequence, their bodies are stunted and weak, and their minds and morals impaired and degraded. If the children in any workhouse are contrasted with the children at even a common country school, their physical and moral inferiority is seen to be very marked, and in the expression of innate heartiness and enjoyment peculiar to early youth, the difference is still more striking.

The effects of insufficient diet in debilitating and im

peding 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 some workhouses, to the evident deterioration of the children subjected to it, and the certain increase of pauperism which must subsequently ensue; but I can only hint at its existence, and throw out a warning, which those interested may afterwards turn to account.

It is naturally the children of the poor who suffer most from the inadequate nourishment of the parent during pregnancy; but those of the higher classes also suffer, though in a different way. The system is duly nourished only *when the food proper in itself is also properly digested;* if the digestion be imperfect, no food, however nutritious, will afford a healthy sustenance. Many mothers in the higher classes give birth to feeble and badly developed children from inattention to this fact. Fond of indulging in every luxury, they eat unseasonably and largely till the powers of the stomach are utterly exhausted, and digestion becomes so much impaired that the food ceases to be nutritious. As regards the infant, the result is the same, whether the want of nourishment arises from want of food or want of digestion; and hence again the duty so strongly incumbent on the mother, of acting 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 own power of nourishing it, as by directly refusing it food after it is born.

In all instances, the great aim ought to be to act according to the laws of the human constitution, and, consequently, 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 quantity is required during pregnancy, there are, nevertheless, many females who enjoy a higher degree of health in the married state, and especially during pregnancy, than they did before, and in whom the appetite becomes more acute, 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 necessary; and all that is required is, not to push it so far as to impair the amended tone or oppress the system. The proper limit can, in general, be easily determined by a little attention. So long as healthy activity of mind and body, aptitude for exercise, and regularity in all the animal functions, continue unimpaired, there will be nothing to fear; but if oppression, languor, or other indications of constitutional disorder, begin to show themselves, no time should be lost in taking the hint, and adopting the necessary restrictions.

There is no period of life at which it is of so much consequence to observe moderation and *simplicity* of diet, and avoid the use of heating food and stimulants, as during pregnancy. Not only is the general system then unusually susceptible of impressions and apt to be disordered by the slightest causes, but, in nervous constitutions, the stomach is the seat of a peculiar irritability, accompanied by a craving and capricious appetite, to which it requires much good sense and self-denial on the part of the parent to refrain from giving way, and which sometimes leads inconsiderate persons to much excess in both wine and food. I have known young females hurt themselves by wine taken in consequence of this craving and their imaginary weakness; and Dr. Eberle notices several remarkable instances in which similar indulgence in indigestible articles of diet produced excruciating colic, followed by abortion, even so early as the fourth month. During the latter stages of pregnancy, the risk from this cause is greatly increased; and, to long existing intestinal derangement produced

by a redundant, mixed, and heterogeneous diet, the same author justly ascribes the appearance of a peculiar and highly dangerous affection resembling puerperal fever, which comes on soon after delivery, and is characterized by a remarkable sinking of the vital energies. In cases of this kind, the disorder of health previous to parturition is not so striking as to arrest attention, although perfectly obvious to experienced eyes; and when, after delivery, danger declares itself, it is viewed with all the surprise and alarm of an unexpected event, although, in reality it might have been foreseen, and, to a considerable extent, guarded against by a well-conducted regimen and due attention to the action of the bowels.

If the public mind were only sufficiently enlightened to act on the perception that no effect can take place without some cause, known or unknown, preceding it, to which its existence is really due, many evils to which we are now subject might easily be avoided. If, for example, women in childbed could be convinced from previous knowledge, that, as a general rule, the danger attending that state is proportioned to the previous sound or unsound condition of the system, and to its good or bad management at the time, and is not the mere effect of chance, they would be much more anxious to find out, and successful in observing, the laws of health, both for their own sakes and for the sake of the future infant, than they now are while ignorant of the influence of their own conduct. Accordingly, I entirely agree with Dr. Eberle, when he says that "the pregnant female who observes a suitable regimen will, *cæteris paribus*, always enjoy more tranquillity, both of mind and body, and incur much less risk of injury to herself and child, than she who, giving a free rein to her appetite, indulges it to excess, or in the use of improper articles of food.

On the subject of *longings* for extraordinary kinds of food, much caution ought to be exercised. Longings rarely occur in a healthy woman of a well-constituted

mind. Indeed, they are almost peculiar to delicate, nervously irritable, and above all, *unemployed* women, who have been accustomed to much indulgence, and have no wholesome subject of thought or occupation to fill up their time. If they are indulged from the first, they gain strength by what they feed on: the whole mind becomes centered on their contemplation, and the fancy incessantly excited to produce new whims for their gratification, to the infallible disturbance of the health of both mother and child. Longing is a disease of the brain and mind much more than of the stomach; and the way to cure it is to provide the mind with wholesome occupation, and the feelings with objects of higher interest, 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.

During pregnancy, the great aim, for the sake of both parent and child, ought to be to sustain the general health in its highest state of efficiency; and in order to attain this, the mother ought to pursue her usual avocations and mode of life, provided these be such as are compatible 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. But any of these carried to excess may become a source of danger to both parent and child Dancing, riding, travelling over rough roads, and vivid exertions of mind, have often brought on abortion.

For many years past, common sense and science have combined to wage war against custom and fashion on the subject of female dress, and particularly tight-lacing and the use of stiff 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 reason than by mechanical compression; and if this great truth shall make way, fashion will ultimately be enlisted on the right side, and the beautiful forms of nature be preferred to the painful distortions of art. Already sounder views of the nature of the human frame, added to the lamentable lessons of experience, have convinced many mothers, that the surest way to deform the figure and to prevent gracefulness of carriage, is to abolish exercise and enforce the use of stiff and tight stays: and that the most effectual way to improve both, is to obey the dictates of nature in preference to the inspirations of ignorance. 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 for both body and mind, as an indispensable preliminary. If the bodily organization be allowed fair play, the spine will grow up straight and firm, but, at the same time, graceful and pliant to the will, and the rest of the figure will develope itself with a freedom and elegance unattainable by any artificial means; while the additional advantage will be gained, of the highest degree of health and vigour compatible with the nature of the original constitution.

If, then, perfect freedom ought at all times to be provided for in the construction of female dress, it is plain that during pregnancy it must be doubly imperative. And accordingly, as is well remarked by Dr. Eberle, "the custom of wearing tightly-laced corsets during gestation cannot be too severely censured. It must be evident to the plainest understanding, that serious injury to the health of both mother and child must often result from a continual and forcible compression of the abdomen, whilst nature is at work in gradually enlarging it for the accommodation and development of the fœtus.

By this unnatural practice, the circulation of the blood throughout the abdomen is impeded—a circumstance which, together with the mechanical compression of the abdominal organs, is peculiarly calculated to give rise to functional disorder of the stomach and liver, as well as to hemorrhoids, uterine hemorrhage, and abortion. The regular nourishment of the fœtus, also, is generally impeded in this way—a fact which is frequently verified in the remarkably delicate and emaciated condition of infants born of mothers who have practised this fashionable folly during gestation. It may be observed, that, since the custom of wearing tightly-laced corsets has become general among females, certain forms of uterine disease are much more frequent than they were sixteen or eighteen years ago."* Hence it ought to be the first duty of the young wife who has reason to believe pregnancy to have commenced, to take special care so to arrange her dress as to admit of the utmost freedom of respiration, and to prevent even the slightest compression of the chest or abdomen.

After these most judicious and forcible observations, I need only add, that the evils of tight-lacing do not end with the birth of the child. The compression farther prevents the proper development of the breasts and nipples, and 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, that many mothers, as pregnancy advances, 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.

But although I strongly advocate the propriety of bringing up young girls without the use of such ill-judged support, I by no means recommend that those mothers to whom long custom has rendered corsets

* Eberle on the Diseases and Physical Education of Children. Cincinnati, 1833, p. 9

necessary should at once lay them aside. They ought, however, to be very careful to wear them sufficiently loose to admit of the free enlargement of the womb in an upward direction, and to substitute thin whalebone blades for the stiff steel in common use. If this precaution be neglected, both mother and infant may be seriously injured, and ruptures or other local ailments induced. To afford the necessary support, a broad elastic bandage worn round the body, but not too tight, will be of great service; but every approach to absolute pressure should be scrupulously avoided. The Romans were so well aware of the mischief caused by compression of the waist during gestation, that they enacted a positive law against it; and Lycurgus, with the same view, is said to have ordained a law compelling pregnant women to wear very wide and loose clothing.

In regard to regular exercise in the open air, the greatest attention is requisite on the part of the mother. Nothing contributes more essentially than this 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, and with excellent effect upon all the functions. Hard riding on horseback, dancing, and every other kind of violent exertion, ought, however, to be scrupulously avoided as also fatigue, damp, cold, and late hours. The early part of the day ought to be selected in preference, especially in winter, as there is always a degree of dampness towards sunset which is unfavourable to health. Riding in an open carriage is a very useful addition to walking, but ought never to supersede it. I have seen even delicate women pass through the whole period of pregnancy and delivery without a single bad symptom, merely from scrupulous but cheerful observance of the laws of exercise and health; and it cannot be doubted that the degree of danger attending it depends very much upon 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 suffering and danger. Where the mode of life and the habitual occupations of the mother are rational, the more nearly she can adhere to them during pregnancy, the better for herself, and consequently the better also for her infant.

Cleanliness and fresh air are important aids to health at all times, and doubly necessary during gestation. Hence the propriety of having recourse to a tepid bath every few days, especially in the case of females of the middle and higher classes, in whom the nervous system is unusually excitable. It promotes the healthy action of the skin, sooths nervous excitement, prevents internal congestion, and is in every way conducive to health. But it must not be either too warm, too long continued, or taken too soon after meals. For the precautions which its use requires, I must refer the reader to my former work, as it would be out of place to repeat them here.*

Other circumstances might be mentioned as influencing the mother's health, and indirectly that of the child; but as they have reference to her only in common with other individuals, and, therefore, come under the head of the general laws of health, I need not now enlarge upon them. Many sensible people who have never thought on the subject, may be surprised at the earnestness with which I have thus recommended attention to the mother's state as the surest way of influencing the health of the child; but let them observe and reflect on what is passing around them, and they will meet with many proofs of the principle which I have been enforcing, and soon be induced to admit its importance.

* Principles of Physiology applied to Health and Education. Chap. III., ninth edition

CHAPTER VI.

OF THE CONSTITUTION OF THE INFANT AT BIRTH.

nfant organization strictly adapted to its wants both before and after birth—changes which occur at birtn.—The nervous system first called into action.—Respiration next.—Changes in the circulation--peculiarities of circulation and respiration in infancy. —Animal heat small in infancy—its sources.—Appetite comes next into play—food and digestive organs.—Functions of excretion –the bowels, kidneys, lungs, and skin.—Animal functions as distinguished from organic—are dependent on the nervous system and organs of voluntary motion.—Animal functions include those for which life is given, and organic those by which life is carried on.—Beautiful adaptation to each other and to the wants of the infant.

Having now pointed out the *indirect* conditions of infant health, or those which operate *through the medium of the parents*, we have next to consider those which act *directly upon the infant itself* after it has entered upon independent existence. But that these may be fully understood, it will be necessary to premise a short review of the peculiarities of structure and function by which the infant being is characterized.

My object being entirely of a practical nature, I shall say nothing regarding the development of the infant within the mother's womb, or the functions which, as common to it with the adult, have been fully treated of in my other works. So far as the welfare of the child is concerned, it may be considered before birth as virtually a portion of the mother's organization; for its life and growth are wholly dependent on her, and it executes no function peculiar to itself. In one sense indeed, it may be said to carry on *growth* and *nutrition*, and to circulate through its own blood vessels the blood by which its life is sustained; but, in reality, all these processes are so closely, though indirectly, dependent upon the mother for their continuance, that they cease with her life, and are effected by every change in her health.

Secluded, as the infant is, in the mother's womb, from all contact with the external world, and all access to food, air, or light, it would have been a strange incongruity to render its life and growth dependent upon the same conditions as after it is ushered into the world. Previous to birth, it would have served no purpose but misery to make the infant conscious of its situation, and the subject of emotions which it could neither act upon nor communicate; or to bestow upon it the elements of a will which it could not possibly execute. Up to this time, accordingly, the brain, the nervous system, and the external senses, have been in a state of nearly complete repose. As yet, they have never come into contact with any thing which could rouse them into action. There has been no light for the eye to see, no sound for the ear to hear, no smell for the nose to perceive, no food for the palate to taste, and no change in the qualities, temperature, or position of surrounding objects, to excite any change of sensation. The organs of respiration have been at rest, for there has been no air for them to breathe, and no blood in their air-cells for them to act upon. The stomach, the bowels, and the kidneys have not been exercised either in digestion or in throwing out the waste from the system; because, as yet, neither food nor drink has been swallowed to excite their functions. The muscles and bones have executed no voluntary movements, because there has been neither will to direct them, nor object to be accomplished by them. Isolated as the unborn infant is, it would have been positive cruelty to endow it with an appetite for food which it could neither obtain nor digest. Being utterly without power to supply any one of its own wants, it was the purest benevolence to render it entirely dependent on the parent system, and to deny to it any endowment of either feeling or intellect.

But when the infant is once ushered into the world, what a revolution in its mode of existence takes place! In one 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 at once to the rude contact of an ever-changing and colder air, and to a harder pressure even from the softest clothing than it ever before sustained. Previously nourished by the mother's blood, it must now seek and digest its own food, and throw out its own waste. The blood, once purified and restored through means of the mother's system, must now be oxygenated by the child's own lungs. The animal heat, once supplied to it from another source, must now be elaborated by the action of its own organs. Formerly defended from injury by the mother's sensations and watchfulness, its own nerves must now receive and communicate the impressions made by external objects; through its smiles or its cries it must now announce to her ear and reveal to her judgment its safety or its danger; and if any of these important changes fail to take place in due time and order, its life may fall a sacrifice.

Such is the revolution which occurs in the mode of life of the new-born infant, and such are the changes for which its organization must be already prepared at the instant of birth, and which render the period of early infancy so full of danger when their nature is misunderstood, and the treatment is not in harmony with the wants of the constitution. Let us now inquire what the peculiarities of the infant organization are, and in what manner these changes are brought about.

Sensation and muscular motion are unquestionably the first functions roused into action by the sudden entrance of the new being into the external world; and in accordance with this fact, we find the nerves of sensation and motion, and the spinal marrow, from which most of them originate, already firm in structure and largely developed The anterior and upper portions of the brain, on the other hand, which serve for the operations of the intellectual and moral faculties, then almost in

abeyance, are still soft in structure and little developed while the posterior portion, lying behind the ear, and connected with the feelings, which have for their object the preservation of the individual, and which, therefore, come first into play, is already of considerable size. We shall now see that, in strict harmony with this arrangement, the functions of sensibility and muscular motion are *indispensable* to the commencement and continuance of independent existence.

From the moment in which the infant ceases to constitute a part of the mother's system, the continuance of its life depends on the instant commencement of *respiration* or breathing. If that be delayed or suspended for a few minutes, it perishes precisely as if from suffocation. But before the infant can begin to breathe and to circulate its own blood, *the stimulus must be felt* which renders breathing an imperative act. In ordinary cases, accordingly, the infant is no sooner out of the maternal womb, 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 impulse which calls the lungs into play. In this manner, it is like the steam which sets the engine in motion. At birth, the lungs and respiratory muscles are, like the well-finished steam-engine, quite prepared for action; but like it also they cannot start into activity of themselves. They await the application of the impulse or moving power—the stimulus of the respiratory nerves. If that stimulus be instantly supplied, they will forthwith start into activity, and breathing will commence. But if it be delayed or denied, the lungs, however well adapted they may otherwise be for their office, will remain inactive, and life speedily become extinct.

The quick sensibility and immediate reaction of the nervous system being thus essential to the continuance of life, the reason of the early development of the ner-

vous filaments and their copious distribution to the tender skin, and of the extreme sensitiveness of the latter, will now be apparent. That sensitiveness is the *condition and safeguard of life;* by the shock impressed upon the sensitive nerves by the sudden transition of the infant from a temperature of 98° or 100° in the mother's womb, to one of 60° or 65° in the atmosphere, respiration is first called into activity. The expansion of the chest is no doubt favoured by the altered position of the child, so well pointed out by Dr. Bostock; but the active agent is unquestionably the nervous shock suddenly exciting the same irregular action of the respiratory muscles, the same panting and sighing, which a similar cause—plunging into a cold bath—does in an adult, and especially in one of a delicate and excitable constitution. In general, indeed, the impression made on the child by the cold air is so vivid and disagreeable that 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 them. Hence crying is always considered a satisfactory sign of a child's vigour on coming into the world.

Of the importance of this nervous agency at the outset of life, some idea may be formed also from what happens during recovery from a fainting-fit—a state bearing some resemblance to that of the infant before birth. During the faint, breathing is almost entirely suspended; and one of the most effectual remedies for restoring it, after the free admission of cold air, is suddenly sprinkling the face and chest with cold water. When this remedy is successful, which it generally is, its first effect is uniformly *a deep sigh* or *inspiration*, by which the lungs are fully expanded. This is repeated several times, at irregular intervals, till by degrees the breathing becomes regular and natural, and the action of the heart is also restored. Here, as at birth, the con-

tinuance of life depends, in the first instance, on the nervous stimulus arising from the sudden impression made upon the surface by the external cold: but where the faint is very deep, a still stronger stimulus becomes requisite to rouse nervous reaction: and hence the utility of strong-scented salts, such as hartshorn, being applied to the nostrils.

It is owing to this direct dependence of respiration upon the previous action of the nervous system, that, when any cause occurs to prevent the nerves of the skin from responding to their nervous stimulus, breathing cannot ensue, and, consequently, life cannot be sustained. This result is sometimes observed from an undue accumulation of blood in the brain giving rise to apoplectic stupor or insensibility; and sometimes also from the opposite state, viz., a want of blood in the brain from excessive flooding during parturition.

Another important purpose fulfilled by the lively sensibility of the skin in early infancy, is protection from external injury. The organization of the new-born child is so feeble and delicate, that a very slight cause is sufficient to disturb its health; and hence it becomes indispensable for its safety that it should be keenly alive to the approach and action of every external influence. A slight excess in cold or in heat, a little hardness or roughness in the material of its clothing, any trifling neglect of cleanliness, or constraint in position, may suffice to 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, incurable disease might be induced, or the child perish, without any previous indication that the 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 where any morbific cause is allowed to act: hence the rapid course, and frequently fatal termination, of many infantile dis

eases; and hence also the much greater efficacy (at that age) of preventive than of curative treatment.

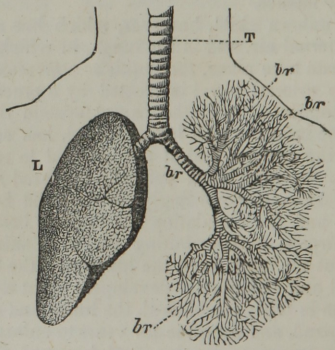
Nervous sensibility and muscular motion being thus roused, the functions called next into action for the preservation of life are those performed by the *lungs and heart*, viz. *respiration and circulation*.

The chief purposes of *respiration* are, 1st, to convert the venous into arterial blood, or restore to the former its lost power of supporting life; and, 2dly, to convert the chyle into blood. Both of these purposes are effected by subjecting the venous blood and the chyle mixed with it to the action of the air in the air-cells of the lungs, where the necessary chemical changes take place. For this reason, it is indispensable that the whole venous blood of the body should pass through the lungs in succession, to undergo the process of aëration; and whenever any obstacle occurs to prevent the blood from following this course, or to interrupt the access of air to the lungs for a short time, as in suffocation, death inevitably ensues.

In the unborn child, however, which has no access to the external air, and in the lungs, in which no such aëration can take place, the requisite conversion of venous into arterial blood is effected by a process more directly connected with the parent system than with that of the infant. The latter, indeed, has so small a share in the change, that it may be said to receive its arterial or nutritive blood perfectly prepared for distribution. At birth, accordingly, as the child has never breathed, and the circulation has hitherto been for the single purpose of distributing the nourishing blood throughout the body, both the lungs and the heart are still small and imperfectly developed. But as soon as respiration is fairly established, the lungs and chest begin to expand, and continue for years to enlarge. The heart also increases in size, and becomes altered in structure to fit it for the additional duty which it is then required to perform. Besides the circulation of arterial

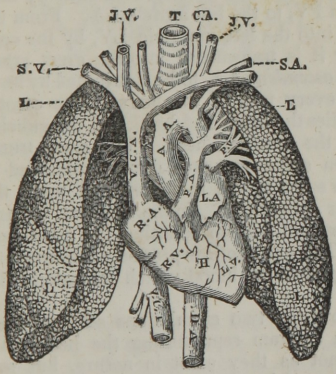
blood which has existed from the first to nourish the growing organization, a separate circulation becomes necessary at birth to transmit the venous blood from the right side of the heart into the lungs for aëration, and thence back in the form of arterial blood to the left side of the heart for general distribution. This new course becomes indispensable at birth; because, the infant being now separated from the parent system, its venous blood cannot regain the lost power of supporting life and yielding nourishment, except by undergoing exposure to the air in the air-cells of the lungs; and, consequently, if any thing occurs to prevent this second circulation coming freely into play at birth, death inevitably and speedily ensues. But these remarks will be better understood after carefully examining the subjoined illustrative woodcuts.

The annexed figure represents the outline of the neck and shoulders, with the *trachea* or windpipe T descend-



ing from the mouth and dividing into two branches, one going to each lung. On the right side, the lung L

remains in its natural state; on the left, the minute sub-divisions or *ramifications* of the wind-pipe, which terminate in the air-cells, are seen at *b r*, as they would appear if the tissue of the lung itself were removed. In the second woodcut, the two lungs, the heart lying between them, and the great blood vessels, are seen in nearly their natural situation. T is the trachea, LL the lungs, H the heart, with which the blood-vessels are observed to be connected. The letters RA and RV designate the *right auricle* and *right ventricle*, constituting together what is called the *right side* of the heart, into which the dark or venous blood is received, and from which it is sent to the lungs. The letters LA and LV indicate the *left auricle* and *left ventricle*, constituting the *left side* of the heart, into which the red



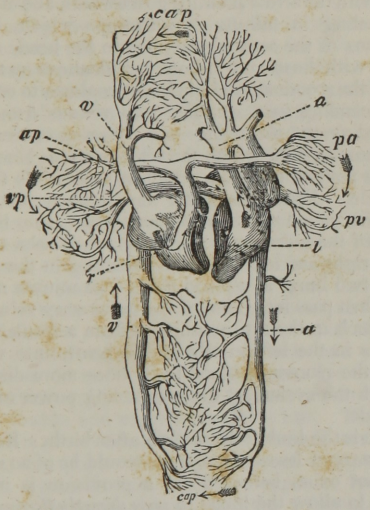
or arterial blood is received from the lungs, and from which it is distributed through the body. The vessels

marked SV and JV, are the subclavian and jugular veins, which return the dark blood from the arms and head, and unite to form the great venous trunk VCA or *vena cava superior* (superior hollow vein,) which terminates in the right auricle RA. Here the *descending* current is met by that *ascending* from the abdomen, trunk, and lower extremities, through the *vena cava inferior* VCI, which also pours its venous contents into the right auricle.

From the right auricle, the collected venous blood passes into the right ventricle RV, which immediately afterwards contracts and expels it into the *pulmonary* or *lung-artery* PA, which is seen to spring from the posterior part of the ventricle. By the pulmonary artery, the venous current is carried onwards and distributed through the lungs, to be there exposed to the air, and returned in a red or renovated state by the pulmonary vein PV, to the left auricle LA. From the latter, it passes into the left ventricle LV, by the contraction of which it is transmitted into the great artery called the *aorta ascendens* AA, to be distributed by its branches through every part of the body. The carotid artery CA supplies the brain and head, and the subclavian artery SA the arm and head. The main trunk of the aorta then makes a curve downwards, and descends along the spine at DA to be ramified upon the trunk and lower extremities. In the woodcut, the arch of the aorta is seen at AA surmounting the right pulmonary artery. The veins follow precisely the opposite course, and bring back the blood which the arteries have carried out.

To show the two circulations still more clearly, I subjoin a diagram representing the heart and blood-vessels, not as they exist in nature, but artificially separated, as if forming two distinct systems. In the centre of the diagram, the heart is seen divided artificially into its right and left portions. In the adult, there is no direct communication between the two sides any

more than if they were actually separated in the way here represented; they merely adhere to each other so as to form outwardly the single organ called the heart. By a little attention to the following description, and to the course of the current as indicated by the arrows, the whole circulation may be easily followed.



Starting from the left side of the heart at *l* we perceive an arrow pointing upwards into the aorta, the arch of which is seen at *a*. From the arch, two smaller trunks are seen going upwards, and branching out to supply the head. Following the small subdivisions of these branches, we find them passing over to the right side, and there terminating in equally small venous branches,

which, coalescing, form a trunk *v*, which is the great vein or *vena cava*, carrying back the now venous blood to the right side of the heart, where the vein is seen to terminate in the right auricle.

Returning to the trunk of the aorta, we find it bend downwards and form at the lower *a*, the descending aorta with the arrow pointing downwards, and ultimately terminating in minute ramifications which, like the branches of the arteries supplied to the head, are connected with the minute venous ramifications on the right side of the woodcut, and gradually coalesce to constitute the ascending vein *v*. The two venous trunks—the descending and ascending—are observed to meet at the right auricle, into which the whole venous blood of the body is poured, and from which it passes into the right ventricle. From the latter the venous blood now proceeds, as indicated by the bent arrow, into the large trunk of the pulmonary artery, which is seen to divide into a right and left branch terminating in the air-cells of the two lungs at *a p* and *p a*. The minute ramifications then pass into those of the pulmonary vein *v p* and *p v* which in their turn unite to form a trunk that terminates in the left auricle of the heart, into which it pours the renovated blood to be once more distributed through the system by the contracting power of the left ventricle.

Such is the double circulation after birth. But as the pulmonary or lesser circulation would be of no use, and does not exist, before birth, a provision is made by nature to allow the blood to *pass directly through from the right to the left auricle* by a hole called the *foramen ovale*, or *oval hole*, which exists till then, but gradually closes up after the child is born. In some instances this hole remains open for life, and the consequence is, that it allows the *venous* blood to pass through to the *arterial* or left auricle, without being previously transmitted to the lungs for oxygenation. The venous blood thus mixing with the arterial, imparts to the latter a darker

hue than natural, and hence the purple colour of the lips and face which is observable in such cases, instead of the vermilion red produced by pure arterial blood. Where the oval hole remains only partially open, life may go on for years notwithstanding a certain admixture of the venous with the arterial blood. But if it is open to its full extent, the infant is either carried off poisoned by the quantity of dark blood which finds its way into the left auricle, or survives for a few months in a very precarious state, and then perishes.

Such are the changes which the circulation must undergo almost at the instant of birth, and without which life cannot be carried on. As the functions of respiration and circulation have been already fully treated of in my Principles of Physiology, I shall not enter farther upon their explanation here.

Before taking leave of this branch of the subject, however, there is a peculiarity, dependent partly on the small size of the chest and imperfect development of the lungs, and partly on the excitability of the nervous system in early infancy, which requires to be noticed I allude to the *rapidity* of the circulation of the blood While in adult age the heart contracts and the pulse beats from 60 to 70 times in a minute, the number of contractions and pulsations in the first months of life is nearly double, and varies from 120 to 130. The breathing also is proportionally frequent, though not deep; it is like the quick short breathing of fever. But as growth proceeds and the chest expands, respiration gradually becomes slower, and the pulsations of the heart diminish in frequency. The phenomena seem, indeed, to depend chiefly on the comparatively small size of the lungs and heart, and the sudden change in the circulation. While in the womb, the lungs receive little more blood than suffices for their nourishment; but immediately after birth, *the whole* of the venous blood must, as we have seen, pass through them to be converted into arterial or life-sustaining blood. The

consequence is, that the capacity of the heart and lungs being then smaller than in mature age, the blood must move faster, otherwise its oxygenation cannot take place with sufficient rapidity; and if it moves faster, respiration also must become more frequent to furnish the necessary supply of air. And this is precisely what is observed to happen.

In infancy, then, we must be on our guard against mistaking a natural for a feverish pulse: and at the same time we must keep in mind that this rapidity of circulation and frequency of respiration, by increasing the nervous excitability, render the system more susceptible of febrile irritation, and hasten the progress of all its acuter diseases. From the same peculiarity of the infant constitution, it is obvious that the *purity* of the air in which the child lives must be much more important to its welfare at that age when respiration is imperfect and feeble, than at a later period, when the function is more vigorous, and the powers of resistance of the system are greater. In infancy, accordingly, living in a pure dry atmosphere of moderate temperature is the best safeguard of health, and in early life the rapid recovery which often ensues, even in very unfavourable circumstances after removal from the confined air of a city to the pure atmosphere of the country, has long been a matter of general observation. For the same reason, the mortality in infancy always bears a direct relation to the impurity of the atmosphere; it is greater in towns than in the country, and in crowded manufacturing districts than in those which are less populous and contaminated.

From the preceding exposition, then, it appears that three most important changes follow instantaneously the birth of the healthy infant: *first*, the excitement of the nervous system into action; *secondly*, the expansion of the lungs and the establishment of respiration; and, *thirdly*, the alteration in the course of the venous blood, by which it is made to pass through the lungs, instead

of going directly from the right to the left side of the heart. But there is yet another indispensable condition of life formerly provided for by the parent which must forthwith come into play at birth, and which, therefore, requires our attention. I allude to the supply of *animal heat*.

A certain degree of animal heat is an essential condition of the well-being of all warm-blooded animals. If it be unduly diminished or increased, all the functions suffer, when in an extreme degree, death speedily ensues. To obviate these sources of danger, Nature has so arranged the human organization, that, within certain limits, it preserves an equality of temperature, whether the heat of the surrounding air be above or below the standard of the animal system. In man a uniform temperature of about 98° is essential to health. In some birds it is 10° or 15° higher. In other words, the temperature of the human body exceeds the average temperature of this climate by nearly sixty degrees; and, as a necessary consequence, without some express provision for producing heat, the body would speedily be cooled down, even in summer, to a degree incompatible with the continuance of life. Our next step, therefore, is to ascertain whether such a provision is made, and the mode in which it is effected.

The three grand sources of animal heat are *respiration*, *digestion*, and *nervous excitement*. The first is the most important of them all, and consequently, other circumstances being equal, where the lungs are largely developed, and play freely in a pure air, animal heat is generated most rapidly. Where, on the contrary, the lungs are small, or their full expansion is impeded, or the air vitiated, its production is comparatively slow. The rapid evolution of heat in a healthy man engaged in active exercise, and the glow which the labourer experiences when at work, without hat or coat, even in a frosty day, furnish a good example of the former; while the difficulty which pulmonary invalids, and

others in whom respiration is weak, find in keeping themselves warm in winter, even with the aid of good fires and clothing, is an equally instructive example of the latter. And we have only to look at the small chest and feebly developed lungs of the infant, and to consider 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 weak indeed.

The next source of animal heat is the vigorous digestion of nutritious food. When the diet is full and nourishing, and the digestion rapid, heat is rapidly evolved, and a genial glow, which sets external cold at defiance, pervades the frame. But when the food is insufficient in quantity or quality, or digestion is impaired, the influence of cold is resisted with difficulty, and a sense of chill is habitually complained of. Here, again, the balance is decidedly against the infant being, as compared with the grown man; for in early infancy the milk is watery and unstimulating, and activity necessarily limited by the feebleness of frame; and hence the power of generating heat is proportionally smaller than in after life.

The last source of animal heat which we shall notice, is the active co-operation of the nervous system. Where a strong nervous stimulus is at work, there heat is always more freely evolved; and where inactivity prevails, its generation will be least rapid. Thus during sleep, when the nervous system is in a state of repose, the production of heat is reduced: hence the fatal effects experienced from yielding to its influence when exposed to intense cold; and hence the necessity we feel for warmer coverings during our hours of sleep than we could bear during those of wakeful activity, and the frequency of colds caused by falling asleep in the open air unprotected by additional clothing. But in this respect also, the infant is inferior to the person of mature age. At first its life is almost a continued sleep, and for many months it is wakeful and active

only by fits and starts; nothing like sustained intensity of nervous action is ever witnessed, except during its diseased states, and then heat is evolved in great abundance. Here, accordingly, is in infancy the state of the nervous system most unfavourable to the production of animal heat.

If, then, free respiration, vigorous digestion of nourishing food, and active nervous influence, are the chief sources of animal heat, it would be contrary to reason and common sense to expect its rapid evolution in infancy—the very period at which these functions are most imperfect, and come into play for the first time, amidst an entire revolution in the state of being and habits of the child, which is any thing but favourable to their exercise. How can respiration be free and vigorous where the lungs are still small, and their air-cells still imperfectly expanded? and how can the new-born infant produce heat from *chyme*, which is itself the product of a digestion that has not yet taken place? Again, how can digestion be vigorous where no food has ever been swallowed, and where the first aliment derived from the mother's breast is so thin and watery, as scarcely to admit of digestion at all? And how can sustained nervous energy be healthily supplied, when the nervous fibres have for the first time encountered their objects, and whole days are spent in sleep, and when the circulation is driven off its balance by the variety of new functions at once excited to action? To the eye of reason, it seems impossible to survey these facts without acknowledging, that to expect the vigorous generation of animal heat in such circumstances, would be very much like expecting an oak to grow without roots, or a fire to burn without air. Notwithstanding this, however, it was once, or rather it still is, a matter of popular belief, that infants have a great power of resisting external cold, and are even invigorated by it. But W. F. Edwards has now demonstrated that, in accordance with what 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 conformity with this rule, it appears that in prematurely born children the heat of the body is several degrees below the natural standard, and is very easily depressed still farther by external exposure. In one instance of a seven months' child, the thermometer stood at 89° Fahr. instead of 98°, or nine degrees below the usual temperature in the adult.

The extreme care, indeed, with which the lower animals protect their young from cold, has often been remarked, and might have led sooner to a perception of the truth. W. F. Edwards observed a very great and rapid diminution of temperature in the new-born offspring of most carnivorous animals when they are removed from the parent, whereas, when lying close to the body of the mother, they lose only 2° or 3° of heat. Young sparrows, in like manner, have a temperature of 95° or 96° in the nest a week after being hatched; but when removed from it, their temperature falls in a single hour to 66½°, that of the atmosphere at the time being as high as 62°.* Man forms no exception to this general rule, and consequently, as the power of generating heat is comparatively feeble in infancy, and a regular high temperature of the body is necessary for existence, it follows that whatever withdraws heat faster than it is produced, must be injurious in exact proportion to the extent and rapidity with which the cause acts, and to the natural weakness of the constitution

The practical conclusions deducible from the preceding exposition are, as we shall afterwards see, of great importance and very general application; but, for the present, it will be sufficient for the reader to bear in

* Muller's Elements of Physiology, translated by Baly, p. 76

mind, that, so far from infants possessing a power of successfully resisting cold, they, in common with the young of all animals, cannot even sustain their own temperature, and speedily perish unless duly protected externally; and that the degree of animal heat which is indispensable to the continuance of life, cannot be kept up till the three great processes of *nervous action*, *respiration*, and *circulation*, are fully established. If these functions be duly executed, life will go on; but if any of them fail after birth, even for a short time, the life of the infant will immediately be extinguished.

The conditions indispensable for entering upon independent existence being provided for in the way we have just seen, the infant may be said to be for a time comparatively safe. Before long, however, new wants appear which require the aid of new functions to satisfy them. By a universal law of nature, wherever action goes on, waste is its invariable concomitant. Hence the human body requires, like other machines, a regular supply of new materials with which to replace those which are worn out; and as it increases in size and development from a scarcely visible speck to the large dimensions of mature age, it evidently requires an additional supply out of which the advancing structure may be formed.

Accordingly, after a short period of repose, sufficient to allow it to recover from the turmoil of birth, the infant awakes, in obedience to a new instinct, to demand the gratification of *appetite*. For the first time, it receives food into its own stomach, and commences the process of digestion for its own sustenance. But this function is evidently secondary to those already considered, and is necessary, not because life cannot exist without it, but because waste and growth are the concomitants of life. In this way, the taking of food is not an instant and immediately 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 draws to a close.

The infant, after birth, being thus dependent on supplies of nourishment from without, which its own system must prepare and *assimilate* (or *render like*, or convert into, a part of itself,) it follows that its organs of digestion must be sufficiently developed at birth to assume at once their now necessary office. Such, accordingly, is the case; but the nourishment appointed for the infant being of a very different nature from that required for the adult, we observe a corresponding difference in the condition of the organs by which it is taken in and digested. In infancy, the food—the mother's milk—is soft and fluid, and requires no mastication. In accordance with this, there are as yet no teeth, the jaws are small, and the muscles which move them are feeble and imperfectly developed. The cavity of the mouth is small, as there is no morsel to be retained in it. The stomach and bowels are equally limited in capacity, because the nourishment is taken frequently and in small quantities at a time, is of a simple and unirritating nature, and leaves no great residuum to be thrown out for which capacity can be required. Their muscular coat, also, is comparatively feeble, because there is no quality of resistance in the food on which it requires to be exercised. The liver is comparatively of larger size than in after life, and the secretion of bile, in common with that from the inner surface of the bowels, is unusually copious, and the evacuations consequently are frequent and thin.

From the simplicity of the natural food of the infant, 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* or *lacteal* vessels, the use of which is to imbibe it from the surface of the small intestines as fast as it is formed, and carry it towards the right side of the heart to be mixed with the venous blood, and converted along with it into *arterial*

or *nutritive* blood, by exposure to the air in the air-cells of the lungs. But the lungs and chest being still small and respiration feeble, if the child is encouraged to suck too much or too frequently, and 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 or beef-tea, or thick arrow-root, be given too soon by way of strengthening a weak child, the chyle formed from it may be, from a similar cause, imperfectly sanguified in the lungs, and feverish irritation be the result. This, indeed, is far from being an unfrequent occurrence, and its consequences are often very serious.

The respiration of a pure air is, as we have already seen, essential to the conversion of chyle into blood, and, therefore, indispensable to healthy nutrition; as is also the distribution of the new blood throughout the body by means of the heart and blood vessels. But as these functions present nothing very peculiar in infancy, it will be needless to discuss them here in greater detail. It will be sufficient to remark, that from the mild nature of the diet, and the moderate extent of respiration, the circulating blood is naturally less highly animalized, and less stimulating, than in after life. The quantity of fluid in a given bulk of the infant organization is consequently much greater than in the adult. This difference, of course, requires to be kept in mind in regulating the diet of infancy, as the highly nutritive food of the adult would evidently be ill adapted to replace the waste and promote the growth of the child.

Such is the way in which the requisite supply of nourishment is provided for the infant system, and such the state of the organs engaged in its preparation and conversion into blood. But without some regular outlet for the old matter which has already served its purpose in the system, and some means of removing the useless remainder of the food which has been swallowed, this

frequent and regular introduction of fresh materials through the medium of the stomach and the function of digestion would speedily lead not only to repletion and oppression, but even to the direct destruction of life by the retention in the system of matter now altered in quality and poisonous in its nature. Hence, then, an obvious necessity for organs or channels through which the old and altered particles, and the refuse of the food, may be removed from the body—or in other words, for *organs of excretion or throwing out*. On these, we shall here offer a few remarks.

The principal organs of excretion are the bowels, the kidneys, the skin, and the lungs; and as we proceed, we shall find that a proper balance between the *nutritive* and the *excreting* organs is an essential condition of health, not only in infancy but at every period of life, and consequently that their due regulation ought to be carefully attended to by all who take an interest in their own health, or in that of the young. If the nutritive functions be allowed to preponderate, repletion and inflammatory disease will never be far distant. Whereas, if the excreting organs exceed in activity, as in diarrhœa, the bodily system will soon give way, unless a timely remedy be provided.

The function of excretion being thus a necessary accompaniment to, or consequence of, that of nutrition, we find the various organs by which it is carried on, ready to start into activity soon after birth. The bowels and the kidneys are duly formed, and require only the presence of their stimuli to excite them to action; and accordingly, the infant has not been many hours in the world before it takes to the breast, and, in the then watery milk of the mother, it receives precisely the stimulus wanted to relieve its bowels from the dark and slimy secretion called *meconium*, which has accumulated in them, and to fit them for the assimilation of the richer milk, which speedily takes the place of the earlier 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, it naturally follows that 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 for the first time, and secrete urine in small quantities, which is also frequently discharged, the bladder, like the bowels, being still of small capacity.

In addition to these channels of excretion, however, two more remain to be noticed—those by the skin and lungs. In certain states of the body and weather, the exhalation by the skin alone exceeds the whole amount thrown out by the bowels and kidneys united;—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 prespiration*. After hard exercise, or in hot weather, it appears in the form of *sweat* or *sensible* perspiration. If cleanliness and frequent change of clothing are duly attended to, the impurities thrown out of the system by the insensible prespiration mix with the air, or are speedily removed by ablution. But if not, their watery portion evaporates, and leaves their more solid elements adhering to the surface, which they speedily irritate and inflame. Hence a fertile source of skin-diseases in early life.

The lungs constitute another important channel of excretion. Every one is aware that a watery vapour is exhaled in breathing, and also a large quantity of carbonic acid. Animal matter escapes in the same way, of which fact we have abundant evidence in the unpleasant taint which the breath assumes in certain states of disease. These excretions from the lungs and skin being very copious, and mixing directly with the surrounding air, are great sources of impurity and disease, where ventilation is not duly provided for; and they, in their turn, are easily affected by changes in the temperature or moisture of the air In a humid, still

atmosphere, perspiration and exhalation from the lungs go on very imperfectly; and hence the dulness and discomfort so often experienced under a "leaden" atmosphere. When the air is too hot and dry, as it is apt to be where stoves are used, the same processes go on too rapidly, and produce a feverish irritability and thrist, which, if continued for some time, are sure to be succeeded by disease. On every account, then, constant attention must be paid to the temperature and humidity, as well as the purity and renewal, of the air by which the young are surrounded. If we allow perspiration, for example, to be checked by exposure to a cold and moist atmosphere, an effort will be made by some of the other excreting organs to get rid of the now hurtful particles 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 being converted into disease. When bowel-complaint is thus produced by suppression of the perspiration, the balance between the two functions may be gradually restored in a well-constituted child, and health be preserved. But in a delicate or invalid child, the increased action of the bowels sometimes continues, and becomes of itself a serious disease. Hence the necessity of avoiding every cause likely to disturb the natural balance between the different excreting organs, and not throwing the labour of one upon another which is unprepared 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 example, is suspended, the venous blood can no longer get rid of the carbon and other materials which are usually thrown out in its passage through the lungs, and the result is, that for a short time it passes onwards unchanged; but, as it is in that state unfit for the support of life, disso-

lution speedily ensues. For a similar reason, when the effluvia issuing from the surface of the body by perspiration are confined in contact with, and are absorbed by, the skin, they act as one of the most deadly poisons. Malignant fever is often produced in this manner, where many persons are crowded together for a length of time without proper ventilation being secured, as happened in the Black Hole of Calcutta. In the same way, not a few persons lost their lives some years ago from the imprudent use, on shooting excursions, of tight water-proof dresses, which entirely confined the exhalations from the skin, and prevented their diffusion in the external air. When, again, the urine is not duly discharged, a portion of it is absorbed and carried back into the current of the blood, and, acting upon it as a foreign body, alters its natural composition, and, as a consequence, destroys the health; its presence in the general system being at once indicated by the peculiar smell which it imparts to the perspiration and other secretions. The same holds good with the bowels. If they are not duly relieved, the more fluid portion of their contents is absorbed once more into the system, and can scarcely fail to affect it prejudicially; while the unnatural hardness of what remains, proves a direct source of irritation to the bowels themselves, and increases their liability to disease.

Such, then, are the effects upon the *general* system, when *excretion* is either obstructed or imperfect in any one of its outlets. But the evil does not stop there; for *local* disturbance also is experienced, which, in its turn, injures the general health. Thus, when the urine is not freely excreted, and its watery parts are therefore partially absorbed, the portion of it which remains in the bladder contains a larger than usual proportion of the salts and earths which enter into its composition. By this change it is rendered more irritating than it ought to be, and by degrees the irritation increases till inflammation ensues. The same thing happens when

the perspiration is confined for a long time in contact with the skin from neglect of cleanliness; its watery part is carried away, leaving its salts and animal matter to irritate the surface, upon which it acts in reality as a foreign body.

The grand object to which all the various functions which we have just passed in review directly contribute, is evidently the *preservation and continuance of life*. By their means, existence and growth are carried on; while, without them, the organization would speedily become a mass of inanimate matter, and, as such, fall to decay. Beyond this, however, they provide for nothing; and were man limited to the possession of these functions, he would live a merely vegetable existence. His body might grow, just as a tree grows; but he could neither feel, nor think, nor act. For this reason, the functions already mentioned are called *organic;* while another class, of which we have yet to speak, are named the higher or *animal* functions. The former or organic functions are essential to the continuance of life, to growth, and to decay; but they serve no other end. They are involuntary in their action, and unattended by consciousness; and, consequently, they go on whether we are awake or asleep, and whether we bestow a thought upon them or not. They are common to all animals, and, in a general sense, also to the vegetable world, or, in other words, to all objects possesssed of *organization;* and hence their distinctive appellation of *organic* functions.

In one sense, however, there is an evident impropriety in the use of the terms *organic* and *animal* functions; as these words may seem to indicate that the former alone are performed by organs, and that the latter are the result of life altogether apart from the organization: whereas the intention with which the words are used is very different. Properly speaking, the organic functions are simply those which contribute to

the *support and life of the tissues* of which the body is composed, without regard to the purposes for which these tissues are individually adapted. It is, for example, by the organic functions of circulation, absorption, secretion, nutrition, &c., that bones, muscles, skin, nerves, blood vessels, the lungs, the eyes, the brain, and all other parts, are formed and nourished. The organic functions thus serve for the formation, life, and support of every kind of structure; and hence they might, without impropriety, be called *nutritive* functions.

The animal functions, on the other hand, refer not to the mere *life* of man, but to *the purposes for which life was given;* they, as well as those which are styled organic, require the aid of organs for their performance, and in that sense might therefore also be called organic. The brain, the organs of sense, and the organs of voluntary motion—the muscles and bones and their relative nerves—are the great organs of the *animal* functions, because 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 of that of the beings who minister to his comfort and safety. By their means, he sees and smells, and 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 the 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 nervous system gains in development and in structure, his feelings gain strength and permanency; he manifests kindness, and reciprocates affection; he resents and repels aggression; acquires a sense of property; seeks the esteem of those around him; imitates their actions; distinguishes what is just from what is unjust; learns to clothe his feelings and

ideas in words; and, gradually becoming acquainted with his own situation in the great family of mankind, at length recognises the duties and obligations which it imposes upon him, and the consequent necessity which exists for him to seek that knowledge, and exercise that judgment, which shall best enable him to make his own way as an independent being. By the nobler of these powers and capacities, all of which act during life through the medium of the brain, and are affected by its health and disease, is man distinguished from the beasts which perish; and to them he is indebted for the privilege which he alone possesses, of knowing and worshipping the one true God, the Author and Preserver of his being.

Of these animal functions, some, indeed, are possessed by the lower animals, even in higher perfection than by man, and in connection with a partial superiority of organization. There are creatures distinguished, for example, by greater acuteness of smell and hearing, by greater reach of vision and vivacity of passion, than man; 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, he stands alone, at once the most privileged and the most responsible of all the creatures which God has called into existence; and in him these high gifts are uniformly found accompanied by a peculiar and ample development of brain, which none of the lower animals are ever found to possess

From this short review of the higher or *animal* functions, as they are called, 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 or digests, or breathes, or circulates blood, or grows, or decays. If he were, a sparrow or a fly might take rank along with

him; for they also eat, digest, breathe, grow and decay A man is a man because he *thinks*, and *feels*, and *acts*, and is the subject of moral responsibility; and he eats and digests, *merely because he must possess organs by which to think, and feel, and act, and these organs must be renewed and sustained in life and vigour.* He must have eyes to see with, because, without a structure arranged with due regard to the properties of light, no luminous impression could reach his mind. For a similar reason, he must have ears to hear, to place him in due relation to the vibrations of the air; and he must have bones and muscles to move, otherwise he could neither lay hold of the bodies around him to ascertain their qualities, nor act upon them for his own protection and support. Pursuing the principle a little farther, it is plain that the mind itself, to which all these impressions are conveyed, and from which the feelings and will emanate, must also be connected with organization during life; and the part with which it is more immediately connected is ascertained beyond all doubt to be the brain. And, accordingly, in early infancy, when depth of feeling and power of thinking would only add to the miseries of the child, the brain is soft and imperfect in structure; and in proportion as the faculties of the mind stand in need of activity and force, the brain becomes more and more developed, and approaches more and more to the type of maturity. It is thus, strictly speaking, *the mind*, and its instrument the *brain*, which constitute the distinguishing features of man; and legs and arms, and muscles and bones, are required only because, placed as we are in a material world, the mind could not act and be acted upon by material objects, unless it were associated with, and assisted by, material instruments.

There is, accordingly, nothing in the whole range of creation more wonderful or more indicative of the omniscience and omnipotence or God, than the exquisite adaptation which everywhere subsists between the na

ture of the individual organization, and the qualities, instincts, and powers by which every species is characterized.

The function of *voluntary motion* is the only other animal function which requires to be noticed; the organs which perform it are the *muscles, nerves, and bones.* The bones afford the points of solid support and resistance, and the muscles are the powers by which their relative positions are maintained or altered at the command of the will. In infancy, when there is neither knowledge nor judgment to guide the will, and when self-action could lead only to self-injury, the bones are soft and almost cartilaginous in texture, and the muscles feeble and imperfectly developed. Hence the bones yield to pressure; and, when unduly loaded, as when the infant is too soon held in the upright position, or attempts to walk too soon, they are apt to become crooked. In proportion, however, as life advances, and the child acquires the power of regulating its own movements, the bones acquire firmness and resistance, and the muscles increased development and strength.

Not only, indeed, is the organization 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 organization, how soft the bones, how frail the muscles, how feeble the senses, how defective the mind; but how active the nutrition, and yet how admirably in harmony with the constitution and wants of the infant! Necessarily and unavoidably, it enters the world ignorant of everything, and has everything to learn. In beautiful accordance with this state, Nature has, by the softness of its bones, and the feebleness of its muscles, denied it all power of self-regulation, and consigned its safety to the watchful care of maternal feeling; and only in proportion as it grows, and becomes acquainted with the

external world, it acquires the powers of motion and self-regulation, because only then it can enjoy them in safety or apply them to use. But let us suppose that the infant were ushered into existence with solid bones, and muscles already knit for action—what would be the result? It would infallibly cause its own death in a very short time, from sheer ignorance how to guide them. It might spring from its mother's arms, or leap out of its cradle, or walk into the water or into the fire, exactly like a moving machine, and its life be extinguished before its parent could recover from her surprise. Possessed of the instruments of action, without the knowledge or judgment by which to direct them, it would be more unfavourably situate than even an idiot, who, in addition to experience, has always some glimmering of feeling, if not of reason, to guide and restrain them.

If we suppose the infant, on the other hand, to be endowed with reason and judgment from the first, the incongruities of its position would be very remarkable In necessary ignorance of external objects, and in utter want of experience, it would exercise reason without materials, and, relying nevertheless upon its dictates as if they were sound, would pass at every moment from the painful correction of one error to that of another, till life itself became a burden too heavy to be endured. If, along with powers of reflection, it possessed the faculty of muscular motion, it would speedily bring destruction upon itself; and if it possessed the former without the latter, how wretched would be its existence! But, arranged as the order of development of its functions is by the Omniscient Creator, how admirably does each accord with the other, and how perfectly do all contribute to one common end—its preservation and welfare!

Ushered into a world where everything is absolutely new to it, and where its safety depends at every instant on its proper treatment, the infant is thrown at first

entirely upon 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 a power of motion or action which it could use only to its own detriment. Unable as it is to act for itself, ripened consciousness would have added miseries to its lot without a single compensating advantage; and, therefore, it passes its earlier days in sleep and dozing, and wakes up only for a moment to satisfy its predominating instinct—the appetite for food, on which its future development depends.

In exact accordance with this beneficial feebleness or immaturity of the infant faculties, we find the bodily organization, by means of which they act, imperfectly developed, and easily susceptible of injury. The eye, indeed, is open to the light of day, and the ear to the vibrations of the atmosphere, and the nostrils to the flavour of external objects; but as yet they communicate no distinct impressions to the mind; and if they are too strongly acted upon by a bright light, a loud sound, or penetrating smells, the respective organs may be injured, and their functions impaired for life. Blindness and deafness are frequently caused by unguarded exposure of this kind in the first days of existence, and every care should be taken to tread in the footsteps of Nature, and direct our exercise of every function according to the development of the corresponding organization. By degrees, however, growth and consolidation proceed: the brain becomes larger in size, firmer in texture, and capable of receiving and retaining the impressions of sense; and, as a consequence, the mental powers become gradually stronger, till at length they assume the same general features which in their full maturity give individuality to the character. Simultaneously with this change in the mind or *directing* power, the bodily organization, the bones and muscles which *obey* that

power, advance towards maturity, till in manhood both attain their highest efficiency and vigour.

Such is an outline of the peculiarities of the infant organization and functions. It is far from being complete, because a regular description of them would be out of place in a work like this. But it will be sufficient to convey to the reader a general idea of the constitutional tendencies of the young; and in laying down practical rules, I shall take occasion to explain further, wherever it shall be necessary, the physiological principles on which their application rests.

CHAPTER VII

THE NURSERY, AND CONDITIONS REQUIRED IN IT.

External conditions of health in infancy—local and personal.—The local now to be treated of.—Most of them included under nursery—locality suited for the residence of children—ought to be dry, airy, light, and cheerful—Situation and conditions required in nursery—sunk and ground floors improper—must be large, easily warmed, and ventilated—purity of air indispensable—proofs and illustrations—disease from bad air—cooking, &c., in nurseries to be forbidden—close curtains injurious—impede ventilation—bad consequences of this—ventilation and heating—cautions to be observed.

Having thus obtained a general acquaintance with the peculiarities of the bodily constitution at birth, the reader will now be prepared to enter upon the practical part of the present inquiry, viz., the consideration of the external conditions and mode of management which experience has shown to be most conducive to the full and regular development of the infant organization, and the preservation of infant health.

Among the conditions by which health is most affected in infancy, some are so invariably beneficial or hurtful in their tendency, that we can have no difficulty in laying down general rules in regard to them applicable, with only slight modifications, to children of every age

and variety of constitution. Such, for example, are the nature of the locality in which the child resides, the position and exposure of the room or nursery, which it especially inhabits, the purity, dryness, and temperature of the air which it breathes, and the other local influences by which it is habitually surrounded. In reference to conditions of this description, experience enables us to decide, on general principles, whether they will act beneficially or the reverse. We can affirm unhesitatingly, for instance, that pure, moderately dry air will prove conducive to health, whatever be the age or constitution of the child. But there are other conditions, the effects of which vary so much, according to the circumstances at the time, that it becomes necessary to exercise considerable caution and discrimination in regulating their application to individual cases; of this kind are food, clothing, exercise, sleep, and moral and intellectual training, which, to be productive of their full amount of good, require to be carefully adapted in kind and degree to the qualities and condition of the individual. The same kind of food and mode of management which are beneficial to one child may prove utterly subversive of the health of another; and hence general rules cannot be laid down in regard to them with the same certainty and precision as in the former instance.

Holding this distinction to be correct in a general sense at least, we shall find it practically useful, in pursuing our subject, to adopt an arrangement in accordance with it, and to begin with the consideration of those conditions of infant health which are of almost universal application, and, as most of them refer more or less directly to the NURSERY, it will prove most convenient to treat of them under that head.

It is scarcely possible to overrate the importance, as a means of health to the young, of a well-situated and well-arranged nursery. The beneficial consequences flowing from it show themselves only after a lapse of

time, and not in such a striking form as to arrest the attention of the careless observer. But though of slow, they are of sure growth, and in their accumulated shape they become too palpable to admit of serious denial. This, indeed, might fairly be anticipated, when we reflect that, in the middle and higher classes, at least eleven-twelfths of infant existence are spent within doors, and that the influences thence arising are consequently in almost incessant operation either for good or for evil. If these influences are injurious in their tendency, the child cannot fail to suffer, whether we remark the connection between cause and effect or not. If, on the other hand, they are favourable, the infant will as assuredly derive advantage from their continued operation.

It is true that, among the poor, and even among the less wealthy of the middle ranks, necessity and not suitableness often decides the parents in their choice of residence, and in the appropriation of their rooms. But although their choice of a locality and their power of providing the requisite accommodation are thus limited, it is still of advantage for them to be acquainted with the local conditions and domestic arrangements most conducive to infant health. Even among the working classes, there are few indeed who may not 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 of the scene of their daily labour, they may nevertheless have it in their power to prefer a better to a worse locality, and a better to a worse constructed house within that limit. But, before they can feel any desire to make such a choice, or attach any importance to it, 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 conditions required for the welfare of the

young. Even when it is beyond our power to fulfil them all, we shall make the nearest possible approximation to their observance by keeping a correct standard constantly before our eyes.

The first and most essential requisite in a nursery, is the constant enjoyment and command of a moderately dry pure air. To obtain this, a residence should be selected in a dry and rather elevated situation, removed from all sources of contamination and humidity, and, at the same time, 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 accurate statistical returns, is the fact of the superior healthiness of the country, especially for the young. The close vicinity to the house 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 impurities which they diffuse through the air, especially at night, but also from the obstruction which some of them present to free ventilation. For the same reason, narrow valleys and localities shut up by thick woods, ought never to be chosen as the sites of 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 better acquaintance with the laws of the animal economy would have shown them beforehand to be very ill suited to the nature of 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. I am acquainted with

several instances in which the additional cost incurred in removing to a better district has been more than counterbalanced by reduction in the expenses of sickness, and I am anxious to enforce attention to the fact, because it is not unusual for men in business to be guided entirely by personal convenience in the choice of their residence, and to live in a situation, simply because it is near, which they would at once remove from if they were aware of its real influence. We have only to contrast the blanched and feeble appearance of children inhabiting the dark and narrow streets of a crowded city, with the rosy freshness of those of the same classes residing in the suburbs or in the country, to obtain a pretty correct notion of the importance of a well-selected locality.

Considering the susceptibility of the influence of cold in early infancy, I need hardly add, that a high and bleak situation, or one exposed to the full force of the north and east winds, is equally unfavourable, and ought to be carefully avoided.

In addition to a dry and airy situation, a good exposure and cheerful prospect are 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 admits of a more free admission of the open air, but because the agency of light, as a gentle and wholesome stimulus, is scarcely less necessary for the animal than for the vegetable world. Every one is aware that vegetables are blanched by the exclusion of light, and that corn growing even under the shade of a tree is paler, sicklier, and later in ripening than that growing in the open field; but we do not keep sufficiently in mind, that on man the operation of light is scarcely less striking. Deprived of its wholesome and enlivening stimulus, he becomes pale and sickly in appearance, his blood is imperfectly oxygenated, and a proneness to diseases of debility arises.

Of these results, we find numerous examples in the narrow lanes and dark cellars of every large town, and in the members of sedentary professions and others rarely exposed to the full light of day; and especially in children, we see them all in an aggravated degree.

A situation of a gay and cheerful aspect is also particularly desirable, because it is one of those gentle but constantly operating circumstances, which imperceptibly, but certainly, 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 organization, is the importance of attending to all these apparently minute objects. A dull and confined prospect is a source of dullness and ennui to the naturally active mind of a child, which cannot feel dispirited or gloomy without suffering in its health and also in its future development; so that, whether we regard its bodily strength or its mental character, we should be equally solicitous to procure for it a cheerful and enlivening prospect.

The different conditions now explained may acquire additional importance in the eyes of some of my readers, when I mention that the development of scrofulous disease is greatly favoured, if not often produced, by neglect of them. Every medical man can testify to this fact, and its truth is exemplified on a large scale in the miserable condition of the cretins in some of the damp and sunless valleys of Switzerland. Consequently, no parent can hold himself guiltless of his child's sufferings, who allows anything short of imperious necessity to retain him in a situation which enlightened experience shows to be hurtful.

As regards the children of the poor also, it is important that the influence of a good or bad locality should be extensively known; for it is common to see cottages, from pure ignorance, built in a positively unhealthy spot, where a situation perfectly unobjectionable, and

equally convenient, might easily have been found within a moderate distance.

The nature of the soil on which a house stands also exerts no small influence on its salubrity. 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 dwelling, and seriously affects its salubrity. An elevated site is no guarantee of dryness of soil; for even on the steep banks of many hills, moisture abounds as much as in a regular marsh; and from overlooking this fact, great errors are often committed in the construction especially of country-houses.

The external requisites of a healthy abode being thus disposed of, we have next to consider the internal; but as our business is solely with infancy, we shall confine our remarks to the selection and arrangements required in that part of the dwelling which is appropriated to the nursery.

As a general rule, the upper stories of a house are more healthy, and therefore better adapted for the reception of the young, than the ground or sunk floors. Independently of the comparative stagnation and humidity of the air in a sunk story, there is always, towards evening and during the night, a degree of dampness in the lower strata of the atmosphere, especially in a wooded or level country—either issuing from the soil and foliage by evaporation and exhalation, or resulting from the nocturnal diminution of the atmospheric temperature which causes the moisture of the air to become condensed. This renders a ground, and particularly a sunk story, peculiarly improper for a nursery. It may be imagined by those who have never thought on the subject, that such dampness must be of little consequence, because, when the doors and windows are shut, as they are during the night, it will be unable to penetrate into any of the rooms. This, however, is a very mistaken view, as any one may easily satisfy himself

by a very simple experiment. If we burn a quantity of damp straw outside of the house, all the door and windows being closed, scarcely a minute will elapse before the smell of the smoke will be offensively perceptible within; thus affording a decisive proof that a portion of the air which was lately on the outside has contrived to penetrate. The same thing is observed in a town when a foul chimney is set on fire in a neighbouring house or street. The offensive smoke soon reveals its presence to the nose in every room of the house, however carefully we may try to exclude it At all times, then, by night as well as by day, this renewal of the air is going on; and whatever the quality of that surrounding a house may be, it is sure to exercise a corresponding influence on the inmates.

From the tendency of condensed humidity to fall to the ground, and of marshy exhalations to remain near the surface, the air surrounding the upper floors of a house is always purer and drier than lower down; and hence the propriety, where we have the choice, of placing the nursery in them. Experience has established this fact by indisputable proofs; and, in accordance with it, we know that travellers passing through the Pontine Marshes and other fenny districts are able to sleep with comparative impunity in the upper bedrooms of an inn, when an attack of fever would be the almost certain result of their sleeping on the ground-floor. Instances have even occurred of individuals, travelling through the marshes after sunset, being protected by the slight elevation of the coach-box; while those in the body of the open carriage suffered severe inconvenience.

In selecting rooms for a nursery, those which have a southern exposure ought to 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 atmosphere which we have seen to be indispensable to health. But, as even educated people possess little precise information on the subject, and as the point is really of great importance to the welfare of the young, I consider it necessary to enforce attention to it at somewhat greater length, and at the risk of some repetition.

We have already seen that *blood* is the grand support of life, and that the action of every part of the organization is directly affected by the supply and quality of the blood which it receives. From the moment that any organ ceases to receive the stimulus of the blood, it also ceases to act. If the current of blood to the brain is arrested, insensibility instantly follows, and, under the same condition, the nerves and muscles become equally disabled. Every part thus depends on the blood for its stimulus and nourishment, and is consequently affected by the *quality* of that fluid, or its power to impart the stimulus and nourishment required. If the blood be imperfectly constituted, it will afford inadequate support, and the general health will become impaired. Of this result we have familiar proofs in the feeble and sickly frames of those whose blood is impoverished by want of food. But the respiration of pure air is, as we have seen, not less essential than proper food to the formation of well-constituted blood; and this fact also is evidenced in the pale and debilitated aspect and health of those who live much in a contaminated atmosphere. In one respect, pure air is even more essential to the formation of good blood than supplies of proper food. The influence of the air we breathe *never ceases for a single moment of our lives*, while that of food recurs only at intervals. By night and by day respiration goes on without a pause, and, every time we breathe, we take in an influence *necessarily* good or bad according to the quality of the air which surrounds us. No wonder, then, that a cause thus permanently in operation should, after a lapse of

time, produce great changes on the health; and no wonder that attention to the purity of the air we breathe should amply and surely reward the trouble we may bestow in procuring it. Accordingly, of all the injurious influences by which childhood is surrounded, few indeed operate more certainly or extensively than the constant breathing of a corrupt and vitiated air; and, on the contrary, few things have such an immediate and extensive effect in renovating the health of a feeble child as change from a vitiated to a purer atmosphere.

Vitiated air and bad food are the two grand sources of that hydra-headed scourge of infancy and youth in this country—*scrofulous disease;* 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 our larger towns, then scrofula in its worst form is the result. Accordingly, we can produce scrofula in the lower animals at will, simply by confining them in a vitiated atmosphere, and restricting them to an impoverished diet. Of the latter cause I shall have occasion afterwards to treat, and for the present, therefore, shall confine myself to the consideration of the former.

Scrofula, in one or other of its numerous forms, is acknowledged to be in this country perhaps the most prevalent and fatal disease which afflicts the earlier years of life. It is the most usual cause of glandular obstruction, defective nutrition, affections of the joints, and other morbid conditions which either give rise to, or greatly aggravate, the danger of many other diseases, such as consumption, measles, hooping-cough, fever, teething, and convulsions; and in this way it proves fearfully destructive of life. But so powerful is the continued breathing of a cold, damp, and vitiated atmosphere in producing it, that where such a cause is allowed to operate, the most promising 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 testimony to the highly deteriorating influence of a vitiated atmosphere. 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, and "concerning which the public generally, at present most ignorant of them, ought to be well informed, 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, the same distinguished physician expresses the conviction, that living in an impure atmosphere is even more influential in deteriorating health than defective food, and that the immense mortality among children reared in workhouses is ascribable even more to the former than to the latter cause.

So long ago as 1810, Mr. Richard Carmichael of Dublin, in an excellent little treatise, on scrofula, drew the attention of the medical profession to this cause, and, on the strongest evidence, denounced the great impurity of the air in the Dublin House of Industry as the grand cause of the excessive prevalence of scrofula among the children at the time he wrote. In one ward, measuring sixty feet by eighteen, and of very moderate height, there were *thirty-eight* beds, each containing *three* children, or 114 children in all. When the door was opened in the morning, the matron found the air insupportable; and during the day the children were either in the same ward, or crowded to the number of severa.

* Clark on Consumption and Scrofula, p. 233.

hundreds in a school-room. Keeping in mind the necessity of pure air to the formation of healthy and nutritive blood, we can scarcely feel surprise that scrofula was extremely prevalent under circumstances so calculated for its production.

I have already (p. 20) noticed the memorable proofs which occurred in the Dublin Lying-in Hospital, of the influence of vitiated air in inducing fatal convulsions in thousands of the infants for year after year, till the cause was at last discovered and obviated, and the mortality consequently reduced from every sixth child, within the first nine days, to only *one in every twenty*, on an average of five years. To these striking facts I here again refer, because it is by such extreme cases that the reality of the cause is demonstrated beyond the possibility of doubt, and that the attention of reflecting but ignorant minds is most powerfully arrested. That impure air is still, notwithstanding all our boasted improvements, a very frequent cause of disease in infancy, may be safely inferred from the great mortality in early life, which I shall presently show to occur in most of the larger towns as compared with that in country districts. No doubt, there is much more misery among the poorer classes in towns than in the country, to account for part of the excessive mortality; but even after making every allowance for this debilitating cause, enough will still remain to prove the destructive influence of a vitiated atmosphere.

On consulting the tables contained in the Appendix to the Registrar-General's First Annual Report, and which show the relative rates of mortality in cities and counties, we find ample materials for a correct judgment. Thus, in Table C, p. 110, the mortality of different diseases in the metropolis is contrasted with that of the same diseases in five county districts *of equal population* as ascertained by the last census in 1831. The ages at which the deaths occurred are not specified, but we shall obtain nearly accurate data by selecting such dis-

eases as are almost peculiar to childhood. The following are a few of the results.

Out of a population in London of 1,594,890.		Out of a population in the Counties of 1,599,024
Measles carried off	1354	only 404
Hooping-Cough,	1066	302
Teething,	477	78
Convulsions,	1717	652
Cephalitis,	294	92
Diarrhœa,	394	227
Pneumonia,	1630	592
Totals,	6932	2347

Or, in other words, diseases chiefly affecting the young are three times more fatal in a population of equal numbers in the metropolis than in the country; for it appears that, even in pneumonia, nearly two-thirds of the deaths occurred in infancy. (First Report, p. 74.)

If we compare the returns for the year ending June 30, 1838, as given in Table E of the Appendix to the Second Annual Report, and which exhibits the rates of mortality from different diseases in an estimated population, in 1838, of 1,841,377 inhabiting the *larger towns* of England, and the mortality from the same diseases in seven *county* districts containing an estimated population of 1,796,783, we shall obtain precisely analogous results. Thus,

In the Cities.		In the County districts,
Measles carried off	1411	only 792
Hooping-Cough,	1356	838
Teething,	1257	204
Convulsions,	4337	1816
Cephalitis,	328	200
Diarrhœa,	497	222
Pneumonia,	3728	1694
Totals,	12,914	5766

Here we have not quite the same extent of mortality from the diseases of youth in the provincial cities as in the metropolis, but still it is more than double the rate of mortality in the county districts.

Mr. Farr, from whose analysis of the returns these facts are taken, distinctly attributes this excess of mortality in towns to the impurity of the air as the chief cause. "The occupations in cities," he says, "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 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.*" (Registrar's First Report, p. 78.) In accordance with this conclusion Mr. 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;*" (p. 79.) If these inferences be correct, (and we have seen from the direct experience of the Dublin Hospitals, and other evidence, as well as from Mr. Farr's own tables, how strongly they are supported by facts,) the reader will feel no surprise at the earnestness with which I insist upon purity of air as essential for the preservation of infant health. In my "Physiology applied to Health and Education," I have considered this subject at some length, as regards persons in mature age; but the very inadequate importance still attached to it as a condition of health in infancy, has induced me to press it again upon the attention of parents and those who have charge of the young.

That a much greater mortality attends the diseases of infancy and youth in cities than in the country, is

further established by the facts referred to on p. 19, where it is shown that the deaths under TWO years of age in Manchester, Salford, Liverpool, and other towns, amount to 428 per 1000 of all the deaths registered, whereas, in the healthiest parts of Lancashire, Cumberland, and Northumberland, they amount only to 276 per 1000; thus affording demonstrative proof, that the impurity of the atmosphere, and other causes of disease, in cities, operate with an intensity equal to 428 as compared with 276 in the country.—(See Registrar's First Report, p. 44.)

It may be said that I have selected only extreme cases to prove the effects of habitually breathing a vitiated atmosphere. Some of them are no doubt of this kind; but when whole cities exhibit the same results, the force of the objection is destroyed. Besides, it is by well-marked cases that the nature and extent of the evil can be most clearly demonstrated; and the destructive influence of an atmosphere impure only in a less degree is not one whit less real, although it may not so easily admit of absolute proof. This is a point that parents should ponder well. If a very vitiated air contributes so imperfectly to the formation of good blood that life is cut short 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 must impair the quality of the blood in precisely the same way and with equal certainty, but only less rapidly, and to a smaller extent. The chief difference is, that, in the former case, the fatal consequence followed in a very short time, whereas, in the latter, the health is more slowly undermined, and a foundation laid for diseases which may not prove fatal till after the lapse of several years. But surely the comparative remoteness or slow approach of an evil is no reason for allowing it to grow up before our eyes when we can so easily prevent it! If it ceased to encroach because we averted our eyes from it, all would

be well; but if it takes advantage of our negligence to increase its destroying power, we shall have as little cause to congratulate ourselves on the success as on the philosophy of the experiment of allowing it to come upon us unresisted.

Keeping these facts in view, it will be obvious that, especially where there are several children, the rooms appropriated for their use should be considerably elevated above the ground, large, cheerful, lofty in the ceiling, not overcrowded with furniture, and provided with the means of ample ventilation without exposing their inmates to currents of cold or damp air. Instead of these conditions being generally fulfilled, however, it is common among the middle classes to find some wretched apartment at the top or bottom of the house selected as a nursery, although possessed of no convenience for the purpose; while one or two large and excellent bedrooms are set apart to be used perhaps twice or thrice a-year for the reception of strangers, for whom, in their hearts, the parents care nothing, and to whom the size or position of the apartment in which they spend the few nights of their stay, would, at the worst, be of very little moment.

From pure ignorance on the part of the parents, it is also a common practice, not only to crowd several children and one or two nursery-maids into a small room, but to allow cooking, washing, and other household operations connected with the nursery to be carried on in it. Nothing, however, can be more injudicious, or more directly at variance with the duty of parents to promote to the utmost the welfare of their offspring. No mother ought to be satisfied with herself, until, in obedience to the wants of the infant organization, 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 atmosphere can be vitiated or its cleanliness impaired. If the size of the house will admit of it, the day-nursery should al-

ways be entirely separate from the sleeping-room. Wherever one or two persons sleep, the air is always considerably contaminated before morning, and the impurity is, of course, so much the greater where, as is often the case, several children sleep in the same apartment. If there is only one room, it is impossible to remove the impurity by 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 damps of our climate would render it utterly impracticable to keep them open for a sufficient length of time. But the case is altogether different when there is a day-room in addition. The children can then be removed from the vitiated air and impurity of their sleeping-apartment into a wholesome and bracing atmosphere, and the bed-room be thoroughly cleaned, the bed-clothes and every thing else well aired, and the room itself effectually ventilated without risk to any one.

It may be said that all this care is superflous, and that children thrive well enough without it. But I have so often seen illness induced and kept up for month after month, by the exposure of delicate children to the damp and draughts inseparable from washing the floor and ventilating the nursery while they are in it, and by the dust, smoke, and dirt inseparable from cooking the children's dinner or the nurse's tea, &c., that I cannot refrain from denouncing the practice as irrational and injurious. If, indeed, pure air contributes to health, there can be no doubt that impure air will be detrimental. The only question that can arise relates to the *degree* of harm; and aurely no rational mother, wnose attention has been once directed to the danger, will voluntarily subject her child to any risk which it is in her power to avoid. The perils which surround infancy are numerous and formidable enough already, without our adding any thing to their number or power.

For the same reason, the closely-drawn curtains and

other appliances by which a free supply of air is systematically cut off from the young are highly prejudicial, and often do more to undermine health than their patrons are at all willing to believe. It is bad no doubt, to allow a current of air to beat directly upon a child's bed, but, if the cause cannot be removed, a screen or curtain opposite is all that is required for the safety of the child; and we might as well lay it to sleep in the bottom of a large packing box, as envelope the bed with curtains on every side in the way generally practised.

When persons faint in the vitiated atmosphere of a crowded theatre, nothing farther is required to restore animation than to carry them out into a purer air. Here every body at once recognises the difference between the sustaining power of a pure and that of a contaminated atmosphere. In infancy, the difference is often exhibited in an equally striking degree. The wailings and convulsions which infants, brought up in a heated and confined air, often experience from any slight irritation, yield more readily to the free admission of a pure and refreshing air than to any other single appliance, while they often resist the most vigorous treatment when, from fear, pure air continues to be excluded. I have already mentioned a remarkable instance of this kind, where a well-constituted child passed within a few minutes from a state of spasmodic irritation and twitching, bordering on convulsions, to perfect health and good-humour, simply by the admission of fresh air into a very close ill-ventilated nursery, in which even the fire was half extinguished for want of air to keep it alive.

In the exposition of the peculiarities of the infant constitution given in a preceding chapter, it was shown that nervous sensibility is so predominant in early life that its excess forms an ingredient in almost every infantile disease, and, therefore, whatever tends to moderate it is to a certain extent a promoter of health Pure

air considered in this point of view, in its wholesome action on the nervous system, can scarcely be estimated too highly. It is one of the safest and most powerful nervous sedatives and tonics which we possess, and, especially when combined with exercise, is of signal efficacy even in the more intractable nervous diseases of mature life. Hence it is a very rare occurrence among country children, who are constantly in the open air, to meet with that morbid nervous excitability which afflicts so many of the children of the higher ranks who are brought up in rooms. In infancy, accordingly, pure air is invaluable as a means of diminishing the irritability attendant on teething and other disorders of the digestive organs; and, consequently, in diminishing mortality. Of this truth, the statistical returns, showing the relative mortality in cities and counties, afford striking proof. In the metropolis, for instance, in the year ending June 30, 1839, there were no less than 3419 deaths from convulsions, and 763 from teething, both being diseases chiefly dependent on nervous irritability; whereas in the agricultural districts, of equal population, the numbers were respectively only 1427 and 179. Taking the totals, the proportions were 4182 in the metropolis, and only 1606 in the counties, or nearly three times greater in the former than in the latter.

If we compare the relative proportions in an equal population in the large provincial towns and the northern counties, as given in Table E of the Registrar's Second Report, we find the mortality

	In the Cities,	In the Counties,
From Teething, .	1257	204
—— Convulsions,	4337	1816
	5594	2020

or little short of three times greater in the cities. I admit at once that other causes combine with impurity of air to produce such a mortality among the young in

cities, but it cannot be doubted that the latter exerts a great and destructive influence.

Those whose attention has never been specially directed to the subject can have no idea of the extent to which this cause of bad health in the young is left in operation among even the middle classes of society, and much more from ignorance than any unavoidable necessity. I have seen many examples of this, but the most striking which I have met with was in a very large family, in which scrofula prevailed with an intensity almost exactly proportioned to the degree of vitiation of the air in which its several members lived. The first-born children escaped altogether, because in their day the nursery and bed-rooms were of course least crowded, and it was easier to have the occupants much in the open air; but afterwards, when five or six young people, and the nursery-maids, lived and slept in one room of very moderate dimensions, in which cooking and washing were carried on, and two more in a small ill-aired bed-closet adjoining, every one of them suffered severely from the disease. The bad air not being suspected to have any share in the result, no attempt was made to improve it by adequate ventilation even during the day; and, in consequence, all the medical treatment and means resorted to served only to retard the progress of the scrofula, but without being able to cure it. In this way, the younger members of the family suffered under it for several years, and in a large proportion of them it was either directly or indirectly the cause of death. If one-half of the expense incurred for medical attendance and sea-bathing had been devoted from the first to removing the original cause, and procuring a permanent supply of fresh air, a vast amount of anxiety and suffering might have been saved to all, and to none more than to the fond parents, who could only mourn over a fatality which they never imagined it possible to prevent.

It is not often that we meet with such strongly

marked examples in private life, but a pretty near approach to them is far from uncommon, especially in families which remove to country or sea-bathing quarters during the summer months. Considering proper accommodation as of no consequence for a few weeks or months, and attaching importance merely to being in the country or near the sea, the ordinary practice, among the middle ranks in Scotland at least, is to pay for the smallest possible number of rooms, and to stow into them as many beds and human beings as can be got easily packed, no matter how confined the space or how impure the air. In this way, a large proportion of the benefit of the change is sacrificed through pure ignorance, and discomforts are submitted to which tell severely upon the constitutions of the more delicate children.

However suitable in size and situation the nursery may be, adequate *ventilation*, or a frequent renewal of the air contained in it, is indispensable 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 ought to be removed into another room, and they ought to be kept at all times out of the way of draughts from open windows or doors. It is for this reason that it is so desirable to have two rooms for the nursery, so as to make a change when cleaning and ventilation are going on. Many delicate children suffer severely from being habitually exposed to the damp arising from a newly-washed floor, to the dust unavoidably raised by sweeping, or to the current of air between an open window or door and the fire-place.

When the weather is cold and damp, 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 ought to be turned down as soon as the child is taken up, and to be exposed to the air for several hours, that they may be entirely freed

from the effluvia collected during the night. This point, is, in general, too little attended to; the appearance of order and neatness being generally preferred to the real welfare of the child.

Pure air being thus provided for, the next condition which calls for consideration is, the due regulation of the *temperature* of the nursery—a condition which is of importance; because, like the quality of the air, it is in almost continual operation. At birth, the infant not only passes, as we have seen, by a sudden transition from a steady heat of 98° to a variable temperature many degrees lower, but possesses less power of generating heat for itself than at any period of life. For this reason, the atmosphere of the nursery ought, especially during the first few weeks, to be kept comfortably and equally warm, and never allowed to fall below 65°. For the first few days, the temperature may be raised with propriety to 70°, provided 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 heated air up the chimney, currents of cold air from the doors and windows are necessarily produced, and if their position in the nursery is not well arranged, it is almost impossible to prevent the inmates from suffering from the partial chills to which they give rise. In this case, a large screen should be placed behind the door to intercept the current of cold air and diffuse it equally through the room. In winter this is especially necessary, as, every time the door is opened, a column of cold air is admitted quite sufficient to cause illness in a delicate child exposed to its direct influence. Cross draughts of air ought also to be guarded against.

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 bright glare and heat of a quick fire, and to prevent older children from habitually placing themselves too near it. Blindness, weakness, of sight, and convulsions, are sometimes induced by neglect of this precaution; the great delicacy of the infant organization rendering it peculiarly susceptible of injury, even from causes which exercise very little influence upon adults.

But, while due care is taken to ensure an adequate temperature, every approach to overheating must be scrupulously avoided. When the temperature of the nursery is too high, a degree of excitability and relaxation of the nervous system is induced, which greatly favours the development of the irritative and convulsive diseases of which infancy is already unusually susceptible. and which we have seen to be often the causes of premature death. Another important consideration is, the additional risk incurred by the transition into the cold external air, when the child is taken out for exercise. Of the extent of this risk, there are, unfortunately, abundant proofs, for it has been proved, beyond the possibility of doubt, that in France and other Catholic countries a great number of infants perish in winter from this cause.

As the system always endeavours to accommodate itself to the circumstances in which the individual lives, it is clear that, if a child spends twenty-three hours out of every twenty-four in a heated atmosphere, its own power of generating heat will become proportionally reduced; and, consequently, when it is suddenly exposed, during the twenty-fourth hour, to the colder open air, it is more liable to suffer from the transition than if it had been previously habituated to a mild but not very warm temperature. In this respect it is with children as with grown people; and, accordingly we find that those among the latter who live constantly in overheated

drawing-rooms and sit nearest the fire, are invariably the greatest grumblers against the cold, and their complaints arise from no better source than attempting to combine, in their own persons, two opposite and incompatible states. They wish to unite the privileges of both a warm and a cold climate, without adapting themselves to either; but, as Nature yields nothing to caprice, they reap their reward in habitual disappointment and suffering. Examples of this kind are of frequent occurrence, and I have seen several in which the inconsistency was corrected by a strong appeal to reason, and health and comfort thus thereby restored, where both had long been strangers.

CHAPTER VIII.

THE MANAGEMENT OF THE INFANT IMMEDIATELY AFTER BIRTH—WASHING AND DRESSING.

Reception of the Infant.—Precautions against cold.—Washing of the Infant—best mode of washing—precautions regarding the eyes, skin, and temperature, &c.—Drying.—Dress of the child—qualities required in infant clothing.—Common defect in dress in leaving the shoulders, neck, and arms, too much exposed—consequences of this defect in causing disease.—The head to be kept cool.—Night-dress and coverings—necessity of attention to these.

Having thus made ourselves acquainted with the mode of operation and extensive influence of *local* or *general* causes upon infant health, we have next to treat of those of a more personal or special nature, the proper or improper regulation of which, in each individual case, constitutes the principal condition on which the welfare of the infant depends.

On the present occasion, I shall not detain the reader with any directions regarding the tying of the navel-string, the separation of the infant from the mother, or the treatment of any unusual symptoms occurring at

the outset of life. The professional adviser invariably attends to all these circumstances, and it is for him alone to give directions concerning them. The duty of the nurse commences only after the separation is effected, and when respiration, circulation, and the other functions necessary to independent existence, are already in exercise.

The new-born infant, as we have already seen, is so susceptible of cold as to be painfully roused by the sudden transition which it makes at birth from the unvarying high temperature of the womb to the comparative coldness of even our summer atmosphere. On this account, our first care on receiving it from the hands of the attendant ought to be, to envelope it in soft warm flannel, and, if it be in winter, to carry it to the neighbourhood of 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 during its sojourn in the womb, but which now becomes a source of irritation, and a direct impediment to the healthy action of the skin, and must, therefore, be removed. This is generally done simply by washing with warm water and a sponge; but as the bones of the infant are so soft as to be incapable of sustaining its own weight in any thing approaching to an erect or sitting position, and it cannot be held up by the hand without inconvenient pressure, it will answer still better to make use, as is done in Germany, of an oval-shaped, shallow, wooden bath, with a raised portion at one end for the head, and containing a quantity of water just sufficient to cover or float the child. By this plan every part of the body is effectually protected from cold, while the position of the infant is that which is best suited to its natural feebleness of structure, and which admits most easily of the head and face being thoroughly washed, without any risk of the impure water running into its eyes. After the infant has been

immersed for three or four minutes, 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 way, 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 eye or eyelids. Neglect of this precaution, especially among the poor—who are less scrupulous in regard to cleanliness—is one of the causes, perhaps the chief cause, of a severe form of *ophthalmia*, or inflammation of the eyes, which is apt to come on within two or three days after birth, and which often ends in loss of sight. To avoid every possible risk from this cause, it will be best to use perfectly clean water and a separate piece of sponge for washing the eye lids.

The temperature of the water used for washing the infant ought to be the same as that of the body, viz., about 96° to 98° Fahrenheit. If it is either much warmer or colder than blood-heat, mischief is sure to follow. Water at a low temperature causes a far more rapid loss of heat than the child can bear; while at a greater heat than 96° or 98°, if continued for more than an instant, it relaxes and debilitates. Momentary immersion in water two or three degrees warmer is sometimes very useful in rousing the vital energies of a feeble or languid infant, but if it is long continued it will inevitably induce exhaustion.

Still keeping in mind the inability of the infant frame to bear the erect or sitting position with impunity, it will obviously be useful, as is strongly recommended from experience in "A Grandmother's Advice to Young

Mothers," to have a large flat pillow or cushion ready prepared and covered over with two or three large, soft warm napkins, on which to lay and dry the child immediately on its being taken out of the water. The cushion ought to be soft enough to yield somewhat, but not too much, to the pressure of the child, and it may be laid either across the nurse's knees or on a small table. By this means, the infant may be dried easily and in a very short time, and gentle rubbing continued with the hand over the whole surface till a genial glow is excited. Care should be taken, however, not to rub too hard or in any way to chafe the skin; and, to prevent any risk of cold, every thing used should be well aired and comfortably warm. The room also ought to be warm and free from draughts. A partial current of air from a key-hole or window-chink, blowing upon a naked child, even for a short time, may be productive of mischief, especially in cold and damp weather. The opposite extreme, of very near approach to a large fire, is not less hurtful, both in exciting inflammatory colds, and in over-stimulating the nervous system, which is already very sensitive at birth.

If any part of the skin, after being gently but carefully dried, is observed to be ruffled, it should be dusted with a little prepared tutty or flour; but the common practice of dusting the sound skin can only do harm, and ought to be abandoned.

The infant being now washed and dried, a thin and fine flannel bandage of five or six inches in breadth, and long enough to go once or twice round the body, is generally applied, partly for warmth, and partly with a view 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 winter and cold weather, flannel is undoubtedly the best material for such a bandage; but when the skin is unusually sensitive, 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.

From an erroneous notion that the bowels require a good deal of support to prevent their protrusion, the injurious practice has arisen of applying the bandage too tightly. In the new-born infant, as may be easily seen by inspection, breathing is carried on chiefly by the rising and falling of the diaphragm, accompanied by rising and sinking of the abdomen or belly, and not nearly so much by the expansion of the chest as in after life. From this peculiarity, it unavoidably happens, that whatever impedes the free rising and falling of the abdomen will not only injure the organs of digestion contained within it, but also impede the due dilatation of the lungs downwards, and thereby disturb the functions of both breathing and circulation. But the evil does not stop there; for the very compression exercised upon the abdomen narrows its capacity, and tends to force the contained bowels outwards during any exertion wherever a weak part will allow them to escape, and hence to produce the very effect which it is wished to guard against. For these reasons, the circular bandage ought never to be tight or more than very moderately firm.

Arrived at this stage of the proceedings, it is the custom with some merely to 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 child. If it seems to be fatigued by the washing and drying, the first plan will be preferable; but if it is not, the latter may be adopted. In either case, it will drop asleep almost immediately on being laid down, and not awake probably

for some hours. In the mean time, we shall, for the sake of the connection, continue our remarks on the subject of the dress.

The clothing of infants will always be more or less under the dominion of the fashion of the day, and, therefore, we need not specify any particular form or construction as that which ought constantly to be preferred. The leading qualities required in the material are lightness, softness, and warmth, and it must consequently vary somewhat according to the climate and season of the year. In construction, the dress ought to admit of being easily put on and taken off; and, while it affords ample protection to the body, it ought to admit of the fullest expansion of the chest and abdomen, and perfect freedom of motion in the limbs and joints. 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; and particularly every approach to the former practice of swaddling the infant in rollers like a mummy—a practice still prevalent in many parts of the Continent, and the only advantage of which is, that the mother, when called out of the room or house for a time can hang up her infant on a nail, like an inanimate bundle, with the positive certainty of finding it in the same position on her return, neither burned to death by the fire, nor with its face scratched or its eyes put out by the cat or pig, as sometimes happens when it is carelessly left sprawling on the floor, or even in its cradle.

If the child has been prematurely born, or is of a weak constitution, or if it be the winter season, 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 slight stimulus which it gives to the cutaneous vessels, it is extremely useful in warding off the internal congestions, and inflammatory and bowel

complaints, to which weakly children are liable. I know an instance where a very delicate and premature infant was saved, contrary to all expectation, by lying imbedded in cotton in a basket, and was thus safely brought to town from a considerable distance. But whatever material is used, the greatest attention should be paid to frequent changes and to avoiding irritation. When, as sometimes happens, from any unusual sensibility of the skin, or other causes, flannel irritates or induces perspiration, cotton or fine linen should be preferred—care being taken never to put them on till thoroughly aired and made comfortably warm at the fire.

As to the other parts of dress, it is impossible to lay down any specific rules, because they ought to vary in quantity and quality according to individual circumstances. The great thing is, never to forget that the supply of animal heat is smaller in infancy than at any later period; and that, consequently, the dress ought to be such as to ensure due warmth, more especially during the winter and spring. The necessity of warmth in infancy is strikingly illustrated by the tender care with which many of the lower animals protect their young from external cold. Moved by instinct, the hen gathers her chickens under her wings, and fosters them with her own warmth; and when left to its own impulse, the infant nestles in its mother's bosom, and shuns the contact of cold. Its dress, therefore, must be such as to ensure its comfortable and equal warmth, without any chance of overheating or relaxing. For however prejudicial exposure to cold may be in infancy, *excessive wrapping up*, or living in too hot rooms, is not less hurtful, and ought to be as scrupulously avoided as the opposite extreme. Perfect freedom of motion in the limbs and joints, and the absence of all pressure on the chest or bowels from undue tightness of the dress, are equally indispensable to health; and if it is faulty in any of these respects, not an hour should be lost in

making the requisite alterations. As far as possible, too, strings should be used instead of pins for fastening the clothes. Where pins are not very carefully inserted, they are apt to penetrate the flesh on any accidental twisting of the body, and to produce serious suffering and danger. By good management, indeed, they may be entirely dispensed with.

The common practice of dressing infants in long flowing clothes during the first few months, is attended with the advantage of protecting the body and lower extremities against cold air and draughts; and when it is not carried so far as to overheat the child, no harm can arise from following it. In cold weather, the feet should be farther protected by soft woollen socks or knitted worsted shoes, which retain warmth without in any degree compressing the feet.

Dr. Eberle has very properly called attention to a glaring inconsistency in infant clothing, which ought to be immediately remedied, and which consists in leaving the neck, shoulders, and arms, quite bare, while the rest of the body is kept abundantly warm;—a practice which is generally continued during the first five or six years of life, and the impropriety of which, especially in winter, shows itself in the dry rough state of the skin on the arms and hands as contrasted with its softness and smoothness where it is covered. Dr. Eberle remarks, that, whilst adults are so careful to keep these parts well covered, it is strange that children should be universally left without equal protection, not only in winter, but even frequently out of doors in cold and damp weather. "It has been supposed," he says, "that this custom is one of the principal reasons why inflammatory affections of the respiratory organs are so much more common during the period of childhood than at a more advanced age; and there can be no doubt that its influence in this respect is very considerable." "Croup, inflammation of the lungs, catarrh, and general fever, are doubtless frequently the consequences of

this irrational custom; and it is not improbable that the foundation of pulmonary consumption is often thus laid during the first few years of life."* These remarks are strongly borne out by the results of late investigations made in Europe, which prove that the proportion of deaths in childhood from inflammatory affections of the organs of respiration, is greatly beyond what was formerly supposed. Thus, in the appendix to the Registrar's Report already mentioned, we find it stated by Mr. Farr, that, among "the diseases of the respiratory organs, pneumonia, which, it must be recollected, includes 'inflammation of the chest,' was next in fatality to phthisis; but *young children furnished the majority of the cases:* of 379 fatal cases of pneumonia in the metropolis, and in some county districts, 228 were children under three years of age." (First Annual Report, p. 74.) When we take farther into consideration that consumption most frequently attacks the upper part of the lungs, we have an additional presumption that the unguarded exposure of the corresponding part of the chest is not without its influence in determining the subsequent disease. That this exposure really operates as a predisposing cause, is rendered still more probable by the greater liability to consumption of females than of males. Female children continue to have the shoulders and upper part of the chest uncovered, while in males the practice ceases with the assumption of their distinctive dress. In conformity with this, we find from Mr. Farr's analysis of the Registrar's First Report (p. 74,) that, while "bronchitis, pleurisy, pneumonia, hydrothorax, and asthma (diseases from active exposure,) destroyed more males than females out of the same number living, consumption and decline destroyed more females than males in the ratio of 4.155 to 3.771." I do not mean to affirm that this defect of dress is the sole cause of the excess of consumption in females; but

* Eberle on the Diseases of Children, p. 24.

when their comparative exemption from many of the other causes is considered, such as reckless exposure to the weather and to fatigue, as well as the debilitating effects of irregular living and active dissipation, it will be difficult to deny that it has a share in the result, and ought, therefore, to be guarded against. This opinion is, I find, confirmed by the testimony of a late popular writer, who declares herself "convinced by repeated observation in various countries, that children who have their bosoms and arms covered for the first two years, are not subject to those severe coughs and inflammations of the lungs, which, during the time of teething, are fatal to so many in this country."*

Knowing, however, the strong tendency of excited feeling to run into extremes, I would here once more caution parents against falling into the opposite error of loading the child with too many clothes, and covering the shoulders and neck with warm tippets or shawls even within doors. More mischief may be done by the excessive relaxation thus induced than by leaving them exposed; all that is wanted is, that the *ordinary upper dress* shall extend sufficiently high to protect the neck and upper part of the chest from variations of temperature, and that the sleeves be made long enough to reach nearly to the wrist.

The head is very commonly kept too warm in infancy; which, considering the natural tendency to nervous excitement and rapid circulation 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 when going into the open air. When in the house the temperature is generally kept high enough by fires to render much wrapping up neither necessary nor safe. When cold is induced by wearing thin caps, it is generally in consequence of the infant being laid to sleep

* Advice to Young Mothers on the Physical Education of children, by a Grandmother.

with the head immersed in a very soft warm pillow, which causes an unusual flow of blood towards it, accompanied by considerable perspiration on its surface. This plan has the double disadvantage of leaving the upper part of the head which is not sunk in the pillow comparatively cold, while the rest is overheated, and in a state of perspiration. 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 every change makes an impression upon the infant, and any accidental irritation is more likely to be followed by spasmodic or convulsive fits.

When, in the lapse of a few months, strength and activity, and their natural concomitant—a desire for motion—become developed, the dress requires to be so arranged as to leave the feet free and unencumbered. Soft warm stockings and easy comfortable shoes are then advisable, but no compression in any form ought to be permitted. In making the change to short clothes, however, regard must be had to the weather, and due care be taken to keep the legs and feet warm when the child is carried out into the open air.

From the account I have given of the activity of digestion, nutrition, and excretion in early infancy, the reader will easily understand how much attention is necessary to ensure perfect cleanliness. The excretions being voided frequently, the wardrobe of the child must be sufficiently extensive to admit of the immediate removal of every piece of dress which is either wetted or soiled, and of its place being supplied by a fresh one. But as I shall have occasion to revert to this subject, I shall not enlarge upon it here.

Nearly akin to dress by day is the provision of proper bed-clothing during the night, and during the many hours of sleep. If an infant is buried under a mass of bed-clothes when asleep, and dressed in the ordinary

way when awake, the very transition is apt to be hurtful. Consistency in this respect is as material as in every other. I have seen mothers guard carefully against too much wrapping up by day, who nevertheless acted at night as if the health and comfort of the infant depended entirely on the quantity of blankets which it could sustain without being smothered. And yet, considering that three parts out of four of infant life are spent in sleep, nothing can be more preposterous than thus to counteract with one hand the good done by the other.

In arranging night-coverings, the soft feather-bed is very often estimated as nothing; or, in other words, the same provision of blankets is considered equally indispensable, whether we lie upon a hard mattress, or immersed in down. It is from this confusion that the common mistake above alluded to takes its rise. The mother, looking only to the coverings laid *over* the child, forgets those on which it lies, although, in reality, the latter may be the warmer of the two. An infant deposited in a downy bed has at least two-thirds of its body in contact with the feathers, and may thus be perspiring at every pore, when, from its having only a single covering thrown over it, the mother may imagine it to be enjoying the restorative influence of agreeable slumber. In hot summer weather much mischief may be done by an oversight of this kind.

As already mentioned, the infant constitution possesses a low power of generating heat, and, therefore, it requires to be warmly rather than imperfectly clothed during sleep as well as during its waking hours. But here, as in everything, the extremes ought to be carefully guarded against, and, while due warmth is provided for when in bed, reason and consistency ought to be adhered to, and excessive heat be as scrupulously avoided as debilitating cold.

From overlooking the necessity of having the under surface of the body kept warm in bed as well as the upper, a great error was committed in one of the work-

houses in Edinburgh a few years ago. A number of children slept, during a severe winter, in beds unprovided with mattresses of any description, and with nothing but the canvass bottom and a single fold of blanket to lie upon. The consequence was, that they lay shivering and unable to sleep from cold, and that most of them became seriously diseased. In this lamentable instance, ignorance and want of reflection were unintentionally the causes of much suffering which might have been easily foreseen and prevented.

CHAPTER IX.

FOOD OF THE INFANT AT BIRTH.

Appetite consequent on activity—appears after the first sleep—to be satisfied by the mother's milk as its natural object.—The quality of the first milk peculiarly adapted to the new-born infant—and consequent impropriety of laxatives and other kinds of food.—Intervals between suckling—crying not always a sign of appetite—often of pain.—At first frequent suckling is required, but regularity ought to be introduced.—True appetite a safe guide.—The mother the best nurse—exceptions are rare—but the mother must be attentive to her own health.—Best regimen for nurses and mothers during suckling.

For some weeks after birth, the whole time of the infant is divided between eating and sleeping, and the predominant functions are those of digestion, nutrition, and excretion. As yet, the organization is not sufficiently developed to fit the child for any of the important duties which shall one day devolve upon it as a moral being; and it becomes so only after years of growth and exercise. Hence the first and most imperative want, after the functions more immediately essential to the sustaining of life are fully in operation, is a regular supply of materials out of which the requisite development of the bodily organs may be effected, and the continual waste of the system may be repaired.

Accordingly, no sooner does the infant awake out of its first sleep, than it manifests unequivocally the activity of a new feeling impelling it irresistibly to the gratification of the want above mentioned. This instinct is the well-known *appetite for food*—an instinct which is always most energetic in its demands at the period of life when both waste and growth are most active, viz. in infancy and youth; and which diminishes in intensity after growth is finished, because waste alone then requires to be provided for. In one sense, growth is the chief function of early life; and, therefore, when adequate supplies of nourishment cannot be obtained, serious consequences ensue much more speedily than in maturer age, when the bodily development is complete, and supplies are required merely to replace the actual waste. Hence, in cases of shipwreck or other accidents involving the deprivation of food, the young are invariably the earliest victims, because upon them want presses with a double force.

So long as the child remains shut up in the womb, there is, as we have already seen, no need of appetite, because the requisite nutriment is supplied to it by the mother's blood; but after birth, when this source of supply is cut off for ever, the active desire for food becomes indispensable to continued existence, and, but for its irresistible impulses, death from exhaustion would speedily ensue. The instinct to eat is thus really placed as a safeguard over animal existence. Without such an impulse to urge the infant to seek the gratification of its wants, no external power would be sufficient to induce it to take the requisite nourishment, and it would inevitably perish in the hands of its attendants. It is a common saying, that an unwilling horse may be *led to the water*, but that no compulsion which we can use will force him to drink against his inclination. It is the same with an infant. We may *dress* it, just as we may saddle or shoe a horse, whether it pleases or not. But if the welfare of the child were

made to depend on our success in inducing it to suck at regular intervals *when it experienced no internal desire* for nourishment, we should find it a more than Herculean task to keep it alive Reason being still undeveloped, we could not hope to succeed by impressing it with the necessity of taking food; and hence appears the beauty of that arrangement of Providence, by which the gratification of an imperative want is converted into a constantly recurring source of pleasure

As soon, then, as the mother has sufficiently recovered from her fatigue—generally within eight or ten hours —the infant, in compliance with its own earnest desire, should be put to the breast. At first, the milk is secreted in small quantity, and, from its watery consistence, resembles whitish serum or whey more than milk; and it is only after the lapse of several days that it has gradually become more copious, rich, and nutritious. 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 described, and the first step towards the preparation of the digestive organs for their functions is the expulsion of this now useless and probably hurtful matter. For this purpose, nothing is so suitable as the watery milk first secreted. It affords to the bowels the precise stimulus required to excite them to act, without the risk of undue irritation; consequently, when the infant is freely admitted to the mother's breast, the meconium is usually cleared out within a day or two; and, almost in proportion as the milk becomes richer and more nutritious, the stomach and bowels become fitted for its reception and more easy digestion.

From ignorance of the general sufficiency of the means thus provided by nature for the expulsion of the meconium, it was long, and still is, the practice with many nurses to refuse the breast till after 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 special direction, none ought ever to be given. In the watery milk of the mother, Nature has provided a laxative at once adapted to the delicate organization of the infant, and conducive to the comfort and safety of the parent. And, therefore, when we *unnecessarily* act in contradiction to this arrangement, it is always at the double risk of irritating the bowels of the child by the needless purgative, and of causing suffering to the mother from the unrelieved distention of the breasts—a state not unfrequently terminating in acute inflammation and the formation of an abscess.

When the bowels require to be assisted in their action, as occasionally happens when no relief is obtained within several hours after birth, and the child obviously suffers from the delay, the mildest laxatives should alone be given. A few tea-spoonfuls of tepid sugar and water, or half a tea-spoonful of fresh drawn castor oil, will answer every purpose; but calomel and all active medicines, although often used by nurses, ought to be strictly and severely forbidden.

Not content with answering the infant's demand for the breast by the exhibition of a purgative, Tissot and other physicians recommend further that a long interval —even more than twenty-four hours—should elapse before the child be permitted to suck, and that, in the mean time, its appetite should be satisfied with gruel, panada, milk and water, or some similar kind of food. When this plan is followed, the consequences, as might be expected, are injurious to both mother and child. In the former, the breasts become tense, painful, and inflamed, and the flow of milk is delayed or suppressed; while in the infant the health of the digestive organs is often upset from the commencement, and it suffers from

the double evil of improper food and inability to digest it. Sometimes, however, from the imperfect health or constitution of the mother, the secretion of milk is delayed so long that it becomes necessary to administer nourishment to support the strength of the child. But such retardation arises chiefly from previous inattention to the laws of health on the part of the parent, 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, and other food should be given only when it becomes evident that the infant is really and unequivocally in want of it.

The vulgar notion that a child requires to be fed immediately on coming into the world rests on the absurd idea of its having undergone a long fast; whereas it ought rather to be considered as having just finished a copious meal. To the last moment of its connexion with the maternal womb, it has been supplied with a rich and nutritious blood, prepared expressly for its support; and some time must necessarily elapse before any real want can be experienced. The best proof of this is the circumstance already noticed, of the stomach and bowels being unfit for their office till relieved of their mucous contents, which can happen only after several hours; whereas, had the child been in instant want of nourishment at birth, it is perfectly certain that the Creator would have adapted its organs for the immediate reception and digestion of food, and endowed it with a corresponding activity of appetite to demand a supply. But as He has seen meet to do neither, and has, moreover, rendered the first secretion from the mother's breast laxative rather than nourishing, we need not fear to follow the path which He has indicated, and delay administering food till it is plainly wanted.

I have thrown out these remarks with some earnestness, because an active cause of the great mortality which occurs during the first months of life is unques-

tionably mismanagement of diet, and digestive disease thereby induced. There is a disposition on the part of mothers and nurses to consider nourishment as, from the first moment of existence, the grand agent which is to avert or cure all possible evils in the child; and there is thus a continual tendency to disregard the beneficent arrangements and designs of the Creator, so legibly depicted in the infant constitution, and to oppress the stomach with loads which it is totally incapable of digesting. Many of the "inward fits," "cramps," and "colics" which afflict infancy, owe their origin solely to this cause; and were the laws of the human constitution better known, and more sedulously acted upon, the difficulty of rearing the young would be greatly diminished. The Creator, in constructing the human body, undoubtedly placed it under the dominion of laws sufficient for its preservation and wellbeing; and, therefore, whenever unusual sickness or mortality afflicts any period of life, we may be assured that, in some material respect, our conduct and treatment are at variance with His designs, and we should never rest till we discover and rectify the error to the utmost possible extent.

When, from the state of the mother, it becomes necessary to administer food to the new-born infant, we should still adhere as closely as we can to the intentions of nature, and give, in preference, that kind of nutriment which approaches most nearly to 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 consists in substituting ass's or fresh cow's milk, tepid, and 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. 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. The stomach, being unprepared for the reception of vegetable matter in any form, is often oppressed by gruel or pap, especially in the quantities usually exhibited; and, unless it is relieved by vomiting, gripes and bowel-complaints are apt to be induced, which at once undermine the strength, and weaken digestion so much as to impair the subsequent nutrition. 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. But whatever is given, the greatest caution should be used not to exceed in quantity, and not to repeat the allowance oftener than about once in three or four hours. A single ounce of milk well digested, will nourish more than double the quantity when it oppresses the still feeble stomach.

In an ordinary state of health, and under ordinary circumstances, the flow of milk will be fully established within from one to three days after delivery; and its nature will be changed, in exact proportion to the wants of the child, 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 any other food, at least for several months. Nature unequivocally indicates this truth, not only by the instinctive desire for the breast implanted in the child, but also by the absence, till a later period, of the organization required for the preparation and digestion of more solid kinds of sustenance.

The mother's milk being thus the natural and best food of the infant, the next point is to determine at what intervals the latter may be admitted to the breast. Here, again, it is indispensable to warn the parent against hurtful excess; for if the stomach is too frequently replenished, or too much distended, digestion necessarily becomes enfeebled, and gripes and flatulence arise and

torment the child. The usual practice with inexperienced and ignorant mothers is to offer the breast whenever the child cries or shows the least appearance of uneasiness or pain, no matter from what cause, as if hunger were the only sensation which the young being could experience. The real character of this insensate conduct may be judged of by analogy. When a boy brings on a fit of colic by over-eating, and cries lustily from the consequent pain, we should consider it a strange mode of relief to put a spoon into his mouth and insist on his eating more; and yet the common way of quieting an over-fed infant, by again offering it the breast, is not a whit more rational or less destructive. The infant cannot possibly discriminate between good and bad, and in the impatience of its suffering, it will often snatch at any thing, however much it may thereby add to its troubles.

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 of cold, of pressure or of hardness, of hunger or of repletion. 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 cause 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 used against so many different evils is not to find out and remove the true cause of offence—but to offer it the breast! No doubt, silence is sometimes obtained by the apoplectic oppression of a stomach thus distended; but no sane being will seriously contend that such quiet is really beneficial, or is such as any mother ought to content herself with procuring.

It is, indeed, no less a mistake to be over-anxious always to put an immediate stop to crying. To a considerable extent, crying is an intentional provision of nature, and is called into play by every new sensation of any force. It is only when often repeated, long-continued, and evidently caused by suffering, that it is detrimental. As a passing and occasional occurrence, it serves to exercise and develope the lungs, to promote equality of circulation, and to excite due intestinal action; and it stands in the place of that bodily activity which is afterwards essential to the maintenance of health. In general, the two kinds of crying are easily distinguished, and very few mothers will long confound 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 ascribing all its varieties to hunger alone, and sometimes filling to repletion a stomach already overburdened with food, we should endeavour to discover the real exciting cause, and seek the surest means of relief in its immediate removal. So constantly, however, is a beneficial purpose conjoined even with suffering, that instances are not rare of delicate children being benefited by the bodily activity and deeper respiration involved in occasional crying. When active disease is not the cause, such children sometimes turn out more robust than others whose original constitution promised greater strength and more vigorous health. But this kind of crying must never be confounded with the constant plaintive wail which characterizes infantile disease, and which betokens both suffering and danger.

The great principle of proportioning the supply of food to the quantity of material expended in growth, or carried away as waste, is equally applicable in infancy as in later life. During the first weeks of existence, the infant does nothing but digest, grow, and sleep, and

it therefore requires to be fed more frequently than at a later period. On an average, about three hours may be allowed to elapse between its repasts, and as it becomes older, the interval may be gradually extended. If the breast be not habitually offered as the readiest means of silencing the child, there will rarely 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 gorge its stomach. In this respect, the conduct of the lower animals may be followed with great propriety. They rather repel than encourage the first entreaties of their young, and yield to them only when appetite is clearly and actively indicated. The result is, that among them indigestion and bowel-complaints are as rare as they are common among mankind At all times, indeed, the indications of appetite may be implicitly followed as a guide in infancy; but the greatest care is requisite not to confound with it the craving arising from listlessness or idleness.

During the night also, as well as during the day, the infant requires to be fed, but not so frequently. At first, it may be put to the breast perhaps thrice in the course of one night; but afterwards twice, viz., late at night and early in the morning, will be sufficient. It is a common complaint among nurses that the child cannot sleep unless frequently fed; and there is no doubt, that, when the stomach is well filled, sleep will generally ensue. But in the latter case, it will be the unhealthy sleep of oppression, which is far from being refreshing If, in attempting to remedy this evil, we succeed in persuading the nurse to refuse giving the breast so often, we are often assured that the infant was, in consequence, very restless, cried a great deal, and perhaps did not sleep at all, and that the old plan must be resumed. The change is expected to work like a charm, and the system to adapt itself to it in a single night; whereas

at no period of life, and least of all in infancy, can any considerable change in the mode of living be *at once* productive of its proper effect, and free from every inconvenience. After a reasonable trial, however, the nights will become more tranquil, and the sleep more healthful and refreshing.

There are great differences of constitution in children as well as in adults, and 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 may 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 gorging it with food, 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 freedom from pain is required, the consequences will be,—on the part of the infant, an increase of uneasiness and indigestion; and on that of the mother, probably irritation of the breast or inflammation, as an effect of which either the secretion of milk will be stopped, or from want of due elaboration, its nature will be changed and rendered so watery as to afford insufficient support. 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, careless, vomits frequently, seems plagued by colicky pains or a tendency to bowel-complaint, and especially if the skin is hot and the evacuations green and unhealthy, it is clear that he is getting the breast too often, and that immediate attention should be paid to the requisite alteration of his diet.

Jaundice is often induced in infancy from neglect of these indications, and it will be in vain to attempt its cure by medical means unless the diet be speedily altered. Opiates, carminatives, and the other remedies usu-

ally resorted to, may lull or hide the expression of pain; but they will never effect a cure without the removal of the cause.

Even from earliest infancy, regular intervals 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 interval is beneficial alike to parent and child, and is an ample reward for the very small trouble required to establish the practice in the first weeks of existence.

Fatigue, vivid mental emotion, or any other cause which violently agitates the parent system, produces an immediate and injurious influence on the quality of the milk. Hence the propriety which every rational mother will see of preserving habitual equanimity of temper, and always refraining from offering the breast for some time after fatiguing bodily exertion or much excitement of mind. From neglect of this rule, even fatal results have ensued, of which a striking instance will be found at page 183. We know how speedily the other secretions in the mother are affected by mental emotion, and it would be very extraordinary if that of the milk did not also suffer. The immediate influence of fear upon the urinary and intestinal secretions, and the instantaneous sparching of the mouth and suppression of the saliva from sudden excitement or great anxiety, are examples familiar to all; and when these functions are so directly disturbed by mental causes, it is not likely, even reasoning from analogy, that the very important secretion from the breast should alone continue in peaceful regularity. Hence a passionate temper, or great excitability of mind, ought to be regarded as a complete disqualification in a nurse.

It is now generally agreed upon, that, till the appearance of the first teeth, no kind of food is so congenial to the infant constitution 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 which cannot exist between the infant and any other woman. The mother, therefore, is peculiarly called upon, by every tie of duty and affection, to become the nurse of her own child; and nothing except ill health and positive inability can excuse her in seeking to devolve this endearing 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 real injury not less of the mother than of the child; but now, reason and the better feelings of our nature have so far obtained the ascendancy, that, unless when specially interdicted by professional advice, at least an attempt is made by most mothers to suckle their offspring, and generally with complete success.

It is quite true that some mothers are, from feebleness of constitution or infirm health, incapable of nursing, and must wholly resign the duty to others, however ardently they may long to fulfil it. But it is not 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 secretion of milk is a purely bodily function, and is consequently affected by every change in the bodily constitution. It is copious and nourishing when the health is good and the mode of life natural, and becomes defective or altered when the health is impaired and the habits are improper. In the abstract, accordingly, this is admitted by every one; but when, in conformity with the principle implied in it, we point out to an uninformed 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, as a consequence, 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, and unaccustomed to act upon principle of any kind, she cannot perceive 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 advantage, she assents for the moment only to give way to the first fancy that flits across her mind, or the first random advice which is offered to her. Being in possession of no fixed principles by which to regulate her judgment, she cannot discriminate what is in accordance with, from what is in opposition to, the laws of nature; and hence her conduct becomes capricious, inconsistent, and not unfrequently injurious to the young being whose welfare she is anxious to promote.

If the necessary consequence of ignorance were to induce the mother to place herself under the habitual guidance of those who possess the requisite knowledge, the evil done would be of comparatively small amount. But, unfortunately, the fact is very different. It is a feature of human nature, that almost every one prefers to act upon his or her own judgment; and, when knowledge or the elements of judgment are absent, any decision arrived at has at best only a chance of being right, and is much more likely to embody some preconceived notion or prejudice at variance with truth. From this reliance on their own mistaken fancies in preference to the dictates of enlightened experience, many mothers in their very anxiety to keep up a copious secretion of milk, put an entire stop to it. Imagining that a rich diet must necessarily furnish the best supply, because it contains a greater quantity of the elementary materials from which milk is formed, they live so fully as to induce an inflammatory state of the system, which is highly adverse to this in common with all other secretions. This latter fact is familiarly exemplified in the scantiness and high colour of the urine and constipation of the bowels which so usually attend the commence-

ment of feverish and inflammatory attacks. And in strict accordance with it, when the excess of food is really digested, a degree of excitement in the system is generally induced, the most frequent result of which is either a partial or total suppression of the milk. Occasionally, however, the tone of the stomach gives way and the milk then becomes impaired in quantity and quality under the influence of the accompanying indigestion

Similar effects are apt to ensue from other causes tending to destroy health—for example, from inattention to the laws of exercise. The mother, not being aware of the importance of *regularity* in sustaining the general tone of the system, is often guided by fancy or convenience alone in going out, and does not consider either the selection of the best time of day, or the length, kind, and regularity of exercise as of the least consequence. Proper exercise in the open air is, however, an essential condition of health, and none of the bodily functions suffer sooner from the neglect of it 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 former works for an exposition of the laws of exercise and digestion. To discuss them here would lead to much needless repetition.

Except in the instance of either such delicacy of bodily constitution or unusual excitability of mind in the parent as ought, in fact, to have prevented her from entering into the married state, or the accidental attack of some serious disease, it very rarely happens that the mother who pays due attention to the laws of health is unable to suckle her own child. This truth might indeed have been inferred beforehand from the experience of the working classes, 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 placed in circumstances very favourable to health. She is employed all day in active but not fatiguing exertion, is much in the open air, has a suffi-

ciency of plain nourishing food, without any temptation to excess either in quantity or in stimulus, 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 equally 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; viz., neglect of exercise: too much confinement in overheated close rooms; the exclusion of wholesome air during the night by closely-drawn bed-curtains, or small bedrooms; the relaxing effect of soft feather-beds; dissipation of mind, or the absence of any serious or healthful interest or occupation; indulgence in late hours night and morning, and in 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 liquids; living in a bad 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 on as destructive of health.* And, while such causes as these are left in unheeded operation, the mother has herself to blame and not Nature, if she finds her bodily functions thereby disordered to such an extent as to deprive her of the power of nursing her offspring.

It is from overlooking the necessity, on the part of the mother, of a rigid observance of the laws of health, that the flow of milk is often greatly lessened or even arrested in a country nurse suddenly transplanted into town. Accustomed to open doors, a constant free circulation of air, much bodily activity, and the healthy

* The Principles of Physiology applied to Health and Education; eighth edition.—The Physiology of Digestion, &c.; second edition

digestion of a moderate meal, the nurse is suddenly transferred to a warm house, whose well-fitted windows and doors exclude the fresh air, and where, although she has no longer any direct call to active exertion to excite a natural appetite for food, she is nevertheless encouraged to eat largely and frequently, and often to indulge in the use of stimulants, to which she has never been accustomed. Is it wonderful that, under such circumstances, the digestive powers should give way, and the bowels become disordered, the general system deranged, and the secretion of milk either deteriorated in quality, or altogether stopped? Or rather, could human ingenuity devise a more likely means to impair it, were such the aim we had in view?

A favourable state of the general health being the chief condition required to constitute a good nurse, every mother who wishes to suckle her own child ought then to adhere scrupulously to that mode of life which experience has proved to be conducive to her welfare. Consequently, when a healthy country woman, who has always been accustomed to plain fare and active exertion in the open air, is removed to town to take charge of a child in a higher rank of life, the more steadily she adheres to her former habits, the more certainly will her health and value as a nurse be preserved. It is true that, while nursing an increased expenditure requiring a proportionate supply takes place. But nature contributes to the necessary adjustment, by generally suppressing the customary monthly discharge during that period, and occasionally also by a certain increase of appetite, which may be safely indulged by a moderate increase of simple and nourishing food. But this excitement of appetite ought never to be converted into an excuse for indulging, as is often done, in a richness and variety of diet, which seldom fail to derange the health of the nurse, and impair the quantity and quality of the milk.

If any mother who may happen to read these pages

should still remain unconvinced of the propriety of adhering 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 fomented liquors of any kind, but live principally on soups, tea, and vegetable and farinaceous food. Among mothers so circumstanced, it is rare to meet with one who experiences any difficulty in nursing her child, and many of them have milk enough for a second infant. 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, without either wine or porter. 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 thick, rich, and stimulating for most infants. In the case of the cow, we have direct evidence of the quality of the milk being immediately influenced by a change of diet. The same thing occurs in the nurse, and hence the necessity of regulating her diet according to the state of the child.

When the constitution, health, and mode of life, are all favourable, it sometimes happens that the milk is secreted in such quantities as to trickle down from the breast even before the infant begins to suck. When this occurs, the first portion of the milk should be allowed to escape before suckling the child; because if this precaution be not resorted to, the infant may experience much difficulty in swallowing the milk as fast as it is secreted; and even if it succeeds, there will be risk of exciting vomiting or indigestion, by the too rapid distention of the stomach.

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 teeth begin to appear; because till then Nature has denied the organization required for the proper digestion of other substances. This truth is now much more generally acted upon than formerly. Wanting faith in the sufficiency of God's arrangements to effect His own purposes, 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 time of teething. But now a better acquaintance with the laws of the animal economy, joined with a more implicit reliance upon the wisdom and benevolence of the Creator, has at last convinced us that the more closely we adhere to the path which God has marked out for us, the more successful shall we be in rearing the young. If, indeed, we bear constantly in mind that the great mortality in infancy is not a part of the scheme of Providence, but arises chiefly from removable causes, and has already diminished as our knowledge has advanced, we shall become more and more anxious to discover and fulfil the laws of the infant organization, as the surest way of benefiting and preserving the child.

Unfortunately, however, mothers and nurses 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 is of good quality, but merely insufficient in quantity to constitute the sole sustenance of the child, the balance is decidedly in favour of her continuing to suckle and giving some mild supplementary food. The infant will generally thrive better by following this plan than by an entire change of nurse. But if the deficiency proceeds from

impaired health in the mother, or 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 parties.

Where additional nourishment is required, the principle for its right selection is to procure the kind most nearly allied in its nature to the mother's milk. Some experienced men recommend goat's, and other ass's milk as an excellent substitute. Both are light and digestible; but the latter, upon the whole, deserves a preference, as being free from the peculiar aroma which characterizes goat's milk. When neither can be obtained, fresh cow's milk, diluted with one-third or one-half of tepid water according to the age, and slightly sweetened, may be given with great advantage. If it is found to agree, nothing else needs be tried till the appearance of the front teeth indicates the propriety of a change. But when, as occasionally happens, it proves too heavy, and gives rise to frequent vomiting, acidity, flatulence, and gripes, advantage may be derived from diluting the milk with well-made barley-gruel or thin arrow-root, instead of water. Sometimes, also, when diluted milk disagrees, the addition of a small quantity of rusk, arrow-root, or well-baked bread, cut into slices and toasted almost to dryness, and 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 these additions are rarely useful in the first months of infancy; and where the simpler and more natural food 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 proves to be necessary, we must be careful to imitate nature still farther, and give it very slowly. The milk drawn from

the breast does not flow rapidly, and, therefore, when ass's or cow's milk is given, either a sucking-bottle should be employed, through which the supply may be equally slow, or if the spoon is used, the nurse ought to be constantly on her guard to give only a small quantity at a time and at proper intervals. To facilitate swallowing, the infant ought to be supported in a reclining position while feeding, as the common custom of laying it on its back endangers its choking. The moment it indicates indifference to its meal, not a particle more should be offered. I have seen a child shaken as if to pack better, and then the feeding resumed; but nothing can be more cruel, or more thoroughly destructive of the health of the digestive organs, than such a proceeding; and the mother who permits it will run the risk of a severe retribution in the sufferings or death of the young being intrusted to her care.

In healthy children, the first teeth appear about the sixth or seventh month; but in delicate children often not till the twelfth or fifteenth month. In ordinary cases, the rule is to continue the nursing till after the appearance of the teeth, provided the mother continues in health, and the milk to be good in quality and abundant in quantity, and to agree well with the child. It is the state of the constitution, and not the number of months since birth, which 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 weaning usually takes place at the end of the ninth month, not because a particular period of time has elapsed, but because certain changes in the system, indicating the propriety of an alteration of food, generally occur about that age. When, therefore, these changes are delayed, the change of diet

ought also to be delayed, even for months beyond the ordinary time. It is the state of the organization, I repeat, and not the mere lapse of a certain number of days or weeks, which ought to determine either the change of diet or the period of weaning.

About the time, then, when the front teeth appear, a little well-made panada, or diluted milk sweetened and thickened with a small quantity of arrow-root or rusk, may be given twice a-day, and the intervals between suckling gradually extended. Where milk disagrees, even when combined with farinaceous substances, barley-water, fine well-boiled gruel, or weak chicken or beef tea, thickened with bread, may be tried, and the one or other preferred according to the state of the constitution. If the child is lively and excitable, the former will suit best; whereas, if he is soft, lymphatic, and inactive, the chicken or 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 be allowed to interfere with the real welfare of the infant. When the bowels are too confined, barley-water will suit better than any thing else. When they are too open, boiled milk with arrow-root will be preferable.

Many mothers are in the habit of beginning the use of other food within a few weeks after birth, even when the milk is abundant. Such a practice is at once unnatural and hurtful. If milk had been improper as the sole food in infancy, Nature probably would have indicated the fact by a corresponding modification in the organization and instincts of the child; but as no teeth appear till after many months, we could scarcely err in following her guidance, even if we had not the evidence of direct observation to prove the bad effects of the too early use of any supplementary food.

It sometimes happens, that, notwithstanding every

attention, the inability of the mother to nurse her child becomes so decided as to render it imperative on 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.

CHAPTER X.

ON THE CHOICE, PROPERTIES, AND REGIMEN OF A NURSE.

Principle on which the selection of a nurse ought to rest.—Nurse should resemble the mother in constitution, age, and time of delivery—exceptions.—Changes which the milk undergoes—qualities of good milk.—Properties required in a nurse—importance of moral qualities—striking example of this.—Physical characters of a good nurse.—Defects to be guarded against—intemperance the worst—mischievous tendency to administer medicine on all occasions—poisoning and disease thence arising.—Management of the breast and nipples—means of protecting them.

From the exposition already given of the intimate relation which subsists between the constitution of the parent and that of the infant to whom she has given birth, the reflecting reader will readily infer that, in the healthy state, the milk of the mother is better adapted to the support and nourishment of the child than that of any other woman; and as a corollary from this position, he will farther conclude 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, accordingly, this proposition is unquestionably true. But in practice it often happens that the very circumstances which render it imperative on us to employ a nurse are precisely those which also oblige us to depart from the principle, and give the preference to a woman of an entirely different constitution. Before entering upon the consideration of these exceptions, however, we shall first briefly direct attention to several conditions, in regard to which it is important for

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

In all ordinary cases it is an advantage, for example, that the mother and nurse should be nearly of the same age. It is not meant by this 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 age 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 one of twenty years old. In like manner, it is desirable that both mother and nurse should have been delivered nearly about the same period, because the quality of the milk alters with the lapse of time; and it has been observed that a newly-born child, when nursed by a woman who has been several months delivered, is apt to become scrofulous. For a similar reason, some resemblance between mother and nurse in the general form and proportions of the body is also desirable, 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, therefore, special regard ought always to be had to the constitution of the mother, whether our object is to counteract or to develope the peculiarities which the infant has derived from it.

The causes which disqualify a mother from 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 some unforeseen accident not admitting of an immediate remedy. In cases of this kind the general principle applies almost without modification, and if it were possible to procure, what we may term, a duplicate of the mother, viz., a nurse resembling her in all respects, there cannot be a doubt that she would be the fittest person to supply the mother's place. Where, however, as most frequently happens, a nurse becomes indispensable from constitutional delicacy in the mother, the principle to be followed requires to be modified in a corresponding degree. Instead of then seeking points of resemblance to the parent, it becomes our chief object to find a nurse free from the constitutional debility which afflicts the mother, and liberally endowed with all the properties in which she is held to be defective. It is only by this means that the infant can be protected from the injurious influence of the impaired constitution of the parent; and if, in such circumstances, a preference were to be given to a nurse endowed with a similar constitution to that of the mother, no advantage could possibly result from the change. Whereas, experience has amply demonstrated 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.

I have already mentioned that, in all cases, regard should be had to the relative times 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 few weeks later. This fact has been long known; but the nature and extent of the changes which the milk undergoes have of late been more clearly de-

monstrated by Dr. Donné than by any preceding observer. Healthy milk, when examined by him with the microscope, was found to contain "globules of various sizes, perfectly spherical in form, with black and regular borders; and they swim freely in a fluid in which no other particles are suspended." But although the *colostrum* or milk which is secreted immediately after delivery also contains some real milk globules, they are *irregular* and disproportioned; some of them appear like large oleaginous drops, and cannot be termed true globules. The majority of the other globules in the colostrum are very small, and look like dust in the midst of the fluid; and, instead of swimming separate ly, they are mostly connected together by a viscid mat ter, so that, when moved about over a glass plate, they separate in small agglomerated masses, instead of rolling over one another as in perfect milk. In addition to these, the colostrum contains other particles of a yellowish colour, like a multitude of small grains, and which seem to consist of a fatty matter and peculiar mucus. This condition continues almost without change till the end of the milk-fever, when the number of granular bodies diminishes day by day, and the real milk globules acquire a more regular and definite form, and approach much more nearly to one general size. At the same time, the globules previously adhering to each other in a viscid mass become isolated, and move in the fluid quite independent of each other. These changes do not always take place within the same period of time; and even in healthy women traces of the first state of the milk may sometimes be detected so late as the twenty-fourth day after delivery. But occasionally, either from disease or defective constitution, the milk retains the *colostric* or imperfect properties for months, or during the whole time of nursing; this has been most frequently observed by Dr. Donné in lean and ill-nourished females. And yet, to unassisted vision, the milk may seem perfectly healthy. Dr. Donné found

also a great analogy between human milk and that of the ass and goat.*

These observations are of considerable importance, both as leading the way to a more careful examination of the qualities of milk, and the changes produced in them by disease, and as proving that neither the appearance of the female nor that of the milk can be relied upon as certain indications of her being a good nurse. A woman may present the external characteristics of health, and the milk show all the properties usually considered as tests of good milk, and yet its actual composition prove its unsuitableness for the infant. Dr. Donné gives an instructive example of this in a healthy-looking young woman who was confined with her second child on July 23, 1836. "On the first of August, the milk was abundant and its aspect healthy, except that it was somewhat viscid The child was quite healthy and well formed, but it frequently refused the breast without any appreciable cause. For twenty days after delivery, the milk remained in the condition of colostrum, as above described, but its colour was normal, its consistence as in the healthy state, and *externally this milk appeared as healthy as that of the best nurses.* Eighteen days after delivery, the child had diarrhœa; the milk did not change its character; and twelve days subsequently the child died, having gradually become emaciated. The former child by the same mother died at the age of five months." Dr. Donné mentions this fact without wishing to infer that the state of the milk was the cause of death in both cases. At the same time, he justly regards the coincidence as deserving of attention, especially as the properties of the milk undergo a change during disease in the mother or nurse.†

The selection of a nurse being generally confided to,

* British and Foreign Medical Review, No. XI. p. 182--3--4.
† British and Foreign Medical Review, No. XI. p. 184.

or at least sanctioned by, the medical attendant, it is unnecessary to discuss *all* the qualities which ought to be deemed indispensable. Sound health, a robust constitution, freedom from any hereditary taint, cheerfulness and presence of mind, orderly, neat, and temperate habits, patient kindliness and good humour, and above all, a strong and innate liking for children, and some knowledge of the human constitution, and of the ordinary laws of health, are of the first importance. If the child be unusually predisposed to any disease, a nurse characterized by a similar predisposition ought on no account to be chosen; and the strict investigation of this point is a duty incumbent on the professional man. For the same reason, violence of temper, extreme nervousness of disposition, intemperance, want of truthfulness, inattention to order and cleanliness, and other moral defects, ought to be held as insuperable obstacles to the selection of any woman in whom they are conspicuous. "An irritable, passionate, and sour-tempered female," as is justly remarked by Eberle, "is but ill suited for this important duty. Not only is the child liable to be maltreated by a nurse of this character, during the fits of ill-nature and passion, but the most serious and alarming effects may be produced on its tender organization by the milk of such a nurse. It is well known that violent anger and habitual sourness of temper are peculiarly apt to give a pernicious quality to the milk. Children have been thrown into convulsions by suckling soon after the nurse has been agitated by violent anger or rage; and alarming vomiting and purging are particularly apt to occur from this cause. Indeed, every inordinate excitement or depression of the mind is unfavourable to the secretion of healthy milk. Protracted grief, sorrow, or mental distress and anxiety, in the nurse, seldom fail to produce a prejudicial effect on the health of the nursling. Women, consequently, whose domestic relations expose them to moral affections of this kind, cannot be regarded as well

adapted for this office. Tranquility of mind and evenness of temper are particularly desirable in a nurse, and no female ought to be admitted to this duty who is, either by temperament or extraneous circumstances, placed in an opposite condition."*

The destructive influence of passion in the mother or nurse on the system of the child, is strikingly illustrated in a case mentioned in the excellent little work of Dr. Von Ammon, physician to the King of Saxony.† "A carpenter fell into a quarrel with a soldier billeted in his house, and was set upon by the latter with his drawn sword. The wife of the carpenter at first trembled from 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 in 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." It is seldom that so remarkable a case occurs in private life; but there are unfortunately many in which perpetually recurring fits of ordinary 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 any thing 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.

* Eberle on Children, p. 35.

† Die ersten Mutterpflichten und die erste Kindespflege, p. 102. 3d edit. Leipzig, 1839.

Another strong reason for rejecting a nurse characterized by a bad temper or other moral deficiencies, is the general system of mismanagement and concealment in other respects 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 natural character of the nurse, indeed, makes such a difference in the manner of doing a thing, and consequently exercises such a direct influence on the welfare of the child, that the latter 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 and no exhortation on the part of the parent can remedy a deficiency like this, and hence the only security against it is 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 wellbeing of her charge, and afraid of losing her situation by stating the fact, such a nurse is often tempted to conceal her deficiency of milk, and give the child in secret some unsuitable food, in the hope that the want may not be discovered. From the very concealment which is practised, it becomes next to impossible that the food so provided can be either proper for the child, or given at proper times; and hence may arise indigestion and bowel-complaints, the true sources of which, if entire confidence is wrongly placed in the nurse, may never be suspected. We cannot, therefore, attach too great importance to moral character in the first selection of a

nurse; for every change is attended with serious inconvenience, and, when deceit is once practised, confidence can never be restored.

When the nurse suckles a child of her own along with the nursling, and the supply of milk becomes insufficient for both, the later is especially apt to suffer, as the nurse naturally prefers her own child to that of a stranger; and for this no one can blame her. All that can be required of her is, that she shall candidly make known the deficiency, that a remedy may be provided before either of the children suffer from it. Occasionally, however, deceit is practised; but, with a little watchfulness, it may generally be detected. In childhood, as in maturity, disease rarely arises without some traceable cause, and so long as both infants get equal justice, they thrive equally well. Whenever, therefore, the one is observed to lose his health, while the other continues to thrive, *and no other cause can be detected*, there will be a strong presumption of improper dealing on the part of the nurse, and, consequently, while all due regard should be paid to her feelings, and every precaution used not to hazard an accusation against her unjustly, the safety of the suffering infant demands that every pains should be quietly but vigilantly taken to arrive at the truth, and to provide the necessary remedy.

The choice of a nurse ought never to be finally decided upon without the sanction of a well-informed physician. External appearances are sometimes deceitful, and a healthy-looking nurse may turn out in reality 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, 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 and eruption. But even where such indications are possessed, 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 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 forms a light cloudy appearance, and does 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 may at once decide in her favour.

When a nurse is first intrusted with the care of an infant, it is advisable that the mother should for a time watchfully superintend all her proceedings, and assure herself, by frequent and unexpected visits to the nursery, that every thing is attended to with due regularity and in a right spirit. If she finds 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 grateful for her good fortune. But if, on looking into the nursery unexpectedly, she finds 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 latter 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 infant, by treating her habitually with considerate kindness and respect.

Of all the vices to which nurses are liable, perhaps the most injurious is intemperance, whether open or

clandestine, and the analogous 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 watched. Many women, acting on the notion that extraordinary support is required during the time of suckling, have insensibly sunk into the lowest state of degradation, from imprudent, and what they considered virtuous, indulgence in fermented liquors. But 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, and not excited still farther by the use of fermented liquors of any kind. Occasionally, however, wine or malt liquor is plainly required to keep up the health and strength; but in such cases their use ought to be cautiously regulated according to the necessities of the system.

But of all the defects which a nurse can have, none is more directly destructive of infant life than that 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 late 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 not acquainted, 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. Mr. Browne, the

coroner for Nottingham, adds, that a celebrated quack "cordial" for children destroys great numbers yearly in that borough, but, as they die off gradually, the cases do not come under his official notice.

In addition to cases of absolute poisoning of the above description, it is well known to practitioners that much havoc is made among infants by the abuse of calomel and other medicines, which procure momentary relief, but end by producing incurable disease; and it has often excited my astonishment, 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 nature of the power they are wielding, and the extent of injury they are inflicting Whenever a child shows any symptom of uneasiness, instead of inquiring whether it may not have been caused by some error of regimen, which only requires to be avoided in future to remove the suffering, many mothers act as if it were indispensably necessary to interfere immediately and forcibly with the operations of Nature, by giving some powerful medicine to counteract its effects; and if relief does not ensue within an hour or two, the dose must be repeated. 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 every hour or two, it is still very ill or 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 are those caused solely by the intended remedies.

That there are cases of disease in which very active means must be promptly used to save the child is perfectly true. But it is not less certain that these are cases of which no mother or nurse ought to attempt the

treatment. As a general 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, not as a something thrust into the system, which requires to be expelled by force, but as an aberration from a natural mode of action produced by some external cause, we should be in less haste to attack it by medicine, and more watchful, and, therefore, more successful, in our management and in its prevention. Accordingly, where a constant demand for medicine exists in a nursery, the mother may rest assured that there is something essentially wrong in the treatment of her children.

It sometimes happens that the quality of the milk becomes deteriorated by the unexpected renewal of the monthly discharge in the nurse; and if the fact be concealed, the child may become weakly and thin without any suspicion of the true cause being excited. Occasionally it becomes necessary, in such circumstances, to change the nurse. At other times, if the nurse be really healthy, the child will continue to thrive equally 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 timeously 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 occurs after the sixth or seventh month, it is usually of less consequence.

In nursing, care should be taken not to confine the infant to one breast, but to apply it to each alternately. From inattention to this simple rule, the child grows unequally, the one side being rendered weaker than the other, while the position favours any tendency to squinting which may happen to exist. The mother, too, suffers from the excessive demand made on the one breast, and the want of healthy action in the other.

Before quitting this part of the subject, it may be proper to direct the attention of mothers to the precautions required in the management of the breast towards the end of pregnancy. Great care should be taken to prevent any undue pressure from the stays, especially over the nipple, as it might otherwise become so flattened and sunk as to make it impossible for the infant to lay hold of it. The skin covering the nipple is extremely delicate, sensitive, and easily excoriated; and if no precaution is used to guard it, the act of sucking may become so painful as to oblige the mother to give up nursing. To prevent this, Dr. Bull recommends that the nipples should be washed three or four times a-day for six weeks prior to delivery, with green tea, brandy, or an infusion of oak or pomegranate bark, or a solution of white vitriol, and that the breast should be exposed to the air for ten minutes afterwards.*

I shall not trouble the reader with any remarks on the use of the cork, India rubber, or other artificial nipples, by which the breast is protected from injury during suckling; because, when the breast is once hurt, its treatment and the choice of the means of protection are always directed by the professional attendant, and the mother can rarely judge for herself which plan ought to be preferred.

* Bull's Hints to Mothers, 2d edit., p. 201.

CHAPTER XI

ARTIFICIAL NURSING AND WEANING.

When artificial nursing ought to be resorted to.—Kind of nourishment to be given—its temperature -mode of giving it.—Sucking bottle—artificial nipple.—Great cleanliness indispensable.—Intervals of feeding.—Period at which a change of food is required.—Best kinds of food—treatment after feeding —Weaning—time and manner of weaning—precautions required—food after weaning—mischief from giving medicines.

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

It need scarcely be stated, that artificial nursing ought never to be resorted to where it can possibly be avoided. Strong healthy children may thrive under careful management although denied the breast; but very 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, of course, greatly increased. The severity of the climate and 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 and judicious care that the disadvantages inseparable from it can be successfully overcome. In favourable weather, however, and with good management, 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 best fitted 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 watery 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, goat's, or cow's milk, largely diluted and slightly sweetened with sugar, deserves the preference over every other kind of food. At first, two-thirds of pure fresh water should be added to one-third of cow's milk; but goat's or ass's milk, which Dr. Donné observed to bear a close resemblance to human milk, does not require more than an equal part of water After a week or two, the quantity of water may be reduced to one-half, and afterwards to one-third; at which proportion it should be retained for four or five months. This change is necessary, because the mother's milk gradually becomes less watery as the digestive organs of the infant become developed and their tone increased; and our great aim ought to be to follow as much as possible in the footsteps of Nature.

Adhering to this principle, the food of the infant ought to be given at the same temperature as that of the mother's milk, viz., at 96° or 98°, because that is the heat most suited to the organization of the child This condition is, in general, little attended to by nurses, and yet it might easily be determined, and all possibility of mistake be 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 ought to 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. I need hardly add, that the dirty and disgusting practice among nurses of putting the food into their own mouths before feeding the child should be wholly interdicted.

The manner in which food is given is also of importance, and here again we should follow nature and give it very slowly. For this purpose, a sucking-bottle, fitted with an artificial nipple pierced with very small holes, is much used, and it answers better than feeding by the spoon. Several kinds of bottles are employed, but even a common vial may be made to suit when nothing more convenient is within reach. A cow's teat, or a piece of washed chamois-leather, or a few folds of fine soft linen, pierced with a small hole, may be adapted to the mouth of the bottle in the form of a nipple. Sometimes a small piece of sponge covered with a rag, or a nipple of either cork or softened ivory, may be preferred; but whatever material is used, great care must be taken not to have the holes too large, otherwise the milk will flow too fast. The utmost cleanliness is also indispensable; and neither the bottle nor the nipple should ever be laid aside after use without being thoroughly washed with hot 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 effectually prevent the milk from flowing at all.

The indispensable necessity of cleanliness, and the propriety of always using fresh milk, and never reserv-

ing 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. For the same reason no trouble is spared in dairies to ensure thorough cleanliness and sweetness in the dishes which contain the milk; and there is reason to believe that much of the excellence of dairy-produce in Holland and other places is due nearly as much to this care as to any other single cause. So ludicrously, however, is this rule neglected in some of the Russian provinces, that a late traveller, Erdman, describes the peasantry as using, instead of a sucking-bottle, a cow's horn with a small hole at the point, over which a cow's teat is tied. The teat being placed in the child's mouth, milk is then poured into the opposite end of the horn, and the child left to suck away at pleasure till it can contain no more. "The worst of it, however," says Von Ammon, "is, that, in the great majority of instances, the horn is never cleaned, and the milk which remains in it curdles and becomes sour, while the teat itself gradually passes into a state of putrefaction."*

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

We have already seen that, for two or three weeks after birth, the infant sleeps almost continually; it wakes up for a moment at intervals to suck a little, and once more goes to sleep. The stomach, being small and unaccustomed to its functions, can bear only a small quantity of nourishment at a time. In accordance with this natural arrangement, similar intervals should be observed in artificial feeding as in ordinary nursing;

* Die ersten Mutterpflichte, &c. p. 134.

and the first sign of indifference may be safely relied upon as an indication that the child has had enough. As a general rule, six or eight table-spoonfuls will be quite 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 cramming. Many nurses, acting under the erroneous notion that liquid food contains little nourishment, think it necessary to administer it often, and thus oppress the stomach and excite vomiting. Observing, again, that immediate relief follows the emptying of the stomach, they farther adopt the notion that vomiting is a sign of health, and by this false reasoning are led to persevere in a course of positive mischief to the child. When an apoplectic alderman obtains relief by vomiting the heavy mass of turtle and venison which endangers his life, he might, with equal reason, be encouraged to persevere in continuing the same regimen by the assurance that the vomiting was "good for his health," which it no doubt is. But it would be still better for his health if he were to refrain from eating indigestible food, and thus avoid the necessity of seeking relief by vomiting. The same rule holds good with the infant.

If the child 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 contra-indication appears. Dr. Von Ammon, indeed, recommends that the child should now draw its food directly from the cow, and thus receive it in its natural state, and at its natural temperature; and, in support of his recommendation, he remarks, that infants fed in this way in the country thrive far better than those fed upon cow's milk in towns, although in other respects the latter receive more attention than the former. But,

whichever mode is employed, care should be taken to select the milk of a healthy cow, as it is well known that 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 organization indicates its propriety.

In some constitutions, however, 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 is added. In this case, it is a common custom in some parts of Germany to dilute the milk with a weak infusion of any light aromatic, such as linden-tree flowers, instead of pure water. But after the first month or two, where diluted milk does not agree, a small proportion of well-boiled arrow-root, grated Dutch rusk, or well-baked or toasted bread, forms a very useful addition where with to thicken the milk to the consistence of thin gruel. Briand, indeed, remarks that milk diluted and boiled for a length of time with any light farinaceous substance is more easily digested by some infants than pure milk; and that, while those fed on milk alone pass white and curdy matters by stool, those who live on a *bouillie* of milk and farina present homogeneous and well-coloured evacuations. For this reason, he recommends panada made by boiling, for a length of time, in water, or milk and water, thin slices of bread previously well dried in the oven. Another form, of which he speaks highly, is the *crême de pain*, made by infusing in water for several hours well-baked

bread, previously dried in the oven in slices, and boiling it gently for some hours more, adding water from time to time to prevent it from becoming too thick. It is then strained and sweetened, and a few drops of orange-flower water are added. For infants a few months old, arrow-root, sago, or semolina, may be used in the same way. The *bouillie* in common use 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 considered an excellent food, especially where the use of milk excites a tendency to diarrhœa or colicky pains. On changing to the *bouillie*, digestion immediately improves, and the evacuations become healthy and unattended by pain.

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

In some children of a lymphatic constitution and low vitality, it is necessary to begin the use of chicken-tea, mutton-broth or beef-tea, at an earlier period than usual, as any less animalized food does not agree with them. In general, however, it will be soon enough to have recourse to it some time after the incisor teeth

have appeared. But if the milky 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 animal broths is, that the former nourishes without exciting, while the latter are always more or less stimulating. In infancy, the natural tendency is to excitement, and, therefore, in ordinary cases, milk and farinaceous substances suit best. 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 carrying it too far, and to give it up the moment any indication of its doing harm presents itself. 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 error to infer that the healthy, well-constituted infants of the middle and higher classes equally require, or will not suffer by, 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 of existence, the infant 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 al-

most sure to follow, accompanied probably by nervous irritation and colicky pains or bowel-complaint. Even when so much sleep is no longer required, quietude for some time after feeding ought to be encouraged, as much bodily activity immediately after meals is unfavourable to easy digestion in a delicate constitution.

The next object to be considered in connection with diet is the period and manner of *weaning*,—a process which used formerly to be much more formidable than it is now.

The time of weaning ought to be determined chiefly by two circumstances, viz., 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 not to take place till the development of the teeth shows that a change of food is required. This usually happens about the ninth or tenth month; but in delicate children teething may be delayed for even several months longer, and, in such a case, weaning ought also to be delayed, that the organization may be fully prepared for the change before it is carried into effect.

If, however, the supply of milk proves insufficient for the nourishment of the child, and the health of the mother begins to suffer before the expiration of the usual time of nursing, it may become necessary, for both its sake and her own, to wean it gradually before any indications of teething present themselves. But, in this case, weaning is recommended not as proper in itself, but merely as the smaller of two evils. To continue nursing under such circumstances would lead to more mischief than if it were given up. In some parts of the Continent nursing is continued for eighteen months or two years; but, unless in very feeble or ill-constituted children, this is an unnecessary prolongation of the process. In weak, scrofulous children, however, the teeth are often very late in appearing, and this may be taken as a sure sign that the breast ought

still to constitute the chief source of their nourishment, whatever their age may be. Sir James Clark, indeed, specially recommends the children of consumptive parents to be suckled for eighteen months or two years, as the surest means of rendering them healthy and robust; and the soundness of the principle is unquestionably borne out by experience—always provided, of course, that an abundant supply of good milk is to be obtained for that length of time from a healthy and well-constituted nurse.

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 appearance of the front teeth may be assumed as the safest indication of its propriety. It is the state of the organization, and not the number of weeks or months that have elapsed, which ought to determine the time of weaning. If possible, however, it is an object to accomplish it in fine weather, when the child can be much in the open air; as nothing tends more than such exposure to sooth the nervous irritability so often consequent upon the change. Of this instructive truth, we have already seen ample evidence in the very small proportion of deaths from teething in the country districts compared with those in the metropolis and cities. From table E of the Registrar-General's Second Report, for example, we find the deaths from teething in cities to be 1257, as compared with only 204 in the counties, a result which he shows to be attributable to the superior purity of the air in the country more than to any other cause.

The grand 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. Formerly 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 appetite for the breast in an equally gradual manner, weaning will become comparatively easy and safe for both mother and child. But if the suckling be suddenly put a stop to, the mother will suffer from the suppression of the usual secretion, and the infant from the rapid change to an unaccustomed diet. On this latter account weaning 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 will be thereby 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 material change in this respect should be permitted until after the appearance of the eye-teeth or fangs. As the organization advances, however, some addition may be made to the diet previously in use. But whatever modification of it is allowed, it is particularly important to guard against too full and nourishing a diet immediately after the weaning has been accomplished; for although the stomach may be gradually brought, in the way just stated, to bear the simpler kinds of solid nourishment when taken at distant intervals, it is nevertheless easily oppressed and disordered if the transition to a substantial diet be inconsiderate or abrupt.*

One of the chief sources of danger at the period of weaning is the tendency of the mother to consider every cry of the child as a sign of hunger which she must immediately hasten to satisfy. By yielding to this impulse, the mother often unconsciously increases the natural irritability of the infant constitution, till, by the

* Eberle on the Management and Diseases of Children, p. 63

indigestion arising from too frequent feeding, mere irritability assumes at last all the characters of serious disease. It is, no doubt, painful to a mother's feelings to witness apparent suffering in her child, but it is still more painful when she herself becomes the instrument of converting a temporary evil into a source of actual 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; for when this happens, the child is on the high road towards scrofulous disease. Generally speaking, the above symptoms are the result of over-feeding or of too rich a diet; and if these errors be persevered in, the health will infallibly suffer from defective nutrition and the usual consequences of glandular enlargement.*

Before concluding this branch of the subject, I think it right to caution the reader very earnestly against having immediate recourse to medicine to remedy every little ailment which may appear during the time of nursing or weaning. Unfortunately, a propensity exists 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 nothing more than an aberration from the regular mode of action of the organization, generally caused by errors in regimen, and often to be removed by a return to a right course. The consequence of viewing disease as arising from something in the sys-

* I may mention that some of the best remarks on the subject of artificial nursing and weaning, are taken from the work of Von Ammon already referred to. Rearing by the hand is much more common in some parts of Germany than in this country, and his opportunities of superintending it seem to have been numerous; and hence his opinions are entitled to weight.

tem requiring to be removed, is, that, on the first symptom of its appearance, medicine is resorted to for its expulsion, while the cause or error in diet is apt to be left in undisturbed operation. The evil is consequently aggravated instead of being cured, and many children are thus carried off by medicine alone, 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 remarks heard in a nursery, that "the child was uneasy, or griped, or feverish, and *I gave it so and so*," without the smallest allusion being made to *why* it was uneasy or feverish, or whether any thing was done to remove the offending cause. In my opinion, a more pernicious habit than that of constantly giving medicine to children does not exist, and I would hold the mother or nurse, who should make frequent use of it without advice, as utterly unfit for the duties imposed upon her.

CHAPTER XII

CLEANLINESS, EXERCISE, AND SLEEP, IN EARLY INFANCY.

Cleanliness of great importance.—Skin delicate and easily irritated.—Perspiration renders ablution indispensable.—Bathing—best mode of using the bath, and treatment after it.—Soiled dress to be instantly changed.—Exercise in infancy—passive at first—parents do harm by exciting to activity too soon.—Exercise in carrying on respiration.—Exercise in the open air—precautions against glare of light and cold air—open air highly beneficial—but cold hurtful.—Position during exercise—precautions in holding infants—and in dandling or swinging.—Active exercise after third month—extremely useful and safe—child naturally cautious—walking exercise—self-regulated action to be promoted—advantages to mind and body from attending to this—infant caution exemplified.—Sleep—management of sleep in infancy—sleep almost constant after birth—principles to be attended to—bed, bed-clothes, curtains, and cradles—regularity desirable.

To complete our sketch of the treatment of early in-

fancy, we have next to notice the requisite arrangements for cleanliness, exercise, and sleep.

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 (p. 143,) the seat of a continual *excretion* or *exhalation* of waste matter in the form of perspiration, often exceeding in quantity that from the bowels and kidneys united. This perspired matter consists of fluid and of solid parts; and, according to Thenard, is composed of much water, a small quantity of acetic acid, common salt, muriate of potassa, some earthy phosphates, and a very small quantity of animal matter. But, in addition to this, a secretion of an oily matter takes place on the cutaneous surface, having for its object 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 also on the forehead and nose, and it has a peculiar smell by which it is easily distinguished. It is this oily secretion which prevents the hair from becoming dry, and which causes water applied to the skin to gather into globules, exactly as when applied to any oiled surface. In the folds of the skin, it serves to prevent the two contiguous surfaces from irritating or adhering to each other, as, from their mutual friction, they would otherwise be apt to do.

In adult age the oily secretion above described, has, in some constitutions, a strong disagreeable smell, particularly in situations where it is abundant, as in the arm-pits, and also in some savage tribes and in the negro. But, in infancy, it rarely exceeds in quantity what is absolutely required to preserve the softness and pliability of the skin, and during health never gives rise to any unpleasant odour.

At the usual temperature of the body, the fluid part of the perspiration escapes and mingles with the air in the form of vapour, while a considerable portion of the

solid or saline ingredients is left adhering to the skin and clothes, both of which it speedily dirties. The vapour, not being visible, is little thought of in estimating the effects of perspiration; but its reality and active properties become very apparent when it is allowed to accumulate from a number of persons congregated for hours in a country church or small room, especially on a warm day, or is condensed in the tissue of a dress not duly changed. We may easily recognize its presence, also, on entering an unventilated bed-room, in the morning from the open air; and we are not equally sensible of it during the day, merely because it is diffused through the atmosphere almost as fast as it is formed.

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, necessarily impede any farther exhalation. The consequence is, that the waste matter, deprived of its usual free outlet, is either partially and hurtfully retained in the system, or makes its egress by some other channel, such as the bowels, kidneys, or lungs, at the risk of producing disease in them by the over-excitement of their functions. At other times, the skin itself suffers, and becomes the seat of troublesome and obstinate eruptions.

Such being the source and extent of the impurities to which the surface of the body is exposed, and such their effects when not duly removed, it will not appear surprising that cleanliness is one of the chief conditions of health at all periods of life, and especially in infancy. We have now, therefore, to consider by what means this condition may be most safely and effectually fulfilled.

Keeping in view the composition of the perspired matter, we must provide, first, 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 first purpose will be completely effected by using a dress of light and porous materials not too tightly fitted to the body, and by frequently changing it. The second will be best fulfilled by frequent and regular ablution with tepid water. Some recommend soap to be used with the water for this purpose; but as the saline particles are soluble, and easily removed by water alone, and the soap serves only to combine with and remove the oily secretion, I consider such an addition as generally unnecessary in early infancy, and frequently hurtful. For removing any *external* or accidental impurity from the hands, face, or arms, soap may be sometimes required. Used habitually, however, it is certainly injurious; as the consequent removal 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 washing the body with soap when in the warm bath; for a time I could not discover why many of those who did so took cold after it; and it was only after continued experience that I found reason to ascribe it to the above cause. In the bleached and sodden hands of washerwomen, we have a strongly marked example of the state of skin consequent on the absence of the sebaceous secretion. On all ordinary occasions, then, ablution with pure soft water is to be preferred.

The safest and most convenient way of washing the infant is unquestionably by immersion in a bath comfortably arranged for the purpose, as recommended in a former chapter (Chapter VIII.) By this means, its wet body is exposed to the air only for a moment, once for all, 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 about it with the hand or a sponge, the con-

tinued 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 washed 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 carefully dressed.

The best times for washing the infant are in the morning as soon as it is taken out of bed, and in the evening before being put to sleep. If, from the delicacy of the child, or any other cause, it becomes necessary to give it the breast immediately on awaking in the morning, it is better to delay the bathing for an hour or more till digestion be advanced. This precaution is of importance, especially in the earlier weeks of existence, when the exertion would be likely to prove injurious if the bath were used with a full stomach.

On account of the great susceptibility of 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, about 96° or 98° Fahrenheit, 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 health and sensations. The younger the infant, the more rigidly should this standard be adhered to; as it is not till after 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 not too warm, it has the double advantage of soothing the nervous system, which is always irritable in infancy, and of sustaining an equable circulation of the blood towards the surface, and thus warding off internal disease. 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 children. For restless and irritable children, also, the evening bath is often of immense advantage, from the quiet and refreshing sleep which it rarely fails to induce. As a sedative, too, it is of great value in subduing nervous excitement. But, when used too warm, or continued too long, the bath is apt to excite undue perspiration, and to increase the liability to cold.

We occasionally, though rarely, meet with children who, from mismanagement, or some other cause, are frightened by immersion in warm water, and 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 be substituted. But in all circumstances, the greatest care must be taken never to allow an infant to be exposed to the air with a 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 improper 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 from the use of the cold bath unhurt. 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. But to make any sudden change in

winter, or where considerable delicacy exists, would be attended with risk. 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 given up, and the tepid bath substituted in its stead. But for farther information on this subject I must refer the reader to my "Principles of Physiology, &c."

At whatever temperature ablution and the bath are used, gentle friction of the whole body after it, with a soft dry towel, or with the hand, 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 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 of the air, and, of its own accord, seek for protection. 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.

Exercise in Infancy.—In infancy, motion of the body is as essential to health, and the appetite 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 organization, and the laws under which the principal functions operate.

At the time of birth, the infant organization is so imperfectly developed as to be entirely unfit for the active exercise of any *voluntary* function. The first great want of the system, therefore, is *growth, or increased maturity of the organization.* But food, digestion, nutrition, respiration, and sleep, constitute the only conditions essential to growth; and hence the earlier weeks of life are consumed in the almost exclusive performance of these functions. As yet there is no desire of voluntary motion, and no will to direct it; and, accordingly, the bones and muscles, which are the instruments of motion, are still soft and feeble. At birth, the child can neither raise its head nor change the position of its body; and if an attempt is made to place it in a sitting position, its head falls over to one side, and its body becomes doubled upon itself. The arms and legs are, indeed, capable of slight motion; but their muscles are so weak as to be controlled by the smallest resistance, and their bones so soft as to give way under the slightest weight. In ordinary cases, it is not till the sixth or seventh month that the bones, ligaments, and muscles, become solid and powerful enough to support the burden of the head, or to fit the child for sustaining itself in a sitting or erect position. In harmony with this, it is not till about the same age that consciousness becomes sufficiently distinct for the child to experience or evince any desire for self-regulated movements.

Such being the state of the constitution in the earliest months of existence, it naturally follows, that, for some weeks after birth, exercise should be of a purely passive kind, and that we should be in no haste to excite the child to premature exertion, or to place it in a sitting or erect position. If this precaution be neglected, and the child be carried in a sitting posture from the first, the soft and yielding spine will bend under the weight of the upper part of the body, and probably induce not only permanent deformity, but, as its necessary consequence, undue pressure upon the lungs, heart,

and digestive organs, and disorder of their respective functions. Hence, in the beginning of life, exercise ought to consist simply in being carried about the nursery, or into the open air, in a horizontal or slightly reclining position on the nurse's arms, or in a carriage, and in the gentle friction with the hand over the whole surface of the body and limbs, an operation which is not less agreeable to the infant than beneficial in promoting a free and equal circulation.

Many parents are so ignorant and self-indulgent as to give way to a habit of exciting the infant to spontaneous muscular exertion, long before its organization is fitted for it, and also at most unseasonable times, such as immediately after a meal. If they were aware of the nature of the infant constitution, and were conscientiously to scrutinize their own motives, they would often discover that they were actuated in this conduct much more by a desire to amuse themselves, than by any clear or disinterested regard for the welfare of the child. If the parents were seriously to ask themselves beforehand what their real object was in giving way to this exercise of their feelings, the infant would, in some instances at least, escape in better plight than at present.

Rightly considered, indeed, the transition from the womb to external and independent existence will be seen to entail upon the child an amount of active exercise, which is generally altogether overlooked, and which renders any addition to it by the parent wholly unnecessary for a considerable time after birth. The moment the child is born, respiration begins, and never ceases by night or by day till life becomes extinct. But the very performance of respiration is a source of new and unremitting action to a great variety of muscles; for almost every muscle of both the chest and the abdomen is more or less engaged in it. To the adult who has breathed for years almost without being conscious of the fact, this may seem a very unimportant

amount of exercise; but if the movements of the respiratory muscles were made to depend entirely on an effort of the will, even for a day, the strongest and most persevering among us would be apt to complain of them as rather a serious burden. So admirable, however, is the arrangement made by the Creator, that respiration goes on by night and by day, whether we are sleeping or walking, busy or idle, gay or sorrowful, and whether we lend our attention to it or not. And yet, for the muscles engaged in it, breathing constitutes a portion of exercise which cannot be considered, on reflection, as either trifling in amount or unimportant in its effects. In the early months of infancy, this constant action assists materially in promoting the development of the muscles and bones of the trunk of the body; and hence we may rest assured that, at that age, respiration, occasional crying, and the tossing about of the arms and legs, constitute all the active exercise which is required for either health or growth, and we need not trouble ourselves to enforce more.

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 for about ten or fourteen days, after which it may be cautiously carried out to 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 three or four weeks, and then only in fine mild weather, and for a short time; till, by repeated excursions, it becomes habituated to the change. The length of time may then be gradually extended.

Whatever the season of the year may be, much caution is required also to avoid injury from thoughtless exposure to the strong light of day, and more especially of the sun. For several weeks, the eye is extremely delicate and susceptible of injury, and vision very imperfect. If therefore, a new born infant be suddenly or rashly exposed even to strong day-light, or a

bright blaze from the fire, and much more if exposed to the bright rays of the sun, the structure of the eye may be irreparably affected, and sight weakened or destroyed. In the Asylum for the Blind at Vienna, this remark has been frequently verified. Some weeks after birth, the organization becomes more matured, and the infant will then turn away instinctively from a very bright light: but at first the eye and brain are so imperfectly organized that the infant shews no indication of receiving any distinct impression from external objects; and hence it may, and sometimes does, receive positive injury, without giving any sign of pain. The parent, therefore, ought to be doubly watchful for its protection. A similar precaution, and for a similar reason, ought to be taken against exposing the young infant to loud and sudden sounds. Violent convulsions have been induced by this latter cause.

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, in proportion as it can be borne. Most infants naturally delight in the open air when 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 feeble. 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 during the winter in temperate regions, they die in considerable numbers. In a former work* I noticed the inquiry instituted by Dr. Milne Edwards to discover the cause

* Physiology applied to Health, &c; ninth edition, p. 83

of the greater mortality of infants in France during winter than during summer, and in the northern than in the southern department of that country, and stated that it was satisfactorily proved to be owing chiefly to premature exposure to cold in carrying the child to the office of the *Maire*, within a few days after birth, for the purpose of being registered in legal form. Dr. Edwards' results have since been confirmed by other observers, and among these by Nicolai, who gives a comparative view of the mortality, at different ages, out of 10,000, in France, Prussia, Austria, and Sweden, and shows that, while in the colder climate of Sweden the number of children dying under three years of age is considerably larger than in France, being as 4243 to 3976, yet the proportion of persons surviving at the age of eighty years is no less than 546 in Sweden and only 231 in France.*

I may add farther, that ordinary medical experience confirms the inferences deducible from these facts; for late careful investigations have shown that a large number of children perish annually from pneumonia, and other inflammatory and intestinal affections, brought on by imprudent exposure to cold.

Influenced, then, both by direct experience and by our knowledge of the infant constitution, we ought to be cautious in 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 best 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, it will be proper to abstain for a time from sending it out, and to give it the necessary exercise in a large, well-aired room.

* Grundriss der Sanitäts Polizei von Dr. A. H. Nicolai, p. 493 Berlin, 1835

In fine weather, the child ought to be carried out two or three times in the course of the day, for one, two, or more hours, according to circumstances; but it ought not to be sent out immediately after being fed, nor should it be fed again directly after its return. Regularity in the hours of exercise ought to be observed as much as possible, and the early part of the day to be chosen for the first walk, that every advantage may be taken of the state of the weather. In winter, and during the cold east winds of this climate, the infant should not be longer than an hour at one time in the open air.

When an infant is taken out for exercise, the nurse should be careful never to carry it *in a sitting position*, 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 breathing and even swallowing. 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. After the fourth or fifth month, the sitting position may be allowed for a few minutes at a time, if the child seems to like it. But when the infant is prematurely carried in this way, even the compression upon the chest, caused by the hand supporting it in front, is not unattended with inconvenience.

When treating of exercise, Dr. Eberle recommends, that for some days after birth, "the infant should be taken from its cradle or bed two or three times daily, and laid on its back, on a pillow, and carried gently about the chamber;" and he agrees with Struve in thinking that "the best way to carry very young infants is, to lay them in a small oblong basket. By this contrivance, a gentle and agreeable swinging or undulating motion will be communicated to them; and the sides of

the basket being three or four inches higher than the child's body, a cover may be thrown over it without restraining the free motion of its limbs. After the third or fourth week, the child may be carried in a reclining posture on the arm of a careful nurse in such a way as to afford entire support to the body and head. This may be done by reclining the infant upon the forearm, the hand embracing the upper and posterior part of the thighs, whilst its body and head are supported by resting against the breast and arm of the nurse. When held in this way, it may be gently moved from side to side, or up and down, while it is carefully carried through a well-ventilated room."*

In *lifting* young children, the nurse should be very careful never to lay hold of them by the arms, as is sometimes thoughtlessly done; but always to place the hands, one on each side of the chest, immediately below the arm-pits. In infancy, the sockets of the joints are so shallow, and the bones so feebly bound down and connected with each other, that dislocation and even fracture of the collar-bone, may easily be produced by neglecting this rule. For the same reason, it is a bad practice to support a child by one, or even by both arms, when it makes its first attempts to walk. The grand aim which the child has in view is to preserve its equilibrium. If it is partially supported by one arm, the body inclines to one side, and the attitude is rendered most unfavourable to the preservation of its natural balance; and, consequently, the moment the support is in the least relaxed, the child falls over and is caught up with a jerk. Even when held by both arms, the attitude is unnatural, and unfavourable to the speedy attainment of the object. To assist the child, we ought to place one hand on each side of the chest, in such a way as to give the slightest possible support, and to be ready instantly to give more if it lose its balance. When this plan is followed, all the attitudes and efforts of the

* Eberle on the Management and Diseases of Children, p. 45

child are in a natural direction, and success is attained not only sooner, but more safely and gracefully than by an ill-judged support given to one side.

When a child is carried out in the nurse's arms, due caution should be used not to compress either its body or its limbs in any degree, but to allow of perfect freedom in their position. It is important also to change, from time to time, the arm on which the child is carried. If this be not attended to, a natural leaning of the body to one side, and turning of the eyes in one direction, or tendency to squinting, will be induced; whereas a change will be advantageous equally to nurse and infant. This principle is too much neglected in practice.

Great discretion requires to be exercised in the common custom of dandling, swinging, and jolting, very young infants. 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 indulged in, they cannot but be prejudicial.

In fine weather, passive exercise in a child's carriage in the open air and over a tolerable road is very salubrious; and, as the infant can be laid at full length and perfectly protected, it is an exercise attended with little fatigue, and quite unobjectionable after the first five or six weeks. But in cold weather it is not so suitable. In general, children are fond of it, but very rapid or rough motion ought to be avoided.

Such are the principles by which exercise ought to be regulated during the first weeks of infancy. But, in proportion as the organization becomes developed, and its capabilities increase, the child begins to show active desires and wishes of its own, which require a corresponding modification in its treatment. At first, the infant seems to have no distinct perception of the existence of external objects; but, after the lapse of some weeks, it gradually learns to distinguish one object from another, and instinctively turns in the direction of a

sound or of the light, and gives various other indications of awakening consciousness, dawning intelligence, and increasing strength. Arrived at this stage of its growth, passive exercise will no longer satisfy it; it becomes impatient for the free use both of legs and arms, and to be allowed to move them after its own fashion. To meet this change in its condition, we should take care to remove every impediment in its dress, and to gratify its love of motion to the greatest possible extent consistently with its safety from external injury. In doing so, we may rest assured that the child will not be tempted to continue its activity a moment too long, provided we refrain from exciting it. When tired, it will cease at once, and betake itself to repose

When a certain degree of strength has been thus 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 a large carpet, or, in fine dry weather, upon the grass out of doors, 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. The ordinary long dress of infants is a great impediment to freedom of motion, and it ought, therefore, 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 going into the open air, and thus every inconvenience be obviated.

By exercise thus adapted to the state of the system, the infant will be much better strengthened, and learn to walk much sooner, and with a more free and erect carriage, than if prematurely set on its feet and supported either by the arm or by leading-strings. The chest also will be more freely 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 infant, 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 excited feelings, she is sure to err. But remove all external sources of injury, and leave the child to its own direction, and it will very rarely hurt itself by its procedure. It will crawl till its bones become firm enough to bear the weight of the body, and its muscles powerful enough to move them. It is the swaddling, bandaging, stays, and artificial exercise of modern civilization, and not the natural action of the body, which give rise to curvature of the spine and deformity of the limbs; and hence such deviations are never met with among the Indians. "They do not swaddle their infants," says an old author in a tone of regret, when speaking of the Caribs, "but leave them to tumble about at liberty in their little hammocks, or on beds of leaves spread on the earth in a corner of their huts; and, *nevertheless*, their limbs do not become crooked, and their whole body is perfectly well made." "Although the little creatures are left to roll about on the ground in a state of nudity, they, nevertheless, GROW MARVELLOUSLY WELL, and *most of them, become so robust as to be able to walk without support at six months old.*"* This quotation shows, in a very striking manner, the superiority of the Creator's ways over those of man, and how implicitly we may rely on a successful result when we adapt our conduct to the law of God, instead of capriciously chalking out a course of our own not sanctioned by Him.

The next stage of infant exercise is *walking*; and here, again, provided we do not stimulate the child to premature efforts, we may safely trust to itself. After a child has acquired a certain degree of vigour and

* Histoire Naturelle et Morale des Isles Antilles. Rotterdam, 1658

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 an infant to rely too much upon 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 yield, and the child, by constantly trusting to its conductor's guidance and protection, gradually acquires a heedlessness in its exertions, which is prejudicial equally to body and mind. The strong effort of the will required to execute every movement gracefully and successfully is withdrawn, and an indifference substituted in its place, which is fatal to unity of action in the delicate muscles. Even the mind suffers in such circumstances. In infancy, as in later life, the most pleasing and invigorating actions are those planned, strongly willed, and executed by the exercise of our own faculties and on our own responsibility; and the favourable effect is greatly weakened when we act merely as automatons in the hands of another. 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 intended the action to be performed. So long as we continue to be machines moved by the will and defended by the prudence of another, we cannot, by possibility, possess the strength of bodily or mental endowment to which our constitution is naturally adequate; and it is an entire mistake to suppose that this principle does not hold even from early infancy. In our own country, we have individual instances of poor children of two or

three years of age acting as guardians to infants not a great deal younger than themselves, and displaying in that capacity, a degree of intelligence, solidity, and presence of mind, not at all expected at so early a period. It is also recorded by travellers in America, that the children of the settlers are left very much to their own guidance almost from the time of their being able to crawl, because the parents are too busily occupied to be able to take that entire bodily charge of them which is usual in this country; and that, nevertheless, accidents very rarely occur; on the contrary, the children grow up with all their senses in full activity, and with all their wits about them, and manifest a presence of mind and readiness of resource unknown to the more carefully tended children of civilized Europe. An instance is given of a child under a year old being seen crawling on all-fours along a sadly mutilated wooden bridge, with a roaring stream flowing under, within sight of the mother's house, where she was quietly engaged in washing, and not troubling herself about the apparent danger which startled the traveller so much. On the latter expressing his alarm, the mother quietly replied that the child was accustomed to take care of itself, and knew well what it was about, and then made him observe the deliberate and cautious way in which it made even the slightest movement; adding, that to run anxiously to its assistance, would be the sure way to frighten it and make it drop into the water There may be exaggeration in this anecdote, but assuredly the principle upon which the mother is stated to have acted is sound, and might advantageously be carried out in practice much farther than it has ever generally been.

It is probable that, by thus following as far as possible the footsteps of Nature, the child would get two or three falls; but on the supposition that all hard bodies have been removed out of its way, and that it is practising upon a carpet or a soft green, under the

watchful superintendence of an attentive nurse, it would run far less risk of sustaining injury from falls than it is certain to do by the substitution of leading-strings and other artificial supports, which tempt it into fallacious estimates of its own strength, and expose it to worse dangers from the momentary 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 the fall teaches the infant much more effectually how to avoid future accidents, than a thousand exclamations of caution on the part of its nurse, which are far more calculated to excite nervous apprehension than to cultivate reasonable prudence and presence of mind. In reference to this subject, Dr. Eberle justly remarks, that "children who are never suffered to surmount, by their own efforts, the little difficulties which may occur in their sports, and are continually warned against accidents, seldom fail to become unduly timid, helpless and irresolute, by inspiring them with a constant dread of falling and hurting themselves. The custom of exaggerating the dangers incident to their usual sports, and of plying them continually with admonitory injunctions against accidents when they are engaged in their amusements, is calculated to favour the occurrence of the very accidents which they are meant to obviate, by the timidity which these perpetual lessons of caution and fear almost inevitably inspire."*

Gentle friction over the whole surface of the body is another form of exercise which is very agreeable to children, and which has a soothing effect when any irritation is present. But the practice in which some nurses indulge of tickling the skin for the purpose of inducing quiet, is stupifying and injurious in a high degree.

* Eberle on the Management and Diseases of Children, p. 50.

Sleep.—The management of sleep is the next subject for consideration in the treatment of early infancy

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 sleep and taking nourishment. As yet, it can scarcely be said ever to be awake; and it is only after the lapse of several weeks that 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 best time for it, that requires our attention, as the situations and conditions under which sleep ought to be indulged.

From the inability of the new-born infant to maintain its own heat, and the extreme care with which the lower animals protect their young against the external cold, as well as from direct experience, there can scarcely be a doubt that, at least during the first four weeks, and during winter or early spring, the child will thrive better if allowed to sleep by its mother's side, and cherished by her warmth, than if laced in a separate bed. But, in adopting this arrangement, great care must be taken neither to over-load the infant with bed-clothes, nor to place it in such a position as to endanger its slipping down under them. If these precautions be neglected, all access to the external air may be inadvertently cut off, and the infant either forced to breathe an atmosphere contaminated by the exhalations from the mother's body, or killed by suffocation. Accidents of this kind are most likely to happen when a soft feather-bed and thick soft pillows are used, as they may yield so much under the weight of the mother as almost to envelope the infant.

After the lapse of six or eight weeks, when the organization has become sufficiently vigorous to be able to maintain its own heat, and to admit of the infant enjoying considerable intervals of wakefulness, it will be better to remove it to a separate bed placed near to that

of the parent or nurse. By this change it will enjoy more refreshing sleep, have easier and more certain access to pure air, and be less tempted to have constant recourse to the breast. For similar reasons, the mother also will be benefited, and be better enabled to provide a healthy supply of nourishment for her infant, than when subjected to continual and anxious watchfulness on its account.

This point being settled, the next matter is to determine the best kind of bed for the infant. Much has been said and written against cradles, but, nevertheless, from their convenience and portability, they keep their ground, and not without reason. They admit not only of being easily moved to any part of the nursery, or placed in any position in relation to the window, fire, and door, but also of ready access on all sides, and of having the whole bed-clothes easily cleaned or removed when necessary. The only objections to which they are really liable, concern their abuse more than their use. It is urged that rocking is often carried to a hurtful extent. This is quite true; but, on the ordinary principle of gravitation, a cradle will remain perfectly motionless if allowed to do so, and, when rocking is abused, it is the fault of the attendant and not of the cradle. It is objected, farther, that cradles admit of the air being easily excluded by closely-drawn curtains. But when the air is so excluded, this again is the fault, not of the cradle itself, but of the nurse or parent who allows curtains to be used, or when used, to be too closely drawn. Curtains 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 itself. When, again, a nursery is so badly constructed that the cradle must be exposed to a draught in whatever situation it is placed, a screen on the corresponding side will afford the necessary protection, without its being at all requisite on that account to surround the cradle with cur-

tains which exclude the air altogether. The modern suspended cradle seems to me an improvement on the old-fashioned one; and even its additional height from the floor is an advantage as regards both greater accessibility to the mother's bed and the enjoyment of a better air.

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 suck, and presently goes to sleep again. By degrees, however, the intervals of waking are prolonged and those of sleep of course diminished; and all that is required in their due regulation is, to trust a good deal to the natural inclination of the child, and not to interfere forcibly with either. If the infant awakes refreshed and lively, we may be sure that it is not sleeping too much, and we need not endeavour to rouse it sooner from its slumbers. If, again, its intervals of waking activity are not followed by any appearance of exhaustion, ill health, or feverish restlessness, we need not concern ourselves about their length, nor try to force repose by vehement rocking or moving lullabies. In proportion as the organization advances, 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 disturbing causes which accident may throw in her way. Where, for example, any slight irritation prevents sleep at the usual time, it is quite proper to sooth the infant to repose by gentle rocking or a soporiferous lullaby; but it would be wrong to follow the same course at a time when the child is not accustomed to sleep, and when the only motive for putting it to bed is to suit the temporary convenience of the mother.

As the infant grows in strength and activity, regularity ought, as far as possible, to be observed in the hours of its wakefulness and sleep. There is a perio-

dicity in the animal economy adapted to that of the physical world, which tends to the return of the same state of the system at regular intervals, and which it is very important to cultivate. It is only by doing so with regard to sleep, that either mother or child can enjoy that undisturbed repose during the night which is so essential to health. If the infant is encouraged to start up at any moment of the day or night and demand the breast, or if the latter is constantly offered to it as a means of soothing its cries, whether it be hungry or not, perpetual restlessness and discontent must be the result; and these once established as a habit, the mother's peace and enjoyment, and the child's health and welfare, are sure to be sacrificed. The infant may be quieted for the moment in this way, but it will be at the expense of tenfold trouble and disappointment at a future time.

While endeavouring to accustom the child to regular hours for eating, sleeping, and all other natural operations, we should, especially as he grows older and stronger, bear in mind that night is peculiarly the season for sleep, and that no arrangement should be permitted which is likely 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 early part of the day to that sleep which all children require more or less till after two or three years of age. Their activity may not then be entirely expended; but, under a judicious system of management, they will be perfectly ready for another interval of rest. Whereas, if they be excited to activity, and sleep be delayed to a later part of the day, it will always be at the increased risk of producing restlessness in the early part of the night.

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, subject the infant to spasmodic and convulsive attacks from any accidental irritation. Many persons act in direct 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. But this is a great and pernicious mistake.

When the stomach is distended, and digestion just beginning, sleep is generally uneasy and disturbed. The infant, therefore, ought not to be put to rest immediately after a full meal. During the first month, it is true, he goes to sleep directly after having the breast; but it sucks little at a time, and the milk is then so diluted as scarcely to require digestion. It is at a later period that the precaution becomes really important.

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 he sleeps tranquilly, and when awake is active and cheerful, and his various bodily functions are executed with regularity, we may rest assured that no great error is committed, and that it is a matter of perfect indifference whether he sleeps an hour more or an hour less than another child of his own age. Where, on the contrary, he sleeps heavily or uneasily, and when awake is either stupid or fretful, and his other functions are perverted, we may be certain that some error is committed, and that he is either rocked to sleep immediately after a full meal, or otherwise mismanaged.

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 which 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 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 from being ill. In this case, the proper course is to seek professional advice, and to employ the means best adapted for the restoration of health, after which sleep will return as before. From not attending to the true origin of the restlessness, however, and regarding it merely as a state troublesome to all parties, 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 inducing the appearance of slumber, no matter whether the reality be sleep, stupor, or apoplectic oppression. The mischief done in this way is inconceivably great, and astonishment would be excited if it were generally known what quantities of quack "cordials," "anodynes," and even spirits, are recklessly given with the view of producing quiet and sleep. In Germany, milk mixed with a decoction of poppy-heads is in common use for this purpose; and Von Ammon mentions a case of a child of six months old, whose parents were at first delighted with the placid slumber induced by it, but in the morning were horrified on finding the body stiff, the extremities cold, the eyes turned up, the pulse nearly gone, and the surface covered with a cold sweat. Many an infant, the true cause of whose death was not always suspected even by the guilty person, has thus passed prematurely to its grave.

Plants, flowers, and strong smelling perfumes, ought to be wholly banished from the sleeping apartments of children, as they act injuriously on their delicate nervous system. The German physician, Kopp, mentions a melancholy example, in which a child of fourteen days old was killed apparently by the strong scent of sabine oil diffused through the room, the father having rubbed his thigh very freely with it for rheumatism, in

the close vicinity of the child's cradle. No other cause of death could be discovered, and, till then, the infant was perfectly healthy.*

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 hour's exposure to the air every day before the child is put to bed. The effect of perfectly fresh coverings is soothing and healthful in a high degree. The quantity of bed clothes ought to be quite sufficient to sustain the natural heat of the body, without being so great as to relax or to excite perspiration; and for this reason a *soft* yielding feather-bed is very objectionable, particularly in summer or in a warm room. In infancy, there is a natural tendency of blood to the head, and where this is encouraged by warm caps, the consequences are often hurtful. The head, therefore, ought to be only lightly covered.

CHAPTER XIII.

MANAGEMENT OF THE INFANT DURING TEETHING.

Growth of the jaw in early infancy—is a preparation for teething.—Teeth appear when solid food is required—unnecessary sooner.—Number and kind of teeth adapted to the wants of the individual—the milk teeth appear first—and are succeeded by the permanent set.—Names and positions of the teeth.—Order of their development.—Symptoms attendant on teething.—Teething a natural and not a morbid process.—Management required before and during teething.—Pure air of greatest consequence—precautions required.—Simplicity of diet also essential—illustrations.—Tepid bath highly useful—friction.—Local treatment.—Excitement to be soothed.—Scarifying the gums.—General remarks.

During the earlier months of infancy the child is intended to draw its whole nourishment from its mother's breast, and there is no solid or resisting food to be bro-

* Von Ammon's Die esten Mutterpflichte, &c., p. 176.

ken down before being swallowed and conveyed to the stomach for digestion. The power of suction alone is required, for the performance of which the lips, tongue, and cheeks, are amply sufficient. In accordance with this state of the constitution and mode of life, the jaws are, for some time after birth, short, shallow, and unprovided with teeth; 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 organization. The bones of the face gradually expand in their dimensions; 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 jaws increase in size and vigour; and, in exact proportion to these changes, the infant manifests increased powers of mastication, and an increased tendency to carry to its mouth every object it can lay hold of; thus evidently contributing to develope still farther the bones and the muscles concerned in mastication.

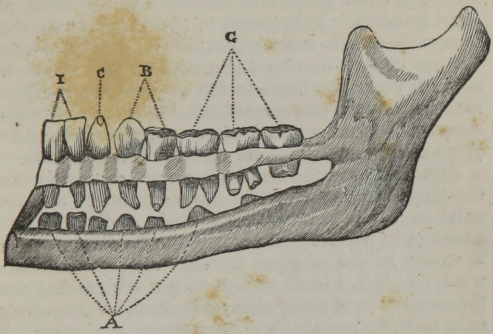
About, or soon after, the sixth month, however, a still more remarkable change begins to take place, and does not terminate till about the end of the second year. I allude to the successive cutting of the first set of teeth, a process on the right management of which the immediate safety and future welfare of the infant very closely depend. Being a natural process, teething is not necessarily attended with danger; and, under proper treatment, a healthy child generally passes through it without much actual suffering. But in delicate or mismanaged children it is often the cause of much danger and consequently of much anxiety to the parents; and the possession of sound views in regard to it is therefore important.

As a general rule, the organization will be found, at every period of life, to be exactly adapted to the wants of the individual. To the infant at the breast, for example, teeth are denied, simply because they would be not only useless, but an encumbrance, and would interfere with its sucking. At a later period, however, when the natural food of the infant is no longer fluid, but firm and consistent, teeth are given; because, without their aid, such food could not be broken down, or formed into a soft mass with the saliva, to fit it for being easily swallowed and digested. In accordance with the same principle, 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 organization, and not merely by the number of months which have elapsed since the child was born.

In like manner, the kind of teeth provided by Nature always bears a direct relation to the kind of food on which the animal is intended to live. For this reason we have different sets of teeth at different ages. In early youth, when the appropriate food is comparatively soft, succulent, and easily masticated, the jaw is still on a smaller scale than in later life, and contains only twenty teeth, called the *milk* or *temporary teeth.* After the age of seven years, these begin to fall out, and, in proportion as the organization advances, and a more solid form of nourishment becomes necessary, the jaw continues to enlarge in depth and length, and the first set of teeth is gradually replaced by a larger, stronger and more numerous set, called the *permanent teeth.*

In the adult, the permanent teeth, thirty-two in number or sixteen in each jaw, are divided into several kinds, the names and situations of which will be easily understood from the subjoined woodcut. It represents,

indeed, only one-half of the lower jaw, and, consequently, only one-fourth of the whole number of teeth but as the upper jaw, and the other half of the lower



jaw, exactly correspond in the number, proportion, and forms of the teeth which they contain, the cut here inserted will be sufficient to convey all the information required.

The permanent teeth consist of eight *incisor* or *cutting* teeth I; four *cuspid*, *spear-headed*, *canine*, or *eye* teeth C; and twenty *molares* or *grinders*, B G. The latter term is sometimes restricted to the three posterior teeth in each jaw G; in which case the two anterior to them B, are called *biscuspid* or *double-spear-headed*, from bearing a resemblance to a double-headed *cuspid* or eye tooth. In Latin, *cuspis* signifies the point of a spear; *canis* a dog; *mola* a mill; *incisor*, any thing which cuts; and, as the use of the incisor teeth is to *cut*, of the canine or cuspid to *tear*, and of the molar to *grind* the food, the respective terms are sufficiently appropriate The offices of the different sorts of teeth

being different, the teeth vary in different animals, and in the same animal at different ages, according to the nature of the food on which each is intended to live.

The *milk-teeth*, twenty in number, consist of eight incisor or front teeth, four canine or lateral teeth, and eight grinders. They begin to appear about the sixth or seventh month, and are generally all developed before the age of two or two and a half years. About the seventh year, they begin to fall out, and are by degrees succeeded by the permanent teeth, the four last of which sometimes do not appear before twenty or twenty-five years of age, and hence are called the *wisdom-teeth*.

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, and occupy the situation in it represented at A in the woodcut. But as it would be out of place to trace their progress in a work like this, I shall content myself with stating that the ossification of many of the milk-teeth is far advanced even at birth, and that a certain degree of regularity is to be observed in the order of their appearance.

The two front 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 of repose, these are in their turn succeeded by the *lateral* incisors in both jaws. After another pause, 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 occupies two distinct stages. During the first period, the capsule of the tooth seems to swell out and stretch the neighbouring parts; while, in the second, the tooth increases in length, rises upwards, presses against the gum, and cuts through. These two processes do not always follow each 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 without 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 is found to be cut, 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 every thing to the mouth, and is evidently relieved by rubbing the gums. The bowels at this time are generally unusually open; but a certain degree of bowel-complaint is beneficial during teething, and therefore 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 every thing 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 burning hot: a pale or bright-red elevated spot appears on the gums, which become very painful when pressed upon. The child changes colour frequently, is restless, wishes to be laid down, and is no sooner down than he is as anx-

ious 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 every thing, and retains nothing. The child appears, in short, 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-complaint are often combined. When once the teeth are fairly cut, however, all these symptoms will vanish."* But many children, and especially those who are well constituted and carefully brought up, pass through the period of teething with scarcely any disturbance or excitement.

The incisor teeth are generally more easily cut than the canine. The latter, indeed, are often preceded by much constitutional disturbance, although their sharp and pointed form would seem to indicate a facility in making their way. From the broad surface and unfavourable shape of the grinders, one might expect their appearance to be preceded by a good deal of suffering; but, in reality, they do not often excite very urgent symptoms. This arises partly from their blunt pressure not irritating the gum, but rather inducing its gradual absorption, and partly from their appearing at an age when the irritability of the constitution is less than in earlier infancy.

Dentition being, as already stated, a natural process, is not necessarily a period of disease and danger. But as it augments the inherent irritability of the infant constitution in a greater or less degree, a slighter cause is apt to give rise to disease during teething than at any other time; and when disease does occur, it is unavoidably aggravated and rendered more dangerous. This irritability is, indeed, the real source of the constitutional disturbance so often attendant on teething; and, consequently, the best method for carrying the child in safety through that troublesome and sometimes perilous

* Von Ammon, p. 182.

process, is the adoption, from the day of its birth downwards, of a proper system of general management. Daily experience confirms the accuracy of this proposition, and shows that, while the symptoms of teething are generally severe in sanguine and excitable children, especially if 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 and general treatment have been conducted in accordance with the dictates of sound 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 fresh air as a condition of health, I cannot refrain from now urging it upon the attention of mothers as one of the safest and most efficacious preservatives against the dangers of dentition. Nothing, indeed, tends so directly as the constant enjoyment of a 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 its already predominant irritability.

The influence of a pure and temperate air as a preservative from the dangers of teething, is strikingly exhibited in the First Annual Report of the Registrar-General, already repeatedly referred to. In Table C of the Appendix, p. 110, we find an abstract of the causes of death as registered in the thirty-two Metropolitan

unions, containing a population of 1,594,890, and a corresponding abstract of the causes of death as occurring in the unions of the counties of Cornwall, Devonshire, Dorsetshire, Somersetshire, and Wiltshire, containing a rather larger population of 1,599,024. From these abstracts it appears that, out of an equal population, the number of deaths from teething is SIX TIMES GREATER in the impure and crowded atmosphere of the Metropolitan unions than in the comparatively pure air of the counties—the actual numbers being 477 in the former, and only 78 in the latter. In like manner, from an abstract given in Table D (p. 112,) it appears that, in another country-population of 1,656,455, only 75 deaths occur from teething; while, in a *smaller* town-population, namely 1,484,402, resident in Bristol, Birmingham, Manchester, Liverpool, Nottingham, Leeds, Carlisle, &c., no less than 524 deaths were produced by it in the same space of time, being nearly SEVEN TIMES more than in the purer air of the country.

These facts are eminently worthy of the attention of parents. When we consider the facility enjoyed in towns for obtaining medical aid and many domestic comforts which are almost inaccessible in the country, the excess of mortality becomes still more striking, and shows that some powerful, general and permanent cause such as an impure atmosphere, must be at work to produce it—a cause which either does not exist, or exists only in a much smaller degree, in the agricultural districts.

But, while the child can scarely be too much in the open air in temperate or fine weather, and when properly protected, the unusual susceptibility of the system during teething renders great caution necessary against exposing it needlessly to the ordinary causes of disease Thus, 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. In like manner, if the nursery be kept too warm, or the head be too much wrapped up, the nervous irritability will be greatly increased, and the restlessness and danger of teething be proportionably aggravated.

From the same peculiarity of constitution, while a mild and simple diet is extremely useful in warding off digestive irritation during teething, any excess or impropriety in the kind of food will be far more apt to excite serious disturbance than if dentition were not going on. Many observers, indeed have been struck with the comparative ease and safety with which infants who have never tasted other food than the mother's milk pass through the early period of dentition. It is, accordingly, when additional food begins to be given that the child is most likely to suffer, because it is then that errors in diet are most likely to be committed.

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.

When teething is actually in progress, increased attention is required to moderate the general excitement which is then apt to prevail, especially in delicate children. In moderate weather, the infant ought to be much in the open air; but, as just remarked, in wet or cold weather, greater caution must be used, on account of the increased excitability of the mucous surfaces. When the weather is decidedly bad, it is better to exercise the child in a large room or hall, with the

windows open, than to carry it out of doors. A light cooling diet should also be observed, and every approach to overfeeding be sedulously guarded against. The stronger kinds of food, such as animal broths and jellies, should be avoided altogether during the acute stage of dentition, and even the milk and farinaceous food be considerably diluted with water. After the irritation is over, the infant will return to the stronger food with double advantage. For the same reason, if teething commences before weaning takes place, the mother or nurse should place herself upon 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 prevent the excitement from rising too high. The mother, also, should be doubly careful to avoid every source of disturbance to her own health, such as vivid excitement, fatigue, and anxiety, as these directly affect the state of the child.

During the active stage of teething, there is a considerable tendency of blood towards the head, which often becomes a source of danger from the facility with which convulsions may be then induced, or with which mere irritation may be converted into inflammation of the brain. Hence the propriety of keeping the head cool, and of avoiding excitement of every description. Even too much anxiety to divert the child may itself 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; whereas the very appearance of restless concern, gloom, and anxiety, only increases fretfulness, and renders the child impatient The unusual flow of saliva from the mouth acts very beneficially in preventing and allaying undue excitement in the head, and ought on no account to be checked. The bowel-complaint, so frequently attendant on teething, also acts as a preservative, by withdrawing the blood from the head and lungs; and there-

fore ought not to excite anxiety, unless it goes to excess 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.

But, as is most judiciously remarked by Dr. Evanson, while we abstain from exciting alarm about the general disorder attendant on teething, we must be equally 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 merely general proposition. We ought strictly to consider each case on its own individual merits, and endeavour to distinguish between the symptoms produced solely by teething and those arising from co-existing and probably more serious disease. On this subject it will be out of place to enlarge here; but, for some excellent practical remarks connected with it, I refer the professional reader to the chapter on dentition in the able work of Drs. Maunsell and Evanson, "On the Management and Diseases of Children,"—a work which embodies the latest and most accurate information on this, as on most others of the important topics of which it treats.

The general principles by which the mother should be guided in the management of teething having now been explained, the only thing remaining for consideration is, the best means of alleviating the *local* pain or uneasiness by which it is accompanied.

When the child suffers much from the swelled and inflamed state of the gums, or when any uncertainty or complication of unusual symptoms arises, the duty of the parent is very obviously not to trust to her own judgment or to chance, but at once to call in profes

sional 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 for the mother to escape the bitterness of lasting regret and the torment of self-reproach. When, however, the child is merely uneasy, and no urgent pain is complained of, the mother may often administer relief in the earlier stage by rubbing the gum gently with the finger, and by giving the child any hard body, such as a piece of coral, a large ring, or a crust of bread, to use at its own discretion. 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. The Germans sometimes give the infant a piece of sponge dipped in sugared water to suck. When there is not much tenderness, the use of a piece of smooth coral promotes the passage of the tooth; but a hard crust of bread answers better when the gum is much inflamed, and, at the same time, relieves the irritation by increasing the flow of saliva.

When much local pain and redness are present, and the constitutional disturbance is considerable, relief may be speedily obtained by scarifying the gum with a lancet, and allowing it to bleed freely. In the first stage of dentition this may be done with propriety, although there is no expectation of the tooth immediately following. In the second stage, when the tooth is about to appear, the same remedy 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 continue the subject.

CHAPTER XIV.

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

Infancy may be divided into two periods corresponding to first and second years.—The first already discussed—some remarks applicable to the second still required.—Mortality very great in second year also.—Causes peculiar to that period—teething and its proper management—errors in diet—abuse of wine and stimulants—principles to be followed in regulating diet—example.—Cleanliness, ablution, and bathing.—Dress, and errors in dress.—Imprudent exposure to damp, cold, and draughts.—Ample exercise and pure air indispensable.—Mismanagement during illness a cause of mortality—abuse of medicines—concealment—crowding of sick-rooms, &c.—Precautions to be observed.

THE period of early infancy, to which this work more especially refers, may be divided into two distinct portions—the first extending from birth to the time of weaning, and the second from the time of 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 milk-teeth is completed about, or soon after, the twenty-fourth month. In a general sense, therefore, the two periods may be accurately enough spoken of as *the first and second years of infancy;* but it is necessary to bear in mind that, in using these terms, I mean to express not the mere lapse of time but the constitutional or physiological states which usually characterize the infant at these different periods of life.

The subjects discussed in the preceding chapters refer, I need hardly say, chiefly to the first of these divisions; but the second also demands no small share of our attention. During the latter, 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 situation of the child, during the

evolution of the milk-teeth, some peculiarity which renders it unusually susceptible of disease, and which, consequently, it is of great importance for us to take into account in regulating its mode of treatment. If we discover and keep in view this peculiarity, our management will be successful in a proportionate degree; whereas, if we remain in ignorance, or disregard the modifications of treatment which a knowledge of it would suggest, the result will be much suffering and a high rate of mortality.

To impress the reader with a full sense of the existing danger to life during the second year, and the necessity of devoting more attention to the discovery and removal of its causes, I may again refer to the fact that, according to the Registrar's First Report, 128 per 1000, or ONE-EIGHTH of the whole number of deaths in England and Wales occur during the second year alone. To form an adequate conception of this mortality, it will be sufficient for the reader to know that the proportion just stated is very nearly equal to that *of all the deaths occurring between the ages of ten and twenty-nine years;* the latter being in exact numbers 138.73 per 1000, compared to the former as 128 per 1000.* In the third and subsequent years, the mortality declines so rapidly as to prove that some of the causes which produced it must have been peculiar to the infant state, while others which continue in operation must, at least, have lost a portion of their power. The object of the present chapter, accordingly, is to inquire what those causes are, and by what means they may be most successfully controlled or counteracted.

Many of the perils attending the first twelve months of existence have already been shown to arise partly from the very delicate state ot the infant organization, and partly from defects of management. The dangers incidental to the second year admit of a similar classification. The organization continues to be in a state of

* Registrar-General's First Report, p. 45.

rapid development, and the constitution is still characterized by the same predominance of the nervous and circulating systems which marks the beginning of life. The functions principally concerned in nutrition and growth are consequently kept in that state of high activity which any accidental irritation suffices to 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 otherwise arising from occasional exposure or errors in diet. To the infant, moreover, every thing 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 becomes conscious of new feelings and desires, and takes a pleasure in the examination of external objects. The will now assumes a more definite expression, and, with a vigour and precision previously unknown, directs the movements of the muscles and bones 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 organization, it is not wonderful that disease and death should so often result from mismanagement and other causes, which might be successfully withstood at a maturer age. Under such circumstances, therefore, a few remarks, applicable more especially to the treatment required during the second year, will not be without use.

Nobody who has come much into contact with children can doubt that the process of teething exercises great influence on health during the second year and deserves the serious attention of the parent and medical adviser. When the child is rightly managed, it generally passes through the period of dentition with

little injury; but, under improper treatment and diet, its dangers become increased in a tenfold degree. Having already, however, given a full exposition of the principles on which the treatment should be conducted, I need not return to the subject here. During the second year, the state of the constitution differs only in degree from what it was towards the end of the first; and the same principles by which our treatment was regulated at the commencement of dentition are still equally 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 upon the reader's attention 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 infant constitution, is by far the most effectual way to diminish the dangers of teething and of all other infantile diseases. It is too late to begin our preparations for defence when the enemy is knocking at the gates, or has actually forced an entrance; whereas, even with a feeble garrison, a great and successful resistance may be made, when adequate foresight has been used, and measures have been taken in time against the coming dangers. In the case of infantile diseases, the parallel holds throughout; and hence we see some feebly-constituted children carried through every obstacle, while, from mismanagement or neglect, the strong and healthy have been suddenly cut down and disappeared.

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 bowels, 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, the parent is prone to give too much or too strong food, and

to give it too frequently. If a child is allowed to eat too fast, it is almost certain to eat too much; and, on the other hand, if it is not duly excercised or amused, it will desire food too often, not because it really stands in need of nourishment, but because it cannot be idle, and must be doing something. The common practice of soothing children by the offer of cake or sweetmeats is very pernicious to health, and injurious to their moral welfare; and the child cannot be too early accustomed to abstain entirely from eating during the interval between meals. The stomach, like other organs, requires a period of repose to regain its tone after being engaged in digestion; and if this be denied, and the child be allowed to eat at its own will and pleasure, indigestion will assuredly follow, and give rise to general disorder of health.

Mischief is often done during the second year of life by over-anxiety to strengthen the child by strong food and the use of stimulants. This is a great error. A healthy child who has been rendered feeble by accidental starvation may be rapidly strengthened in this way. But in debility arising from imperfect digestion or assimilation, or from an irritable nervous constitution, the milder the food, the more nourishment will it afford; and the stronger and more stimulating, the less likely will it be to restore the system to a healthy state.

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 four incisor teeth and the two anterior molar have appeared, the child may be gradually accustomed to a more solid diet. At first, chicken-tea or weak mutton broth, freed from fat, may be given in small quantity along with farinaceous food, and afterwards a little soft-boiled egg, 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. But I agree with Locke in thinking it better that "flesh should be forborne, at least till the child is two or three years old," and that by doing so "children would breed their teeth with much less danger, be freer from diseases, and lay the foundation of a healthy and vigorous constitution much surer." White meat is to be preferred as less stimulating than red meat. But when it gives rise to heat or restlessness, it should be at once given up as premature.

A small quantity of any light and well-cooked vegetable will also be allowable after the appearance of the teeth. Cauliflower, carrot, stewed fruit without husk or skin, ripe gooseberries, grapes, and such articles will be highly relished and easily digested, provided the quantity be not too large and different kinds of food be not given at the same time. When the bowels act sluggishly, soft food of this description is safer and more suitable than meat or strong broths. Dr. Alcott and other American physicians even contend that a milk and vegetable diet is the only one proper for children, and that animal food in every shape is injurious.

Spicy, stimulating, and concentrated food is hurtful at this time of life, unless when used medicinally; because it tends to aggravate the natural excitability of the system, and is deficient in the fluids which form so large a portion of the animal frame in youth. Hence, when rich animal food is freely given at an early age, the child generally becomes thin, excitable, and feverish; and improves in health 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 really suited to the state of the constitution.

In childhood, the nervous and vascular activity is al-

eady so predominant as to render the common use of wine, 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 professional man can judge) that any advantage is to be derived from their use. Many parents, however, are in the habit of having their children brought to table at the end of their own dinner, and of giving them wine, fruit, or confections, when nothing but mischief can follow from the indulgence. This 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 stimulus to the infant appetite, just as light is to the eye, or a suffering object to the feeling of compassion; and, consequently, it is both harsh and unjust, first to introduce a child to the temptation, and then deny him the indulgence which he sees freely granted to all around him. In such circumstances, even the principle of imitation comes into play with peculiar force, and 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.

In their conduct towards children, parents ought never to forget the fundamental principle that every faculty is roused into action by the presence of its own objects, without any intermediate operation of either reason or judgment; and that both appetite and feeling may be thus cherished and strengthened simply by reiterated exercise. The prayer, "Lead us not into temptation," recognises this truth in a very pointed manner, and attaches to it not more importance than it deserves. Many an individual remains pure and virtuous in the absence of the object or temptation, who would find his powers of resistance taxed to the uttermost by its presence. What, then, are we to think of the wisdom of those who, convinced in their own minds of the

impropriety of unduly cultivating the appetites of their children, nevertheless unfairly subject them to temptation by bringing them into contact, after their own whims, with the jellies, puddings, and fruits, which were never intended for them? If the children are brought to table and yet denied a share in these good things, they naturally feel themselves wronged and harshly treated in having desires excited which are not to be gratified. If, on the other hand, after having received their regular meals, they are allowed to partake in another, of which the system does not stand in need, the first result will be the improper pampering of a false appetite, and the second most probably a fit of indigestion. As a general rule, therefore, children ought never to see either food or delicacies, except what are intended for their own use, and at their regular meals; and the practice of giving biscuits, sugar-plums, cake, &c., between meals, ought to be positively forbidden. Even very young children are sufficiently clear-sighted to perceive, or at least *feel*, inconsistencies in the conduct of their parents, and cannot understand why, if it is right to give them sweet-meats or wine one day in addition to their ordinary fare, it should be *wrong* to do so another, or every day. If, again, it is *wrong* to do so *at any time*, the confidence of the child in the truthfulness and consistency of the parent is naturally shaken, when he finds the latter in any instance deliberately doing that which he as deliberately condemned.

For these reasons, as well as for its directly injurious effects on the excitable constitution of the child, the common practice of bringing young children into the dining-room and giving them wine, even when they show a dislike for it, cannot be to much reprobated. The taste, too, for such stimulus is speedily acquired, and, when encouraged, often goes far beyond the limits contemplated by the over-indulgent parent. Few children, will, however, refuse wine, which they see

prized by persons older than themselves; and, in proof that even the direct danger is not imaginary, I may mention that Golis, a celebrated physician of Vienna, relates, that he himself has witnessed three sudden deaths of infants in their mothers' arms, from Malaga wine given for the purpose of strengthening them. In this country, it is certain that, among the poorer classes, many children fall victims to whiskey or gin administered with a similar view.

To convey a connected idea 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. "A healthy child," says Dr Maunsell, "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. Light fresh table-beer would not be injurious to a child

of four or five years old; but it is unnecessary, and no advantage would in this instance result from the creation of a new want. 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." (P. 51.)

With these remarks I entirely agree; and they are in accordance with the opinions of Struve, Von Ammon and our best writers on the subject. The only difference worthy of notice between our own and the Continental physicians is, that the latter recommend a light soup, such as chicken-tea thickened with bread or sago, in place of milk and bread in the afternoon, and frequently also in the morning; and in sluggish constitutions this change is certainly attended with advantage. Ripe fruit is also more freely given to children on the Continent than in this country; and, particularly where the bowels act imperfectly, it is often very useful. It ought to constitute a part of the regular food, however, and not be given between meals as an addition to it.

For many reasons, most of which will suggest themselves to the mind of 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 of the organization and greater powers of reaction, the temperature of the water used for washing the child in the morning

should, during summer, be gradually reduced from 98° to 75°, or even ten degrees lower, in proportion as the increasing energies of the child render it safe and advantageous to do so. But during winter, or when the child is delicate and seems not to rally easily from the shock, we must not be in too great a hurrry, or go too far, in lowering the temperature. The evening ablution is now less necessary, as the child is trained to habits of regularity and cleanliness. But when it is required, the water ought always to be tepid; and, when the child suffers from teething, restlessness, or want of sleep, the evening tepid bath may be resorted to with the greatest advantage.

The *dress* should be frequently changed, and such as to afford adequate protection against both heat and cold; in material as light, and in construction as free from tightness or restraint, as it can possibly be made. In this country, fashion and vanity are often consulted in preference to reason and experience, and many children are thus sacrificed, who might have been reared with ease under better management. In winter, soft flannel should be worn next the skin, if the child be at all delicate or show any difficulty in maintaining its own 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 adopt the material which ensures sufficient warmth without going to either extreme. This may be easily determined by a little attention to the feeling and comfort of the child. In many constitutions, 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 ought at once to be adopted.

A fear of inducing relaxation by excessive wrapping up, has led many parents to the opposite extreme of clothing their children in a most imperfect and injurious manner. In alluding to this fact, and to the feeble power of resisting cold in infancy, Dr Maunsell very

forcibly expresses the wish that he could "adequately depict one of those miserable victims of parental vanity, whose appearance in our streets will sometimes, upon March or November day, strike cold into our hearts. The cap and feathers set upon, not covering, the child's head, and probably of a colour and richness contrasting mournfully with blue ears, sharpened nose, and shrunken cheeks, in which cold has assumed the features of starvation,—the short kilt and Highland hose, exposing between them cracked and shivering knees,—altogether require for their description more graphic power than we presume to lay claim to."* I have known families to which this description applied with almost literal accuracy; and although acute disease was not the immediate result, several of the children soon manifested symptoms of glandular obstruction, and a strong tendency to scrofula. The dress, therefore, ought to be amply sufficient to protect the child from every sensation of cold or chill; but, at the same time, light in quality and easy in construction, so as to admit of the utmost freedom and activity of motion without any chance of overheating.

Imprudent exposure in the nursery or out of doors is another common source of disease in the second year, against which provision may generally be made. Within doors, draughts of air and the damp of a recently-washed floor are the most frequent exciting causes of this description, and in delicate children often give rise to inflammatory affections of the wind-pipe, chest, or bowels. Out of doors, injury is sometimes inflicted, especially in cold or damp weather, by allowing the child to remain inactive or lie down on the ground or on the grass while the nurse is talking, or sitting down to read or work, instead of occupying herself with her proper charge. Playful activity is the proper remedy for this evil.

* Maunsell and Evanson on the Management and Diseases of Children, p 59.

Sufficient exercise and pure air are indispensable conditions of health during the second year, and, as already mentioned, both conduce greatly 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. If very young and unable to walk, he may be laid down on the grass with a few toys around him, and allowed free scope with them. If the grass is not perfectly dry, a shawl or a piece of water-proof cloth should be spread over it. In the nursery, the child may be placed on a carpet for the same purpose. By self-exercise of this description, he will not only amuse himself better, but develope his muscular strength, and acquire the power of standing and walking sooner and more securely than if attempted to be taught exclusively by another. Premature attempts at walking by the aid of an attendant ought to be strictly forbidden. When the child feels himself able for it, 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. Injudicious parents often consult their own vanity and pleasure much more than the child's happiness, by exciting him to the utmost to attempt to walk before the organization is sufficiently matured for the purpose; and I cannot help repeating, that it would be well for them to ascertain clearly whether their impelling motive in doing so is not simply *their own amusement*, before they act upon it. If they were to examine themselves conscientiously, the child would, I think, frequently escape, where at present it is sure to suffer.

The occurrence of measles, hooping-cough, and other infantile diseases, is another great source of mortality in the second year, which requires the serious consideration of parents. I have no intention to say any thing in this place regarding 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 is 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, every thing tends to demonstrate the paramount influence of the ordinary management.

Domestic mismanagement during illness is another not uncommon cause of death in infancy, on which it may be requisite to make a few remarks; and it shows itself in a variety of forms, according to the natural dispositions and external circumstances of the parents. Many mothers are continually administering medicines of one kind or another, and thereby deranging instead of promoting the healthy operation of the infant system. Instead of looking upon the animal economy as a mechanism constituted to work well under certain conditions, and having, in virtue of that constitution, a natural tendency to rectify any temporary aberrations under which it may suffer, provided the requisite conditions of 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. Under this impression, they are ever on the watch to see what *they can do* to keep it moving; and, altogether distrustful of the sufficiency of the Creator's arrangements, they no sooner observe a symptom than they are ready with a remedy. Such persons never stop for a moment to inquire what the *cause* is, whether it has been or can be removed, or whether its removal will not of itself be sufficient to restore health. They jump at once to the fact that disease is there, and to a remedy for that fact. If 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 very probably the one used is inapplicable to the individual case, and both the disease and the cause being, in consequence, left in full operation, instead of being removed, the danger is increased.

This is no imaginary picture, but one of daily occurrence. Viewing disease as an entity lodged in the system, the uninformed and anxious parent 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 not an abstract entity, but an aberration from the natural state of an organ or function, proceeding from some active cause, and is not to be removed till the diseased organ is again placed under the conditions essential to its healthy action, more attention will be paid to seeking the co-operation of Nature in our curative treatment, and much less mischief be done by rash attempts to expel the disease by force. The physician, when in his right position, is the "*servant and interpreter*" of Nature, and not her ruler or opponent; and the same principle ought to apply with double force to the mother. Accordingly, I have no hesitation in expressing my conviction, that a child can encounter few greater dangers than that of being subjected to the vigorous discipline of a medicine-giving mother or nurse; and wherever a mother of a family is observed to be ready with the use of calomel, cordials, anodynes, and other active drugs, the chances are, that one-half of her children will be found to have passed to a better world.

Of this truth, Dr. Merriman mentions one or two instructive examples. A woman living near Fitzroy Square, thinking her child not quite well, gave it a dose of Godfrey's cordial. In a very short time, the child fell into convulsions and died. In less than a month afterwards, the child of another woman in the same house complained of disordered bowels. The first

woman, not suspecting that the cordial had any share in her own child's death, pursuaded her friend to give it to her child. A dose was accordingly given from the same bottle, convulsions speedily ensued, and it also died.*

I have already alluded to a Parliamentary return of the deaths from poison in England in 1837—38, as showing the recklessness with which the most powerful medicines are given to children. In that return, we found a total of *seventy-two* deaths in infancy from laudanum and other preparations of opium, given either in overdose or by mistake for other medicines. In *twenty* infants, death was caused by oil of vitriol given by mistake, in four instances for Godfrey's cordial, in one for castor oil, and at other times accidentally. In *seven*, an overdose of Godfrey's cordial was the direct cause of death. If the returns were accurate and complete, I have no doubt that the number of deaths in infancy from the maladministration of active remedies, would be proved to be much greater than the report exhibits at present. Many of the cases never come under the notice of the coroner, and consequently altogether escape observation.

Even when the child is under the care of a professional adviser, it is by no means safe from the risk arising from the exhibition 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, every one 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

* Bull on the Maternal Management of Children, p. 111.

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 perhaps suffers from this abuse of 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 perfect self-complacency with which the anticipated results are looked for from the individual doses, no matter how much they may counteract each other. Even if the consequences are fatal the self satisfaction is scarcely impaired, because supported by false consciousness that *they have done every thing which could be done* to avert the catastrophe. It would be a great mistake to suppose that conduct of this description is to be met with only among the uneducated poor. Even the middle and higher classes are as yet little educated on the subject of the human constitution; and although from greater general enlightenment, 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 counsellors and remedies.*

The system of concealment from the family physician, into which the adoption of "every body's" advice is so apt to lead, is itself an evil of the first mag-

* While the first edition of this work was in the press, a case occurred which I subjoin merely as an example of what is happening almost every day, and which shows the necessity for increased caution in the use of drugs. It is entitled "DEATH OF AN INFANT FROM NARCOTICS," and is as follows: "On Tuesday an inquest was held before Mr. Carter, on view of the body of Emma Piper, aged four months. From the evidence it appeared that the mother of the deceased has been for some time confined to her bed, and had a nurse to attend her. Some extract of poppies was given to the mother to procure sleep, and on the following morning the nurse gave the child a little peppermint in the same cup without having previously washed it out. Mr. Yeldam, surgeon, of Blackfriar's Road, promptly attended, but the little sufferer go-

nitude. By inducing him to ascribe effects to wrong causes, it necessarily tends to mislead his judgment, and may thus render him also 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, they will then be adapted by him to the necessities and peculiarities of the individual case, and the different parts of the treatment be carried on consistently and safely. If, on the contrary, they do not, the physician will have an opportunity of assigning a reason for his disapproval, and of pointing out the greater fitness of the means already employed; and if the parent shall not be satisfied with this explanation, but still insist on the suggestions 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 am aware that even the most experienced may occasionally derive advantage from a hint thus thrown out by a casual observer. Something may escape notice during the shortness of a professional visit which may be easily remarked at another time by a less skilful person, and which may render necessary some modifications of treatment not previously thought of. In like manner, useful practical suggestions may be

worse, and expired at nine the following morning. Verdict, 'That the deceased died from congestion of the brain produced by the accidental administration of extract of poppies and peppermint.' The coroner, at the request of the jury, severely reprimanded the nurse for her careless conduct."—*New Court Gazette*, 11*th April* 1840.

thrown out, by which any professional man may profit without reproach to his own skill. At times, the most obvious indications are unaccountably overlooked, and that, too, when the mind is most intent upon their observation, just as a person whose gaze is fixed upon a coming danger may, without any impeachment of his sense, overlook the stone at his foot which brings him unexpectedly to the ground. All, therefore, that I contend for is, that the physician in charge of the child should be consulted before any remedies unauthorized 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 give up the charge altogether, or to administer them in the only way which can be either beneficial to the patient or satisfactory to himself.

When a child becomes seriously indisposed, it should, when 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 child itself be benefited by the change. The natural excitability of the infant constitution being always kept in view, it is obvious that the sick-room ought never to be made the rendezvous of anxious friends or officious neighbours, and that nothing should be allowed in it which can disturb its quiet or impair the salubrity of the air. The close overheated atmosphere which some parents insist upon, from a morbid apprehension of cold, is productive of worse effects in febrile complaints than the very evil which they are afraid of. The same may be said of the closely-drawn curtains, and enervating quantities of bed-clothes occasionally heaped on the young sufferers.

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 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; and hence, as a general rule, a mild and moderate diet is required, even when the strength is much reduced. Stimulating or highly nutritive food, then, increases debility by aggravating the febrile action; but, looking to the debility alone, parents and nurses think they cannot give too strong or too much nourishment. This is the source of much mischief, and of the occasional inefficacy of the best devised and most appropriate treatment. But, having already alluded to this subject in a former chapter, I need not now touch upon it at greater length.

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. Where a child complains, therefore without some obvious and important cause to account for the disorder, the sooner advice is sent for the better. and even when such a cause is present, if the effect proves more serious or long-continued than usual, it will be more prudent to ask for assistance than to await the development of disease. In like manner, when any natural function continues for some time in a disturbed state—as when the bowels become constipated or too open, the breathing hurried or irregular, the surface too warm or too cold, or the sleep heavy or broken—attention should be timeously directed to the discovery and removal of the offending cause before the health has been allowed to suffer. 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 two points which, before concluding, I would earnestly impress upon mothers. The one is, to

send notice to the physician as early in the day as possible when the child is really ill, and not wait, as is so often done from a spirit of procrastination, till the darkness and solitude of night begin to work upon the mother's fears, and then send in great haste at some midnight hour, when the difficulty of procuring the requisite means of cure is greatly increased, and the whole household is thrown into commotion. Timeously warned, the physician could easily make his visit at a more seasonable hour, not only with more benefit to the patient, but at far less expense of time, trouble, and anxiety to all parties, than by waiting till night, when he has perhaps returned exhausted by the labours of the day, and is consequently more unfit for active usefulness. It is true that in this way he might occasionally be sent for when there was not much need for his services; but, as he would thus be enabled to make his visit without inconvenience, he would never grudge the few minutes it consumed; and very certainly mischief would, in many instances, be warded off, where help a few hours later would come too late to be of much use.

The other point which I would strictly enforce is, to prevent the medical attendant ever being rendered 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 as their steady friend. When he is viewed in this light, his presence sooths and tranquillizes 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. I shall never forget a remarkable example of this which I witnessed in the Hotel Dieu of Paris, many years ago, under the care of the celebrated Dupuytren.

The patient was a child of little more than two years old, who required to be operated upon for stone, from which it suffered at times considerable pain, Dupuytren's better feelings were all alive for its relief, and under their influence he acquired extraordinary power over the little creature. At the morning visit it was ever on the watch for him, and was never satisfied till it threw its arms round his neck and kissed him. Whatever pain he caused by his examination was submitted to without repining, and the cry to which it gave rise was almost instantly replaced by the smile of gratified affection. When the operation was decided upon, the child agreed to whatever "Papa" thought right; but became terrified on being brought into the room which was filled with students. Dupuytren, however, speedily restored its confidence, after which it was laid on the table. When the operation was about to begin it cried and asked for another kiss. During the operation it cried as children generally do, but the instant it was over, the poor child threw its arms round Dupuytren's neck and kissed him repeatedly, exclaiming, "*mon bon papa!*" in a tone of the purest love and affection. Contrast such a scene as this with that which occurs in a nursery on the approach of a practitioner who is most injudiciously held up by the nurse or mother as an object of terror to the child. I have often heard ignorant and thoughtless mothers make use of threats of what "the doctor would do" if the child would not take medicine or submit to some other disagreeable prescription, till the very sight of him was sufficient to neutralize the effects of the best devised treatment. Either "the doctor would bleed them," or "put a blister on them," or "take them away with him," or do something equally terrible to them. The result of such folly is, that, when the child is really ill, it is thrown into such agitation by the approach of the doctor, as to render it impossible for him to distinguish accurately how much of the disturbance is due to fright, and how much to disease;

and, at the same time, to raise up a powerful moral obstacle to present comfort and future recovery.

Occasionally, the same ready method of reducing the child to submission is resorted to by the attendants wholly unknown to the parents; and my chief object in now directing attention to it, is to put the latter fully 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. Neither by the parents nor by the attendants, ought the medical man ever to be spoken of, in the presence of the young, but with kindness and respect. If he is a person in whose character and skill the parents repose 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 in 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.

CHAPTER XV.

ON THE MORAL MANAGEMENT OF INFANCY.

The rudiments of the mind the same in infancy as in maturity.—Gradual development of the five senses—depending on that of the organization, and promoted by exercise.—The senses deserving of care and cultivation.—State of the powers of emotion and thought at birth—their gradual development resembles that of the senses—and is promoted in the same way.—Intellectual and moral powers independent of each other, though working in harmony.—Each to be exercised on its own objects.—The different faculties start instinctively into activity when stimulated by the presence of their objects—importance of this in infant education.—Rules deducible from it in moral training.—Infant schools—their abuses and uses.—Importance of society to children—effects of seclusion—example of influence of bad training.—Exercise to be in due proportion, and not in excess or deficiency.—Hints for the exercise of the infant faculties.—Value of spontaneous and self-regulated activity—rules and cautions.—Conclusion.

In the present chapter I propose to offer a few remarks on the mental constitution of infancy, and to

point out as briefly as possible the principles on which moral and intellectual training ought to be conducted during the first two years of life.

In early infancy the mental constitution presents the rudiments, as it were, of the same properties and powers which afterwards characterize the human being in maturer age. The external senses of seeing, hearing, taste, smell, and touch, and the several faculties of emotion, perception and thought, are all essentially the same, but some of them are developed much sooner and in a higher degree than others. At birth, indeed, the powers of sensation are the only ones 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, and the shrinking which it manifests on being roughly touched resembles very much the simple irritability of fibre by which the muscles contract when stimulated after death. The light may strike upon the eye, an atmospherical vibration upon the ear, or a smell upon the nostrils, and yet no clear impression be conveyed to the infant; unless the impulse be of sufficient intensity to excite pain, in which case it will shrink and give unequivocal indications of uneasiness. As yet there is only one of its actions which seems to have a determinate end,—that of turning the mouth in search of the breast, and of sucking when it is obtained. A week or two later, however, the eye begins to follow the light, and sudden sounds give rise to a start as if of surprise. But it is only by slow degrees, aud after the lapse of several weeks, that the senses become capable of receiving and conveying distinct impressions to the mind; and 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 as much unerring freedom and decision as if the external world had long been familiar to them.

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 matured and developed to a proportionate extent; whereas in man, and those animals whose senses are very imperfect at birth, the corresponding organs are still immature or incomplete in structure, and each individual sense, when duly exercised, acquires power and distinctness in exact proportion to the advance of its organ towards the state of maturity.

From this dependence of each of the senses upon the constitution and condition of its own object, there are two necessary results, 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 and capable of cultivation before the rest,—seeing before hearing, for instance, or 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, for example, we must admit light and visible objects to the eye, in a manner adapted to the nature and delicacy of the organ. And in the same way with the ear: If we either exclude sounds altogether, or subject the ear to the impulse of loud and sudden noises before its structure is matured, we may impair or destroy the sense of hearing; whereas, if we adapt the exercise of the organ to its structural delicacy, we promote its development and increase the acuteness of hearing far beyond what is commonly met with in civilized life. The same principle applies to the senses of smell, taste and touch; and hence, by well-regulated systematic exercise, the senses of hearing, seeing, and smelling, acquire

an intensity of action among some savage tribes, which would seem incredible if the facts were not authenticated beyond the possibility of cavil.

In the production of this extraordinary acuteness, the grand secret is, simply, that each sense and its organ are exercised 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 upon whether we will or not. When light reflected from any body strikes upon the eye, vision takes place equally independently of the will. And when the air is impregnated with strong perfumes, smell takes cognizance of of their presence and qualities without any intermediate volition. But when all these natural sources of excitement are shut out from the senses, the respective organs languish and become feeble from want of exercise, and differences are passed over unnoticed, which, in a more cultivated state of the sense, would be instantly and accurately recognized. The infant, indeed, 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 every thing within its reach; and if it does not seek the exercise and gratification of smell in the same way, it is only because the nose or organ of smell is still small and comparatively unfit for its functions. So wholly, however, do many parents 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 own voice, or lays hold of any object to examine and admire 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

Even among thinking and educated men, the external senses are treated with very little ceremony. Valuable as they are, as inlets to the storehouse of the mind, no regard whatever 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 compunction as if its nerves, lens, and membranes were not most delicate living structures, but instruments fashioned by the hand of the optician, which no abuse can injure. The ear is, in like manner, exposed to loud and sudden sounds, which, in extreme cases, go far to destroy the function of the nerve, and induce deafness for life; while in no instance are any pains bestowed in training the sense to finer and finer perception, by well graduated exercise, according to the condition and development of its organs. Blindness and deafness are sometimes thus produced at the very dawn of existence, when a little knowledge and prudence would not only have effectually preserved the sight and hearing, but have improved them in a remarkable degree.

The extent to which acuteness of perception may be brought about by judicious training of the senses from infancy upwards, may be judged of from the specimens which abound in savage life, and among some classes in civilized society. The savage, taught by early practice, can distinguish the tread, and track the route, of an enemy or an animal, when no sound whatever is perceived by the European, and no visible trace is revealed to his eye. The shepherd, in like manner, can distinguish the individual sheep of a numerous flock, which, to an unpractised observer, seem to be merely fac-similes of each other.

As the senses are bestowed upon us for use, and without them man would be shut out from every source of active and social enjoyment, it is surely worth our while to devote some attention to their improvement and preservation in infancy, when their organs are still so sus

ceptible of external impressions. The very prevalence of short-sightedness among the young is a proof that our present management of vision, for instance, is very defective; and there is great reason to believe that the constant confinement of the young within doors at school and at home has no small influence in producing this result. The eye, like every other organ, adapts itself as far as possible to the circumstances in which it is placed; and, accordingly, while that of the seaman or wandering Indian is accustomed to scan distant as well as near objects, and thereby 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, acts only upon objects at hand, and becomes unfit for the perception of those more distant—becomes, in other words, *short*-sighted. It is true that natural constitution has a large share in the result; but it is not less true that constant exercise upon a circumscribed horizon tends greatly to aggravate the defect.

As the object of the present chapter is to unfold merely the principles of infant training or education, I cannot enlarge more upon this branch of the subject, and shall only add, in relation to it, the remark, that, to derive benefit from the exercise of any sense, the strength and continuation of the stimulus must be duly proportioned to the health, maturity, and condition of the organ upon which it acts. If this be neglected, the sense will run the risk of being impaired or destroyed, at one time by the exercise or stimulus being carried to excess, and at another by its being unduly withheld.

Coming now to the *internal faculties of the mind*, as they are sometimes called—namely, the powers of emotion, observation, and thought, we shall find the very same principle to apply with scrupulous accuracy, and to afford us a valuable guide in the training of the infant mind. At birth, the brain, which, during life, is not less essential to the action of the internal faculties than the eye, ear, nose, &c., are to the external senses,

is so imperfectly and delicately constituted as to be almost wholly unfit for active mental manifestation; and, accordingly, we meet with none except sensation of bodily pain, and the desire for food. Beyond these, scarcely any trace of activity of mind can be detected; and hence sleep, or the negation of mental action, occupies nearly the whole time. The structure of the brain, however, being then extremely delicate, is very easily disordered, and susceptible of permanent injury, which, as in the similar instances of the eye and the ear, may impair the efficiency of its functions to the end of life; or in other words, induce permament idiocy or imbecility.

Such is the state of the mind and brain for some time after birth. By degrees, however, traces of extended mental activity 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 a late 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 action of the same feeling in the mind of another, is already at work. A smiling air, a caressing accent, raises a smile on his lips; pleasing emotions already animate this little being, and we who recognise 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 un-

known, 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 philosophy of infancy, and to the right training of the infant mind. The internal emotions, like the external senses, are distinct from each other, and independent in their action. Present its appropriate object to one whose organ is already sufficiently developed, and it will start into activity, just as the eye does when the rays of light are directed upon the retina. Look at an infant six months old, for example, and observe the extent to which it responds to every variety of stimulus addressed to its feelings. If we wish to sooth it in a moment of fretful disappointment, is it not a matter of notoriety that we 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, inadvertently, an acrimonious dialogue ensues between the nurse and any other person in the presence of an infant, is it not a common occurrence for the child to become as uneasy as if the scold was directed to itself, and forthwith begin to cry? If, on the other hand, an affectionate and gentle-tempered 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 instantly 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, ill-tempered, coarse-looking person, happens suddenly to approach an infant, are not the instantaneous results an

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

exclamation of terror, and a clinging to the mother's bosom for protection?

The bearing and importance of these truths would be at once perceived were parents acquainted with the structure and laws of the animal economy, and with the fact that the mind acts through the medium of bodily organs, to the influence of which it is subjected during the whole course of life. The mind can see, for example, only through the medium 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, the mind no longer sees distinctly. It can hear only through the medium of the ear; and when that organ is hurt, either by the impulse of too violent sounds, or by want of exercise, the mind loses the power of hearing and discriminating sounds. When the eyes and ears, on the contrary, are duly and regularly exercised in the degree and with the attention which their delicacy requires, both senses become acute and vigorous, and are ever ready at a call; because their organs, strengthened by exercise, become fully developed, and disposed to respond to their respective stimuli.

The internal feelings and intellectual powers are in precisely the same situation as regards the influence of the bodily organization,—are each independent in their action, and must be exercised according to the same rules. If we wish to call out and give healthy development to the kindly and affectionate feeling in an infant, we must treat it, and every other person in its presence, with habitual kindliness and affection, because these are the natural stimulants to such feelings and their organs, precisely as light is to the eye or sound to the ear. Consequently, when we present the stimulus of grief, caprice, discontent, or bad temper, to an infant, we call up in its mind not kindliness or affection, but the corresponding disagreeable feelings; and by the habitual exercise of the portions of the brain with which these

are connected, we strengthen their development, and thus run the risk of giving them permanence for life.

We have already seen, that, in training the external senses, each must be exercised upon the objects appropriate to the constitution imparted to it by the Author of our being. We cannot improve vision by reasoning, or by learning abstract rules of conduct. We cannot educate the ear to the nice discrimination of sounds by mere scholastic precepts or by logical theories. We have no choice in the matter. We must either respect the dictates of Infinite Wisdom, and employ the eye in actual seeing, and the ear in actual listening, or we must remain contented with the possession of imperfect senses. God 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.

Thanks to the invaluable discovery of Gall, we are now in a position to explain why the past efforts of mankind in the education of the higher portions of human nature—of *the intellectual and moral powers*—have been comparatively unsuccessful; and we are in possession of principles, by the judicious application of which a great and steady advance may speedily be made, and by means of which a great improvement has already been effected. By demonstrating that the various propensities, and powers of emotion, observation, and thought, are independent and distinct in their nature; that they act each through the medium of an appropriate portion of the brain, commonly called its "organ;" that each mental faculty is, by its natural constitution, related to a different class of objects, and is prone to start into activity when these objects are presented; and, lastly, that we can no more cultivate the emotion of justice or of pity than we can the sense of hearing or seeing, by a mere intellectual exposition of its propriety; phrenology has thrown upon the science

of education a flood of light which will not be duly appreciated for years to come, but for which posterity will assuredly be grateful when the benefits resulting from it shall be widely felt. To enter upon the consideration of all the applications which may be made of phrenology to the improvement of infant training and general education, would lead me far beyond the limits assigned to the present work. But I should be insensible of what I myself owe to its assistance were I not to express in the strongest terms my obligations to its guidance, and to affirm, that, in the hands of a rational and well-educated parent, it is calculated to remove many a discouraging difficulty, and to implant in the mind a profound, pervading, and unshaken, because enlightened, reliance on the goodness, stability, and wisdom of the Divine arrangements, as the safest, clearest, and best which can be followed in the education of the young, as on all other occasions in which man is to be either influenced or improved.

The grand principle, then, to be borne in mind, in the moral and intellectual treatment of even the earliest period of infancy, is, that the objects which are specially related to each individual faculty form the natural stimulants of that faculty. Danger is thus the object or natural stimulant of the feeling of fear, and suffering that of the feeling of compassion, just as sound is of the ear, or light of the eye. The child has no choice of the matter. If the natural stimulant of any feeling be presented, that feeling will start into activity precisely as vision does when the eye is penetrated by rays of light. We cannot by an effort of the will cease to see or hear so long as light and sound reach the eye and ear; and neither can we prevent the internal feeling from arising when its object is present.

It is a law of the internal faculties, as well as of the external senses, that, when they are repeatedly, appropriately, and attentively exercised upon their own objects, they gain both in strength, in durability, and in

readiness of action. We have seen that, by exercise of this description, the Indian becomes expert in following tracks and distinguishing sounds which the unpractised European cannot detect. By the application of the same principle to the emotions of the mind and to muscular efforts, the Indian becomes trained to the display of firmness in enduring pain, to the prosecution of revenge, and to dexterity in the use of the bow; and it only requires to be carried farther and more consistently into practice by civilized man to yield equally marked results in his moral and intellectual advancement. But to succeed in this to the utmost possible extent, it is clear that we must first know the nature of the different internal faculties, and the object or qualities to which they are respectively related, that we may call each into activity by the stimulus of its own objects with the same precision as is done in the case of the external senses. Here it is, however, that our knowledge is most deficient, and that the chief difficulties cross our path. But here also phrenology comes efficiently to our assistance, and affords a much nearer approximation to the truth than any preceding philosophy of mind. Faulty and imperfect in many respects as it still necessarily is, it has laid a solid and lasting foundation for a true theory of mind, and has already ascertained the existence and scope of a considerable number of primitive faculties, and in so far facilitated and given greater certainty to the educational training of the parent and teacher.

From the principle already laid down, that each faculty is constituted with a distinct relation to objects or qualities as peculiar to itself as light is to the eye or sound to the ear, it follows that, when we wish to exercise or strengthen any of them, we must directly excite them to activity by the presentment of, and directing attention to, their own stimulus; and, when we wish to keep in abeyance a faculty which is already too strong, the only effectual way is to withdraw its objects and

leave it in repose—in short, "*to lead it not into temptation.*" Except for the ready response of the faculty to the stimulus of its objects, temptation would be a word devoid of meaning.

From this proneness of the mental faculty to respond readily to its natural stimulus, it obviously becomes a matter of great importance to the future character of the individual to regulate the circumstances in which he is placed, or the circumstances by which he is surrounded, especially during the very impressionable period of infancy; for, with the fact before us that every feeling or faculty is in this way strengthened by reiterated exercise, it is natural to suppose that many a child owes much of its perverse temper, or cheerful disposition, to the continued influence of similar dispositions exhibited by the nurse or mother during the early period of its existence.

After the preceding pages were printed, I became acquainted with an occurrence which so strikingly illustrates and confirms the accuracy of the principle insisted upon, that I cannot refrain from inserting it. A respectable-looking woman made some purchases in a shop in town, in payment of which she presented a five-pound note. The clerk, on examining it, refused it as a forgery. The poor woman took it back with some surprise, and offered another of the same value in its place. It also proved to be forged, some suspicion was excited, and the woman was handed over, in a state of great agitation, to the police. Having failed to account satisfactorily for having the notes in her possession, an inquiry was instituted, by which it was ascertained that she had been for several years in the service of a gentleman in the country, where she bore a high character for integrity and good conduct. About a year before, she first saw the two notes lying unconcealed among some old papers in her master's room, where they continued undisturbed for month after month, as if forgotten by him. For a long time, she never thought of touching them; but at length the desire to appropriate

them arose in her mind, as she believed they would never be missed. After resisting the impulse for months, the desire increased so much by the daily stimulus of the object which excited it, that she at last yielded, and subjected herself, for the first time in her life, to the degrading consciousness of guilt. Afraid of detection, she made no use of the notes for some time, but reserved them for the purchase above referred to, and with what result we have already seen. The gentleman had known the notes to be forgeries, and allowed them to remain undestroyed.

Considering the manner in which this poor woman was "led into temptation," and her desire of appropriation strongly excited and *educated* by the daily stimulus of its appropriate object; and considering also the fearful moral evil brought upon her in the permanent degradation of character of which she must have been conscious even when undetected; it is impossible not to acknowledge that she was an object more deserving of pity than of punishment; and that greater blame was due to the person who so carelessly exposed a fellow-creature to such a snare, than to her who fell into it after so long a period of resistance. Had the gentleman been fully aware of the real force of a direct stimulant thus incessantly addressed to any feeling of the mind, he would have felt that his own negligence was not less culpable than its results were unfortunate.

It is astonishing, indeed, from what an early age a faculty will respond to its stimulus, whether that stimulus be direct or only from sympathy. Madame Necker de Saussure gives an affecting example of this fact, which she witnessed in a child of nine months old. "The child was gaily playing on its mother's knees, when a woman, whose phisiognomy expressed deep but calm sadness, entered the room. From that moment, the child's attention was wholly fixed on the person, whom it knew, but for whom it had no particular affection By degrees its features became discomposed

its playthings dropt 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. (Vol. i. p. 179.) Facts like these show how careful we should be in duly regulating the moral as well as physical influences by which infancy is surrounded.

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 while admitting that the quality of the milk may exert an influence, I am disposed to believe that the effect upon the child is caused more especially by the natural action of the evil passions stirring up, and, in a manner, educating the corresponding passions in the child. Many sensible people imagine that they may say or do any thing in the presence of an infant, because it is too young to observe or be affected by it. This, however, is a great mistake. It is true that an infant may be unable to form an intellectual opinion on any occurrence; but it is not less true that, from a very early period, as shewn by 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.

It is a common and pernicious error in modern education, to imagine that the passions and moral emotions implanted in the human mind are the results of intellectual cultivation, and that intellectual discipline will suffice to regulate them. Under this mistaken notion, 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. I have known a father, under this false impression, lecture, and threaten and punish his child and take every way to

correct it but the right one, and all in vain. Fortunately for mankind, however, morality and religion have a much more solid foundation than as mere deductions from an erring intellect. They are based on feelings implanted in the very nature of man, and which mere intellectual cultivation or neglect can neither generate nor destroy; and their real strength and authority will not be fully recognised till they are cherished and developed in strict accordance with their natural constitution. Like the external senses, they must be habitually exercised upon their appropriate objects—in worshipping the true God, and in doing justice and loving mercy—before they can attain their proper influence over the character, and their true authority in regulating human conduct. From almost the first hour of existence, this principle should be systematically acted upon, and the utmost care be therefore taken to secure at all times, a healthy moral atmosphere for the young. To do perfect justice to the infant, there is required, on the part of the mother, a combination of cheerful activity, 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 approximation to what is required than if we rest satisfied in indifference with whatever occurs. It is lamentable to reflect how numerous are those mothers, who, from indolence or other causes, leave the entire control of their offspring to an unqualified attendant, and even themselves give way to expressions of anger or caprice, which cannot fail to act injuriously upon the infant mind.

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, upright, and true we must habitually exhibit the same qualities as regulating principles in our conduct, because these qualities act as so many stimulants to the respective faculties in

the child. 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 develope moral purity and simplicity of character in them. It is in vain to argue that, because the infant intellect is feeble, it cannot detect the inconsistency which we practise. The feelings and reasoning faculties, being perfectly distinct from each other, may, and sometimes do, act independently, and the feelings at once condemn, although the judgment may be unable to assign a reason for doing so. Here is another of the many admirable proofs which we meet with in the animal economy, of the harmony and beauty which pervade all the works of God, and which render it impossible to pursue a right course without also doing collateral good, or to pursue a wrong course without producing collateral evil. If the mother, for example, controls her own temper for the sake of her child, and endeavours systematically to seek the guidance of her higher and purer feelings in her general conduct, the good which results is not limited to the consequent improvement of the child. She herself becomes healthier and happier, and every day adds to the pleasures of success. If the mother, on the other hand, gives 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 the mother secures, in the one case, the love and regard of all who come into communication with her, she rouses, in the other, only their fear or dislike.

The remarkable influence of the mother in modifying the dispositions and forming the character of the child has long been observed; but it has attracted attention chiefly in the instances of intellectual superiority. We have already seen that men of genius are generally descended from, and brought up by, mothers distinguish-

ed for high mental endowments. In these cases, the original organization and mental constitution inherited from the parent are no doubt chiefly influential in the production of the genius. But many facts concur to show that the fostering care of the mother in promoting the development of the understanding also contributes powerfully to the future excellence of the child; and there is reason to believe that the predominance of the mother's influence upon the constitution of the offspring, in such cases, is partly to be ascribed to the care of the child devolving much more exclusively upon her than upon the father during this the earliest and most impressionable period of its existence. It is, therefore, a sad mistake to imagine, that it is a matter of little consequence whether the person, to whose guidance the infant is intrusted, be an active-minded and amiable woman, or one whose good nature is the passive produce 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 see that at no period of life is it more important than during helpless infancy that her child should be surrounded by persons of intelligence, refinement, and the purest morality; and that it is a gross dereliction of duty to devolve her trust entirely upon others. The mother is, and ought to be, the natural guardian of her infant's happiness; and if *she* prove neglectful, is it to be expected that any substitute, however well qualified, will be able fully to supply her place?

In thus giving a decided preference to the mother's influence, 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 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 deficiences with which many of them are

chargeable are almost inseparable from their position in society, and their very imperfect education; and if, in their ignorance of the laws of the human constitution, they sometimes do positive mischief when their aim is good, this is no more than happens almost as frequently with the mothers in whose service they are placed. In pointing out errors, therefore, my object is simply to secure and advance the welfare of the child, and not at all to throw blame upon the nurse for defects from which it is morally impossible for her to be free.

But it is not merely the direct behaviour of the mother or attendants to the child itself, which it is important should be under the habitual influence of our best feelings. It is equally essential that the same right feeling should predominate in the behaviour of the attendants to each other. 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 affections, and are the direct stimulants to its fears, without any perception on its part to whom the scold is meant to apply. In the same way an unkind or unjust act done to another will instinctively disturb the harmony of its mind, just because every feeling responds to its object, as the eye does to the rays of light, without any previous inquiry being requisite in what the moral wrong consists, or by what cause the light is produced.

Infant schools have been strongly objected to, because two years of age is considered too early a period at which to commence the business of education. In reality, however, practical education and moral training begin from the first dawn of consciousness, and the true question comes to be, whether the child will derive most advantage from the education of chance, or from a treatment adapted to its natural constitution. Nobody has condemned more strongly than I have, the establishment, under the name of infant-schools, of places of confinement, and intellectual and theological cramming; and nobody has a clearer

perception of the evils they inflict upon the young. But such establishments are mere perversions and abuses of a thing really good in itself: a fitter instrument for the physical and moral improvement of infancy can scarcely be imagined, than an institution in which the young are brought together, and their affections and nobler feelings called into habitual and pleasing exercise in the regulation of their conduct towards each other in their sports and plays; while their physical energies are, at the same time, developed and promoted by inspiriting and social exercise. In a well-conducted infant-school, intellectual tasks and close confinement are entirely discarded; while the senses and the observing powers are pleasingly employed in the gratification of the strong curiosity natural to that period of life. Objects, or images of objects, are placed before the child, and its attention is directed to the observation of their colour, form, properties, and uses, exactly on the principle, so strongly insisted upon, of presenting every faculty with its direct stimulus when we wish to excite it to activity. But in thus cultivating the intellectual powers in infancy, we must be on our guard against always receiving the accurate and ready repetition of a sound as a proof that the object or idea represented by it is understood by the child. From neglect of this caution, a great mistake is often committed in infant as well as common schools, and especially in those in which the children are taught in groups. The quick imitative faculty of a child may seize in a moment the sound made by its teacher or companions, and yet its mind be wandering upon the mountains of vanity during all the time of its repetition. I have again and again seen this truth exemplified in infant schools, where the appropriate word was uttered in a sing-song tone at the appropriate 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, possessed the slightest conception of the idea the words were intended to convey. Hence the moment children so taught are examined out of the regular order of routine, their readiness and self-possession forsake them, and their stock of ideas is found to be on a far smaller scale than the sample would lead us to expect. This, however, is no proof of the system of infant training being a bad one. It only goes to show that it is far from being always carried efficiently into practice, and that *teachers must themselves be trained for teaching* before their services can be productive of every possible advantage to the pupil. It shows also the necessity of attending more to the state of mind of each individual child than is done at present —a condition which in its turn implies an increase of the number of teachers.

But the chief value of infant schools and of the society of other children is, in my opinion, to be found in the advantages which they afford for the development and regulation not so much of the intellectual as of the moral powers and affections; and, in this point of view, I rate them very highly. The affections and moral emotions have all direct reference to other human beings, and, in solitude, can find no objects of excitement or gratification. 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*. In infancy, as in maturity, this fact is of much importance. To develope the powers which God has given us, and turn them to purposes conducive to our happiness, we must associate with our fellows, and, in our intercourse with them, actively exercise the sentiments of justice, kindness, forbearance, and mutual regard, in the practical regulation of our conduct. In solitude, on the other hand, the various faculties have self alone for their object, and the beings on whom we should pour out kindness, love, and affection, and towards whom we should practise patient forbearance and justice, be-

ing absent, selfishness is unavoidably cherished and increased, while the higher and more disinterested powers, in the exercise of which true happiness consists, are, from the absence of their objects, deprived of their legitimate gratification and strength.

It is, then, important for the due cultivation and development of the moral and social affections, and of the general character, that the child should, from an early period, enjoy the companionship of other children. Grown persons can never display the entire youthfulness of spirit required to qualify them for becoming the sole companions of children.

We are so much accustomed to associate the idea of education with scholastic discipline, that many parents have a difficulty in understanding that education commences in reality almost with the life of the child. Whatever acts upon its senses, interests its feelings, or attracts its observation, necessarily modifies its mental state, or, in other words, becomes a means of education. Hence, 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 in which they are conducted, and the very toys with which the child amuses itself, exert an influence over its constitution, and, under the direction of an enlightened mother, become a means of education for its feelings and its intellect. "In caressing a dog or a cat in the presence of a child," says the acute observer already quoted, "we develope 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 that admiration which is one of the most exalted movements of the soul; by placing imitations or pictures before him, we awaken his imagination; and 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 about it. It is thus that he forms and exercises 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."*

Obvious as the principle of strengthening the faculties by their direct exercise seems to be when broadly stated, and beautifully as it is illustrated in the above quotation, it is surprising how wholly its importance is overlooked in practice. I have seen parents, for example, deliberately encourage the pigmy passion of an infant against some unhappy animal or plaything, because it diverted them to contrast the violence of his rage with the impotence of his efforts to give effect to it; and never entertain even a suspicion that, in so doing, they were as assiduously cultivating his worst passions as if such had been their only object. I recollect one notable instance of this kind, in which a child about a year old was placed on the table after dinner, and purposely provoked by some slight insult, that the persons present might be entertained by the exhibition of its fury and the stamping of its feet; and I learned, strange to say, that this was a favourite pastime with both its parents, neither of whom had the remotest suspicion of the probable consequences of such a disgraceful education upon the future peace and character of the child.

In like manner, how often is the child trained to the systematic practice of lying and deceit by the habitual example of the very parent who, perhaps, does not hesitate occasionally to punish it severely for profiting by the lesson. Of this, I saw very lately a revolting example. The child, from fear of punishment for some trifling fault, equivocated and denied its guilt. The fact, however, was certain, and the mother punished

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

the child *for the untruth*, affirming that it would not have been punished had it not told a lie. The striking part of the proceeding was, that in the presence of the same child a few minutes before, the mother had herself told a deliberate falsehood regarding an event which also happened in the child's presence, and which it perfectly understood!

From these remarks, the reader will be apt to infer that the first step towards improving the moral training of the young, is to improve the education and enlarge the knowledge of those to whose care they are intrusted. This inference is perfectly just, and it constitutes the chief reason for the length to which I have carried this little work. Even when writing these pages, I was accidentally a witness to a striking instance of the evils of ignorance and misdirected zeal. On the street a little before me, two well-dressed little boys were walking hand-in-hand under the care of a young woman, whom they were closely following. In turning a corner, the foot of one of them slipped into a hole in the pavement, which caused him to fall and drag over his brother above him. Neither of them was hurt; but the one who fell first looked anxiously at his brother as he rose, and smiled when he saw him safe and rather amused than injured. The young woman, in the mean time, turned round and saw what had happened. Instead of being pleased with their mutual good feeling and satisfaction, she saw only that their clothes were partially covered with dust, and in her anger first shook both of them roughly by the shoulders, and then deliberately struck the one several blows on the chest for having fallen and pulled the other down! The expression on both their countenances instantly changed. The smile of good humoured affection and amusement at their tumble gave way to a look of sullen and dejected disappointment and surprise, and they resumed their walk more like condemned felons going to prison under the charge of an unfeeling jailer, than of open-

hearted innocent beings, breathing an atmosphere of love and affection, and rejoicing in the spring-day of existence. The young woman herself presented nothing unusually harsh in her appearance, or indicative of want of intelligence, and I truly believe would have been grieved could she have formed a conception of the moral tumult of outraged justice, affection, and love of esteem, which she had raised in the minds of her charge. In her ignorance, she never imagined that the harshness and resentment which she displayed were direct stimulants to the lower passions of the children. Her object was evidently to prevent the repetition of such an accident from carelessness; but how differently would she have endeavoured to accomplish her end had she known any thing of the mental constitution of the young, or been herself subjected to right and moral training!

Another important principle which requires to be borne in mind 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 inactivity.* This caution is the more necessary, because the error is one very frequently committed; and I have no hesitation in saying, that if the moral faculties were as assiduously called into exercise in infancy as the feelings of vanity self-esteem, cautiousness, cunning, imitation, and the love of novelty, there would be a much more rapid advance in the morality of mankind than we are likely to witness for some time to come. 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 conduct of those around them, these feelings would become daily more influential with them, and at last gain paramount authority over their actions in all ordinary circumstances. Of this truth, the works of Wilderspin, Stow, Barwell, and others, on infant education and training

afford numerous instructive examples; and I regret that my limits preclude me from doing more than referring to the pages of these writers. To the parent, their perusal and study will prove highly instructive; and 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 in reality 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 its necessity, and the means of conducting it, in a clearer and more practical light than they were ever placed before.*

It is of much importance to begin the moral training of the young by the appropriate exercise of the different feelings and emotions from their earliest dawn; and not to allow any of the propensities to gain an undue ascendancy by habitual indulgence, while the moral feelings which should regulate it become weakened from inactivity. We know well from experience how susceptible the infant is of both physical and mental impressions; and we ought consequently, to be only the more careful about the nature of those made upon its moral faculties. We have seen how certainly the eye or ear may be cultivated, by reiterated exercise, to the nicest, quickest, and most accurate perception; or enfeebled and blunted by inaction. Precisely the same principle applies to the feelings, affections, and intellectual powers, all of which are subjected to the same rule, and may be modified in strength, rapidity, and precision of action, by habitual use or disuse.

The very restlessness and impatience of the infant,

* Wilderspin on Infant Education, 3d edit.—The Training System adopted in the Model Schools of the Glasgow Educational Society, &c., by David Stow, Esq. Glasgow: M'Phun. 1836.---Supplement to Moral training and the Training System, by David Stow, Esq. Glasgow 1840.---Simpson on National Education, 2d edit. Edin. 1836, Mrs. Barwell on Nursery Government, London 1837. Barwell on the duties of Nurserymaids, 1839. Barwell on Infant Treatment in Chamber's Educational course 1841

when we attempt to fix it for a length of time to one train of feeling or perception, are themselves proofs of the necessity of varied action and employment, to give due scope and exercise to its numerous powers and feelings. 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 some variety or other of mental emotion. At one moment it is the smile of affectionate recognition on the entrance of its mother; at another, it is the playful enjoyment of muscular motion in its limbs; at a third, it is the delighted wonder of gratified curiosity, arising from the handling or tasting of some new object; at a fourth, it is peevish dissatisfaction at being thwarted in some wish; at a fifth, it is gratified affection, roused by the unexpected appearance of a little brother or sister; or lastly, it may be the fear of some unprepossessing stranger, from whose approach it shrinks in alarm. True, it cannot express its feelings in words, and thus prove the rapidity of their succession to the uninterested or unobservant bystander; but to the intelligent mother every emotion is as perceptible as if uttered in the plainest language. And if it be granted that such really is the variety of active feelings in the infant mind, can any one, after a moment's consideration, 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 either mother or child? It ought, therefore, never to be forgotten, that the due exercise of the moral and other feelings upon their appropriate objects is as indispensable to their development and strength as exercise of the intellectual powers is to intellectual proficiency; and no opportunity, in the ordinary course and circumstances of social life, should be lost of turning this principle to account in the formation of infant character.

In exercising the different powers of the mind, we re-

quire to attend to the degree in which they are respectively developed at the different stages of infancy, and to adapt our 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 sometimes appear in succession. The same thing holds with the internal faculties. They also are developed in succession, and arrive at maturity at different ages. This fact, however, is too much overlooked in practical education, and it may therefore be necessary to enforce attention to it by a few illustrations.

In the case of the external senses, the power of perception 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 respective organs are already fully developed. Others remain blind for several days, and acquire the power of distinguishing objects only by slow degrees. In man, also, the like phenomena are observed. The infant feels before he sees or hears, and both sees and hears before he shows any power of discriminating smells. These results are always in perfect 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 organized while the nose remains flat and small, and the nostrils limited in extent.

From this relation between the senses and the organs of which they are the functions, it follows that the power of the sense increases in proportion as the organization advances. In accordance with this, we observe that the infant at first merely shrinks from whatever gives pain. By degrees, its eyes begin to follow the light; by-and-by, they are attracted by bright and shining objects; afterwards, by those which are strongly coloured, and lastly, the infant ends by perceiving the existence, size, and form of objects, from the slighter shades of colour and of light. The sense of hearing

goes through nearly similar stages. At first, the infant is merely startled by a sudden noise. By degrees, it seems to listen, but without observing the source or direction of the sound; by-and-by its attention is more distinctly arrested by the qualities of sounds, and it takes pleasure in their sweetness and harmony, and also in making a noise around it.

The cause of this remarkable progression, then, is not merely an increase of attention on the part of the child, but a positive advance in the state of the organization. Without this advance, the child would remain as incapable of distinguishing colours at three years of age as at three weeks. But, on the other hand, if light were to be shut out from the eyes, and the senses were never to be exercised, the development of their organs would be greatly retarded, and their vigour considerably impaired. Hence, both conditions must be taken into account in our educational proceedings, and the exercise of the sense always bear a relation to the condition of its organ.

On observing the operation of the *internal faculties* of the mind, we find that, like the external senses, they also are developed in succession, and that some of them arrive at maturity sooner than others. The child observes long before it reasons and compares. It feels and appreciates affection and kindness before it experiences the sense of justice, the love of praise, or the desire of gain; and it is not till puberty that the sexual feeling begins to be felt. From a very early period, however, 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 habits as it may be made one of good.

Pleasure always accompanies the legitimate exercise of a faculty, and hence 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 direct opposition to this principle, and seek to amuse the infant at one time by tickling its external senses, at another by dandling, and at a third by some vivid appeal to its wonder. Generally speaking, parents are not sufficiently alive to the value of *self-action* and *self regulation* as the grand desiderata in the formation of infant character. They are either too officious and anxious, or too careless. They do too much or too little, and cannot make up their minds to leave nature to do any thing. "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 new-born child. 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 visiter. It ought always to be welcomed, and sometimes gently invited; but once present, it ought not to be stimulated to excess. Immoderate, it is followed by tears, and shakes the delicate fibres which soon oscillate in the opposite direction." (Vol. i. p. 166.)

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, in many instances, it lays the foundation of that nervous susceptibility which forms a prominent feature of the constitution for the remainder of life, and ultimately becomes the source of great suffering of both mind and body. Morally, also, it inflicts an injury, by the real, though unintentional, cultivation of the selfish feelings of our nature. 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 vigorous and exacting; and, in proportion as the infant feels its power, it shows the tendency to abuse it, and becomes a tyrant in its own petty sphere. The parent 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, keeping in mind the principle that every faculty is strengthened by exercise on its own objects, what other result could reasonably be hoped for? The conduct pursued towards the child, of yielding every thing to its wishes, is the direct stimulant to its self-esteem and love of power, much more than to its affections; and, consequently, the selfishness of pampered pride, and not the beaming of affection, is eminently the characteristic of spoiled children.

When, again, in our whole intercourse with children, we occupy ourselves exclusively with their feelings and doings, and dress and appearance, and make little or no effort to draw their attention outwards upon other beings or objects beyond themselves, what can we expect but that they should become the constant subjects of their own thoughts? We educate them to selfishness, and we are disappointed at the success of our own efforts! By nature, however, a child is by no means so exacting and selfish. It feels its dependence from an early hour, and, rightly treated, it will repay kindness with kindness and gratitude combined. But where the good feelings of an infant are not called into play by genuine maternal benignity, and its will is yielded to simply as the means of obviating discontent, the amiable emotions necessarily languish from want of exercise. Here, then, we have the selfish feelings *actively* strengthened, and the higher feelings *indirectly* weakened;—and what can

be the result of such treatment but general deterioration of the infant's dispositions and that perversity of character of which we hear the parents who produce it, so pathetically complain?

Contrasting such management with that of an infant treated from the first with the same kind intentions but directed by greater intelligence and higher moral principle, how different do we find the result! Let the parent exercise a salutary control over the manifestation of the purely selfish desires, and steadily oppose what she feels to be wrong, while, at the same time, every means of legitimate gratification are kindly, cheerfully, and ungrudgingly bestowed; and the infant will display in return, not only an 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.

To enter fully into the subject of the moral and intellectual management of infancy would require an extent of detail sufficient of itself to fill a volume, and upon which I cannot here venture. All that is in my power is to direct attention to principles by which those may profit who are engaged in this most interesting and important occupation. If the principles be kept in view, the intelligent parent, who knows something of the constitution of the human mind, will experience many facilities in soliciting and directing the activity of the different faculties in their natural channel, and, by repeated observation, will soon discover the appropriate stimulus to each.

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 the preceding two, and because this volume has already extended to a much greater length than I contemplated. 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 regulatiou 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 fulfilling the conditions under which any organ or function is intended to act, we may modify or improve its action; but we cannot alter the nature of the function itself. We may modify, in short, but we can neither change nor create. Acting on this principle, we may, by appropriate treatment, partially subdue the leopard's ferocity, but we can no more extinguish its passions and substitute others than we can change the spots on its skin. In education, accordingly, it is indispensable to success 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 the laws of its constitution, so that these laws may themselves become the instruments, as it were, of attaining the result.

In ordinary life, however, this principle is, chiefly from ignorance of the human constitution, wholly overlooked, and we hear even sensible men talking habitually as if they could implant or eradicate any quality of mind at pleasure, and at the same time adopting in practice the most heterogeneous methods to accomplish their purpose. But to make this clear to the reader, let us take an illustration from the education of sight.

The sense of sight acts under a definite constitution devised for its regulation by the Creator. It is one law or portion of that constitution that a certain quantity of light is indispensable to healthy vision; it is another, that the eye shall be frequently or habitually employed in the exercise of vision. If the eye be frequently overstimulated by exposure to a bright glare, or too long intent on minute objects, vision will suffer, because the organ will become diseased. If the eye be precluded from action for a great length of time by the absence of light, or not duly exercised in observing, vision will become impaired, because the eye will be weakened But if

the eye be duly and regularly exercised, and the light be neither too strong nor too feeble, nor the exercise too long continued, vision will become acute and strong; because then the health of the eye will be provided for to the utmost extent by the fulfilment of its laws of action. Whereas, if, from wholly disregarding the laws of the organization and of vision, we neglect to regulate our training by their dictates, and confine ourselves to *pointing out to the intellect* the advantages of quick vision, it is obvious that disappointment will be the appropriate reward of our folly and conceit. We may strengthen the reasoning powers by such means, but we shall do nothing to improve the faculty of sight.

Precisely the same rule applies to the propensities and moral and intellectual faculties. Each and all of them are implanted in us by the Creator, with a definite constitution and definite functions; 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 a definite relation to each other, and governed by laws emanating from a Wisdom and Beneficence which it is impossible for him fully to scan, but which it is for him 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 his limits, and attempt to fashion man by laws and fancies of his own, he will not less assuredly and deservedly reap pain and trouble for his reward.

THE END.

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