

THE MANAGEMENT
CHILDREN • IN INDIA.

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GOODEVE'S HINTS
FOR THE
MANAGEMENT AND MEDICAL TREATMENT
OF
CHILDREN IN INDIA.

SEVENTH EDITION.

ENTIRELY RE-WRITTEN IN ACCORDANCE WITH THE MOST
RECENT MEDICAL EXPERIENCE,

BY

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P R E F A C E.

TOWARDS the close of last year, Messrs. Thacker and Co., of London, did me the honour of requesting me to re-write "Goodeve's Hints for the Management of Children in India." I undertook the task, and the following pages represent my attempt.

It is almost needless to mention that the object of the book remains as heretofore—to instruct as to the rearing of children in India, and to enable the parent to meet the emergencies incidental to child-life in that country—and that it is in no way intended to supplant professional advice.

E. A. BIRCH.

WIESBADEN,

1st March, 1879.

I AM glad to learn that my little book upon "The Management and the Diseases of Children in India" is about to come forth once more in an improved form and under an able editor.

Originally written, more than thirty years since, in the few hours which I could spare from the all-absorbing occupations of an important professorship in the Medical College, and a very extensive private practice, it was, I am well aware, in many respects, imperfect.

If I had continued, for a few years longer, to hold the position I then occupied, I should have endeavoured to bring out a second, and as far as I was able, an improved, edition of my work.

But I retired early from India, and from active professional life, and the task was taken up by more competent writers, by whom various excellent and greatly improved editions from time to time have been produced.

I have no hesitation in saying that the present one is for many reasons superior to its predecessors. It is written very carefully, and with much knowledge and experience on the author's part, whilst it possesses the great advantage of bringing up the subject to the present level of medical science.

H. H. GOODEVE.

COOK'S FOLLY, NEAR BRISTOL,
July, 1879.

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LIST OF CORRECTIONS.

The reader is requested to make the following corrections before using the work.

- | | | |
|------|-----|---------------------------------------------------------------------------------------|
| Page | 30, | line 29, for “ (Chap. XL.) ” read “ (p. 327). ” |
| ,, | 40 | ,, 25, <i>expunge</i> the syllable “ un- ”. |
| ,, | 49 | ,, 21, for “ (Chap. VI.) ” read “ (Chap. VIII.). ” |
| ,, | 74 | ,, 19, for “ 22 ” read “ 24. ” |
| ,, | 80, | last marginal note, after the word “ as ” <i>add</i> “ introductory. ” |
| ,, | 82, | last line, for “ 9 ” read “ 89. ” |
| ,, | 88, | line 3, for “ milk ” read “ risk. ” |
| ,, | 112 | ,, 30, for “ cent ” read “ mille. ” |
| ,, | 113 | ,, 29, after the word “ candles ” <i>insert</i> “ will become extinguished. ” |
| ,, | 193 | ,, 27, for “ (p. 66) ” read “ (p. 68). ” |
| ,, | 211 | ,, 9, for “ (p. 215) ” read “ (p. 253). ” |
| ,, | 221 | ,, 24, for “ (p. 105) ” read “ (p. 102). ” |
| ,, | 224 | ,, 2, for “ (71, 81, or 79) ” read “ (77, 81, or 79). ” |
| ,, | 226 | ,, 11, for “ of ” read “ for. ” |
| ,, | 243 | ,, 5, for “ inspirations ” read “ respiration. ” |
| ,, | 260 | ,, 19, for “ closed ” read “ cleared. ” |
| ,, | 323 | ,, 14, <i>omit</i> “ sudden. ” |
| ,, | 324 | ,, 18, for “ p. 317 ” read “ p. 318. ” |
| ,, | 353 | ,, 12, for “ p. 308 ” read “ p. 378. ” |
| ,, | 396 | ,, 3 from bottom, after word “ indicated ” <i>add</i> “ (see also pp. 177 and 193). ” |

HINTS FOR THE GENERAL MANAGEMENT OF CHILDREN IN INDIA.

PART I.

On the Management of the European Child in India, while in health.

CHAPTER I.

INFANT MORTALITY IN INDIA,

AS INFLUENCED BY THE KIND OF MANAGEMENT TO WHICH
THE CHILD IS SUBJECTED.

WHEN an individual becomes possessed of any piece of property, he will first consider what means he shall adopt to preserve it and to bring it to perfection ; but his energies and zeal will naturally be regulated by two considerations, viz.; the value of the property, and the results which he believes are possible of attainment. Assuming the value of the object to be universally assessed at a high rate, it is sure to receive a certain amount of attention ; but its further treatment will wholly depend upon the opinion entertained by its possessor as to his power to preserve it and to increase its value. Should he believe that his

CHAP. I.

Introductory.

efforts are capable of effecting little, if any, change in the ultimate result, he will, unless he be almost more than human, devote but scanty time and attention to it. If, on the other hand, he is convinced that according to his management so will be the return yielded, his interest and his energies will be fully concentrated upon it. So that, after all, it comes to be a mere question of individual belief. This is precisely the situation of the European parent in India as regards his child's health and well-being. That which the parents believe, will guide the management of their offspring. Perchance it is conceived that no power for good or evil is possessed, that the details of daily life have little to do with health or delicacy, with living or dying, and that "climate" is responsible for all misfortunes. Whatever be the nature of individual opinions, certain it is that there is great ignorance prevalent upon this subject. Some believe one thing and others the opposite; but each acts, it may be imperceptibly to himself, upon his convictions or conceptions. Each side has part of an argument to advance, and neither is convinced.

It being quite impossible to obtain an intelligent appreciation of the subject discussed in this book without the possession of clear ideas as to the effects of good, bad, and indifferent management upon European child-life in India, it becomes a necessary preliminary to investigate the subject. In doing so it will not be difficult to demonstrate the frightful results of bad management on the one hand, and the extremely favourable results of

good management on the other hand, in the hope that the knowledge will stimulate the energies of parents in the right direction, convince them of the vast powers they possess, and of the great responsibilities they have incurred, as well as enlighten those who are sceptical of their own ability to influence events.

CHAP. I.

There is a vague impression abroad that the climate of India is extremely fatal to European child-life. Paradoxical though it appear, it may be stated that such a belief is at once true and it is untrue; the mortality is enormously in excess of that which prevails in Europe, and it is lower than, or as low as that of Europe.

Prevalent belief.

The children of European soldiers in India are, few will deny, but indifferently cared for, in so far as the peculiarities of climate demand, notwithstanding the many efforts which are made to alleviate their condition. From 1871 to 1875 inclusive, there was an average of 11,794 children under fifteen years of age of European soldiers in India, out of every 1,000 of whom 824 (or a total of 9,723) were yearly admitted into hospital; 35 per 1,000 (or 413) were daily sick in hospital, and 70 per 1,000 (or 826) died annually, of whom 3·4 (or a total of 40) succumbed to cholera. During the seven years 1868 to 1874 the proportion of deaths in the Bengal Presidency was 90·73.

General mortality among soldiers' children.

Without going too minutely into figures, it may be briefly stated that under five years of age the soldier's child dies in India at the rate of something like 140 per 1,000 of strength. Now the death-rate in England for this period of life is

Compared with England.

4 MANAGEMENT OF CHILDREN IN INDIA.

CHAP. I.

about 68 per 1,000, or less than one-half of the Indian rate; and under fifteen years, it is about one-third. Dr. Townsend drew up a table some years ago, which exhibits the contrast very plainly, and to which I now add the Bengal figures for 1875.

	England, the mean of 29 years.	Bengal, Soldiers' Children, 1870.	Bengal, Soldiers' Children, 1875.
Under 5 years ..	67.58	148.10	191.0
5 to 10 „ ..	8.80	17.73	22.4
10 „ 15 „ ..	4.98	11.51	7.0

Fairness of
the compari-
son.

Nor can the comparison be stigmatised as being unfair; for although the management of the soldier's child may be characterized as indifferent, we have no approach to the actually bad management, the want, privation and exposure, to which multitudes of the children of the poor in England are subjected. A writer in the *Calcutta Review* (1866) observes, "The mortality among soldiers' children of pure European race more than trebles that frightful death-rate which prevails among the infants of the poor at home." The editor of the *British Medical Journal* (1878) thus contrasts the mortality of the soldier's child in India with that of children of the same age in London:—

			DEATHS PER 1,000.			
			Under 1 year.	1 to 5 years.	5 to 16 years.	5 to 20 years.
India	..	..	314	104	20	—
London	..	..	185	35	—	5

The statistics for the last two periods are not so arranged that comparison can be exactly made, but "it is at all events quite certain that soldiers' children in India, between 5 and 16 years of age, die with four times the rapidity which obtains among individuals varying between the ages of 5 and 20 in London."

It is a deplorable fact that the measures which have so vastly reduced the soldiers' death-rate have not effected the same for their children, as the following figures prove :—

Children's mortality not reduced in conjunction with that of the soldier.

Average death-rate of children per 1,000 per annum. { 68.83 during 4 years (1851-54), Dr. H. Macpherson.
94.41 " 6 " (1864-69), Sanitary Commissioner.
94.58 " 5 " (1868-72), Dr. Bryden.

We must therefore look elsewhere than to general external sanitary conditions to account for the excessive rate at which soldiers' children die in India.

Viewing the mortality in relation to the birth-rate, we find that in England about 15 per cent. of all infants born die within the first year of life. There is but little evidence as regards soldiers' children in India in this particular, but the

Deaths to births.

following may be quoted from the *Calcutta Review* of 1851 :—“ Taking the returns of two regiments which reached India last year, we find that in one there have been born 44 children, of whom at the end of the fifteenth month there are only 29 surviving, showing a loss of 27 per cent. within the first year. In another regiment 52 children have been born within 14 months, of whom 32 have died within the same period, giving a ratio of mortality equal to 33 per cent. during the first 12 months of their Indian life. In another case, taking the children born in England or on board ship, who arrived with the regiment in India eight years ago, out of 159 (the original number) no less than 110 have perished. Of the remaining 49, how few in all probability will grow to manhood ! Hence we see that whether we take 100 children imported from England, born of healthy parents, or 100 children born of the same parents within the first year of their arrival in India, still the melancholy fact remains the same.” The same writer quotes the following table, exhibiting the respective ages of the survivors of 261 children born in one regiment since landing in India eight years ago :—

From 7 to 8 years	..	4
„ 6 „ 7 „	..	8
„ 5 „ 6 „	..	13
„ 4 „ 5 „	..	15
„ 3 „ 4 „	..	20
„ 2 „ 3 „	..	15
Under 2 „	..	38

Died 148. Survivors 113. Total in 8 years 261.

It would be easy to multiply instances and to

INFANT MORTALITY IN INDIA.

7

place the contrast more vividly before the reader, but only to draw a terrible picture would be unprofitable. Enough, however, has been said to show the dark side of the surface, in a general way. Happily there is a bright side.

CHAP. I.

Several years ago Dr. Macpherson undertook an investigation into the European infant mortality of Calcutta. His data were imperfect, yet he arrived at an inference the correctness of which has since been verified. The following figures are recorded by him:—

The bright side.

Ages.		Calcutta. 1,568 Deaths.	European Rate.
Under 1 year of age	..	54·7	55·7
1 to 2 years	..	23·9	20·2
2 " 3	..	10·6	11·2
3 " 4	..	5·4	7·4
4 " 5	..	5·19	5·2

European children in Calcutta.

and he then observed, "The table proves this much at least, that of all who die under five years the casualties at the earliest period are quite as few here as in Europe. The differences are trifling, and the results shown, if corroborated by further observation, would indicate that the season of teething is slightly more trying to children in India, but before and after that period they thrive at least as well in India as in Europe up to five years." Dr. Payne has done an important service by placing on record facts which are no less startling than instructive, in that they conclusively demonstrate the results actually

Macpherson's investigations.

Dr. Payne's facts.

CHAP. I.

Results in
orphan
asylum.Sanitary com-
missioner's
opinion.Fayrer's com-
ment.

attained by good management. He shows that, "while in the native town of Calcutta, infants die as they die only in the most fatal countries, European infants, with 5·8 per cent. of deaths in the year, enjoy in Calcutta a degree of vitality which surpasses that of the most favoured spots elsewhere." Again, there is in Calcutta an institution named the European Female Orphan Asylum, of which Sir J. Fayrer has written a sanitary report for six years, commencing January, 1863. It seems that there was during that period an average of 65 inmates, varying in age from 1 to 18 years, the great proportion being between the ages of 5 and 16. "The abstracts of admission into hospital show that there has been a great immunity from epidemic disease of any severity; and the very low mortality (6 deaths in 6 years), as well as the small amount of sickness, prove that the European child, under proper hygienic conditions and careful physical training, may live and thrive in the plains of Bengal *almost* as well as in its native country."

The Sanitary Commissioner with Government admits these facts as proof that under favourable sanitary conditions Indian climates are not necessarily so injurious to the health of European children as was formerly supposed*; while Fayrer, in commenting upon Dr. Payne's report, considers that up to 6 or 8 years of age European children "thrive, if anything, better than in England."

We need not travel so far as India to observe an immense difference in the infant death-rate.

* Report on Sanitary Measures in India in 1876-7.

Dr. Farr* finds that the infant mortality of European countries ranges from 41 per 1,000 in Norway to 113 per 1,000 in Italy. In the year 1860 the infant mortality (under one year) in England was 17, while in Scotland it was only 14½ per cent. In some mining districts of England 270 infants under one year die annually out of every 1,000 born, while in rural districts about 100 less children perish within the same period. These instances will suffice to show that in other general communities differences are as well marked as they are in India.

CHAP. I.

The dark and bright sides of European countries.

Referring again to India, infant mortality is small among the Europeans of Calcutta, large among the Eurasians, and very large among the natives, being higher among Mahommedans than Hindus.†

Different races in Calcutta compared.

The significance of all these facts leads to a conclusion of the greatest practical importance, and one which it is most desirable should be thoroughly comprehended by those who have the charge of children in India, for without such knowledge the immense powers we possess in the matter of preserving infant life not only remain obscured, but they can hardly be guessed at,—so great, so enormous, so otherwise incomprehensible are they.

Necessity for the foregoing knowledge.

What, then, is the reason that soldiers' children

Why are these things so?

* Journal of the Statistical Society, 1877.

† White .. = 58 per 1,000 born.

Mixed Races = 306 ..

Hindus .. = 315 ..

Mahommedans = 363 ..

(Payne.)

CHAP. I.

The different results entirely explained by the management to which subjected.

Individual responsibilities.

Investigations as regards Europe.

die at a very high rate, while of the European civilian's child an exactly opposite condition holds? that native children die at a most excessive rate? that the Eurasian rate is intermediate between these two latter? that the rate which prevails in certain countries of Europe is double or treble that of other European countries? that the rate for England is higher than that of Scotland, and that it even varies in certain districts of England itself? The reply is summed up in the one word, management. "In respect to the management of infant health, and referring to the theories and empiricisms brought to bear upon it," writes Sir R. Martin, "I have everywhere observed that even the fatal results of mismanagement but rarely cure the mother of her theory or her quackery,—so much stronger are ignorance and prejudice than death." For this very reason I have appealed to the intelligence of the reader, who if he will but allow himself to reflect upon the stern facts here put before him, ignorance, prejudice, theories, and quackeries cannot find standing room upon any platform the mind can conceive.

Know, then, that whether your child is to live or to die in your far-off home is a matter which lies chiefly in your own hands. "The treatment of the child in the first twelve months either destroys his life or leaves indelible traces on his future existence," writes Farr, who procured detailed accounts from several countries in Europe of the treatment of their babies, and found it to be very different, and in many in-

stances very sad. "Here they are bound up like mummies; there they are not nursed by their own mothers, and as they advance in age are fed on improper food;" and to the difference in management the difference in mortality is shown to be due. The same great authority observes that there is something terribly faulty in the present mode of treating infants in England, "for if the English mortality from convulsions were reduced to the Scottish standard, 17,000 lives would be annually saved to England. These 17,000 lives who annually die in England from convulsions above the Scottish proportion are truly lives wasted, and their deaths are truly preventable deaths. There cannot be the slightest doubt that the cause of the very high mortality among the nursing children of England is that they get spoon-food far too early in life, before the stomach of the tender babe can digest anything but the mother's milk. This is, indeed, the vital difference between the mode of feeding infants in England and in Scotland." The high tribute which is exacted by death from the parents of infants in the mining districts of England is due to the same causes in an exaggerated form; while the agriculturists, whose pecuniary means are less able to bear the burden of supporting a family, are immensely more fortunate, because custom does not demand that they desert their infants daily, for the mine's mouth or the factory. The squalor, dirt, and confinement, of parts of all large towns exert their marked influences in a very perceptible way among the children of the poor, just as they do in

CHAP. I.

Investigation
as regards
India.

the native portions of Calcutta. "That a high rate of infant mortality should prevail in native Calcutta will appear natural to those who know the effect of filth and foul air on infant life, but the full measure of this needless destruction of life can only be understood by consideration of its special causes, of the singular exemption of European infants, and of certain saving influences which are in existence here, but are neutralized" (Payne). But though dirt in Calcutta plays its usual part in enhancing the mortality, in the more filthy localities the actual death-rate is but slightly in excess of that of the cleaner places; and the proportion of deaths among the various races is maintained without variation in all localities, proving that to the domestic treatment of the infants the terrible result is really due, and not primarily or principally to dirt.

A low mortality to be expected in India.

It has often been remarked that there *ought to be* a low rate of infant mortality in India, seeing that scarlatina, measles, whooping-cough, and other affections peculiar to childhood, are either unknown, or run such a mild course as virtually not to affect the death-rate: for instance, the Army Sanitary Commissioners, comparing the Indian with the English rate, note the fact that, taking a period of six years and all causes, scarlatina caused 5.5 deaths at Aldershot, while only 0.39 occurred in India from this cause. "Calcutta, among its resources for the destruction of infant life, does not include those less avoidable causes of death which work elsewhere, but owes to qualities or habits of its

own the pre-eminence which must be assigned to it among deadly places. That European infants die in small numbers means simply that they are not subjected to the same fatal treatment; and that the mixed races hold an intermediate place is due to the admixture of native habits among the poorer classes. Death, where it abounds, does not arise from climate, or any cause that is out of reach, but from that which the people have created and perpetuated for themselves" (Payne).

CHAP. I.

Happily, the verification of the legitimate anticipation that a low death-rate is normal to India has now been attained; and it is proved beyond all gainsay that the management to which parents subject their children is the great factor which influences the result.

General
conclusion.

CHAPTER II.

GENERAL EFFECT OF THE CLIMATE

UPON THE CHILD'S CONSTITUTION.

CHAP. II.

Notwithstanding, the climate is inimical to European child-life.

WE have seen that there is really a very hopeful—indeed, we may say a satisfactory—side to the question, in that the climate is deadly only as we make it so. But is the climate of the plains of India in no way inimical to the European child's constitution? No well-informed person will reply to this question in the negative. Unfortunately it cannot be said that no hurt is to be apprehended greater than might occur in its natural climate. On the contrary, it may be laid down as an axiom that an amount of carelessness which in England will give but an ordinary English death-rate, will in India yield a frightful mortality. Neglect in India will render the chances of survival much less than those of death,—in a word, to preserve our children to us in normal proportion we must adopt precautions more stringent than are called for in England.

Medical testimony on the point, and the age at which a child should be sent to Europe.

There is a pretty general medical opinion that the Indian climate does not in any way injure the health of the European infant during the first year of its life; further than this, the conviction is prevalent that with proper precautions up to the age of 5 or 6 years the child may

be reared nearly as satisfactorily in the plains of India as in Europe; but beyond these ages all are agreed that physical and moral degeneration occur. The child then “exhibits the necessity for change of climate by emaciating and outgrowing its strength” (Martin). So profoundly does the climate after the period of immediate childhood influence the constitution that the effect of a more prolonged residence is rendered permanent throughout life. Such is the teaching of experience; indeed, Sir R. Martin goes so far as to condemn the attempt to rear children up to and past youth, in the plains, as an “altogether cruel and impracticable endeavour.” And so it is, unless there be special management, as has been shown in the first chapter. Dr. K. Mackinnon remarks that even where there is no tangible disease nutrition and oxygenation do not appear to go on favourably, the skin becomes pale, the muscles waste in substance and tone, the joyous spirits of children are wanting, the body is inert, and the mind listless. We daily observe evidence that “the European was not made for the climate, nor the climate for him” in the attempts to rear children in the plains past a certain age. “The children of the upper classes of Europeans in India who remain there during the first five or six years of infancy only,” says Martin, “exhibit a restlessness and mobility of the nervous system—a busy idleness—beyond their age, as compared with the habits of children of the same ages born and bred in England. There is also a marked disposition to relaxation, and to a loose, relaxed

state of the joints in such children, and to consequent lateral curvature of the spine." In 1872, Sir J. Fayrer wrote without being in possession of the valuable mass of facts which Dr. Payne has since put forward; yet I think the case cannot to-day be stated more correctly and more plainly than in the following words, when he says, "I have no desire to prove too much, as I certainly should appear to attempt to do were I to advocate the theory that Calcutta, or any other part of the plains of India, is a *desirable* locality for the training and nurture of European children; such, indeed, would be a theory as dangerous as false. For although the exceptionally favourable circumstances of the European Female Orphan Asylum prove that the European child may thrive, yet it is certain that without favouring influences it will not; and the statistics of infant life in the British army in India prove not only that such is the case, but that the obstacles to success in the rearing of children are very great. It has long been known to the English in India that children may be kept in that country up to five, six, or seven years of age without any deterioration, physical or moral, and in the higher classes of life with probably as little, if not less danger to life than in England; for most assuredly in some respects—as, for example, scarlatina, measles, hooping-cough, thoracic complaints, and even dentition—they suffer less in India than in England. But after that age, unless a few hot seasons spent in the hills should enable parents to keep their children in India until a somewhat later

age, to do so is always a doubtful proceeding. The child must be sent to England, or it will deteriorate physically and morally,—physically, because it will grow up slight, weedy, and delicate, over-precocious it may be, and with a general feebleness not perhaps so easily defined as recognised, a something expressed not only in appearance, but in the very intonation of the voice; morally, because he learns from his surroundings much that is undesirable, and has a tendency to become deceitful and vain, indisposed to study, and to a great extent unfitted to do so,—in short, with a general tendency to deterioration which is much to be deprecated, and can only be avoided by removal to the more bracing and healthy (moral and physical) atmosphere of Europe.” The further we investigate the matter it becomes more and more evident, in the words of Quetelet, that “care does everything, and climate nothing or very little;” nothing in the native climate of the child, and not much in a foreign climate. Circumstances combine to prevent some parents sending their children to Europe. For such there ought to be immense comfort in the knowledge that with properly directed care the pernicious effects of climate, which carelessness will render disastrous, may be assuredly warded off.

This is the proper place to inquire, what are the peculiarities in the infant constitution which render the climate of India obnoxious to its vitality and maturity? The several parts which compose the body of the infant in any climate

Why the infant is peculiarly liable to the influence of climate.

CHAP. II.

Morbid
constitutional
effects of a hot
climate.

are softer, they contain more blood, and are more fluid than those of the adult. The skin is exceedingly delicate, and the microscopical blood-vessels which pervade the whole body are at this early period of life exceptionally active. The same may be said of the glands. The brain is large, and it is less solid than in the adult. The whole nervous system is developed out of all proportion in advance of the muscular system, wherefore the excitability is greater by far than at any subsequent period of life, and it is to be recollected that all the functions of the body are immediately under nervous control. In short, the vital powers are extremely though delicately active, the nervous susceptibility is extreme, and there is a quick and comparatively strong circulation, with a very abundant supply of blood. Now it may be laid down as an axiom that the higher the temperature the more easily is the nervous influence transmitted. A hot climate at first stimulates the nervous system (even in the newly arrived adult), which being, so to speak, in excess in infancy, is out of all proportion thus affected if unduly exposed. Hence we have in hot climates infantile lock-jaw, frequent convulsions, death during teething, and an abundance of nervous affections generally where there is bad management. But a hot climate has a secondary or depressing effect, producing a feeble circulation and lessened muscular power, with consequent congestions of the liver, spleen, and bowels, which are peculiarly soft and vascular in infancy. The minute muscles, the innumerable blood-

vessels of which ensheath these softer organs, being relaxed, obviously they will become flaccid and expand, the result being that practically, in such cases, a certain amount of blood, which is thus stored, is lost temporarily to the general circulation and to the nutriment of the body. The balance between the circulation and nervous influence is, in fact, disturbed. .

This knowledge not only coincides with all the facts stated in the first chapter, but it actually explains them. The infant under ten or twelve months of age, with care, thrives, we have seen, as well if not better in India than in Europe, because the large amount of heat which is natural to it, and which then is one of its greatest requirements, it has in abundance, and at the same time means are taken not to expose it to excessive heat. It possesses freely the blessing of fresh air, more so than in Europe, and its food being everywhere uniformly simple, the vital functions enumerated are not called upon unduly; hence the favourable statistics of the children of the well-to-do Europeans in Calcutta, whose education, and the facilities yielded by social position, enable them to adopt those precautions against the effects of a tropical climate which are so easily put into practice where there is an abundance of house-room and a sufficiency of attendants, but which nevertheless are out of the reach of none; while the indifferently cared for soldiers' children give a high rate of mortality from nervous affections and diarrhoea during the earlier months of life, and the badly managed infants of the natives

CHAP. II.

This knowledge applies to infant life explains the statistical facts.

CHAP. II. of Calcutta yield a terrible mortality from lock-jaw and other nervous disorders.

Effects on
general
health of older
children.

But when the term of infancy has expired, the child participates more and more each year it lives in the disadvantages under which the adult exists in India, till after a few years they are exceeded. The elder children therefore languish, or to some extent degenerate more or less. What are these disadvantages? Categorically they may be enumerated thus:—(a) a digestion slower than in the European's natural climate, (b) consequently a lessened appetite, (c) and therefore slower nutrition; (d) a generally relaxed state of the system, and (e) a tendency to poverty of blood; (f) and finally, lessened mental and bodily vigour, because the wear and tear (waste) incidental to climate is more considerable, while the supply (nutrition) does not replace the loss so rapidly as in a colder climate.

Other effects
of climate.

On the food
and appetite.

These are the more plainly marked deleterious effects; but there are others which it is desirable to mention briefly. Heat of climate very materially affects the quality as well as the quantity of the food appropriated for nutrition, and not infrequently creates a morbid appetite for a class of food which may sooner or later prove injurious. The belief is now largely entertained that the summer infantile diarrhoea of England is chiefly due to an alteration, effected in the quality of the food by sudden accessions of heat. With such sudden accessions, the infant bills of mortality, rise, in England, as certainly as does the thermometer. Every parent in India is

aware of the trouble there is to restrict children to their appropriate food; how the light pudding is carefully eschewed and highly-flavoured meats clamoured for—a petition too frequently entertained. The effects of the vicissitudes of the Indian climate are deserving of a moment's consideration. The skin is, it is almost needless to state, penetrated with nerves so closely that a needle's point cannot touch it without coming into contact with some of them, and all these nerves have direct telegraphic communication with the inner vital parts of the body. In consequence of the congested state of the surface, and the exalted nervous impressionability of the child in India, as products of a hot climate, the body is peculiarly liable to chills, which being conveyed by the nerves to the interior, frequently derange the functions of the abdominal glands, obstructing assimilation of nutriment, creating congestions, and otherwise doing injury. The liver and spleen frequently suffer much in this way. An impaired liver means diminished removal of worn-out tissues, and their consequent retention in the body; while the spleen, having much to do in the way of perfecting the blood and preparing it for nutrition, if impeded in its function, is sure to originate poverty of blood and general loss of bodily vigour. Such effects of chill are only to be explained by the increased nervous susceptibility and diminished powers of reaction which have been discussed. There is yet another important effect of climate, viz., that the force

Chills.

The liver and spleen.

CHAP. II. of the respirations is very greatly diminished.
 Respiration. • The lungs being one of the great channels for the consumption of waste or worn-out materials by oxygenation (combustion), their diminished action will manifestly throw additional work upon the liver, which is another of the chief means for the disposal of waste; but the liver itself is, so to speak, working under difficulties, hence we see how essential it is to adopt a simplicity of diet, and to attend to the state of the bowels, these being the most potent, though the easiest means of preserving the healthy action of the liver, which organ, for the reason stated, is rendered by climate unusually susceptible to derangements, which need not actually amount to disease to work profound harm.

European children thrive well in the hills.

Effects of Residence in the Hills.—In 1873 there were 1,082 soldiers' children located in the hills, many of whose constitutions no doubt had previously undergone deterioration in other parts of the country, and there were 5,671 in the plains. The death-rate among the former was 50 per 1,000, and among the latter 71 per 1,000. In the previous year the proportions were 91 and 117 per 1,000 respectively. The numbers of the previous four years were much the same. These figures represent an additional mortality of 20 per 1,000, or 110 deaths in the plains out of the 5,671 children more than would have occurred had all been in the hills. Sir R. Martin, in 1861, wrote, "The principal of the Laurence Asylum says that the children of soldiers in the plains die so early that only about one in five is found surviving its

fifth year of Indian sojourn, while in the mountains they thrive like children in the healthy country districts of England." In the same asylum from 1847 to 1850 only two deaths occurred, and these were cases of children who had been but a few weeks in the institution, and who arrived ill. It is true that "the inhabitants of the asylum have nearly all passed the most dangerous period of life, but a small proportion being under five years of age" (Sanitary Commissioner), and that it is therefore hardly fair to institute a comparison with the soldier's child; nevertheless the fact stands out prominently that the community is an exceptionally healthy and vigorous one. Beyond all cavil, European children may be born and brought up in the hills in a state of physical health not inferior to that of those who have been wholly reared in Europe. I have known many such, but unless advantage be taken of some of the excellent institutions which are available, the moral tone is not likely to be of a high order.

CHAPTER III.

THE MOTHER'S HEALTH DURING PREGNANCY,

AND ITS EFFECTS UPON THE CHILD'S CONSTITUTION

SUBSEQUENTLY.

CHAP. III.

Subject not
generally ap-
preciated.

THE mother's blood yields nourishment to the infant before its birth. If then the mother's blood undergo deterioration, it requires no argument to make it evident that the nutriment of the child must be affected; but the extent to which it may thus suffer is either unknown, or it is generally but very ill appreciated. By bearing in mind the extreme rapidity of the child's development while still within the womb, and that no other material of any kind is supplied to meet the whole burthen of growth, it becomes easy enough to understand the great influence—which often proves permanent—thus exerted upon the constitution of the child. Possibly it may be that while the influence of the quality of the blood is fully admitted, there is a difficulty in understanding or believing the readiness with which those qualities become changed in response to the surrounding circumstances of the individual, for as no mother would wittingly malnourish her child after its birth, it is hardly to be supposed she would commit a similar crime

before it has been called into independent existence. CHAP. III.

Under any circumstances, the pregnant European's health is, in India, liable to sufficient deterioration to cause it to be a matter of great importance that she adopt precautions much more vigorous than are demanded in a European climate; otherwise not only may mischief arise to the child, but its actual death may be brought about. Nothing is more certain than that impressions, constitutional or mental, are transmitted to the child from the mother while the former is still within the womb. "This consideration is of such importance, and appeals so directly to the most powerful feelings of womanly nature, that it ought to be sufficient to ensure an adequate attention to health, on the part of all likely to become mothers. Common sense and a little self-denial will generally secure all that is in her power" (Churchill). Its importance.

The diet of the pregnant woman should be amply sufficient, but always simple. An unusual use of wine or beer is not only unnecessary but positively injurious. The capricious appetite, which does, to some extent, attach to the condition of pregnancy, must not be yielded to. Moderate exercise, short of fatigue, should be indulged in. Riding, dancing, and all violent exercises, such as lawn tennis and badminton, of a straining nature should be avoided. Walking is beneficial. The legs may be used, but the arms should be spared. By straining at the games named, just as happens in lifting weights, the Hygiene of the pregnant woman.

CHAP. III.

abdominal muscles are brought into sudden and jerky action, which obviously ought to be avoided. Late hours are to be eschewed. Rest in the horizontal position may be more freely indulged in than formerly. The bowels should be kept regular by means of diet, or, if necessary, of castor-oil or rhubarb. Such aperients as aloes and seidlitz-powders, as well as all patent medicines of unknown composition, are to be rigorously avoided as actually dangerous. The dress should be loose, so as to allow space for the growth of the child and to give a freedom to the mother's lungs sufficient to compensate for the increased upward pressure of the womb on the chest. It is not desirable that she should forego any of her usual occupations.

Importance of
control of
temper.

Not less important is it that the future mother should control her temper and avoid scenes of excitement, which it is proved are calculated greatly to injure her unborn child. The brain and nervous system of the child are advancing with such rapidity that any diseased action is, as it were, easily sown in a virgin soil, and once established is not so easily dispelled, but, on the contrary, may develop proportionately with increase of the organ, which then possesses no natural powers of resistance to re-establish healthy action. Instances are not wanting of the immediate death of the infant in the womb of a woman who has been subjected to sudden terror or violent passion; nor is it difficult to learn of many cases in which mental emotion of mothers has been succeeded by the births of

Maternal
mental
emotions
transmitted.

CHAPTER IV.
MANAGEMENT OF THE INFANT
AT AND IMMEDIATELY AFTER BIRTH.

Section I.—The first day of life.

- CHAP. IV.** AN infant, let us assume, has been born without accident, and separated from its mother. The essential points demanding immediate attention are, care of the cord, warmth, and rest.
- Points requiring immediate attention.**
- Inspection of the cord.** The cord having been inspected carefully to see that there is no oozing from it, the infant is to be rolled in a flannel, which has been well warmed, and allowed to rest in the arms of an ayah or other warm place, while the necessary attention is being bestowed upon its mother. Warmth is at this moment of the greatest consequence, for the temperature of the newly-born infant falls to many degrees below that which, during the rest of its life, will be natural to it, or which would subsequently be compatible with its vitality.
- Warmth.**
- Rapid loss of temperature which succeeds birth.** Even twenty degrees below the natural standard has been registered. It is easy enough to understand the cause of this phenomenon. While the child is within the womb it is surrounded by a fluid of a temperature of about ninety-nine degrees, and there are no means for any but the very smallest production of heat, inherent within the infant. From this warm bed, the wet body is suddenly exposed to the comparatively cold air ;

evaporation produces rapid cooling, heat is given off from the body to the colder atmosphere, while none is produced within, as it is in the adult, to compensate for the sudden loss, so that in a few minutes a diminution of five or six degrees is sustained.

CHAP. IV.

Rest, for these few minutes after the comparatively violent exercise of struggling and handling, is a good thing, though hardly essential so far as it concerns delaying the next operation, namely, the bath, should everything be ready for it; but which, in any case, after this interval, is (at a temperature of 100°) to be administered with *gentleness and rapidity*.

If there is not a thermometer at hand, the elbow of the nurse immersed in the water will afford a fair test as to the appropriateness of the temperature. The hand should not be trusted to; it is not so sufficiently sensitive as the thinner skinned and habitually protected elbow.

Sometimes there is a large quantity of white sticky substance adhering to the child's skin; sometimes there is but a little, almost always some. The complete removal of this substance is usually easily effected by anointing with a little friction, those portions of the skin upon which it is seen, with a small portion of oil, lard, or butter. An emulsion is thus formed, which admits of ready removal with the sponge, soap, and water. This portion of the proceeding may be conveniently carried out upon the nurse's lap, whence the infant is to be immersed in the bath, whereby all remaining impurities are removed. Should it happen that all the white substance is not thus completely removed, no delay, or picking or rubbing, is justifiable in further attempts. Rapidity and gentleness are the really important

Rest.

Temperature of bath.

Vernix caseosa.

First washing.

Quickness and gentleness the essentials.

CHAP. IV.

Care of the
eyes.

points, and it is of no great consequence whether thorough dislodgment be effected; but it is of moment that neither chill nor exhaustion be imposed upon the delicate organism which has been transported from the warm, dark, and still womb, into the midst of cold, noise, and light. A word of caution as regards the eyes, during this first bathing, has to be mentioned. Scrupulous care should be observed that none of the soiled water be permitted to enter them, otherwise the newly-born infant may commence its life with an attack of ophthalmia. The process of drying and the application of dusting powder (Part iv.) are now to be proceeded with.

Navel string.

The arrangement of the navel string next claims attention. The first thing to be done is to examine it attentively for a moment, and if there is any appearance of blood oozing from it, to apply a fresh ligature close to that which is already upon it, and which should be allowed to remain as originally placed.

Why a second
ligature is
sometimes
necessary.

Occasionally it is found necessary to do this, because the jelly-like fluid which is in the cord, having had time to escape, the first string may have become loose; thus the infant would be exposed to great risk from bleeding, which would occur after the body has become warm and the depression which immediately follows birth, has passed away.

Great care must be taken that the cord be not jerked or pulled, through carelessness (Chap. xl.). From the centre of a piece of soft old rag a portion is cut sufficient to allow the cord to be passed through it, and this having been placed in position, a strip of similar rag is to be gently

wound round the cord, which should now be loosely coiled upon the flat piece which lies upon the abdomen. Over all a flannel binder is to be sewn with a wool-needle and cotton (pins should never be employed), and the process of dressing is to be completed. Then the infant should be wrapped in a soft woollen shawl and placed in its mother's arms, in close proximity to her body. Usually the baby will at this time fall asleep, and so remain for some hours. From such a slumber an officious nurse must not be permitted to awake it on the plea of giving it nourishment, or upon any other pretence. Should, however, there not be an inclination to sleep, the mother may at once apply her infant to her breast, an act which will prove beneficial to herself and to her infant—to the former, by contributing to the contraction of the womb and stopping any tendency to bleeding; to the latter, by communicating warmth, and inducing the flow of nourishment.

Infant's sleep
not to be
disturbed.

Infant to be
given the
breast at once.

The circumstance of proximity to the mother was found by Dr. Crombie's observations to exert a marked influence on the temperature of the infant. The power of manufacturing its own heat has not yet been gained by the infant, hence blankets and shawls are no more sufficient to keep it warm than they would be to preserve the temperature of a piece of slightly heated iron: All the heat which can be safely spared has been parted with by the little body, which cannot create more, to be retained by the shawl and clothing. "The consequence of this is that the powers of the child are insufficient to raise its temperature above 94 or 96 degrees unless assisted by artificial warmth to be derived from the body of its mother. A great practical lesson underlies this subject, namely the duty of the physician to see that newly-born children, especially such as are weakly or premature, are never left exposed unnecessarily

Imparted
warmth essen-
tial.

CHAP. IV.

to the air, even in a warm climate like this ; that they are warmly clad, even from the very first, and that they receive all the artificial warmth from their mothers, possible. The feeble powers of the young infant may be just insufficient to raise its own temperature to a point compatible with the performance of the functions of life, unless aided by the instinct with which mothers are endowed, to lessen the radiation from the surface of their infants by contact with their own persons."

Imparted
warmth to
infant enables
ventilation
of apartment.

Another reason why the infant should be in proximity to its mother at this time is that it enables the ventilation of the room to be thoroughly carried out ; a matter of the greatest importance to both mother and child. So long as the infant lies in contact with its mother's warm body, there need be no fear of its catching cold. The windows and doors may be thrown open with impunity, if only draughts be excluded and the cold is not excessive. As a rule the lying-in chamber is kept much too warm, either for comfort or safety.

Dress.

The mode of dress must be left to the previous ideas of the mother, but a protest cannot be out of place against the "fashion" which prescribes innumerable garments, and which, to say the least, entails delay, unnecessary exposure, and fatigue at a moment when each and all of these should be shrunk from. I will only recommend that flannel be not placed next the skin, the very softest is too rough and irritating ; but flannel may be used, and just as effectually, immediately outside a muslin chemise.

No artificial
food to be
given.

It is seldom—almost never—necessary to have recourse to any artificial means of nourishing the newly-born infant, though prejudice on the part

of nurses usually eventuates in an opposite course being pursued. "Seeing is believing," say they, and till the white fluid can be actually squeezed from the breast, it is concluded no nourishment is secreted. Thus has originated the popular belief that till the third day there is no sustenance for the child to be had from the mother. This is altogether an error, and a serious error. Nature has fully supplied all that is necessary for the wants of the child. "Small in quantity and comparatively poor in quality as this provision admittedly is during the first two or three days after delivery, it is nevertheless amply sufficient for the purposes of nutrition." (Ewart.) Not only is this so, but the early secreted juice (for milk in appearance it then is not) is almost invariably sufficient to effect the removal of the black contents of the bowels, about which nurses usually express so much anxiety that they are unhappy if not permitted to drench the unfortunate infant, within a few hours of its birth, with purgatives. The secretion which is abstracted from the breast by the infant meets all requirements of nourishment and purgation; sleep, warmth, and cleanliness being its only other necessities.

Secretion of
breasts is
sufficient.

Some deprecate the practice of putting the child to the breast immediately after its birth. It is well, therefore, to quote the words of a great authority. "The earlier the child is put to the breast the more fully does the uterus contract, the sooner is the meconium purged off, the less chance will there be of the mother suffering from milk fever, sore nipples, distended, painful, and knotty breasts, milk abscesses, &c., and of the child from flatulence, disordered stomach and bowels, aphthæ, &c." (Rigby.)

CHAP. IV.

No aperient
to be given,
being actually
injurious.

The castor oil which it is usual to administer to the newly born infant is actually injurious, in that it acts as too rapid and too powerful a purge. It at once removes the whole contents of the intestine, part of which, it is intended by nature, should be absorbed into the blood, to contribute nourishment and heat to the body, pending the full secretion of milk, and during that period of rest which is so much needed by mother and child. When castor oil has been wrongly administered, it is almost a necessity that some artificial food be given, because a premature appetite has been created by the removal of nature's provision. Restlessness follows as a matter of course, instead of that complete tranquillity which should be enjoyed. The infant is subjected to the risks and disadvantages of artificial food (*vide* Chaps. vi. and vii.), at the very moment when it is least fitted for an ordeal by which indigestion, flatulency, and perhaps bowel irritation may be induced. In short, the balance between nutrition and digestion is overthrown by interference, while the probability of necessity for the further use of aperients is increased.

Remainder of
the first day.

Throughout the remainder of the day the infant should be left wholly with its mother, who should offer it the breast whenever it wakes or cries, without reference to periods of time. Thus the attention of the parent will be diverted, and anxiety for herself removed. Of course care must be taken to change all wetted and soiled napkins without delay, and to wash the soiled parts of the child with warm water. A few hours after birth, perhaps in a much shorter

time, the first flow of urine will have taken place, and possibly the usual black evacuation from the bowels will have occurred. In this manner should be conducted the first day of the infant's life. "Masterly inactivity" is a policy which will be found eminently suitable to India, in this matter at least.

Section II.—Accidents and Unnatural Conditions.

But all may not go smoothly with the child. There are some *accidents which may happen at or immediately after birth*, and some unnatural conditions, which, with their remedies, we now proceed to consider.

I. A child may be apparently STILLBORN, or it 1. Stillborn may apparently cease to live very soon after its birth. Not a moment should be lost. A human life is in the balance, and let it be remembered that in seemingly the most hopeless cases proper and instant treatment has been rewarded with success. Proceed as follows :—

(a) If the child is still attached to its mother, ascertain by grasping the cord lightly between the forefinger and thumb whether there is any pulsation in it. If there is pulsation, on no account divide the cord until the child has cried vigorously ; for so long as it beats there is some circulation through the child's body, which may serve to maintain life till respiration becomes established. Should there be any delay in the commencing of breathing, while the child still remains attached to the mother, commence artificial respiration (see p. 36).

(a) Child attached, and cord pulsating fairly.

CHAP. IV.

(b) Barely perceptible pulsations.

(b) If the pulsation in the cord be so feeble as to make it almost doubtful that any exists, and if there are no signs of returning animation; after a short interval (a minute or so), without hesitation, ligature the cord, divide it, and proceed as directed in the following paragraph:—

(c) No pulsation of cord.

(c) If there is no pulsation, quickly ligature and divide the cord. Dash a little cold water on the face and chest of the infant, and smartly slap the chest and the buttocks. Plunge the infant for about half a minute into a warm bath (temperature 102 degrees or so); rapidly remove it from the water, and holding it by a finger hooked into each arm pit, expose it to a current of air, by swinging it backwards and forwards two or three times.

(d) If no success, artificial respiration.

(d) If success does not attend these efforts, proceed at once to excite artificial respiration.

(e) Afterbirth expelled with stillborn child.

(e) If the afterbirth has been expelled with the child, or if the separation has already been effected by the attendant, at once adopt the measures described in the foregoing paragraphs (c) and (d).

Mode of artificial respiration.

ARTIFICIAL RESPIRATION is conducted as follows:—Place the infant on its back on the bed. An assistant should draw forward the tongue with his fingers and so retain it between the gums. Grasp each elbow and extend the arms upwards till they meet directly above the top of the head, thus causing an indraught of air by increasing the capacity of the chest (inspiration). Then bring the elbows steadily down to the sides again, gently pressing them against the chest, which will be felt to bend in a little, thus expelling the air (expiration). Repeat these

motions with about the rapidity of a child's ordinary breathing, until there is a natural attempt at respiration. As far as practicable, regulate the further movements in concert with the natural efforts which are being made, and do not desist till the function is properly established, and the child cries lustily and persistently.

How long should these efforts at resuscitation be persevered in? The reply is,—not only so long as there is a sign of a spark of life, but while the body retains its warmth. How long should effort continue?

II. SWELLINGS OF THE SCALP are not infrequently observed in the newly born infant, and may occasion alarm. They are soft and puffy, and are caused by the pressure endured at birth. No treatment is required, as a rule. The swellings are unimportant and will generally subside of their own accord in a few days. Scalp swellings.

III. BLEEDING FROM THE NAVEL-STRING is to be treated by the application of an additional stout ligature placed nearer to the body than the former one (p. 30). Navel bleeding.

IV. Should an infant appear to be unable to suck, a medical man should be consulted with as little delay as possible, who will ascertain whether the infant be TONGUE-TIED. Should there be no immediate possibility of obtaining medical aid, the infant must be fed *by means of a spoon* with its mother's milk, or if this be not obtainable, with fresh cow's milk ($\frac{1}{3}$) and warm water ($\frac{2}{3}$) to which a little sugar has been added. Tongue-tied

Very few children are really tongue-tied. Do not therefore too quickly jump at the conclusion is a rare condition.

CHAP. IV. that such is the case, simply because an infant does not *readily* suck.

recognised. It may be concluded that the tongue is tied down, when that organ cannot be raised from the floor of the mouth by passing the little finger underneath it ; when the string is seen to extend nearly to the tip of the tongue ; and when, the infant attempting to suck, the milk flows down the breast without entering the throat.

In absence of surgical aid. It may so happen that in an out-of-the-way district medical aid cannot be obtained. Only under such circumstances of urgent necessity is it justifiable for unskilled hands to undertake the *surgically* simple operation, for its relief.

Operation. To operate, place the child in a good light in the sitting posture, its head being firmly held ; then take a pair of scissors, the points of which have been carefully ground off, and having lifted the tip of the tongue sufficiently to stretch the string, nip it slightly, the point of the scissors being held downwards away from the tongue. With the end of the finger, gently tear through the remaining obstruction, and the operation is complete.

Non-action of the bowels. V. Should the BOWELS NOT BE MOVED within the first twelve hours of life, examine the fundamen and gently introduce the ordinary pawn stalk, or a piece of soap about the thickness of a slate pencil and $1\frac{1}{2}$ inch long. Should it be that the skin extends over the anus, and that no opening can be found, from surgical aid alone is relief to be obtained.

Cleft palate. VI. An infant may be born with a CLEFT PALATE ; that is, the roof of the mouth is split from behind

forwards. This condition requires great attention in the matter of feeding; there is not the slightest use in giving the child the nipple, or in attempting to use the feeding-bottle in the ordinary way. The child cannot suck; if it attempt to do so, the milk will get into the nostrils instead of passing into the stomach. Artificial feeding (Chap. ix.) must of necessity be adopted, and it is best conducted in this way: Mode of feeding. An old-fashioned feeding-bottle should be used, a piece should be cut off the top of the nipple, sufficient to make a circular opening about so large (O); the child should then be placed in the semi-erect posture, the bottle, about half full of milk and water, being at hand. The nipple should now be placed in the mouth, and the end of the bottle suddenly tilted up. Of course the result will be a gush of milk down the throat. Almost instantly the end of the bottle is to be again lowered, and after a few moments' interval re-elevated, and so on. The feeding is to be conducted by a series of jerks. A spoon may be used, but it is troublesome and not nearly so effectual.

An ingenious contrivance by Mr. Oakley Coles Artificial palate. consists in attaching to the stalk of the ordinary nipple of the feeding-bottle, an elastic flap cut to fit the palate. During suction this is forced back and forms an artificial palate, which prevents the fluid from entering the nose.

By such means an infant with a cleft palate may be thoroughly nourished and kept in good health till baby-hood has passed. Afterwards there Surgical relief at proper age will be no difficulty, and at two or three years

CHAP. IV. — of age the surgeon will be able, in the majority of instances, altogether to remedy the defect.

Section III.—After the First Day.

The first day of the child's life having been conducted in the way described, and the mother having assumed her natural function, the subsequent general management of the infant should be as follows :—

Ablution.

It has been said that the first washing may be hastily performed, but this is not admissible with any subsequent ablution, which must be thorough and daily repeated. The word "ablution" is used advisedly in contradistinction to bathing, for the child ought not again to be plunged into the bath till the navel-string has become detached, the object being to preserve the string from any contact with moisture, which in India will cause it to smell abominably; besides which, moisture has the effect of prolonging its retention for some days. If the string be kept perfectly free from water, it will soon become hard, dark-brown coloured, as dry as a chip, without the faintest odour, and it will usually fall off on the third day.

The navel string.

Nursing.

The infant should be nursed frequently, about every second hour day and night, and no unnecessary artificial food should be given to it, for the reasons previously entered into (p. 32). Whether or not the mother's milk be apparent, there need not be the slightest fear of starvation, (the argument with which the nurse is pretty sure to appeal to the mother's feelings), unless indeed an aperient has been wrongly administered (p. 34).

The bowels will probably be relieved three or four times each day. On the second day, the evacuations will become of a yellowish colour, the black matter having been for the most part purged off by the first milk; but whether this be completely so or not is a matter of no importance, though it will be urged by the nurse as a reason why the castor oil, which previously had been objected to, should be now administered. In very exceptional cases, where the mother's milk does not possess the requisite aperient properties, it may be advisable on the third day to allow half a small egg-spoonful of castor oil mixed with warm water, to which a couple of grains of carbonate of soda have been added. By this time the conditions which before rendered a purgative directly injurious will have passed away.

It may here be remarked that during the whole course of a human life there is no period at which thorough ventilation is so much needed, and is of so great importance to vitality (both of mother and child) as it is during these early lying-in days. Dr. Payne, with much labour, has *proved* beyond all gainsaying, the frightful effects upon infant life, of the conditions in which the lying-in rooms of the native mothers of Calcutta, are maintained; crowded, every aperture closed, and stifling to the senses. No wonder, then, that one-half the children born to them, die within the first fifteen days of life, by a "process of asphyxiation!"

The early removal of all fouled linen and evacuations of both mother and child is a matter

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Effects of dirt
and foul air.

of much importance, and one which if neglected is calculated to affect very injuriously the health and life of the child, more especially in small apartments. There are certain diseases to which the infant is liable under insanitary conditions, particularly in a hot climate, during the first ten or twelve days of its existence which are known to be the direct effect of foul air and dirt; for instance, the native infants of Calcutta die largely from lock-jaw, an almost hopeless condition, which is all but unknown among the European infants of the city, and which is the direct produce of dirt and foul air.

Warmth.

Warmth is still very essential to the infant's well being; it must not be the warmth of foul air but the imparted heat of the mother. Foul air will not impart heat, nor will fresh air cause colds or chills. Foul air is at this time a most effectual poison; fresh air conveys life and health, and by increasing the vitality, greatly helps to augment the growth of natural internal heat.

Yellow
coloration of
the skin.

Very frequently an infant's skin becomes of a yellowish colour about the third or fourth day of its life. The coloration may deepen for a day or two and then it will as gradually subside. This condition is not one of jaundice, but is due to the changes which the blood is undergoing in the over-congested skin (West), and is of a trivial importance, requiring no treatment. It is, however, certain that want of warmth and of ventilation contribute to its appearance.*

* Should the whites of the eyes become yellow, then true jaundice is present, and the affection is no longer to be considered trivial, but this is very rare.

CHAPTER V.

NURSING AND TOPICS RELATIVE TO IT.

As during the next six or seven months of its life, the infant should depend wholly upon its mother's milk for its nutriment, we may briefly at this place say a few words concerning "nursing."

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I have never known injury to be inflicted upon a mother's breast by the application of her infant, before the white milk was to be seen ; or, as soon after birth as possible (see also p. 33). The mother should not partake of much fluid till the sense of distention of the breasts has passed off, but when the infant has been sufficiently early applied, there is seldom any trouble on this score. The relief of her bowels daily, by the assistance of simple warm water injections, will materially tend to lessen the likelihood of such an occurrence ; it may, however, be sometimes necessary to employ fomentations and gentle frictions aided by oil, to relieve a painful hard breast. The frictions should be very lightly performed, the hand barely touching the skin when passing from the nipple towards the edge of the breast, but being

General
management
of the mother.

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Hours of
nursing.

pressed with gentle firmness when travelling in the opposite direction.

It is usual to lay great stress upon the observance of regular hours in nursing. No doubt it is desirable that some effort at regularity should be made, but as a matter of fact it is impracticable to effect much, at a very early date. It is impossible to insist that the child have its food only every second hour; still, as age advances, education ought to effect a great deal, till a very near approach to regularity be attained by about the end of the first month, if the child be healthy and the management has been good. If it can be accomplished, every second hour during the day and every third hour at night will then suffice, till about the end of the second month, when about an hour may judiciously be added to the daily periods, while an interval of five or six hours ought to be attained at night, and a gradual increase should be maintained as time passes.

Evils of
continual
suckling.

The continual application of the child to the breast weakens the mother by the abstraction of more than nature intended to yield, and deprives her of rest. It does the child no good; on the contrary, it brings on indigestion, rejection of milk, flatulency and diarrhœa from over-feeding. The mother should try to teach her infant not to feed so frequently at night as during the day-time, wherefore it is well that it sleep in a separate cot, except in very cold weather and while very young,—say for the first fortnight or three weeks.

“ An infant should not receive its nourishment

lying down" (Deweese). The semi-erect posture is the proper one to adopt; exactly that position in which a mother naturally places her child, when she sits in a chair, nursing. The muscular power of swallowing is, in the infant, very feeble, but with the semi-erect position, we avail ourselves of gravitation; the child, when so placed, actually obtains more nourishment, and the apparently causeless rejection of milk is then much less frequent.

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Position
during
nursing.

As to the food the mother should use during nursing:—she should abstain from very few things, and be careful to use a variety. Of course, during the lying-in period, the usual simple diet should be employed, but of this I say nothing. Subsequently she should eschew hot curries and highly seasoned dishes of all kinds, salads, radishes, and uncooked vegetables generally, lobsters, tinned provisions generally, and an excess of solid meat.

The nursing
mother's diet.

Rice, tripe, whipped eggs, sago, tapioca, barley, boiled milk, raw eggs, lamb, parsnips, roasted and baked potatoes, and fricasseed chicken are the most easily digested substances in the order here given: the rice disappears from the stomach in 1 hour, and the fricasseed chicken in 2½ hours. Beef, pork, mutton, oysters, butter, bread, veal, boiled and roasted fowls are less digestible,—roast beef disappearing from the stomach in 3 hours, and roast fowl in 4 hours. Salt beef and pork disappear in 4½ hours (Parkes).

She should be particular to partake of a sufficiency of vegetables and good fresh meat. There is a prejudice on the part of nurses against vegetables, particularly potatoes. Such folly is based upon ignorance—indeed, we may term it, dangerous ignorance. A nursing mother differs not from the rest of humanity as to the laws which

Vegetables
essential.

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Beer and
wines.Nursing no
drain.

Thirst.

govern the physiological process of nourishment, and these declare that if fresh vegetables be excluded, or even very sparingly partaken of, a scorbutic taint of the blood is engendered, which impairs, more or less, the general health, unfitting the mother for suckling, and rendering her milk unwholesome for her infant. Many times have I succeeded, by this advice, in enabling a mother, who never before had done so, because she had previously held fast to the theory of the necessity for, excluding vegetables, to nurse her child, with perfect health to herself and infant. With such an unfortunate conviction is allied another, namely, that it is essential during nursing to consume a considerable proportion of beer or wine. It is alleged that milk is thus created, and the drain of nursing upon the system is urged as a reason for the necessity for "support." Spirituous liquids *do not* lead to the formation of milk in any degree whatever, and their use in no way compensates for the lack of a proper admixture of food in the diet; nor is it true that nursing is a drain upon the health of any moderately healthy woman—on the contrary, it is known to be beneficial, and that women generally improve in health during its progress. A nursing mother requires, it is true, more fluid than others. She is frequently thirsty. To relieve this thirst, she should drink gruel or barley-water, or milk and water, which, besides being drinks, are really nutritious, and therefore milk-forming. Thorough nourishment of the system is certainly demanded, but she does not

need extra stimulation, which will' render her feverish, heat her blood, and deteriorate her milk. The usual glass of ale or stout, need not be denied at dinner-time, and also, at tiffin if desired, but such an allowance is ample ; more is injurious.

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Fresh air and exercise are essential to good nursing, but over-fatigue should be carefully avoided. A point seldom attended to—possibly but little known,—is that immediately after exhaustion, violent exertion, fright, or a fit of passion, a woman's milk is unfit for an infant's nourishment. Instances of the breast-milk having proved fatally poisonous immediately after great terror, are on authentic record ; such, however, are rare ; but diarrhœa, nervous irritability and general indisposition, are symptoms which usually show themselves under these circumstances.

Effects of
fright.

Should a mother happen to menstruate during the suckling period, it is an unfortunate occurrence, but it is not one which should prevent her continuing to nurse, unless the ordinary period of weaning be at hand. Usually, the infant, during the days the function continues, will show some signs of indisposition, generally slight, but which if at all severe and recurring, proclaim the mother unfit to continue her office ; otherwise it is unnecessary that she desist.

Menstruation
during
suckling.

The European mother is usually able to nurse for about eight or nine months, if she takes care of her health ; but a robust native nurse may often be permitted to continue her duties for a full year.

Duration of
nursing.

Sometimes it happens that a mother is unfit to suckle her infant. (1) Severe constitutional

When unfit
to suckle.

debility, the result of malarial fevers or the influence of the climate, may be a justifiable cause for non-compliance with the dictates of nature, but fortunately it is not a frequent reason, for the general health usually improves during nursing, and the alleged "drain" of suckling upon the system is a fallacy, in most cases. Sometimes, however, it will prove a reality. Because there have been occasional attacks of ague, or because the system is a little below par, is no sufficient reason that nursing should not continue to be conducted; but the debility may be such that the quality of the milk is much deteriorated and unfit for the child; or there may not be sufficient glandular activity to supply the fluid; or, being supplied, there may not be sufficient general inherent vitality in the mother to compensate for the loss. Except where the debility is considerable and of long duration, the effort is not only justifiable, but it is a duty. A trial should at least be made. (2) A mother who is subject to epilepsy or other violent paroxysmal nervous disorders should not nurse, both for her own sake and that of her child. (3) Abscesses of the breast, if severe, compel non-nursing. (4) The continual recurrence of intermittent fever is also a fair cause for desisting. (5) The occurrence of pregnancy is opposed to good nursing. The quality of the milk then greatly deteriorates, the mother's system not being able to nourish both the babe at her breast and that in the womb at the same time. (6) If after a fair trial it be proved that the secretion of milk is too scanty to be practically of

any use, there is no object in continuing a fiction, but unless the mother be prepared to obtain the services of a wet nurse, it is her duty to continue to give what nourishment she possesses, provided her own health do not suffer, to the infant. Even such very partial feeding increases the chances of the child's life. (7) The nipples may be so retracted as to present a serious difficulty. This point should have been attended to before confinement, otherwise the obstacle may be great; but suction, or the use of Maw's "nipple shield with elastic tube," will usually remedy the defect, if properly employed. Very seldom should this cause be permitted to conquer and to drive the child from its mother.

Assuming it to be decided, that the mother, from **Wet nurse.** one or other of the foregoing causes, is unable to suckle her infant, there remains but the choice between hiring a wet nurse and adopting artificial feeding. That the advantages of the former course are incomparably greater will presently (Chap. vi.) be shown. We are therefore led to consider the **Selection of** question of the selection of a wet nurse. It is a matter for congratulation that in India, the much discussed disadvantages connected with this class of servants, are reduced to a minimum, as compared with England. A wet nurse should be (1) young but not youthful,—never under 20, seldom over 30. **Necessary qualification** (2) In good health; well nourished, with a sleek skin, free from all eruptions or appearance of former eruptions; free from enlargement of the spleen; possessing a good set of teeth; a clean tongue; sweet breath, and without enlarged glands

in her neck. (3) The date of her confinement should approximate that of the age of the child she undertakes to nurse.

This is of importance, for the milk varies in nutritive properties in definite proportion to the age of the child. The milk of a woman whose child is 6 months old, even though she have plenty of it, is not fit nourishment for a baby of 3 or 4 weeks of age. It contains too much of some constituents and too little of others.

(4) The breasts of the candidate should be firm and plump, not hanging loosely down, and should contain a good supply of milk of a bluish colour, and which on standing should yield a cream.

"The best test of the goodness of milk," observes Dr. E. Smith, "is derived from observation of the child. He should be watched while at the breast, and if he sucks vigorously, finishes the meal with the milk running down over his lips, and requires suck but five times in the day, we may infer that the milk is sufficiently abundant. If, on the other hand, he constantly requires the breast, sucks laboriously and with effort, occasionally desisting, and crying peevishly, the milk is probably scanty. As an additional test the infant may be weighed immediately before and after taking the breast. The increase in weight should be from 3 to 4 ounces, according to age."

(5) If the woman be menstruating she should be rejected. (6) She should be of a patient and cheerful disposition.

Enquiries to
be made.

Enquiries should be made (1) into her previous history, concerning any illnesses she may have had, whether she ever suffered from any sickness which involved prolonged sore throat, eruptions of the skin, or ulcers. If such be the case, she should be rejected. (2) Concerning her husband and his health, present and past, the enquiries last named should be instituted. (3) Inspect the

woman's infant, assure yourself that it is hers and not a borrowed one, consider its age with regard to her statement upon the point, observe whether it presents a healthy appearance generally, and be particular to notice whether there are any sores between the buttocks or at the corners of the mouth. The presence of such sores would call for the rejection of the candidate. (4) Let particular enquiry be made as to whether the woman is in the habit of smoking ganjah or opium; should either be the case, she should be rejected. (5) Under inspection, the breasts should be emptied by her own child, or artificially, and the woman directed to present herself again after the lapse of a few hours, in order to ascertain whether she really possesses a sufficient supply of nourishment, and that she has not attempted fraud by having permitted a large accumulation.

With due attention to all these points, a wet nurse having been selected, her future management becomes of importance. In the first place she should have a warm bath and wash thoroughly all over, after which, and when clad in clean warm clothing, she may commence her duties. The next thing is to be careful not to overfeed her, or even to place her too quickly on a liberal diet; but to have due regard to her previous diet and mode of life. By sudden overfeeding, the milk may very greatly diminish or become so rank as to be injurious. Let her be employed as much as possible in general household duties to ensure a due amount of exercise,

Future management of wet nurse.

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and cause her to move about occasionally, with the infant in her arms, to provide for its due exercise. A wet nurse when hired is too frequently allowed to moon-away her time in idleness. She is then apt to lose her milk, indigestion will set in, she will become feverish, and her milk unwholesome and irritating. To violent exertion, she should never be subjected (p. 47). Do not allow the child to sleep with the nurse at night. See that regularity as to its meals be observed, and that it be not continually hanging on to the breast. Hot curries, chutnies, or too much meat must not be allowed to the nurse. Be very particular that vegetables constitute a due proportion of her diet. Allow her plenty of sleep. Be sure that the woman's own child be kept at a distance, lest she devote part of her nourishment to it. For further details the reader is referred to the section on "nursing" (p. 43).

Teach the
bottle.

After the first 10 days or so of life have passed, it is well, in India, to "teach the bottle" to an infant, because of the liability to intermittent fever and other derangements, which may temporarily unfit a mother or nurse for suckling. It is not recommended that the bottle be employed at this period for the administration of nourishment, but merely that its use be taught to the infant with a view to enabling it to meet emergencies. A single teaspoonful of milk with 4 or 5 of warm water and a minute portion of sugar, given through the bottle, once a day, will effect the needful education, which, if not commenced early, will only be accomplished subse-

quently, with great trouble and delay, if at all. CHAP.
The old-fashioned *feeding-bottle* without tubes of Feeding
bottle.
any kind is to be preferred, because it can with
great facility be thoroughly cleaned, any particle of
old food adhering to it being readily seen, except
if concealed in the nipple, which should always
stand in a glass of cold water when not in use ;
and because it ensures due attention to the
process of feeding on the part of the nurse, who
is compelled to hold the bottle in her hand all
the while.

CHAPTER VI.

THE PRINCIPLES OF DIET,

AS APPLICABLE TO CHILDHOOD—MILK—FARINACEOUS FOODS—
INTERMEDIATE FOODS—WATER.

CHAP. VI.
General principles of diet.

HENCEFORTH it will be impossible to follow the child's life step by step. We must therefore consider each point involving its existence in detail. To enable the parent to understand the proper mode of feeding her child, it is desirable to state briefly the general principles of diet as applicable to the infant.

What is an alimentary principle?

Every human being, whether infant or adult, must consume not only nourishing food, but he must have a proper admixture of the different elements of food, or alimentary principles, as they are termed. Bread, for instance, is a food, but it is not an alimentary principle; on the contrary, it contains some of all these principles. A pudding is a food, but we know that it has been made with so much flour, so much butter, so much fruit, &c. Any one article of food which can be named is just as much a mixture as is a pudding. Milk is as simple a food as can be conceived, yet in reality it is a complex mixture of the different alimentary principles. We know that it contains a quantity of water, which is an alimentary prin-

ciple ; that it contains oil (termed butter), which is another principle ; that it contains curd, which, when freed of fat, is another, and so on. The same holds good of bread, or beef, or vegetables, and all other foods. This is what is meant by alimentary principles, which are classified as follows* :—

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1. The flesh-forming or albuminous.
2. The heat-forming, consisting of the starches, fats, and sugars.
3. The salts, which are necessary to preserve other substances in solution.
4. Water, necessary for fluidity.

Classification

Of each and all of these, humanity must have some in its food. Instinct leads a healthy individual to consume a proper proportion, the appetite being the guide, and it is a wonderful fact, that the ratio of one to the others, never varies in anything but a comparatively trivial degree. The infant, or the young of any animal, is provided for by the secretion of its mother's milk, the constituents of which contain the exact alimentary proportions necessary for its perfect nourishment. Cow's milk, for instance, contains in 100 parts, roughly speaking, $4\frac{1}{2}$ parts of albuminous and $8\frac{1}{2}$ parts of heat-forming substances, $\frac{1}{2}$ part of salts, and $86\frac{1}{2}$ parts of water.

All must exist in food.

As life proceeds, the requisite proportions alter greatly, so that in ratio to its weight, the child of ten requires three times as much heat-producing

Proportion vary with a

* Scientifically this classification is not altogether accurate, for the fats and starches are not really convertible elements in nutrition, as might be inferred from the arrangement in the text.

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food as does the adult, and six times the proportion of albuminous nutriment. Again, the child requires a greater proportion of food relatively to its size than does the adult, because of its extremely rapid growth, by which much nutriment is utilised for the building up process; because the waste consequent upon the ever active life is great; and because respiration, which is one of the chief means of combustion or consumption of material, is especially active in childhood.

Milk unsuitable for all ages.

These conditions change further with age; hence the qualities of the food must also change. An adult, for instance, could not be wholly fed upon milk, because, to enable him to obtain a sufficiency of albuminous aliment, he should consume not less than eleven pints daily, and then the amount of fat would be greatly in excess.

Effects of exclusion or improper proportion.

A human being cannot exist upon any one class of aliments, nor yet upon any three to the complete exclusion of one. If an animal be fed exclusively upon any one for a period, its health will rapidly become impaired to such an extent that even a return to its natural diet may not save its life. Similarly, if inferior milk be given to an infant, or if the artificial milk be improperly prepared by too much or too little dilution or otherwise, it follows that evil results will assuredly ensue, because there will be excess or defect of some one or more of the ingredients.

The salts; their nature and use.

The expression "salts," it should be noted, is by no means analogous with what is implied when we talk of common salt. They are com-

pounds of lime, soda, and potash, and are of great importance in the vital process, as they are especially concerned in the currents of nourishing fluids which pervade every part of the body, including the glands of the breasts, which, without their aid, would not be able to secrete perfectly; hence, as before stated (p. 45), the mother who excludes vegetables from her dietary runs the risk of losing her milk and impairing her health, while she denies her infant those numerous salts which are essential to its perfect nutriment, and which should be largely obtained to her blood and her milk, through the judicious use of proper vegetable food.

MILK.—In all kinds of milk the four great principles exist, though in very varying proportions, as the following comparison will show :—

(PAYEN'S ANALYSIS, QUOTED BY PAVY.)

Analysis of Milk.

Kind of Milk.	100 parts contain		The Solids consist of		
	Water.	Solids.	Fatty.	Albuminous or flesh-forming.	Sugary and Saline.
Woman's	89.54	10.66	3.34	3.35	3.77
Cow's ..	86.40	13.60	3.70	4.55	5.35
Goat's ..	85.60	14.40	4.10	4.50	5.80
Ass's ..	90.50	9.50	1.40	1.7	6.40

A moment's perusal of this table will render it intelligible that the young of animals fed upon each of these milks in reality obtain a wholly different kind of food, and it requires no argument

The varieties represent different kinds of food.

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to convince that the milk of one is therefore an unsuitable food for the young of another. Compare the milk of the cow with that of the woman, and observe that while the amount of water is less, that of the solids is much greater, the fatty, saline, and albuminous matters being in excess, while the sugar is diminished. Hence it is usual to reduce the quantity of butter and curd by dilution, and to add sugar in order to imitate the woman's milk; but no proportion of dilution will effect an exact imitation.

Ass's milk.

It is usually believed that ass's milk is the nearest in quality to that of the woman, but this is an error. It contains more water but is much poorer in curd and butter, and has about twice as much sugar and salts; but it is sometimes very valuable for children who are too delicate to bear cow's milk, it being very easy of digestion, though sometimes it causes diarrhœa owing to excess of salts. If a healthy infant be fed upon ass's milk, twice as much will be needed to make up the necessary quantity of butter and albuminous substances, but then the salts and sugar will be much in excess. Ass's milk, therefore, is not an appropriate food for a healthy infant. The addition of cream would remedy the chief defects, but cream is not easily obtained in India.

Cow's milk.

The milk of the cow is the closest approximation, though each kind of the solid ingredients is in excess.

Goat's milk.

Goat's milk is richer in solids, and both the sugar and salts are much in excess. Still this milk may be used with great advantage for the

rearing of children. But the goat is a very promiscuous feeder, and it is well known that the nature of the food greatly affects that of the milk. It is quite familiar to everyone that purgatives administered to a nursing mother, will readily produce an effect through her milk upon the infant's bowels. Hence it is needful that a goat whose milk is used, should be tied up within the range of only wholesome food. Neglect of this precaution has led to a prejudice against goat's milk, which is frequently found to produce irritating effects when the animal is allowed to wander about.

Examination of milk.—The lactometer is usually relied upon by the public as a means of judging the quality of milk, but it is a faulty instrument, because, although it may, in the cold weather sink to the letter M which is supposed to indicate that the milk is pure, the very same quality of milk, in the hot weather, will appear when tested by it, to contain 15 or even 20 per cent. of water. It is better, therefore, to use the hygrometer (fig. 1), (which is the same instrument, except that in place of a letter indicating the purity of milk, and figures representing that so much water has been added, there is a scale of figures from above downwards—0, 10, 20, 30, 40 and 50, between which there are graduations indicating units), and to apply a

Examination
of milk.

Lactometer is
a faulty
means.

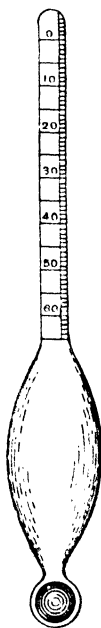


FIG. 1.

Hygrometer.

CHAP. VI. correction for temperature, which Parkes gives as follows :—

39° F = 1031	80° F = 1027½
60° F = 1030	90° F = 1025½
70° F = 1029	100° F = 1024

That is, at any of these temperatures, the hygrometer will mark the specific gravity as above, if the milk be pure; but if the specific gravity, as read on the hygrometer, be lower, it is an indication that water has been added. If, for example, the temperature of the milk is found to be 65°, and the specific gravity to be 1025, we know that a considerable quantity of water has been added, though had the temperature of the milk happened to have been blood-heat, the above specific gravity would indicate purity. In this example, we see by reference to the table that the specific gravity ought to have been 1029½, instead of 1025, which represents a loss of 4½°, showing that 15 per cent. of water has been added.

There is a loss of 3 degrees as marked on the hygrometer for every 10 per cent. of water added when the temperature of the milk is about 60 degrees.

Thus pure milk will mark	.	.	.	.	.	80*
Milk diluted with about 15 per cent. of water	.	.	.	.	.	26
do.	20	do.	.	.	.	23
do.	35	do.	.	.	.	18
do.	45	do.	.	.	.	15

When milk has been skimmed, even though it may be diluted with water, the specific gravity will be higher, and similarly a milk which is particularly rich in cream will show a lower specific gravity. Hence another source of fallacy in this method of estimating the quality of milk. As a matter of fact, chemical analysis, is the only reliable means.

* These numbers are to be read as 1030, 1026, &c., water, which is the standard, being 1000, and marked 0 on the scale.

Another very simple plan is to gum a piece of paper which has been marked into 100 equal parts, to the outside of a long glass tube, the lower numbers being uppermost. Fill it with the milk to be examined, and allow it to stand for 12 hours at least, in a place sheltered from all wind. The cream will rise to the surface and the number of degrees (that is the percentage) occupied by it, may be read off. Usually it ought to occupy 8 degrees; but it may amount to more considerably, though even something less is not conclusive as to the addition of water. Macnamara objects to this test for India, because the climate causes such rapid coagulation of the milk that it prevents the cream rising rapidly, but in the cold weather the objection does not apply.

Cow's milk ought to be faintly acid, and this is ascertained by dipping into it a scrap of litmus paper (which is of a blue colour, but) which will turn pinkish or red, if acid be present. Of course if chalk has been added, the litmus paper will not change colour. Woman's milk on the contrary is alkaline; it will never turn litmus paper red. For this reason, before cow's milk is given to a baby, it is usual, indeed it is necessary, to add a proper proportion of lime-water to it. This removes the acidity, a fact which should be verified by the use of litmus paper, some of which should always be kept in the nursery.

It is well known that milk will soon curdle if it be exposed to hot weather, or if it has been kept in a vessel which contained any traces of former milk which had turned sour; but the housekeeper

CHAP. IV.

Another plan.

Cow's milk is acid.

Woman's is alkaline.

Use of Litmus paper.

Milk curdles in the hot weather,

CHAP. VI.

Milk curdling
upon being
boiled.

may sometimes be sorely perplexed by the fact, that milk, which has been seemingly all right, upon being boiled, curdles and becomes unfit for use. Now this is accounted for easily enough—fermentive change has already commenced, and the lactic acid thus generated is insufficient to produce a manifest effect at ordinary temperatures, but it is sufficient to do so at a greater heat. Such an occurrence, therefore, argues that the milk has been in contact with an impure vessel, or that the boiling has been delayed till the weather has had time to commence fermentation.

When boiled
milk is less
nutritious.

It should be known that milk which has been boiled does not possess the same nutritive value to the young infant as raw milk, for there is a certain volatile principle driven off by the heating which possesses much value in assisting assimilation.

Quantity of
milk con-
sumed by an
infant.

As to the quantity of milk an infant requires ;—a series of experiments conducted in Paris by weighing infants before and after feeding, and other observations, have led to the conclusion that a healthy baby aged 3 months, will extract from its mother about half a pint of milk at each meal, and allowing five such meals daily, the total quantity will be about $2\frac{1}{2}$ pints. This fact will serve as a guide to the quantity of food an infant, which is being artificially fed, requires.

Alterations in
the quality of
breast-milk
with lapse of
time.

The length of time which has elapsed since confinement, considerably affects the quality of the milk. The quantity of water and that of sugar diminish during the first month ; the

solids increase up to fourth month; the butter increases up to sixth month; the salts at first slightly increase and then decrease. Hence the necessity for the date of a nurse's confinement approximating that of the birth of her nursling.

CHAP. VI.

The sugar which milk contains is not the substance which we know by that name. "Sugar of milk" closely resembles grape sugar in quality, and it comports itself similarly in the stomach. Sugar of milk may be procured from the chemist, and should always be preferred to common sugar for addition to infants' food, when it can be obtained.

Sugar of milk.

FARINACEOUS FOODS.—All articles of a farinaceous kind, such as bread, arrowroot, corn-flour, sago, rusks, biscuit, &c., are in every way foreign to the diet of the infant before the period of dentition. "Constituted in great part, as these articles are, of a principle (starch) which has no existence in milk, and which requires to undergo a certain kind of digestion to fit it for absorption, it is presumable that the digestive organs are not adapted at this stage properly to meet the demand that is made when these substances are consumed. From the fact that they are light and nourishing for older children there is a popular tendency to regard them as forming suitable food for early infancy, but all authorities concur in condemning them as improper for use at such a period. It is true, later on they represent the most appropriate solid material to begin with, but this is when the digestive organs have reached a more advanced stage of development"

Farinaceous foods are foreign to the diet of early infancy.

Pavy's opinion.

CHAP. VI.

West's
protest.

(Pavy). Dr. West puts the case even more strongly: "You are aware," he says, "that physiological and chemical research have proved that food has two distinct purposes in the organism. The one to furnish materials for the growth of the body, the other to afford matter for the maintenance of its temperature; and that life cannot be long supported, except on a diet in which these elements bear a certain proportion to each other. Now in milk, the proper food of infants, the elements of the former are to those of the latter in the proportion of 1 to 2, while in arrow-root, sago, and tapioca they are only as 1 to 26, and even in wheaten flour only as 1 to 7. If to this we add the absence of oleaginous matter, which the milk contributes to supply the body with fat (and which can be eliminated only by a conversion of their elements, to which the feeble powers of digestion in early life are not equal), and the smaller quantity and to a certain extent the different kind of the salts which they contain, it becomes at once apparent that by such a diet the health, if not the life, of the infant must almost inevitably be sacrificed." "A child is not nourished," observes Dr. Eustace Smith, "in proportion to the bulk of the food he receives into his stomach. He is only nourished by the food he can digest. . . . Among the poorer classes children are commonly fed upon farinaceous food as soon as they are born. This, of course, they are totally unable to digest. As a consequence they dwindle and rapidly die, or if of a particularly robust constitution, linger on, weak, ailing, and

E. Smith's
experience.

rickety, until an attack of bowel complaint or other intercurrent disease carries them off." CHAP. V

So immensely important is the appreciation of this matter, that I have preferred thus to quote acknowledged living authorities than to give my own words. I am convinced that one of the chief causes of the lamentable mortality of the soldier's child in India is due to ignorance of this great fact so plainly and so forcibly set forth above. Farinaceous food is *never* to be substituted for milk, nor should it be presented to the infant in any form or quantity till dentition justifies it. Rest assured that should ignorant anxiety lead to deviation from this simple rule the mother will, in nine cases out of ten, rue the result. Even after the teeth proclaim the fitness for more than mere milk, too large or too sudden an addition of this class of food, will pretty certainly be attended with illness. Without a sufficiency of milk, and with the addition of a useless and irritating substance, the child can only live through accident, so to speak,—the chances are it will die.

An infant's digestive system, in its anatomical details, resembles, to some extent, that of the flesh-eating animals, especially in the shortness of the length of the intestine, indicating that it is fit to receive only animal food. The saliva is not secreted at all during the first few months. A general transition is, however, gradually working, which is partially effected when the teeth appear, at which time saliva is being secreted, and starch in very moderate quantities can be digested. Saliva is as necessary to the digestion of starch as

Immense importance of this matter

Anatomic argument against farinaceous in early infancy.

CHAP. VI.

is fire to the baking of the loaf. The system becomes each month more and more fitted to utilize farinaceous food, and milk alone becomes less and less adapted for sole and perfect nutriment, though it still must constitute by far the chief proportion.

Results of
such food
before the
proper time.

Farinaceous food, it then appears, before the system is ready for it, is, in the first place, an irritant (and as such indirectly a poison), and, in the second place, it will effectually starve the infant.

But milk is
the only kind
of animal food
wholly suit-
able.

Let it not be argued that animal food being anatomically indicated, soups, &c., may with impunity be substituted for milk. Such would be a fallacy, less fatal than unbounded belief in corn-flour and arrowroot, it is true, nevertheless fatal.

Nature, in
due time, pre-
pares for other
kinds.

For such forms of animal food, as well as for farinaceous substances, nature, in her own good time, will effectually prepare the way, but she will not brook being tampered with; she will resent interference in a manner which usually conveys a warning, but which renders resistance, not only futile, but disastrous.

Intermediate
Foods.

INTERMEDIATE FOODS.—There is a class of malted foods, which the genius of Liebig has given to the world; but as it will be more convenient to discuss them, when investigating the subject of artificial feeding, their consideration will be deferred for a future page (Chap. ix.) It will suffice to mention here that this class consists of farinaceous foods which have been chemically acted upon, whereby many of the objections stated in the last section are completely removed,

Peculiarities
of.

the work of the salivary glands is already accom- CHAP. I
plished and the irritating properties are removed.

Unfortunately, the public usually regard these Popular e
foods as simply varieties of the usual "infant
foods" which are everywhere puffed and adver-
tised; but they are nothing of the kind. It is
hoped that the remarks and explanations subse-
quently to be made, will lead some to appreciate
their value and to use them with discrimination.

WATER.—As a very important article of diet, it Water.
is essential to understand many things about
water.

The child, in proportion to its size, requires Liberal s
more water than the adult. It is a cruel and a necessary
hurtful thing to deny the free use of water to
children, as is sometimes done. The error of
taking too much is not likely to be committed, if
it be pure; but without a sufficiency the mobility
of the fluids (that is, the process of nutrition) is
directly impaired, the in-coming nutriment is not
thoroughly dissolved, nor is the solution of the
worn-out tissues (waste) sufficient to enable their
excretion through the kidneys, skin, lungs, and
bowels.

It is quite possible that a child may get the
habit of drinking water more constantly than is
necessary, and it may even be right to check the
habit to some extent. But what harm can an
abundance do? Very little, if any, while short
commons may do much. Fortunately the sensa-
tion of thirst is so imperious as to permit but
little interference. There are circumstances under Circum-
which it may be right to withhold water for a stances

CHAP. VI.
—
justifying
restriction.

short time, but they are very rare. I do not think a child should be allowed to acquire the habit of drinking largely at the commencement of a meal, because the heat which is in the stomach, and which is necessary to digestion, is abstracted. A little later on in the meal, when the stomach has "warmed" to its work, the objection vanishes. In many cases of prolonged and debilitating illness, the drink as well as the food should, for this reason, be given only after having been slightly warmed, although cold food and drink may be more agreeable.

Physiological
reasons for
free supply.

The plentiful supply of cold drinking water is one of the most powerful means of reducing the heat of the body, and it is also essential to supply the great loss by perspiration. "After compensating for the loss by the skin and with the breath, the surplus passes off through the urinary channel, and it is desirable that this surplus should amply suffice to carry off the effete products forming the solid matter of the urine in a thoroughly dissolved state. The notion has been started that it is advisable to restrict the amount of fluid taken with the meals with the view of avoiding the dilution of the gastric juice. Whether as the result of the influence of this notion upon the public mind or not, mischief, I believe, is frequently occasioned, especially amongst the higher ranks of society, by a too limited consumption of fluid. . . . It is a mistake to suppose that when we drink with a meal we are diluting the gastric juice. The act of secretion is excited by the arrival of the meal in the stomach, and the

"Dilution of
the gastric
juice"—a
fallacy.

gastric juice is not there at the time of ingestion. It happens, indeed, that the absorption of fluid takes place with great activity, and the liquid which is drunk during a meal becoming absorbed may be looked upon as proving advantageous by afterwards contributing to yield the gastric juice which is required" (Pavy).

CHAP.

On the
contrary
water
increases
producti

But water is liable to many impurities, and it is very essential that the importance of a really pure supply be understood. A very hard water is apt to cause dyspepsia and perhaps stone in the bladder. "There is conclusive evidence to show that the most serious consequences have arisen from water polluted with organic matter. This, in fact, is the impurity that is most to be dreaded. Outbreaks of diarrhoea have been very distinctly traced to the use of contaminated water of this kind. It is acknowledged to be one of the most common causes of dysentery, and has been alleged, when derived from a marshy district, to be capable of inducing malarious fever and its concomitant enlargement of the spleen. From the facts that have been recently made known, there can be no doubt that typhoid fever has been frequently communicated through the medium of water. Some well-established instances have lately been brought to light where milk adulterated with polluted water has been the cause of serious outbreaks of fever. . . . Cholera is another disease which may be considered as having been traced to contaminated water, and probably this forms the chief mode of its spread through a community" (Pavy). Several forms of intestinal

Evils and
dangers
drinking
impure
water.

CHAP. VI.

Ordinary
modes of
contamina-
tion.

worms may also be propagated through the medium of water.

The ways in which water is liable to contamination in India are numerous. The bheestie's rope and leathern bucket are often kept in a dirty hovel, and when polluted, it may be with distinct disease germs, lowered into the well; the sides of tanks are used as convenient places for the offices of nature; drainage from foul surfaces is permitted to trickle or percolate into wells; washing and bathing take place near wells, &c. Then, the bheestie is often not too particular whence he obtains his supply, provided it saves him a journey; the interior of his mussuck is frequently contaminated by drawing foul water for horses, &c., and subsequently filling the same mussuck with the domestic supply. Nor is the milk-man over careful whence comes the diluent which he deems essential to his profits. Again, in a warm climate where fermentive changes are so rapid, contaminated water is doubly dangerous, particularly when added to an animal fluid like milk, which fosters germination and the growth of disease germs.

Waters to be
avoided.

Tank water, being liable to so many sources of contamination, should, as a rule, be avoided. Water taken from a large and quickly-running river is usually purer in spite of the impurities it receives, because its motion acts as a purifier. Water obtained from a source closely surrounded by the dwellings of men should be avoided; surface and marsh water should be rejected as unfit for use.

The drinking water should always be filtered; but the old gurrah sand and charcoal filter, with its open surface, should not be used. Some years ago, Dr. Macnamara showed the fallacy and even danger of those filters.

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Filtration.
The "old
gurrah and
sand" filter
to be avoided

Since then, Dr. Lewis, who has added so much to our knowledge in many matters, has connected the mosquito, which deposits its larvæ on the edge of standing water, with certain kinds of microscopical entozoa which he discovered in the blood of man, and which are disseminated in swarms, causing to its victims, bloody urine and elephantiasis, and producing nervous and febrile states.

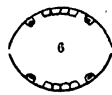
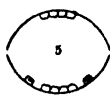
The ordinary compressed charcoal filter is that which is commonly used, and a most efficient purifying medium it is. But the purifying powers of filters have a limit,—a point which is seldom thought of by their owners. Of course, the length of time that one will operate efficiently will depend upon the amount of impurity in the water. A filter should, however, be cleansed every few months. The following are Dr. Parks' instructions as to how to do so.

Best kind of
filters.

Every two or three months (according to the kind of water) air should be blown through, and if the charcoal be in the block form, it should be brushed. Then four to six ounces of the pharmacopœial solution of potassium permanganate (Condy's fluid), or 20 to 30 grains of the solid permanganate in a quart of distilled water, and 10 drops of strong sulphuric acid, should be poured through, and, subsequently, a quarter to half an ounce of pure hydrochloric acid in 2 to 4 gallons of distilled water. Three gallons of distilled or good rain water should then be poured through, and the filter is again fit for use. If sponges are used they should be removed from time to time and thoroughly washed in hot water.

How to
cleanse a
filter.

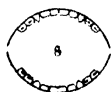
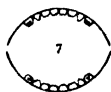
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4. The corresponding teeth of the upper jaw, at the tenth month.

5. The two front grinders of the lower jaw, at from twelve to thirteen months.

6. The corresponding teeth of the upper jaw at about fourteen months.



7. The four eye teeth in the vacant spaces, at from between the sixteenth to the twentieth months.

8. The second grinders between the twentieth and thirtieth months.

Origin of the second set.

Order of appearance of the second set, and shedding of the first set.

With the appearance of these twenty teeth the first dentition is completed. Strange as it may appear, the germs of the second set have also existed in the jaw from before birth, more deeply seated than those of the milk teeth. At about the 6th or 7th year a grinder appears behind each of those already existing, making a total of 22 teeth, and soon after their appearance, the central front teeth fall out, their roots having been absorbed by the advance of the young permanent set. About a year is occupied in shedding the four central cutting teeth (fig. 2) and another year by the four outer cutting teeth (fig. 4). During a third year the front grinders

(fig. 6) are similarly replaced. Next, the second temporary grinders, and lastly, the eye-teeth are shed at any time from $9\frac{1}{2}$ to $12\frac{1}{2}$ years, while a little later, four new grinders show themselves, making 28 teeth. Between 17 and 21 years, the last four grinders, or the "wisdom teeth," complete the full set of 32.

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Do not let it be supposed that the order above related is invariably followed. On the contrary, the deviations are numerous. Children have, rarely it is true, been born with teeth, and children have reached the age of $1\frac{1}{2}$ years without a tooth showing, but the above description is the general rule. Very frequently the side cutters of the upper, appear before those of the lower jaw, and very often the temporary eye teeth fall out before any of the grinders. As a rule, a healthy child teeths with a close approach to regularity. Delay in the appearance of the teeth usually argues want of development, consequent upon some constitutional fault; but strumous children frequently teeth very early.

Teething is frequently irregular.

Indication of delay.

In England it is an observed fact that the first dentition is passed through with less trouble during the summer than the winter, in the country than in large towns, and, as might be anticipated, by healthy children than by delicate ones.

Circumstances influencing ease of dentition.

Most of those who are best entitled to give an opinion as regards India, hold that teething is a process, which *per se*, proceeds with moderation, and such I am persuaded is the case. Sir R. Martin observes, "It may be said that

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Proceeds
mildly in
India.

Popular
tendency to
attribute all
co-incident
ills to
teething.

under ordinary care in diet and clothing the operation of teething proceeds kindly in the climate of India; and speaking from my personal experience I should say that severe teething irritation is seldom a primary affection, but that on the contrary, it generally follows upon previously existing gastric, intestinal, or fibrile disorder; and it is not too much to say that in 18 cases out of 20 these last are but the result of mismanagement and weakness, more common to the most civilized than to the most barbarous communities;" and he adds, with as much force as truth, "to read some books and to hear some people talk, one might be led to suppose that the teething process of infancy is a *morbid* one from beginning to end." Every affection, whether it be a trivial skin eruption, or a fatal diarrhœa, is usually attributed to teething, should such complications happen to occur during its progress. An unfortunate infant which is poisoned with corn flour to the exclusion of milk, dies of diarrhœa, or, during the course of this affection, a convulsion ends the brief life, whereupon, death is without hesitation attributed to teething. Another, carelessly exposed to malarial influences, is attacked with fever, and similarly perishes in a convulsive fit,—again, teething is blamed; while down the throat of a third, are thrust lumps of meat and highly-seasoned curries, and the usual bloody bowel evacuations which of course succeed, are, the parent thinks, due to teething.

For a moment, it is not intended to be affirmed that teething has no influence on the constitution.

It most undoubtedly has this influence, that the nervous system already, as before explained (p. 18), possessing high susceptibility, is somewhat more than usually exalted in its sensibility, as, indeed, may be very readily imagined; but it is not true that nature has subverted one of the natural processes of growth into a mode for slaying an indefinite number of infants. No doubt through carelessness and bad management, the mortality is higher during teething than if there were no such process in nature; possibly, even with all due care, a few of the more delicate might be cut off in consequence of the additional state of nervous tension, but teething never did kill anything like the number of infants whose deaths are attributed to it.

CHAP. VII.

The real extent of the effect of teething.

Here I would enter an earnest protest against the popular idea that diarrhœa during dentition is a natural and a good thing. So far as India is concerned it cannot be too clearly understood that diarrhœa is never a good thing, that let it occur under any circumstances there is always a very considerable element of danger in it, and that the convulsions which it is supposed to ward off during teething, are a common mode of death from purging, without any progress of dentition at all. Many and many an infant has been sacrificed by anxious mothers, who would willingly lay down their own lives for their children's sake, to this prejudice. The purging is not to be checked, because the child is teething, it is argued. The child becomes weaker and weaker, more flabby and more pallid. At last a

Diarrhœa during dentition.

The seriousness of permitting it.

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doctor is consulted, who sees through the case at a glance, he endeavours to check the progress of the drain (an effort in which he possibly may be thwarted, if an ignorant nurse or parent has any voice in the matter), but too late,—a convulsion ends life, and according to the popular theory, the purging having been checked or attempted to be checked, “it went to the head.” What the “it” represents it is as difficult to conceive as to explain.

General
management
during
teething.

The dribbling and crossness of the child, the swollen state of its gums, and its desire to bite at things,—when these signs exist, which is by no means always the case—show that the coming of the teeth is felt by it. When such is the case, we should naturally be particularly careful as to simplicity of food, avoidance of exposure to chills or sun, and of over-heated verandahs. We should keep the bowels regular, seek the open air, not permit diarrhœa or constipation, be careful to have the clothing adapted to the season, be very particular that sleep, which the warm bath will facilitate, be obtained in abundance; and, if necessary, have the gums lanced.

Propriety of
lancing the
gums.

As to lancing the gums, there is a singular prejudice against it on the part of some. I am convinced it is essential and very useful when there is feverishness and a swollen state of the gum, but that otherwise it is unnecessary. It is, however, as nearly painless as can be, and no harm can result from it, unless there be ignorant and cruel hacking, which will increase the irritation fourfold. It is a mistake to imagine

that a gum which has been once lanced, and which has closed over a tooth, is more resisting than formerly. On the contrary, even if the cut has healed, it is much less capable of obstructing the tooth, before which it will open out more readily. Although the gum in such a case may appear to have healed, the probabilities are it never had actually joined together, but only approximately closed.

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Lancing
does not
harden the
gum.

While urging that dentition is a perfectly natural process, it is necessary to recollect, as already stated, that there is then increased nervous susceptibility, which increases the facilities with which diseased action may be initiated through carelessness, and that, therefore, it is a period demanding a specially stringent application of the ordinary rules of sanitation as applied to infancy.

Exceptional
care is
necessary
during
teething.

Diet after the appearance of the first teeth :—

Although a definite period has been mentioned as that at which the first change of diet may with advantage be made (p. 43), or rather when another form of alimentation may be cautiously given in addition to the mother's milk, it must be laid down as a law, that this alteration is to depend not upon age, but upon the readiness of the system as indicated by the teeth. Till the first pair of teeth have come fairly through, the mother's (or nurse's) milk alone is to constitute the sole food, when there is a sufficiency of it. Even then an alteration is to be very gradually and watchfully made ; and it is to consist simply of two meals a day, of cow's milk (if warm from

Addition to
diet to be
guided by the
teeth.

First addition
to the
natural food.

CHAP. VII.

the animal, so much the better), to which has been added about a quarter of its bulk of lime water, and a teaspoonful of sugar of milk ; or one quarter of its bulk of pure water, with twenty drops of the saccharated solution of lime (see *formula No. 2*), may be substituted for the lime-water.

Objects of addition of lime water.

The objects of the addition of the lime water are (a) to correct the acidity of cow's milk and to make it resemble that of the woman in this respect, and (b) to prevent it curdling into a single solid mass in the stomach. All milk which enters the stomach is converted into curd, but when lime water is added, instead of forming one large lump, it will curdle into a number of minute flocculent particles which, it is obvious, will be more perfectly brought into contact with the digestive fluids whereby digestion is facilitated and heaviness of the stomach avoided. When infants are overfed or when they drink too quickly they often reject a portion of milk, which being observed to be curdled, a mother might imagine the milk was not agreeing, but the above explains the act, which is a natural one.

The second addition.

If necessary, a third similar meal may be given in the 24 hours. Even at this period, the power of utilizing any other substance than milk as has been shown in a previous section (p. 65), has been but partially acquired ; therefore it is well to wait till another month has elapsed, before any farinaceous articles are added to the diet. Then the addition ought invariably to consist of an article selected from the intermediate class of foods (p. 66), for the reasons stated. Either Liebig's, Mellins' or Salmon's preparation will answer equally well.

The "Intermediate" class to be used as

Let it be a standing rule that the first addition to the simple milk diet of infancy, be one of this most valuable class, which should

always be adopted as the introductory medium to the true farinaceous foods. Of course, a mother may be compelled, long before this period, to supplement the ordinary food of nature, and for such a case instructions will be found under the heading "Artificial feeding;" but just now we are considering the case of a healthy child with a healthy mother or nurse, who is fully capable of performing her part.

CHAP. V

The moth
may be
compelled
suppleme
the diet n
earlier

After a short time, say a fortnight or so, there is no objection to employing ordinary farinaceous articles of food, such as Robb's biscuits, Hards' food, or baked flour. But whatever selection be made, the milk should be but *slightly* thickened with it.

Pure
farinaceou
foods.

Nurses are always desirous of making the food as thick as possible, with the object of rendering it more "satisfying." True, a thick food may apparently have such an effect, but it is really torpor and not satisfaction which is induced, while the practice jeopardizes the healthy working of the bowels. It is difficult to persuade a nurse that because good hearty feeding of the kind will fatten an elder child, it will not have the same effect upon the tender infant, but that it will be actually bad for it. Here most assuredly it may be said that "what is one man's meat is another man's poison."

Too great
"thickeni
of the food
injurious.

At the eighth month or so, after the second pair of cutting-teeth have appeared, pure milk may be given, and the quantity of thickening material, another fortnight later, may be slightly increased; and thus till the ninth or tenth month, when weaning is to be commenced.

Food at
eighth
month.

At about the time of weaning, a little *weak* broth may be given once a day, but at an earlier period it would be very apt to cause acidity and

At weaning
time.

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When meat
may be
given.

Avoid periods
of teething
distress for
changes of
diet.

Practices
which
pervert the
taste.

Promiscuous
feeding
highly
objectionable.

flatulency. The broth may, with great propriety, be added to the milk. On no account should meat pass a child's lips before it has reached 1½ years of age, and it is very seldom desirable before the age of 2. Certainly two years of age is sufficiently early to commence meat in ordinary circumstances. The Indian dish, "pish-pash," is in every way suitable.

Should there be much annoyance from the teeth at any time, such periods should be avoided for changing or adding to the diet.

It is a common practice to give children at about this age a bone to suck, and other similar dainties. The practice is a bad one; firstly, because the limit is not likely to be made at the bone,—a little flesh with the bone is sure to be allowed, and this leads to other dangerous departures from good management; and secondly, because the taste is perverted, the simple milk is rejected, and stronger meat petulantly demanded. The practice of giving a young child a taste of everything it may fancy is, says Churchill, "a monstrous invasion of nature, which will inevitably entail its own punishment in delicacy, ill-health, and suffering."

For further information on this topic the reader is referred to page 9 *et seq.*

CHAPTER VIII.

CHAP. V

WEANING, LACTATION, SUCKLING.

SECTION I.—WEANING. SECTION II.—TOO PROLONGED
LACTATION. SECTION III.—THE RESULTS OF SUCKLING
COMPARED WITH OTHER METHODS OF REARING.

SECTION I.—WEANING.—The determining elements as to the period when a child should be weaned, namely, the fitness of the nurse to continue her office, the general health of the child, and the development of its teeth, should be carefully weighed before a decision is arrived at. Obviously we should incline to delay the cessation of the natural food of the infant if its dentition be backward, for the teeth still continue to indicate faithfully the forwardness of development. Similarly, if a nurse be fairly good, we should not counsel a discontinuance of nature's food in the case of a sick child, although it might be deemed judicious to supplement it with some other kind of nutriment.

Points to consider

Teeth still guide.

Weaning be delayed if child sickly.

Broadly speaking, we may fix from the ninth to the twelfth month as the period for weaning with safety; never before the one, if it can be avoided, nor after the other. The milk of the strongest woman becomes poor after 12 months' nursing; and her health, if the attempt be further prolonged, is pretty sure to be injured. Many native

Time of weaning.

CHAP. VIII. — women make excellent nurses for a full year, but it is seldom so with the European mother in India.

Periods of nervous irritation to be avoided.

Menstruation a reason for hastening weaning.

Mode of weaning.

We should, as before said, avoid weaning at a time when there is much teething irritation, selecting rather a period of quiescence of the nervous and digestive systems. Menstruation would be a justifiable reason for hastening weaning; but not for abandoning nursing too hastily, before the age and development of the child justify such a course (p. 47). The process of weaning should be a gradual one. The mother should at first abstain from nursing at night, and after a time she need only suckle her infant twice a day, morning and evening. The demand for the milk being thus lessened, the supply will decrease steadily in proportion. Should the child, with persistent perversity, decline to accept other food than that of the breast, it must be permitted to suffer hunger, a weapon which, if judiciously employed, will eventually conquer. As to feeding after weaning, see p. 89, "artificial feeding."

Too prolonged lactation.

Effects of.

Warning symptoms.

SECTION II.—TOO PROLONGED LACTATION.—Although nursing is a natural function under which the health usually improves, if continued too long, the constitution will suffer. Nervous symptoms will supervene, the appetite become impaired, and the digestive organs fail. Mental depression, headache, and loss of flesh are the more marked signs, while ringing in the ears, faintings or faintness, palpitation and pains in the breasts, are each of them warnings which should not be neglected.

There are also effects upon the child, with CHAP. V. which it is important to be acquainted. Children Effects upon the child. subjected to this mismanagement for any length of time become pale, flabby beings, whose stamina cannot be easily re-established by subsequent good management; their stomachs enlarge; their appearance is pinched, they continually whine, and occasionally scream shrilly. It is asserted by high authority that children from this cause are unusually liable to rickets and consumption.

SECTION III.—THE RESULTS OF SUCKLING Comparative results of natural and artificial rearing. COMPARED WITH THOSE OF OTHER METHODS OF REARING.—“The infant,” says Dr. West, “whose mother refuses to perform towards it a mother’s part, or who, by accident, disease, or death, is deprived of the food that nature designed for it, too often languishes and dies. Such children you may see with no fat to give plumpness to their limbs—no red particles in their blood to impart a healthy hue to their skin—their face wearing in infancy the lineaments of age—their voice a constant wail—their whole aspect an embodiment of woe. But give to such children the food nature destined for them, and if the remedy do not come too late to save them, the mournful cry will cease, the face will assume a look of content, by degrees the features of infancy will disclose themselves, the limbs will grow round, the skin pure red and white, and when at length we hear the merry laugh of babyhood, it seems almost as if the little sufferer of some weeks before must have been a changeling and this the real child brought back from fairy land.” But there are not wanting many, who Frequent result of deprivation of mother’s milk.

CHAP. VIII.

Ignorant
advice based
upon isolated
instances.

Effects of
different
methods of
rearing upon
development.

because they have known a single or a few instances where children have been successfully reared by hand, will not hesitate to urge a similar course upon their acquaintances. Let us, therefore, turn from a general statement, valuable though it be as coming from such a source, and view hard facts. Dr. Routh has compiled the following table, which speaks for itself more loudly than words can do:—

Method of feeding.	Result in each 100 cases.
1. Breast milk alone till ninth month or longer	63 well developed 23 medium „ 14 badly „
2. Breast milk somewhat scanty, necessitating other food during later months to supplement breast milk	57½ well developed 25½ medium „ 16 badly „
3. Small supply of breast milk only, necessitating additional food from birth... ..	27 well developed 26 medium „ 46 badly „
4. Fed entirely by hand from birth—no breast milk at all	10 well developed 26 medium „ 64 badly „

Compare the fourth with the first series, and it will be seen that the numbers have become pretty nearly inverted; that is, out of each 100 hand-fed children, 10 only have shown good development (and how many never live to undergo the test?), against 63 naturally nursed children!

In Glasgow.

Dr. Russell has shown that in Glasgow 69 per cent. of the unsuckled infants die, and of the

suckled 45 per cent. In other words, natural nursing saves twenty-four out of every hundred lives. CHAP. V

The process by which children brought up by hand, and who are improperly fed, decline into the grave, is usually gradual. If so fed from birth, the child "seldom lives longer than two or three months. If he has been suckled for some months before the commencement of the improper food, he has greater power of resistance; and although under the new diet he will soon become dull, and pale, and flabby, yet the effect upon his flesh and strength are less noticeable, and he usually drifts into rickets before any appearances have been thought sufficiently serious to require medical interference" (Eustace Smith). Gradual
constituti
decline of
artificially
fed.

It is needless to trouble the reader further with figures, but it may be stated that the mortality of hand-fed children is vastly in excess of that of those who are nursed at the breast. Dr. Merriman, after much careful investigation, goes so far as to state that the attempt at hand-feeding in London "proves fatal to seven out of eight of these miserable sufferers." The records of Foundling Hospitals bear similar testimony. Mortality
London o
artificial
fed.

Nothing, therefore, but the most urgent necessity justifies a mother in bringing up her child by hand. Even partial hand-feeding should not be lightly undertaken, though it is admitted that this course is quite justifiable if the mother is unable to supply all the nourishment needed. Being partially able to nurse without detriment to her own health, it is her manifest duty to do so, and Only urge
necessity
justifies
artificial
feeding.

CHAP. VIII.
—

to supplement her own nourishment thoughtfully and carefully. Statistics show that such partial nursing very considerably decreases the milk to the child.

Statistics, however, only show the results of all kinds of artificial feeding, both good and bad.

It is but right to mention here that the figures in the foregoing table and the other statistics regarding artificial feeding are open to the very just objection that they include those who have been fed artificially upon bad as well as upon sound principles, or upon no principle at all; and that any argument deduced from them cannot apply to cases where proper food is given, combined with good general management; still the numbers show what the public actually do accomplish in attempts which are actuated, no doubt, by the best motives.

CHAPTER IX.

CHAP. IX

ARTIFICIAL FEEDING.*

THE METHOD OF ARTIFICIAL FEEDING AND SOME HINTS
REGARDING THE DIET OF CHILDHOOD.

WHEN a mother is unable to suckle her child, and it is not the intention to employ a wet-nurse, the child must be brought up by hand. The deficiency of the mother, however, seldom amounts to absolute inability, and it is her duty to nurse her infant to the full extent of her capacity, howsoever partially she may be able to fulfil the task. In almost the worst cases she will be able to suckle twice a day, for a few weeks at all events, and for the rest, artificial feeding must be relied upon.

Mother's duty to nurse to the full extent of her ability.

But hand-feeding is a process which demands so much attention on the part of the nurse, and so much judgment in adapting the nature of the food to the powers and requirements of the infant, that the general result is eminently unsatisfactory, and it is therefore a course which should be entered upon with reluctance. * On the other hand, it is quite certain that infants may be satisfactorily nursed artificially, provided all the teachings of experience and science be adhered to.

Difficulties of hand-feeding.

Satisfactory artificial feeding quite possible.

An infant, then, is to be brought up by hand :—
Let it be again and again impressed upon the

CHAP. IX.

Milk the only
true food at
first.

Dilution
alone not
sufficient.

How to
prepare cow's
milk so as to
prevent
curdling.
(1) By lime
water.

(2) By barley
water or
gelatine.

parent that milk and nothing but milk under these or any other circumstances, is the only article in the world which is a true food from the moment of birth till the first teeth have appeared. On a previous page (58) it has been shown that by proper dilution and the addition of sugar, cow's milk may be made to resemble closely that of the woman. But mere dilution will not suffice to effect the necessary similarity, because cow's milk curdles into a firm, heavy clot when it enters the stomach, while woman's milk behaves quite differently, falling down in separate loose particles. There are two simple means by which this objection to cow's milk may be obviated. The first is by the addition of lime water (p. 80), which, however, is so weak (containing only $\frac{1}{2}$ grain of lime to each ounce) that one-third of the total quantity of fluid must consist of this solution to suffice for the accomplishment of the necessary change, unless the saccharated solution of lime (see *formula* No. 2) be employed. The second means is by the addition of a small quantity of barley water (see *formula* No. 3) or gelatine,—not, be it remembered, with the object of increasing the nutritive properties of the food, but as preventing the disposition to clot by simple mechanical means, the thickening substance so separating the particles of curd that they cannot come together into a solid lump, but fall separately as innumerable minute particles. It is as well to know that no other farinaceous article than barley will fully meet the requirement, because it alone contains very little starch,

and that little is in a state of extremely fine division. Gelatine (see *formula* No. 4) may be used for the same purpose with equal advantage. A teaspoonful of the solution is then to be added to half a bottleful of the milk and water. CHAP. IX.
—

For the newly born infant two tablespoonfuls of milk may be diluted with an equal quantity of filtered water, and to this should be added two tablespoonfuls of lime water, or it may be treated with barley water in equal quantity with that of the **milk** used, or with gelatine as above described; a **sufficiency** of sugar of milk or white sugar to slightly sweeten the food completes the preparation. Brown sugar should not be used, because it is apt to set up fermentation and cause acidity. Food for the
newly born
infant.

Brown
sugar to be
avoided.

Should the parent be on board ship, or otherwise so situated that ordinary milk cannot be obtained, condensed milk may be used at this period with great safety.* “Infants immediately after birth almost invariably do well upon it” (Eustace Smith). Condensed
milk.

For the first two months, an interval of about two hours should elapse between each meal (p. 44), the food being administered from the feeding-bottle (p. 53), which should be kept scrupulously clean.

The insane ignorance of dealing prematurely with farinaceous foods has been fully discussed at page 63, and the parent who attempts to rear her child by hand will do well to ponder the re- Religiously
avoid
farinaceous
foods.

* One teaspoonful to a teacupful of warm water is the proper strength for this age.

CHAP. IX. marks there made. The temptation to resort to other foods than milk are, in hand feeding, so great, that the practice is too frequently adopted.

If condensed milk used, early addition of Liebig's food necessary. Should it happen that the use of condensed milk is compulsory, it is desirable to add to it, after about six weeks, Liebig's food for infants; or better still, because it is more palatable, Mellin's preparation of the same article, or Salmon's malted food.

Intermediate foods. This leads us to a consideration of a class of foods not before discussed—that class which is represented by Liebig's food, and which is prepared by the aid of malt. Such foods are in the strict sense of the term "farinaceous," but viewed from a physiological standpoint they are not so. The fact is, that their farinaceous base has been so chemically treated that the greater part of the work of digestion has been performed before the food reaches the stomach,—the work of the salivary and other glands which are in abeyance in infancy (p. 65) has been accomplished artificially, and the starch has been disposed of. Thus we are introduced to a most valuable intermediate class of food, and one which should be invariably used as the first addition to the diet at the proper time, when it is procurable and can be afforded.. Nevertheless none of this class is a perfect food for the infant, nor should any of them be resorted to too early, or without some substantial reason. At the same time, the great dangers of the farinaceous class are removed, and amongst this class are included the innumerable so-called "infant foods."

Great value of.

The first few days of life having passed, the artificially fed infant's diet should consist of equal parts of milk and lime water, to which has been added a teaspoonful of sugar of milk. Three to four ounces of the food only need be prepared for each meal.

CHAP. IX.
Food after first few days of life.

From six weeks to three months, only one-third of lime water is to be used; and from three to five months, this quantity may be reduced to one-fourth.

From six weeks to three months

The milk should be given as soon as possible after having been prepared, especially during the hot weather, lest fermentation commence (p. 61); and for the same reason a greater quantity than is required for present use should not be prepared at any one time. The slightest perceptible sign of acidity should call for its rejection.

Food to be prepared freshly for each meal.

The food should be warmed by dipping the bottle into hot water, and not by actual heating over the fire, which will drive away the aromatic principles of the milk, which aid its digestion.

Should be warmed, how

After two months of age, every third hour will suffice for the nourishment of the child, except at night, when it should be taught to sleep undisturbed from eleven p.m. till five or six a.m.

Times of feeding.

In some cases of hand-feeding, when the milk seems not to agree altogether with the child, that is, if the child does not thrive well, it is quite justifiable and proper to add a small proportion of Liebig's or Mellin's food, or Salmon's malted food to the diet, at about two months of

May add Liebig's food.

CHAP. IX. age, avoiding the serious error of too great thickening (p. 81).

Only
justifiable
additions to
the milk.

The only justifiable additions to the milk of an infant under six months of age, or the period of dentition, in addition to the necessary one, water, are—(a) Liebig's food or one of the other malted preparations; (b) limewater; (c) gelatine; and (d) barley water—all of which are *only* to be used in the manner described.

Evils of too
frequent
feeding.

If a child be fed too constantly, the stomach will become overloaded, and the result will be the same as if it had been fed upon improper articles, viz., irritation, from which will arise many difficulties and anxieties, if not dangers.

If milk
disagrees.

Do what we may in the above ways, which are usually successful, the milk will sometimes not agree with the child, who may suffer from vomiting, flatulence, and diarrhoea. It is then well to try some other plan:—By re-milking the cow, after the daily supply has been abstracted, we obtain the "strippings," which are very rich in cream and poor in curd. By mixing this with

Try
"strippings."

Barley water.

an equal quantity of barley water we obtain a food which often proves successful, a teaspoonful of caraway water (12) being added if there is flatulency. Condensed milk, with the addition of Mellin's food, is another change which sometimes effects the desired end. Should the motions become persistently relaxed, it is a common and a useful practice to boil the milk; but, because it has been found necessary to do this once or twice, it should not be continued. After boiling, it is well to

Or condensed
milk.

Should
diarrhoea
occur, boil
the milk.

skim the milk; and the process of boiling, cooling, and skimming may be repeated several times with increasing advantage. A sour smell from the child's mouth, and from the rejected food, is a sure indication that fermentation is proceeding, and steps should be immediately taken to remedy a condition which may become serious. In such a case it is well at first to try the omission of sugar from the food, to increase the quantity of water, and to add a small pinch of salt. Should this simple means not succeed, it may become necessary to omit milk altogether from the diet for two or three days, substituting Mellin's extract and whey, the milk being cautiously and gradually re-introduced when the symptoms have subsided.

CHAP. IX.

If acidity,
omit sugar.May be
necessary to
omit milk
altogether.

Should it not have been found necessary to have given Liebig's or one of the other malted foods at the age of two, three, or four months, it is well to introduce the child to it at about five months of age, that is, about one month previously to the use of flours not so prepared, to which the malted preparations serve as an efficient introduction.

Five months
of age.When malte
foods may b
given.

At about six months, or the time of the eruption of the first teeth, ordinary farinaceous articles may with advantage be commenced; and concerning this class of foods, there is this important point to be known,—that it is by no means immaterial which particular one of the group be selected. In milk the flesh-forming elements are to the heat-producing elements as 1 to 4. Obviously we should endeavour to choose a food

Six months of
age.When
farinaceous
foods may be
commenced.The kind used
is important.

CHAP. IX. which most nearly approaches milk in composition, with the object of avoiding too sudden a change, and one which will call upon all the powers of digestion to meet. In wheat the proportions are as 1 to 5, in potatoes 1 to 9, in rice 1 to 10, and in arrowroot, tapioca, and sago only 1 to 20. The natural conclusion, therefore, is that wheat is the article most suitable for the purpose.

Chapman's
wheat flour.

Change of
diet desirable.

Almost any of the various kinds of good flours which are sold in the market will answer very well. Those who fancy a name and a high price will find they will possess a good flour in any of the "foods for infants" which they may purchase. There is, however, one kind which deserves special mention, viz., "Chapman's Entire Wheat Flour," because it has the advantage of containing the inner husk of the wheat, which retains some very valuable nutritive qualities (particularly phosphates). Whatever species of farinaceous food be used, only two light meals of it a day are at first capable of digestion, in addition to three others of milk. Sometimes the first use of farinaceous food is followed by constipation, a symptom which may be relieved by the substitution of a teaspoonful of fine oatmeal for the flour in the morning meal. In any case, it would seem advisable to change the monotony of the diet from time to time, substituting, for instance, Mellin's food for Chapman's wheat flour for a few days occasionally, and making similar simple variations.

Saccharated

It is still desirable to continue the addition of

lime to the milk; but for travellers, or persons living in camp, the space occupied by lime water is an inconvenience, which may, however, be overcome by carrying instead a couple of ounces of the saccharated solution of lime (see *formula* No. 2; but it is also obtainable from the chemist), of which fifteen or twenty drops will be sufficient to add to each meal.

CHAP. IX.

solution of
lime saves
space to
travellers.

At eight months, dilution of the milk need not be continued. The two farinaceous meals, as described, should be continued.

Eight months
of age.

At about nine months, a little *thin* chicken or mutton broth, or veal tea, carefully freed from all grease, may be given in lieu of one of the meals of milk; or the broth may, with great propriety, be mixed with the milk.

Nine months
of age.

At ten months, the quantity of farinaceous food may be increased, and, if necessary, the yolk of one egg may be beaten up with the afternoon milk meal. On no account should any other article be allowed to supplant milk as the staple of diet. At this age the child will consume about a pint and a half of milk in the twenty-four hours.

Ten months
of age.

The child is now quite sufficiently old to be capable of appreciating a variety in its food, and it will thrive all the better for it. To meet this end, instead of the egg and milk meal, broth or beef tea (*formula* No. 5), and a rusk, may be allowed every alternate day; or half a teaspoonful of cocoatina (not cocoa, which is too rich) may be added to the morning meal instead of the farinaceous food. To avoid the evil of having to give food between meals, care should be taken that a sufficiency

Milk still
necessary.Variety essen-
tial.

CHAP. IX.

be offered each time to satisfy all reasonable demands.

One year of age.

After twelve months of age, light puddings, well-mashed potatoes with gravy, or the lightly boiled yolk of one egg may be allowed; and with meals which were before purely of milk, a rusk or a slice of stale bread, soaked in milk, may be given. The fifth or night meal may now be discontinued. A child should always receive a drink of milk if it wakes in the morning long before its breakfast hour, or if it is sent out of doors before breakfasting, as is usually necessary in the hot weather. Milk still is to be the staple food.

Eighteen months of age.
Meat first allowed.

At eighteen months of age, a very little meat may be allowed,—a small piece of roast mutton, without fat or grease, finely minced or pounded, is as suitable as any; or the Indian dish, “pish-pash,” will prove a suitable food. A slice of good bread and butter is also admissible; but milk is to be the chief nutriment.

Two years of age.

As two years of age are approached, the quantity of meat allowed (about a tablespoonful of mince) may be gradually increased, but it should never be given more than once a day. As soon as it can be conveniently effected, the number of meals may be reduced to three, in addition to the cup of milk and slice of bread taken before early morning exercise.

Three to four years of age.

Between two and three years the same diets may be continued, and a little stewed fruit may be occasionally added. As to vegetables, the potato is sufficient for all purposes till the age of three is approached, when vegetable marrow,

Vegetables.

asparagus, or young carrots may be introduced; CHAP. IX.
but greens should be avoided till about four years
of age.

It will be seen that the various transitions have Transition to
be effected
cautiously.
to be effected gradually and with great caution
—a remark which applies more especially to the
introduction of animal food,—and that milk must
always be the staple food.

The habit of thorough mastication should be Mastication.
sedulously inculcated, and the habit of giving
food between meals as sedulously avoided. Rest after
meals.
Rest after a meal, for a short time, is always desirable,
as all the nervous force is required for digestion.

Salt is an article which should be added in Salt.
moderation to all meals; but children should not
be allowed to devour it at an immoderate rate, as
many will, if permitted.

Sugar is perfectly harmless if allowed only in Sugar.
moderation, but in excess it causes acidity and
fermentation, and perverts the appetite. A
moderate amount of ripe and digestible fruit may Fruits.
always with safety be given to a child over
three years of age; but nuts, dried and preserved
fruits (except when stewed), should never be al-
lowed. Very weak tea, largely diluted with milk, Tea.
cannot do any harm after about two and a half or
three years of age. Alcoholic liquors, in any form, Alcohol.
should never be permitted to approach a child's
lips, unless illness demand it imperatively.*

* For many of the details given in the foregoing summary,
the writer is indebted to Dr. Eustace Smith's "Wasting
Diseases of Children," Third Edition, 1878.

ON VACCINATION.

Dreadful
 ravages of
 small-pox
 prior to inocu-
 lation.

CENTURIES ago small-pox had become a "naturalized plague" in England. In 1796 (the year of the introduction of vaccination) the deaths by small-pox exceeded 18 per cent. of the total deaths; about 1 in 4 of those attacked died, and more than half the blind people owed their privation to small-pox.

The intro-
duction of
inoculation.

Inoculation has been practised by the Hindoos from a remote period. About 1717, Lady Wortley Montague, the wife of the British ambassador at Constantinople, had her son inoculated, and through her instrumentality the operation was introduced into England. "Then followed, under the sanction of the Royal Society, six condemned criminals; next five pauper children of St. James's; then the children of a few families of distinction; and to crown all, their Majesties, acting on the cautious advice of Sir Hans Sloane, had all the royal children submitted to the operation" (Guy). A greatly lessened mortality followed the introduction of inoculation, but it originated many epidemics, and was a source of great danger to others who approached the patients, the most

Results of
inoculation.

virulent form of small-pox being capable of being imbibed from the mild inoculated form. CHAP. X.

On May 17th, 1749, the immortal Jenner was born, who in 1796 discovered vaccination, which is an operation by which "the matter which forms on the udder and teats of the milch cow, is introduced into the human body; only local effects ensue, with slight feverishness; the trifling affection is not infectious; it prevents the occurrence of small-pox in the great majority of cases, and when it does not prevent an attack it mitigates its severity as certainly as does a previous attack of small-pox" (Guy). Vaccine matter is really only small-pox matter, after having passed through the body of the cow. Jenner discovers vaccination.
What is vaccination?

Writing of England, Dr. Guy says, "A fall from 3,141 per million per annum to 2,286 represents, therefore, the reduction of mortality from the reign of small-pox uncontrolled, to the rule of small-pox modified by inoculation; and from 2,286 to 272, the superiority of vaccination with State patronage and aid, to inoculation without it." For the ten years ending 1770, small-pox caused 108 deaths of 1,000 deaths from all causes, and for ten years ending 1860 it caused 11 per 1,000. In Berlin, before vaccination was introduced, 3,422 per million of the population died of small-pox; since vaccination 176 so die. Results of vaccination.

Inoculation was a great blessing, but in the presence of vaccination it is a great evil. Is inoculation still to be practised?

The powers of vaccination, like those of a previous attack of small-pox, are not absolutely unlimited. A second attack after the lapse of years is possible, though improbable; and when Small-pox after vaccination rare, and then very mild.

CHAP. X.

Vaccination
of persons
attacked with
small-pox.

it does come, it is "modified" or comparatively trivial, seldom bringing danger. Even after small-pox has attacked an individual, it is a fact that vaccination still possesses a life-saving power if promptly resorted to. If such a person be vaccinated on the second day of the small-pox, it will prevent the development of the disease; if on the fourth day, the small-pox will be modified; if on the fifth day, it will be useless, because the vaccination will not have had time to arrive at that period of maturity which conveys immunity before the small-pox is developed—the latter gains the race in fact.

Imperfect
vaccination.

Vaccination, however, like everything else, requires to be done well to be efficient. An operation may be performed which conveys no immunity from small-pox, and a parent may rest in a false hope that his child is safe. Again, an operation may convey only partial protection. It therefore becomes us to enquire into the proper mode of operating and the means by which we can judge of the success or failure of the procedure.

Operation.

Mode of Operating.—In an out of the way place a medical man may not be available at the time wanted. The first thing to do is to induce the mother of some healthy child, whose arm is in a fit state to yield matter (see below) to consent to the abstraction of a minute portion. Against allowing this, some have an objection, under the impression that it lessens the potency of the protection, that it causes inflammation, &c.; but such notions are fallacies. In no degree whatever, does such an effect result. The vaccination has, by this time, affected the

If possible
vaccinate from

whole constitution, and the local interference (which is really nominal in amount) is quite incapable of influencing the change which has been already accomplished throughout the body.

Such ignorance among the educated is calculated to do much harm by example. But is it always ignorance? or does selfishness in any way influence some parents, who are ready enough to accept, but unwilling to yield? Surely, in all honour, if they believe the protective power to be lessened by the abstraction of lymph, it is hardly right that they should so gladly receive that which they suppose injures another, for their own benefit. If all acted thus grudgingly, how is the supply of lymph to be perpetuated? Let it be understood that it is a moral duty to aid the cause of vaccination, by placing no obstruction in the way of transmitting lymph. Obviously, this duty becomes an obligation of honour if the lymph of another has already been accepted. In any case, objection can only be based either upon ignorance or selfishness.

It seems hardly rational to have to refer to the absurd objection some have, to their children being vaccinated from native children. What is the nature of the objection? Simply gross ignorance. Is it that "black blood" is supposed to be thus transmitted? Why have we not all grown tails long ago, seeing that all vaccine matter comes from the cow?

The arm to be operated on having been exposed, and the child seated on its mother's lap in a good light; with the point of a needle or the point of the lancet, a couple of pricks just sufficient to puncture its covering, are to be made in the vesicle. Immediately two drops of limpid fluid will exude. These are now to be touched with the side of the point of the lancet (which has been previously warmed by dipping it in hot water, after which it is to be wiped dry), with which, thus charged, five duplicate scratches are to be made,

// // thus, // on the skin, which should, at the

CHAP. X.

time, be steadied by the arm being gently grasped from behind with the left hand. The scratches should be very superficial, barely sufficient to show blood. Or, a better plan, is to insert the point of the charged lancet obliquely under the outer skin.



By this means, the matter is received within a valvular flap, and is not so easily rubbed away.

Vaccine tubes. If it be impossible to procure a child from whose arm to obtain the matter, application should be made to the civil surgeon of the district or to the superintendent of vaccination, who will send by post a few hermetically sealed tubes containing lymph. When required, the ends are to be broken off with the nails and the contents blown out upon the lancet point. But it should be recollected that the best results are obtained by arm-to-arm vaccination.

Age for vaccination.

A child should be vaccinated within the first two or three months of its life—delay represents unjustifiable risk. The weather in India presents an insurmountable obstacle at times, but not so great as is sometimes imagined. I would urge that the attempt at vaccination should be made in any weather, if small-pox prevail in an epidemic form in the neighbourhood.

Number of places which take, important.

The number of punctures made is a matter of the greatest importance. Let all mothers bear in mind these two facts:—First, that in proportion to the number of vesicles which appear in response to the operation, is the general feverishness and disturbance less; and secondly, that in the same proportion is the amount of protection

gained. The Medical Officer to the Privy Council reported as follows :—

CHAP. I

Cases of Small-pox.	Deaths in every 100 cases which occurred.	Statistics to prove the point.
Unvaccinated	35	
Said to have been vaccinated—no marks	23·57	
Having one mark	7·73	
„ two „	4·70	
„ three „	1·95	
„ four „	0·55	

How are we to know that the vaccination has “taken;” that is, that it is successful?—By the character of the vesicle. On the second day, there will be seen a slightly red elevation over each puncture, which is so marked on the third day as to enable us to say that the case is a successful one. On the fifth day there will be a raised round bleb, with a depressed centre; and on the eighth day it is much larger, of a whitish pearl-colour, and distended with lymph,—around the whole, an inflamed blush. This is the proper time to abstract lymph for transmission to other children. Lymph used for this purpose should be clear like water; if cloudy or mixed with blood, it should be rejected. The hotter the weather the earlier it ought to be taken. In India usually about the 7th day is the best time. After the 9th day, it is useless. After this latter period, the vesicle scabs and becomes brown and hard; and about the 20th day the scab falls off, leaving behind the vaccine “mark,” which remains permanent throughout life.

Has the vaccination “taken?”

Course of the vesicle

Time for the abstraction of lymph.

GENERAL HYGIENE.

CLOTHING, EXERCISE, SLEEP, VENTILATION, LIGHT, AND
BATHING.

Peculiarities
of the seasons
which have to
be considered.

SECTION I.—*Clothing*.—What are the general principles upon which a child should be clothed in India? In temperate climates we merely have to consider how best to keep the body warm; and for this reason we select as materials the worst conductors of heat, such as flannel and other woollen materials. During the greater portion of the year an opposite condition obtains in India,—we have to guard against heat; the skin is congested, it is irritable, it perspires freely, and evaporation is rapid. At another time of the year, particularly in the Upper Provinces, pure, dry and piercing cold has to be encountered by the body, which has been but badly prepared by the previous heat to meet it. Again, there is the intermediate season of the rains, when the cooling of evaporation is absent, and vicissitudes are of constant occurrence. The first is characterised by the accession of heat, the second by its abstraction, and the third by the dangers which arise from sudden chills. Manifestly, then, the

clothing of the child is a matter of no small importance. CHAP. XI.

Clothing is made of either flannel, cotton, or linen. Flannel is a very bad conductor, cotton less so, and linen still less so. Of course a bad conductor will not quickly take away the warmth of the body it enwraps, and therefore the heat is retained or kept in by the covering; but we have to admit, on the other hand, that a bad conductor will also refuse to conduct the external heat to the body, hence the wearing of a loose great coat to keep out the heat of the direct rays of the sun is no fallacy, and black, which absorbs rays, is hotter than white clothing which refracts them.

Now flannel is heavy, it is irritating, and it is such a bad conductor that, although it is absorbent of the excessive perspiration, it does not draw away the heat from the body with sufficient rapidity. From this it will appear that flannel is not a suitable article of clothing during the hot weather, except when the person is exposed to the direct rays of the sun. In the rains, when evaporation is almost suspended, flannel is so thick that it does not readily enough yield up its moisture to the air; the body is then kept in a state of irritation and moisture, by which prickly heat and general discomfort are produced.

Linen is objectionable, because it becomes so soon saturated, because it conducts too readily the external heat to the body, and in a current of air it parts with its moisture so rapidly as to cause shivering; whereas cotton is light, it is absorbent, it draws away more heat from the

The use of materials depends chiefly upon their conducting powers.

Objections to flannel.

Objections to linen.

CHAP. XI. body than does flannel, and it leads less to it than

Why cotton is
the best.

linen; nor does it in the rains, when there is no evaporation, retain the moisture (perspiration) in contact with the body as flannel does.

Gauze flannel. So far, therefore, as the hot weather and rains are concerned, all the advantages are with cotton. In any weather, all the disadvantages are with linen. Some of the gauze flannels which are made (being a mixture of silk and wool) almost approach cotton in their properties; but under the action of soap and water, even the best of them, become thick and harsh.

Flannel in the
cold season.

Even during the cold weather, cotton is the best form of clothing next the skin; flannel, once employed, is not easily left off. If its use be deemed essential, all the advantages it possesses can then be secured by using it over the cotton garment, by which means its irritating qualities are got rid of.

Exceptional
care as to
clothing
necessary
in the rains.

During the rains or other times of vicissitudes, it is impossible to be too guarded regarding the suitability of children's clothing. We know from experience how we ourselves then pass rapidly from a state of excessive heat to one of chill, and it is but reasonable to conclude that the child or infant will, in proportion to its greater nervous susceptibility, become severely affected. In fact, during infancy and childhood, nature is less able to resist the external influences of temperature than in adult age; and no greater mistake can be made than the absurd notion that exposing the limbs of tender children to cold, from which we

The fallacy of ourselves shrink, "hardens" them; on the con-

trary, it is both a cruel and a dangerous practice, often not expressing itself openly at the time (though it sometimes does in severe diarrhoeas, bronchitis, and other inflammations), but covertly laying the foundations of slowly progressing wasting affections.

CHAP. XI.

the theory of
"hardening."

At night it is desirable to clothe children in flannel garments (jacket and trousers buttoned as one) because during sleep, the temperature is lowered, and the punkah puller very frequently creates a vicissitude.

Flannel suit-
able for the
night.

The power of generating heat is so small in the young infant that it can hardly be kept too warmly clad, nor does it suffer from any heat of climate, a capacity which the child possesses in a lesser degree, and one which it apparently loses gradually year by year. The child has, on the other hand, much less ability to encounter and resist cold, than the adult, a power which it by degrees acquires.

Ability of
young infant
to bear heat
is great.This alters as
childhood ad-
vances.

The clothing of a child should not, in India, be too frequently changed, as is sometimes the fashion, even when it has become wet with perspiration, for chill is then very apt to be induced, and the perspiration is too powerfully solicited.

Clothing
should not be
too frequently
changed.

SECTION II.—*Exercise and Sleep*.—Exercise produces waste of tissue, that is, expenditure. Sleep is the time of rest, when expenditure is at its lowest point, and renovation proceeds without interference. The more exercise, the more sleep. But exercise not only causes expenditure, it also causes all the vital functions, circulation, respiration, &c., to proceed with increased activity,

General effects
of exercise.

CHAP. XI.

which means that repair is at the same time more quickly conducted; indeed, nature so acts as though she understood that the exercise is to be continued indefinitely, and she therefore repairs at a rate in excess of expenditure; a practical illustration of this we see in the muscular growth of the blacksmith's arm. On the other hand, without exercise the rejection of the old and reception of the new materials is not effected as rapidly as ought to be the case; the old remains longer than it should, making no room for the new; hence we have flabby muscles, a pale face, and impaired health.

The exercise
of infants in
arms.

The young infant requires exercise, as well as the growing boy or girl. In India a baby may usually be sent out of doors, carefully wrapped up, after it is a fortnight old. The nurse should not be allowed to sit down and gossip to her friends, as is the ayah's wont, when she takes the baby out to "eat the air," because the motions to which it is subjected by her action in walking, represents to it proper and necessary exercise. Even when in the house, an infant should not be left lying too much on its back in bed, but should be carried about in the arms frequently, in slightly varying positions. Too prolonged lying flat upon the back proved to be one of the principal causes of mortality in the Foundling Hospital of Paris, by producing congestion and inflammation of the lungs, all the blood gravitating to the back of the chest. "Change of position and gentle movements are as necessary for the health of the internal organs as for muscular development"

Evil effects of
not exercising
young infants.

(Churchill). The clothing of an infant should always be sufficiently loose to permit of the free play of its limbs, its kicking about being exercise of an important nature. CHAP. XI.
—

A child should not be taught to walk; such exercise, before nature has fitted the bones to bear the weight, will do great harm, and may produce deformities; rather should he be permitted to discover his own way to his legs. Boisterous play is essential to the health of children; by it the lungs are expanded and the muscles of the chest—all the muscles, in fact,—are brought into full action. Riding is admirably adapted for Indian children; it creates a manly spirit, and makes a thorough and exciting change in the routine of the day. Exercise for
elder children.

Play essen-
tial.

Riding.

Children who are prevented from making any noise in a house, who are restricted to a single room, and who are sent out for the dreary daily walk, do not get a sufficiency of exercise to maintain health. All children should be sent early to bed, so that they should be up and out betimes in the fresh morning air (before which they should have had a cup of milk and a bit of bread). A child should not be disturbed from its morning sleep in order to send it out. Send him to bed early, so that he will awake at the desired hour himself. When a child is sickly much harm may be done by sending him out too early. "Persons," says Scoresby Jackson, "who are not in robust health should not, as a rule, take exercise before breakfast; a mistaken zeal on this point frequently subjects children of delicate constitution to un- The exercise
should pos-
sess interest.

Sleep should
not be dis-
turbed.

Sometimes
early morning
exercise is
hurtful.

CHAP. XI. necessary cruelty." All children up to three and a half or four years of age should sleep one or two hours in the daytime, to allow of conservation of waste ; but not immediately after a meal, nor yet immediately before it. When possible, children should sleep in upper rooms which are thoroughly ventilated, but free from all draught.

SECTION III. — *Ventilation, Light, and Bathing.*—In the hot weather the European child is necessarily confined to the house during a great part of the day, but in the cold season it spends the larger part of its time out of doors, and the houses are then more or less wholly thrown open. On the whole, the European child in India is extremely favourably situated as to fresh air, a circumstance which no doubt has a great deal to do with the low death-rate of those who are well cared for.

The importance of ventilation during the first days of life has been already adverted to (page 41), but something more needs to be said on the general subject.

The air consists of certain gases, chiefly oxygen and nitrogen, the former being its vital principle, the latter merely effecting a proper amount of dilution ; keeping it at the right strength, in fact. When we breathe, the carbon from the lungs combines with the oxygen of the air, and forms carbonic acid—a gas which, in very minute proportions, less than $\frac{1}{2}$ per cent., exists in all air for the support of vegetable life ; but this carbonic acid gas, when increased by respiration, in the atmosphere we breathe, to a quantity equal to double

European child is favourably circumstanced, in India, as to ventilation.

Ventilation during first days of life.

Atmospheric air.

Product of respiration.

the natural amount, becomes very injurious to health. But besides the formation of carbonic acid gas by respiration, we also spoil the air by breathing out a quantity of animal matter, which floats about imperceptibly. The amount of carbonic acid and of animal matter always bear an exact proportion the one to the other, therefore the amount of carbonic acid being detected by the chemist, the quantity of poisonous animal matter present is also known. Now, bad as it is to breathe an air loaded with carbonic acid gas, the animal matter is really very much more injurious and dangerous. A mouse if put under a glass, will soon die, because it rapidly exhausts all the oxygen from such a small space; but even if precautions be taken to supply it with a full proportion of oxygen by chemical means without permitting ventilation, death will just as certainly ensue, because it will be poisoned by the organic matter.

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Why air constantly
breathed is so
injurious.

Two poisons, then, are produced; the first, or carbonic acid, is known popularly under the name of "choke-damp;" and the second is, in large quantities, as we see, a deadly poison.

Two poisons
present.

It may be as well to quote one or two practical illustrations of the deadliness of a vitiated atmosphere:—

When air contains 3 per cent. of carbonic acid gas, lighted candles and animals will speedily die in such an atmosphere. A lighted candle is therefore put down into old walls before men dare to descend; many a life has been lost through neglect of this precaution. The story of the "Black Hole" of Calcutta is well known. "One of the most recent cases of what may be termed wholesale poisoning

Illustrations.

CHAP. XI. by means of vitiated air occurred on board the *Londonderry* in 1848. This vessel was on a voyage from Sligo to Liverpool, when, a storm coming on, the captain confined 200 passengers below the hatches, which he battened down and covered with tarpaulin. . . . Imagination fails to realize the horrors of the living tomb into which these persons were forced, and in which nearly 100 of their number laid down their lives—poor victims sacrificed on the altar of ignorance! During the voyage of the emigrant ship *Liebsietz*, from Hamburg to New York, Nov., 1867, 108 out of 544 passengers died in consequence of over-crowding, want of ventilation, and the filthy condition of the vessel” (Cameron).

Physical
effects of a
vitiated air.

“The breathing of vitiated air for even a few hours produces,” says Parkes, “increased temperature, quickened pulse, furred tongue, loss of appetite, and thirst, for even forty-eight hours afterwards. The continued respiration of the same quantity of air renders it at length a deadly poison.”

Town and
country air.

Dr. Farr tells us that of children under five years of age in large towns, 10 in 100 die annually, and that of those who are brought up in the fresh country air, only 4 in 100.

Over-crowded
nurseries.

English nurseries are, as a rule, tolerably well looked after, but even there over-crowding produces its effect. A report, 1871, to the Obstetrical Society says, “A nursery of three or four children never does well. The air becomes foul, and they all droop and fall away in flesh, even with the best food, attendance, and cleanliness.”

Results
attained by
improving
ventilation.

More than half a century ago, every sixth child born in the Dublin Lying-in Hospital died within a fortnight of its birth, and lock-jaw was almost the sole cause of death. Means were then adopted to secure the efficient ventilation of the hospital,

and the mortality at once fell to 1 in 20. A few years later it fell to 1 in 59, and but little more than one-ninth part of that mortality depended upon lock-jaw. CHAP. XI.

Already I have alluded to the enormous mortality of the native children of Calcutta, but the whole state of the case is altered, when the first year of life is over, and they "pass their time freely in the open air. Those who survived the suffocation of their earlier days, now show the effect of exemption from the specific diseases and misfortunes of English children, in a death rate lower than that of England, between the ages of one and five years" (Payne). Native children of Calcutta.

An adult will spoil 1,000 cubic feet of air in an hour. A child, no doubt, will vitiate a smaller quantity, but the difference is not so great that it is to be practically considered. If, however, a room has 1,000 cubic feet of space, for each individual occupying it, the ventilating arrangements ought to admit the same quantity of air each hour; if half that size, the arrangements must have double the admitting and exit capacity. An opening $3\frac{1}{2}$ inches each side of a square, will admit, without draught, 1,000 cubic feet per hour. A chimney with a fire in it will suffice for the exit. If there be no fire, another opening of the above size should be made in another place. This is the least size of ventilating opening which is necessary for each individual; but in India, in the cold weather, ventilation is practically unlimited. In the hot weather, the doors must of necessity be closed during day- Amount of ventilation necessary for each room.

CHAP. XI.

Evils of
soiled napkins,
&c., in a
nursery.

time; still, the houses are very roomy, the rooms all open into each other, and the outer doors are frequently being opened. Every morning and evening all doors and windows should be thrown fully open. Chimneys should never be blocked up, as they act as extractors, and children should occupy the largest rooms. Nothing in the shape of drying clothes at a fire in a nursery (a practice which prevails in some badly managed homes) should ever be permitted. All soiled clothes and napkins should be removed instantly from the dwelling house.

This latter is a most important matter. If the mother does not see to it herself, the ayah is pretty sure to go to very little trouble about it; indeed, the mother is often quite satisfied if the soiled napkins be removed to the other side of a bath-room curtain, or door which is being constantly opened. Highly injurious gases are largely emitted from such soiled linen. Another filthy practice of ayahs in charge of nurseries is to empty chamber utensils upon the pucca flooring of the bath-rooms. In illustration of the very fatal nature of an atmosphere so vitiated, I cannot forbear quoting the following from Dr. Routh's work:—

Illustration
quoted.

“Some years ago there was connected with the Cripples' Home an infant nursery, where babies were taken in to nurse during the day. The whole arrangements of the place were put under my care. I had an experienced nurse; the diet was judicious to a degree. Cleanliness extreme, both in the infant, and the room, and the attendants. Yet the children did not thrive; they died in large numbers of ‘muget’ and diarrhoea. One

remarkable circumstance observed was that there was a faint odour always present in the room ; yet it was a large room, about 50 ft. to 60 ft. long. One side of the room was made up of windows, which went up about 10 feet, where the roof bevelled up in an inverted V shape, but which raised the room some 7 or 8 feet more in height at the centre.

“Do what I would, I could not get rid of this smell. One day, being much annoyed thereat, I procured some long steps, which extended some three feet above the upper ledge of the windows. On walking up, no sooner had I got my head one foot above their level, than I found a terrible odour that made me feel giddy and sick, and I was glad enough to come down. I instantly sent for a workman, and desired him to remove three or four tiles at each end of the room, on a level with the highest point of the roof. He did so. In ten minutes all smell had disappeared, but his work was no sooner ended than he was taken very ill—giddy and practically sick,—so completely had he been overcome by the pestilential atmosphere.

“Some idea may be formed from this anecdote how intensely poisonous a baby nursery may become, even where great care is taken and plenty of air apparently supplied.”

Soiled napkins should be at once thrown into a vessel of water kept for the purpose, and removed from the house altogether.

Children are not likely to suffer from want of Light. *light* in India ; but light is sometimes too much shut out of the nurseries of the upper classes. Glare may be shut out, light should not. Want of light bleaches humanity as well as plants, and diminishes vitality.

Bathing.—All the evils which arise from ex- *Bathing.*posure to cold through insufficient clothing may very easily be acquired by injudicious bathing. I need not enter into a description of the innumerable pores of the skin, the necessity for keeping them free, and through them, preserving the function of cutaneous respiration, which is absolutely

CHAP. XI.
—

Particular
cleanliness
essential in
India.

essential to perfect health, because personal cleanliness in India, is, on the whole, well attended to.

It is not only external dirt that has to be removed by the bath, but that portion of the internal waste which finds its way out of the body through the skin, and which, when permitted to accumulate, blocks up the pores, and forms a much worse kind of dirt. In India the skin is called upon to do more of this kind of work than in England; in fact, the skin is, in India, a more important structure.

Daily bathing. Every morning, immediately after the early walk, the child should have his bath, which should, in infancy and early childhood, be tepid, so that there be no great shock conveyed. Especially during the hot weather and rains should tepid water be used (sometimes, indeed, the water taken from the well or tank has been already sufficiently heated by nature); but the temperature should never be such as to render the bath so agreeable that the child desires to prolong the operation unduly. It is quite true that the cold bath may be used by children with much less risk than by the adult; and it is equally true that many children may with great security be bathed daily in cold water; but, as a rule, the liability of the internal organs to congestion in India, is sufficient to make it a risk in any case. Even in a temperate climate, when for larger children the cold bath is the proper thing, there must, for the moment after bathing, be an increase of the blood sent to the liver, spleen, and kidneys; but under such circumstances, the constitu-

Cold water
should not be
used.

Objections to
the cold bath.

tional vigour is sufficient almost instantly to re-establish the natural distribution of the blood. It is not so in India; the internal organs can not so readily free themselves again, and the habit of congestion may be engendered to such an extent as to prove eventually very injurious, if indeed it be not established as an actual condition.

Every day, in sickness or in health, a child's body should be cleansed in every part. Sometimes it may not be possible to place a child in a bath; then it may be sponged, limb by limb. When it is not thought judicious in illnesses to run even this so very slight risk of chill, it is seldom that frictions with oil, a very efficient means of cleansing the skin, will not be admissible.

Cleansing the skin in illness

There are other objections to the use of cold water for bathing children. Except when the body is suffering from the unnatural heat of fever, the effect of cold water is depressing. It is true a stimulating effect succeeds, but in order to ensure this latter it is essential that the bath be very brief, hardly sufficient for the cleansing of the skin of a child who has been actively engaged all day in a hot climate, and the dressing must be very rapid. In neither of these matters are ayahs to be trusted, and if they are neglected, chilliness and languor ensue; that is, a weakening shock without any reaction, is endured.

Depressing effect of cold bath.

The water of a child's bath should never be below 65° temperature. During the first nine or ten months a blood heat is desirable. A greater heat is injurious, for although the first effect is that of brief stimulation, depression

Temperature of the bath.

CHAP. XI.

Dangers of
overheated
bath.

quickly succeeds. A very hot bath is not only injurious, but actually dangerous. Steiner mentions the case of "a midwife, who from want of proper appreciation of the temperature in which she washed the children, used it too hot, and in the course of two years among 380 births lost 99 children of lock-jaw."

Avoid
frightening
child.

If a child evinces any terror of its bath, a good plan is to place a sheet over the tub, so as to conceal the water. The child is then to be gently lowered into the tub upon the sheet.

PART II.

The nature, mode of spreading, prevention, and detection of the Illnesses of European Children in India.

CHAPTER XII.

CHAP. XII.

THE NATURE OF THE SICKNESSES WHICH MOST PREVAIL.

(1) ACCORDING TO SEASON. (2) ACCORDING TO AGE.

SECTION I.—*Sickness according to the Season.*—The statistics of soldiers' children give full information.
In determining the sicknesses to which a European child in India is liable, and against which at certain seasons and certain ages it is necessary to take precautions, the statistics of soldiers' children afford every information, in that these children are sufficiently exposed to the climate and other peculiarities of life, and yet are not so well cared for as to influence the results of the effect of Indian residence; nor are they so very badly cared for as to vitiate the value of the lessons taught. What are the most unhealthy months? The relative healthiness of each month.
The following figures answer this question in the clearest manner. They refer to 7,017

CHAP. XII. children in the Bengal Presidency during the year 1875 :—

Months.	Sick in Hospital per 1,000 of strength.	Died per 1,000 of strength.	Months.	Sick in Hospital per 1,000 of strength.	Died per 1,000 of strength.
January ..	23·6	2·83	July ..	44·4	9·49
February. .	21·4	3·17	August ..	49·8	8·30
March ...	25·1	5·10	September	52·5	9·35
April ..	36·5	7·90	October ..	45·1	6·01
May ..	39·8	6·23	November	32·1	6·51
June ..	41·2	7·33	December	17·7	4·58
			For year 1875 ..	35·8	76·67

The most unhealthy months.

The most healthy.

Influence of heat and damp.

The most unhealthy months are, we see, July, August, and September—one-third of the total admissions and nearly one-third of the deaths then occurred; and December, January, and February are the healthiest months. A gradual rise to the beginning and fall from the end of the first-named period is marked by the figures with singular regularity. The increase of mortality and sickness is coincident with the advent of extreme heat and damp. Even in England the mortality among infants is similarly influenced by extremes of heat; for example, in the week ending January 6th, 1878, the mortality of infants under one year showed an increase upon the average of the seven preceding weeks of no less than 21 per cent., in consequence of a sudden accession of hot weather.

The tables (Nos. I. and II.) quoted in the appendix show us the kind of sickness to be apprehended and specially guarded against each month, and the attendant fatality. It is not desirable

here to enter into details of figures ; those who wish to inquire further may study the appendices with profit. CHAP. XII.

Taking each month separately, the following general statement will suffice for the present purpose. *January* is a healthy month ; but those children who, during the continuance of the rains, had been so much affected with fever or malarial influences as to injure the quality of their blood, suffer much from the cold. In such subjects, fever is apt to return upon exposure ; or, although only a little delicate during the rains, never having had actual fever before, they may now for the first time be attacked (as frequently happens to children sent to the hills for the benefit of their health), as though the malarial poison, which before had found ready exit through the skin, now is accumulated in sufficient force to develop fever. Great precautions are, therefore, necessary to clothe such children warmly, and to prevent exposure to night air. Under undue exposure to cold, existing congestion of the spleen will increase. But let it always be remembered that the cold weather, without exposure, is a season of blood-making, wherefore it is incumbent upon the parent to allow his child to be as much as possible out of doors. Fevers give the greatest number of admissions into hospital, though *primary* malarial fevers are uncommon. Next in order of frequency, we have the debilitated cases remaining from the hot and rainy weather, the cold often telling severely upon such children. *Diarrhoea* is, in healthy children, in abeyance, and is readily amenable to treatment.

January.

Chills produce fevers.

Spleen congestions.

The cold weather the season of blood-making.

Secondary malarial fever common.

Diarrhoea in abeyance.

CHA P. XII. Cases of this affection now occurring are manifestly traceable to bad management, unless they be in a chronic form, and the result of malarial debility.

Causes of death.

Convulsions, diarrhoea, and debility cause 50 per cent. of deaths; but figures do not assist us much in discriminating between each, for one may arise out of the other, and each case is necessarily registered under the heading for which admitted into hospital.

Liability to chest affections.

The child is liable to bronchitis and other chest affections, though not so much as during the rains. During this and the other cold months there is liability to measles and hooping-cough. So far as the tables are concerned, dentition would seem to be peculiarly easy, but many illnesses which occur during the more unhealthy months are attributed to teething, wherefore much reliance cannot be placed upon statistics in this particular.

Measles and hooping-cough. Dentition apparently easy.

February is the healthiest month, but chest affections common.

February is perhaps the most healthy month of the whole year, but chest affections are more common than at any other period, particularly among children between one and two years of age. The cold weather has been in sufficiently long to have produced a marked effect, and to have diminished the number of general debility cases. Fevers are more uncommon than at any other period of the year. Head affections and convulsions are infrequent. This is a month in which the child should spend most of his time out of doors and at play.

March. Effects of heat noticeable.

March.—There is a marked increase in the number of bowel complaints. The accession of heat increases the number and fatality of con-

vulsions and head affections; and the nervous excitability arising from dentition is heightened. CHAP. XII.

Measles receives a spurt, but it is not fatal. Measles.

There is danger of infection of small-pox, owing to the native practice of inoculation during the cold season. The fevers increase, probably owing to improper exposure to the sun. Dysentery becomes an item of importance. Danger of small-pox infection.

Fever and dysentery.

April.—Diarrhœa and dysentery become still more formidable and fatal, being four times more common than in January. Fevers continue to increase and to yield an appreciable mortality. Chest affections are very rare; croup is uncommon. The danger of small-pox infection continues. Cases of convulsions from the ardent fevers produced by exposure to the sun are common; or, such cases running a more rapid course, may terminate fatally as heat apoplexy or as infantile paralysis. April. Diarrhœa and dysentery increase.

The malarial debility cases, if properly nourished, improve, on the whole. The nervous excitability of dentition continues high. Sun heat produces some formidable cases.

May seems to be a somewhat healthier month than April, the constitutional shock of the sudden accession of heat having passed off to some extent, and the greater intensity of the heat, compelling great care and less exposure, no doubt helps to the general result. Head affections and dentition continue to yield results very similar to those of April. Fevers retain their April position. Dysentery and diarrhœa give about the same number of admissions, but they cause fewer deaths, by half. Chest affections are uncommon. May. Somewhat better.

The depressing effects of heat are much felt. On the whole much same as April.

Depressing,

CHAP. XIII.

The want of house-room, or anything like over-crowding, will serve to produce very baneful effects. Great care is necessary that children get a sufficiency of air and play. They may with safety be permitted to prolong their airing, after dusk. The mid-day sleep, in a pure atmosphere, is now very essential.

Exercise after sunset allowable.

June.
Marked falling off.

June.—A considerably less healthy month, the rains in the lower provinces having commenced. Measles and hooping-cough reach a climax. Fevers, and consequently debility cases, increase considerably. Bowel complaints cause the greatest loss of life, but fevers also prove fatal. Debility cases are 30 per cent. more common than in February. The cooling which was produced during the hot dry months by evaporation is absent, consequently the heat is felt to be particularly depressing; but the air itself is cooler than it was, therefore we can and should admit fresh air more plentifully, and this is necessary to the cooling of the body. Once the rains have set in, exercise should not be prolonged into the dusk of the evening.

Is generally depressing.

Late evening exercise dangerous.

July.
Increase of unhealthiness.

July.—Still more unhealthy. Great increase of fevers and bowel complaints. Diarrhoea, convulsions, and debility are the chief causes of death. Infectious eye complaints prevail among the natives, and are to be avoided. Cholera causes a considerable mortality.

August.
The most unhealthy month.

August.—The most unhealthy month of the whole year, and the most fatal. Cholera rife. Diarrhoea and dysentery at their climax. Convulsions and dentition, too, cause many deaths.

Cases of bronchitis not infrequent, owing to vicissitudes, and they are prolonged by the weakened state of the constitution, and probably by night exposure. Infectious eye complaints very common. This month seems to be favourable to croup.

CHAP. XII.

Bronchitis.

September.—An improvement in the general health. The nature of the sickness and the fatality remain much the same as in August, but the mortality and number of admissions begin to decline.

September.
Some improvement.

October.—A marked improvement, the admissions diminish by one-fourth and the deaths by one-third. Fevers still prevail to the same degree, and are equally fatal. Cholera mitigated. Bowel complaints diminish very greatly. The month seems to be unfavourable to the development of croup. Convulsive affections and dentition cause much fewer admissions and deaths. The nervous tension is being relaxed.

October.
Marked improvement.Nervous and
bowel complaints less.

November gives much the same general results as October. The diminution in sickness and mortality is maintained, but is not progressive; in fact, the mortality is somewhat higher, remittent fever having been particularly common and fatal. Intermittent fevers, too, are at their height, but bowel complaints incline to diminish. Convulsions and dentition give unfavourable results as compared with the last month, probably owing to the greater proportion of fevers.

November.
Conditions generally stationary.

December.—An immense diminution in both admissions and deaths—19 per 1,000 of the former and 4 of the latter, as compared with 43 and 9½

December.
Great improvement.

CHAP. XII. in August, or 29 and 5 in November. Malarial fevers reduced by two-thirds, dysentery by one-third, and diarrhoea by two-thirds upon the rates of the previous month.

Immunity
from certain
diseases.

Such is a very imperfect sketch of the year as it affects the European child in India. In glancing over it, one cannot but be struck with the absence of any mention of such affections as consumption, scarlet fever or small-pox, as having occurred among the soldiers' children in India, yet such was the case.

The most
common
diseases are
largely pre-
ventable.

A very cursory attention to these details, will show that care will be able to effect a great deal—in fact, to alter the whole story from the present narration to that which Payne and Fayrer relate of the European child in Calcutta.

Most common
affections in
order.

In order of frequency the most common diseases are—

1. Eye affections, during the rains. These should never be known in any well-regulated nursery.
2. Diarrhoea, with the first accession of hot weather, and during the rains. Largely preventable by attention to diet.
3. Fevers, during the rains and in autumn. Preventable to a great extent (p. 143) by avoiding exposure.
4. Wasting does not observe seasons, but is frequently the result to the Nos. 2 or 3.
5. Measles, at the end of the cold weather. Prevented by avoiding infection.
6. Chest complaints, at the end of the rains and in the cold seasons. Prevented by avoiding exposure.

7. Dentition bears a ratio to the intensity of the heat, by which nervous susceptibility is increased. Chiefly to be avoided by preventing violent diarrhœas and fevers.

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8. Convulsions during the hot season and rains, for the same reason. Means of prevention the same.

The most fatal affections are in due order—

Most fatal
affections in
order.

- | | |
|----------------------|-----------------------|
| 1. Diarrhœa. | 8. Dysentery. |
| 2. Convulsions. | 9. Tabes mesenterica. |
| 3. Wasting. | 10. Croup. |
| 4. Dentition. | 11. Apoplexy. |
| 5. Measles. | 12. Whooping-cough. |
| 6. Fevers. | N.B. Cholera is here |
| 7. Chest affections. | omitted. |

It is not necessary here to enter into an exact comparison between the differences in the kinds of sicknesses which prevail in India and England. In illustration, however, of the vast difference that really exists, I may mention that in England scarlatina heads the list of fatal diseases for the 2nd, 3rd, 4th, and 5th years of life. Whooping-cough stands second for the 3rd, 4th, and 5th years. Inflammation of the lungs is third for the 2nd, 3rd, 4th, and 5th years; and bronchitis is fourth. Now all of these diseases hardly count at all in the Indian bills of mortality.

Great
difference
between Indi
and England
as to kind of
fatal diseases

SECTION II.—*Sickness according to Age.*—The next appended table (No. III.) shows the mortality at different ages. Regarding each period separately, we find that *under 6 months* of age the total mortality is about 300 per 1,000. Diarrhœa,

Fatal sickness
most common
at each age.

Under six
months.

CHAP. XII.

High
mortality at
this age
peculiar to the
army.

convulsions, dentition, and debility then cause most of the deaths ; but it is very difficult to judge how far each of these may not have been really a part and parcel of some other, for a case is returned naturally under the heading for which it came under treatment. I believe diarrhœa to be the chief originator of the others, and that the lamentable loss of life of soldiers' children even at this age is due to this affection, which is then a truly preventable disease ; at all events, it is certain that these causes of death are rare among the English infants of Calcutta, and that if they were similarly rare among the soldiers' children, the statistics of the latter would be referred to as a proof of the healthiness of India to the European child, instead of being used, as at present, to demonstrate its unhealthiness. We have a practical reply to the questions,—Can they be removed ? Is it mere theory to affirm they can, or is it really practicable ? In short ; remove this great blot, and reduce the mortality during this period, to the Calcutta scale, and the whole question would bear a different aspect.

Chief cause of
high mortality
of soldiers'
children.

In a former chapter (p. 11) we have seen that 17,000 infants are sacrificed in England above the Scottish standard, from convulsions alone, because of a simple difference in the matter of feeding. In this respect the soldiers' wives chiefly err. Nearly 300 of their children out of every 1,000 born, die at this age ; and of these, over 200 die from affections which are mainly preventable, representing that number of lives wasted. The practical lesson here taught is that which has been

frequently inculcated throughout these pages, and which, at the risk of being tedious, I again repeat—feed a child *only* on milk till the first dentition, and let that milk be its mother's. The thick satisfying foods mean death. A child at this age is of course liable to croup, bronchitis, and whooping-cough, but these affections run a mild course in India; and there is a singular exemption from cholera.

From 6 months to 1 year the total mortality is about 180 per 1,000. The soldier's child's chance of living is increased by about one-third upon the former period. Bowel complaints still claim a large proportion of victims, convulsions are three times less fatal, and dentition is credited with 35 deaths out of every 1,000 children. Wasting causes more deaths than at any other period of the child's life—a condition usually indicating mal-nutrition consequent upon ignorant and injudicious feeding, though some such cases arise no doubt from fever and spleen. The child becomes more liable at this age to dysentery. There is greater liability to brain affections than subsequently. In fact, the nervous impressionability is so high that teething, if there be general mismanagement, produces a large number of deaths. The digestive organs still require tender care. The liability to chest affections is increased, and cholera comes upon the scene, though sparingly as yet.

From six months to one year.

Commoner diseases.

From 1 year to 18 months.—Total mortality about 160. Diarrhoea reaches its highest fatality. Dysentery holds its own. Brain affections and

One to one and a half years.

CHAP. XII.

Commoner
diseases of
this period.

convulsions slightly decline. The proportion of deaths attributed to "dentition" remains much as during the former period. Chest affections are more formidable than at any subsequent period, the child being able to expose but not to protect itself, either by exercise or intellect. To whooping-cough and measles there is full liability, the mortality from these complaints being at its highest in 1875. To the fevers of the country, there is considerable liability (16 per 1,000 dying from them). Cholera becomes much more common; and the liability to croup increases (being at its highest in 1875)

One and a
half to two
years.

Bowel
complaints
lessened.

From 18 months to 2 years.—Mortality about 70 per 1,000. The mortality is reduced to one-half upon the former period; the child's digestion being much stronger, it is able to utilize the foods which before tended to kill it; therefore we find diarrhœa reduced by one-half and dysentery by one-fourth of their former fatality. The nervous excitability is lessening, and the period of first dentition is for the most part over, therefore the danger of teething, and the liability to convulsions and brain affections are much less common. The child is able to take exercise; wherefore chest affections greatly recede in number and seriousness. The cholera liability increases, but measles and whooping-cough are less fatal.

Two to three
years.
Cholera
liability
increased.

From 2 to 3 years.—Mortality about 60 per 1,000. The cholera mortality is doubled. Measles is more prevalent. Dysentery becomes more frequent and formidable. Diarrhœa, with increasing age, becomes less dangerous, though there is still

special liability to it, and it is the principal cause of death. Chest affections are tolerably common. Convulsions and brain affections diminish much. Measles are common.

From 3 to 4 years.—Total mortality 60 per 1,000.—Cholera liability still further increased. Measles less fatal. Convulsions and brain affections claim but few victims. Dysentery increases, and diarrhœa decreases. Chest affections much less frequent and fatal, the child being more capable of exercise and self-care. Fevers increase in seriousness. Three to four years.

From 4 to 5 years.—Total mortality 30 per 1,000, or a reduction of 50 per cent. Malarial fevers prevail, and cause 6 deaths per 1,000. Diarrhœa becomes an inconsiderable item. Cholera liability continues. Convulsions and brain diseases uncommon. Croup liability continues. Four to five years.

CHAPTER XIII.

ON THE SPREADING OF DISEASE, INFECTION, AND DISINFECTION.

Infectious
diseases not
common in
India.

CHILDREN'S sicknesses of an infectious nature are more common in England than in India,—particularly is this so with regard to scarlatina and whooping-cough; but we meet with all the European varieties in India, though to a less extent. They include the following:—Scarlatina, whooping-cough, measles, small-pox, diphtheria, typhoid fever, dengue, influenza, and erysipelas.

Some of these diseases are capable of being spread by other means than those which are ordinarily termed infectious,—as, for instance, typhoid fever through the medium of water; and scarlatina and diphtheria have both been largely disseminated through the agency of milk, the attacked persons never having been near the sick individuals.

Diseases
spread
through
water.

There are other affections which are spread almost wholly through the instrumentality of water, and are not therefore in the popular sense of the term infectious; such are cholera, dysentery, and some kinds of intestinal worms.

Malarial
diseases.

Again, there are certain diseases termed malarial, which have their origin in the soil, and which are not in any way transferrable from individual to individual.

What is infection? By the expression "infectious" we mean the capacity of a sick individual to propagate his disease to others; but of the infection itself, that is, of the actual agent, we knew very little till comparatively recently. Formerly the air surrounding a patient was known to be tainted; some impalpable change was vaguely supposed to have occurred in it. But now, through the labours of scientific men, we have been led several steps in advance. We now know that infectious diseases are multiplied by germs or seeds which are given off from those who are ill, and which, sown in the bodies of others, produce the same diseases in them.

CHAP. XIII.
The nature of infection.

Is a veritable seed.

The important points to know, are, that the infective material is a congregation, more or less numerous, of living germs or seeds; that it consists of particles which, in some cases, have been isolated, seen, and measured; and that the particles possess life. "The contagium particles in a patient's breath resemble an enemy's bullets. The breath would be harmless without the particles, just as an enemy's powder would be harmless without his bullets" (*Med. Chir. Review*, 1877).

Nature of the seed.

Professor Tyndall states the case thus plainly and popularly:—

Tyndall's description.

"From their respective viruses you may plant typhoid fever, scarlatina, or small-pox. What is the crop that arises from this husbandry? As surely as the thistle arises from the thistle seed, as surely as the fig comes from the fig, the grape from the grape, the thorn from the thorn, so surely does the typhoid virus increase and multiply into typhoid fever, the scarlatina virus into scarlatina, the small-pox virus into small-pox. What

CHAP. XIII.

is the conclusion that suggests itself here? It is this,—that the thing which we vaguely call a virus is to all intents and purposes a *seed*; that in the whole range of chemical science you cannot point to an action which illustrates this perfect parallelism with the phenomena of life—this demonstrated power of self-multiplication and reproduction. There is, therefore, no hypothesis to account for the phenomena but that which refers them to parasitic life."

Why the specific fevers do not occur twice in the same person.

Each kind of contagium particles requires its own peculiar kind of nourishment. Thus, measles attacks a patient who has never had the disease before, it feeds upon those elements of his body and blood essential to its nourishment, it exhausts the body of its special food, making it impossible for another germ of the same species to grow in this exhausted soil, and thus removing the possibility of a second attack of this kind of disease. The food which is required for the germs of those diseases which occur only once in a lifetime, is of a nature that, when once abstracted from the body, it is not reproduced.

Vitality of germs.

The poisons of some diseases are very easily got rid of by ventilation alone; but the viruses of such affections as small-pox and scarlatina will spread in spite of the freest ventilation, and finding appropriate resting-places, they may lie dormant for long periods. The membrane of diphtheria and the skin scales of scarlatina may be exposed to dry air for weeks, and still retain their potency. Cases are on record where for years old and uncleaned walls have retained and propagated small-pox.

How the germs enter the body.

The modes by which the disease germs or seeds enter the bodies of previously healthy persons are numerous. The particles which are thrown off

from the infected body, pass into the air which may be breathed; or, from the air they get into water or milk or other food, and thus gain access to the stomach; or they may light upon a broken surface, such as an ulcer or a wound, as occurs in cases of erysipelas.

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The giving off of the infection takes place most actively from those parts of the infected individual's body which are the chief breeding-places of the particles. Thus, from the skin and expectoration in measles; from the mattery discharge and skin in small-pox; from the mouth and skin-scales in scarlatina; from the stools in typhoid fever; from the vomited matter and stools in cholera; and so with others.

How the germs are given off from the sick.

The ways in which diseases are spread through human agency are almost innumerable. The dhobee, if permitted to wash for others, may disseminate small-pox or scarlatina. The tailor, who is allowed to take away work to his wretched hovel, may ply his needle close to diseased persons. Convalescents too early coming in to contact with the healthy is, no doubt, the most common means of propagation.

Infection through human agency.

"Dr. Grimshaw, who has devoted much special attention to the subject of the spreading of contagious diseases, relates that a patient with small-pox pustules on him, admitted into hospital, had on the previous day been occupied in dressing a lady's hair, and he writes, 'I have a butcher in the hospital who cut up four carcasses of beef after he had the pimples on him; I have a grocer who was attacked in his shop, and sold tea and sugar to the public with the rash on him; I have a telegraphist who was working in the post office after the eruption was out on him. With these things occurring, is it any wonder that small-pox is spreading in every direction?' " (Cameron).

Illustration

CHAP. XIII.

The object of
disinfection.

The particulate living nature of the disease germs being understood, it becomes quite evident that if we can destroy them or their vitality before they find an appropriate soil for their further growth, we prevent the further spread of the particular disease. To accomplish this end we endeavour to deal with the poison at the seat of its origin, as far as it may be accessible to disinfectants, in conjunction with other preventive measures, such as guarding against the entrance of the poison into water; but as these matters cannot well be separated, they had better be discussed in detail under the heading of each disease in the next chapter. We must, however, also adopt general measures, and of these we now proceed to speak.

Management
of the sick
room.

As to the sick room. An abundance of fresh air should be admitted. A large room selected, no curtains, carpets, or tablecloths allowed; light should be admitted freely, unless the nature of the case requires otherwise; slops and stools should be instantly removed; soiled linen should be placed at once in a solution of lime chloride (1 part to 30). As little communication as possible allowed between the sick and other inmates of the house. Other children should be removed to a distance; and should the patient die, speedy interment should be adopted.

Disinfection
of the empty
room.

Disinfection of the empty room. After removal of the patient, all windows should be thrown open, all woodwork should be thoroughly washed with soap and water to which carbolic acid (1 pint to 4 gallons) has been added, and the furniture after-

wards removed into the open air. All fabrics should be placed in the solution of chloride of lime in the room, and then removed from it. The walls should then be brushed, and when the dust has blown away or subsided, every window and door should be carefully closed. Then a sufficiency of sulphur (Gunduk) should be procured and placed in different parts of the room upon open earthenware dishes, and set alight. The quantity of sulphur required will be about 1 seer for every 1,000 cubic feet of space (a square measuring 10 feet in all directions) in the room. For about 4 hours, the room should be kept closed; then throw it open for 24 hours. If the walls are whitewashed, they should be scraped and re-washed, carbolic acid having been added to the whitewash.

Disinfection of clothing. An extremely high dry heat is the most efficient mode of accomplishing this; but except in large towns, where a special apparatus exists, it is usually impossible. A baker's oven might be improvised, by placing sand upon its floor to prevent injury to the clothing, which may be suspended upon lattice-work within the oven. But by properly conducted soaking and boiling, the object may usually be effected, by adding 1 gallon of the strong commercial solution of chloride of lime to 20 or 30 gallons of water, or adding 6 oz. of the powdered chloride to a gallon; or making a solution of carbolic acid, 1 pint to 100, we get a good solution, in which clothing should be soaked for 24 hours, after which it should be boiled and dried. But these solutions will injure delicate fabrics. Fumigation with sulphur is

Disinfection
of clothing.
Dry heat.

Soaking.

Fumigation.

CHAP. XIII. — another method of purifying clothing. The articles should be suspended in small closed chambers, and a large quantity of sulphur set on fire beneath them. Mattresses should be pulled to pieces, and their interiors destroyed by fire or thoroughly fumigated.

CHAPTER XIV.

CHAP. XIV.

THE CAUSES AND PREVENTION OF THE MORE COMMON DISEASES.

“THERE are two modes,” says Dr. Parkes, “by which we may attempt to prevent the occurrence of disease.” How to prevent disease. 1. By conforming with the general rules of hygiene, by which the health is maintained at the point most capable of resisting disease. 2. By investigating and removing the causes of disease. The precise cause of some diseases is not perfectly understood. Then “we must act, as in so many other affairs, on probability, and endeavour to remove those conditions which, in the present state of our knowledge, seem to be the most likely causes.”

MALARIAL FEVERS.—Malaria is that condition Malaria. which makes the climate of India so obnoxious to the European. By numerous observations it has been established that some æriform material of a poisonous nature is exhaled from marshy or wet grounds in the process of drying. A high temperature, under certain conditions of moisture, is An emanation from the soil. evidently necessary to its extrication and development. These conditions we have in India, to perfection, during the autumn months.

There is also some strong evidence tending to

CHAP. XIV. prove that drinking water from a marshy soil is

May be introduced through drinking water.

capable of introducing the poison into the system. "One very important circumstance is the rapidity of development of the malarious disease, and its fatality when introduced in water," observes Parkes, after an analysis of the evidence on this point.

Air of marshes.

The air of marshes is proved to contain a considerable quantity of organic matter (of plants, animalcules, and insects).

We see, then, that there are two modes by which the poison may be introduced into the system,—viz., through the air and through water.

Water not a source of great danger.

As to the latter, or water origin, the dangers (the usual precautions being observed) are not great. The water of wells is supposed to be safe, but it may be otherwise if the well exists in low-lying, swampy ground. The water of tanks is not so safe; but we possess such easily applied and thorough means for its purification (pp. 71, 72), that there remains no excuse for the consumption of a dangerous water, except among the extremely poor. The examination of the source of supply, filtration, and attention to the details laid down at p. 71, are the simple and efficient means of prevention.

Prevention.

As malaria does not naturally exist 3,000 feet above the sea level, removal to such a height, when it can be adopted, is an obvious means of prevention. When the locality cannot be left, the choice of a well-ventilated house, which is raised some feet from the ground level, situated on the

highest attainable spot, and removed as far as possible from marshy ground, is a matter which should not be neglected. Dense herbage in the compound should not be allowed, though trees, which do not impede the ventilation of the house or of the soil, are beneficial. Indeed, belts of trees between a marsh and a station are a recognised mode of preventing the access of the poison. During damp weather the very early morning and night air should be avoided. Chills undoubtedly are capable of developing fevers of this type; but it is not generally believed that they, without the previous imbibition of the poison, can of themselves originate a malarial fever or condition. They certainly do not do so in temperate climates, and they certainly are an exciting cause in India (p. 123). The administration of quinine in small doses is the only preventive known, so far as medicines are concerned. Warm clothing, observance of the precautions above enumerated, and the partaking of food before exposure, are other accessory means.

Chills as a
cause of
fevers.

CHOLERA.—All evidence opposes the idea that cholera is infectious, *i. e.*, that its poison is exhaled from the body. From this it might be thought that the cholera patient may be approached with impunity. This is not so, for it is most certain that the motions and vomited matters of cholera patients are the most powerful means of conveying the poison. "It cannot," says Mr. Simon, the medical officer of the Privy Council, "be too distinctly understood that the person who contracts cholera in this country (England) is, *ipso*

Cholera but
very slightly
infectious.

Yet may be
spread from
person to
person.

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The evacuations the great means of spreading.

facto, demonstrated with almost absolute certainty to have been exposed to excremental pollution ; that that which gave him cholera was (mediately or immediately) discharged from another's bowels ; that, in short, the diffusion of cholera among us depends *entirely* upon the numerous filthy facilities which we let exist, and especially in our larger towns, for the fouling of earth, air, and water ; and thus, secondarily, for the infection of man, and whatever contagion may be obtained in the miscellaneous outflowings of the population." Therefore, when treating a cholera patient, the destruction and disposal of the evacuations should receive special attention (p. 146). When a cholera patient vomits, or when he passes his watery stools, these matters soon dry up and become capable of diffusion in the air, whence they may enter the bodies of other persons, or, adhering to their clothes, they may be carried about : hence it is necessary to avoid those who are stricken with the disease ; and children should be removed from the vicinity of the disease. But the particles may be conveyed into drinking water, or into food, as well as into the lungs, in the manner mentioned, whence they may obtain access to the bodies of others. The chances of imbibition through the air are small, if we judge by the very small number of attendants upon the sick, who are attacked. Spreading through the medium of water is the most common. Numerous facilities for the pollution of water exist in India. Macnamara has shown that when cholera stools are added to water, the water becomes capable of disseminating

Spread through the stools and vomited matters. By air.

Or food.

Attendants seldom attacked.

By water.

the disease, when certain microscopical forms of animal life appear ; but not till then, and not after their disappearance. The cholera poison is capable of preservation in an active state for a very long time if kept dry, as it may be in soiled clothing, or in the soil. When it gains access to a suitable place its virulence is called forth. Such, in a few simple words, are the conclusions to which laborious investigation has led.

CHAP. XIV.

Period of
activity of the
germ.
Vitality
great.

The measures for prevention are, therefore, obvious. (a) Firstly, the most scrupulous attention should be paid to the drinking water, the precautions detailed at pp. 70 and 71 being sedulously carried out.

Purity of
water.

"If," writes Dr. Macnamara, "we can only establish the principle that nothing but freshly and properly filtered water shall be consumed by the inhabitants of a town, barrack, or house, not only when at home but when at work—at all times, in fact, when cholera is abroad,—we may, I believe, discard all and every other means of preservation." (b) The sources of the food supply should also be carefully attended to. Foods should

Of food.

not be procured from infected neighbourhoods if they can be got elsewhere. Milk should not be procured from an infected bazaar, but the cows should be milked at the door. The possible contamination of milk with foul water should be recollected. (c) Should it have been necessary to touch a cholera patient, the most careful ablution of the hands should follow every such contact. Great care should be observed that the fingers be not inadvertently conveyed to the mouth after touching a patient or any article

Avoid contact.

- CHAP. XIV. which had been in his use. (d) As diarrhœa has
 Check early been proved to increase the predisposition to
 diarrhœa. cholera, all irritating articles of food should be
 avoided during a cholera period, and all diarrhœa
 ought to be at once checked by astringents.
- Disinfection (e) But most important of all is the destruction
 of the evacua- by disinfectants of all evacuations both from the
 tions. mouth and bowels. These should be received into
 earthenware vessels containing earth. The moment
 the evacuation is thus received it should be treated
 with a strong disinfectant, added without measure-
 ment and with a most liberal hand, such as very
 strong solutions of carbolic acid, or chloride of
 lime, or chloride of zinc. Sulphate of copper or
 sulphate of iron, both of which are obtainable in
 the bazaar, may also be used; or, in the absence of
 any of these, quicklime should be employed. The
 next thing to do is to dispose of the disinfected
 evacuation, which is still to be considered dan-
 gerous, though possibly it may not be so. Deep
 burial in the soil, at a distance from any source
 of water supply, is, perhaps, the safest course.
- Disposal of (f) The clothing worn by the patient should either
 the evacua- be destroyed by fire or thoroughly disinfected
 tion. (p. 139). Robustness of health is no safeguard
 against cholera. Quinine is supposed by some to
 act as a preventive, but this is far from proved.
- Good health, no safeguard. Quinine.

THE ERUPTIVE FEVERS.—As to the prevention of small-pox, the reader is referred to the section "Vaccination" (p. 100). Of the other fevers of this class we know very little regarding their prevention, further than that good sanitary conditions lessen the chances of infection. Avoidance

of a source of infection is an obvious measure; and the isolation of the sick, an imperative duty. An equally needful precaution is the adoption of the measures detailed (pp. 138, 139) regarding the management and disinfection of the sick room and clothing.

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General pre-
ventive
measures.

In addition to the above, the following special measures ought to be carried out during the progress of cases.

Measles.—The skin should be daily rubbed with oil, or camphorated oil, as soon as scaling commences, and the application should be continued until the skin has wholly resumed its natural appearance. The expectoration should be received in a vessel containing Condyl's fluid, or a solution of carbolic acid, and the clothes should be disinfected before being sent to the wash.

Measles.

Special mea-
sures.

Scarlatina.—The throat and the skin are the points to attack in attempting the disinfection of this most infectious disease and subtle poison. From the commencement the skin should be rubbed with oil, or with carbolic acid, 1 part, and olive oil 50 parts (one table-spoonful sufficing for the whole body), with the object of preventing the breaking up of the minute scales and their diffusion in the air. All expectoration should be received in a vessel containing Condyl's fluid or sulphurous acid. Gargles of salicylic acid should be constantly used. The strictest isolation and freest ventilation are imperatively called for. The clothing and bedding had best be burnt, but if this be objected to they must be disinfected (p. 139).

Scarlatina.

Special mea-
sures.

CHAP. XIV.	<i>Small-pox.</i> —Oily inunctions will be found both
Small-pox.	useful in preventing infection, and grateful to the feelings of the patient. The wonderful length of time which the germs of small-pox will retain their potency should be borne in mind as regards the thorough disinfection of every article of the patient's clothing, and of the room he has inhabited. Even after the actual advent of the disease, vaccination, if promptly resorted to, may prevent the development of the disease (p. 102).
Special measures.	WHOOPING-COUGH.—Avoidance of those suffering from this highly contagious affection, and the isolation of the infected, are the only known means for prevention of spreading.
Whooping-cough.	TYPHOID FEVER.—In this affection the poison enters the system in much the same manner as does that of cholera,—chiefly through polluted water. There is also evidence to lead to the belief that it may emanate from the decomposition of the contents of cesspools or other places where ordure is allowed to remain and putrefy. The medium, then, is either air or water. Of late there have been many instances of the multiplication of the disease through the agency of milk which has either been diluted with infected water, or been allowed to stand in dairies in close proximity to patients suffering from the disease.
Typhoid fever.	
Mode of spread. Same as cholera.	
Through Milk.	
Is it contagious?	A well, for instance, in the neighbourhood of a cess-pit, or of a place which formerly had been a cess-pit, may yield a typhoid-producing water. Though the disease, if at all contagious in the ordinary sense of the word, is very slightly so, yet when introduced into a household or village it

shows a decided tendency to spread, just as cholera does. It is very certain that a privy used by a typhoid patient becomes a source of danger to healthy persons who resort to it; the dried-up discharges polluting the air, the germs gain access to the bodies of others and infect them.

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So clearly demonstrated are the above means of propagation, that Sir Thomas Watson "cannot help entertaining a doubt whether the disorder really ever has any other origin."

Sir T. Watson's opinion.

It becomes clear, this being so, that attention to the water supply, its source and filtration (p. 70); and the disinfection of the bowel evacuations (p. 146), are the measures preventive of spreading. "Be lavish," says Budd, "in the use of chemicals rather than run the terrible risk of failing by default."

Preventive measures.

A privy or water-closet used by an infected patient should be thoroughly sluiced and disinfected. In fact, all the precautions called for in cholera are here just as applicable.

To the unthinking it may seem almost ridiculous to suppose that such wide-spread diseases as cholera and typhoid fever are spread almost exclusively through the medium of the bowel evacuations; but, writes Dr. Budd, "every year in England more than 100,000 human intestines, diseased in the way already described, continue each, for the space of a fortnight or thereabouts, to discharge upon the ground floods of liquid charged with matters on which the specific poison of a communicable disease has set its most specific mark."

Does this mode of spreading account for its general diffusion?

DYSENTERY AND DIARRHŒA.—The causes of these bowel complaints may be briefly stated to be the following:—(1) Impure water, which may

Causes

CHAP. XIV.
—

The effluvium
of stools par-
ticularly per-
nicious.

Prevention.

Disinfection
and fumiga-
tion.

Avoid irri-
tating food.

Scorbutic
bowel dis-
eases.
Exposure to
wet and cold.

Malaria.

Causes.

bring on either complaint in children very readily. The greater the amount of organic impurity, the greater the chances of dysentery as opposed to diarrhœa. The selection of a good water and filtration (pp. 70, 71) obviate this danger. (2) Impure air is a well-known cause; particularly noxious is the air from sewage matter, the effluvium of privies and cesspools; but "of all organic effluvia those from the dysenteric stools appear to be the worst" (Parkes), wherefore it is most important that dysenteric evacuations be rapidly disinfected (p. 146), and that they never be retained longer in the house than actual necessity demands. The fumigation (p. 138) of rooms in which dysentery patients have been treated ought always to be carried out. (3) Improper food may directly cause bowel complaints by producing irritation, and indirectly by mal-nutrition of the body, whereby an unhealthy state is engendered, which is likely to expend its force upon the bowels. The denial of vegetables and fruits from the diet, for instance, is very apt to engender a scorbutic taint, which will induce dysentery of a most unmanageable nature. (4.) Exposure to wet and cold frequently causes such congestion of the bowels as to produce diarrhœa, if not a state of inflammatory dysentery. (5) Malarial poisoning is often attended with diarrhœa or dysentery. In such a case the only means of prevention is to treat the malarial state.

HEAT APOPLEXY AND SUNSTROKE are caused by excessive heat and stillness of the surrounding atmosphere, or by direct exposure to the sun. These causes may also produce serious fever.

Exhaustion during exposure to heat increases the liability. The means of prevention are—(1) to prohibit exposure; (2) to arrange the clothing rationally, taking care to allow the chest full play; (3) to allow plenty of cold water at all times for drinking, as being a powerful means of reducing body heat by its direct cooling effect, and by increasing perspiration and evaporation. CHAP. XIV.
Prevention.

OPHTHALMIA is a very contagious dirt disease. A dirt disease.
The matter secreted by the eyes of the sick, rapidly dries, and the small fragments are blown into the eyes of others—a direct inoculation, in fact. Avoid-
ance of any source of danger is the plain precaution; but should it occur in a household it may usually be prevented spreading further by taking precautions that towels or water which have been employed to wash the sick be not used for the healthy—a matter in which native servants are not to be trusted; that the sick be segregated as far as possible; that the freest ventilation be adopted, and the utmost cleanliness observed. Prevention.

CONVULSIONS.—The most common causes are —(1) improper food, and (2) fevers occurring during the early years of life. As to the first of these causes Sir Wm. Jenner writes of the children of the poor :— Causes.

“For the first two or three days after birth their tender stomachs are deranged by brown sugar and butter, castor oil and dill water, gruel and starch water. As soon as the mother's milk flows, they are, when awake, kept constantly at the breast. And well for them if they are not again and again castor oiled and dill watered, and even treated with mercurials, for the poor have learned the omnipotent virtues of grey powder. After the first month bread and water, sweetened Jenner's account of the rearing of the children of the poor.

CHAP. XIV. with brown sugar, is given several times a day, and during the night the child is, when not too sound asleep, constantly at the breast. As soon as the little ill-used creature can sit erect on its mother's arm, it has at the parents' meal-times 'a little of what we have,'—meat, potatoes, red herrings, fried liver, bacon, pork, and even cheese and beer daily, and cakes and raw fruit, and trash of the most unwholesome quality, as special treats and provocations to eat when its stomach rejects its ordinary diet."

By such treatment attacks are frequently induced directly; or indirectly, by producing diarrhoea and consequent debility and bloodlessness. Adherence to the rules of diet already laid down is the means to prevent this catastrophe. As to the second cause, the measures detailed on p. 170 *et seq.*, for moderating the temperature of the body in fevers, are the only pretty certain means of prevention.

Intestinal Worms.—The worms which may infest the bowels of children are of several kinds (p. 302).

As to the *thread* and *round worms*, there is little doubt that the young escape from the eggs soon after the latter are expelled from the bowel, and gain access to the human body with our drinking water or uncooked vegetable food, and there they propagate themselves.

As to the *tapeworm*, its early history has been accurately observed. Each segment of the worm (being bi-sexual) is fitted for reproduction. An impregnated segment becoming detached is expelled from the intestine. After a time it bursts and allows the escape of little embryos, each of which is provided with a boring apparatus having three pairs of hooks. These may be eaten

by some animal, say a rabbit, or a pig, or an ox, with its food. Once inside the body of an animal, the embryo proceeds to lodge itself in the flesh by boring, and having selected a satisfactory home, it drops its hooks and undergoes transformation into a bladder-like form, producing the affection which we know as "measles" in the pig. When this measly flesh is eaten, the creature attaches itself to the inside of the human bowel, where the peculiar nutriment it meets with, causes it to develop into a tapeworm. Many animals besides man are subject to tapeworms, and help to propagate the parasite in the above-described manner.

Having regard to the development and manner Prevention. in which intestinal worms gain entrance, the obvious means of prevention include (1) the purity of the drinking water ; (2) the thorough washing all uncooked vegetables with a *stream* of pure water, to carry off all deposits from the surface ; (3) the thorough cooking of all meat ; and abstention from the flesh of the pig ; (4) the daily use of salt with the diet is also found useful.

THE EXAMINATION OF SICK CHILDREN.

Difficulties.

A YOUNG child no more understands what sickness is than that the world is round. When it first becomes ill it simply feels a strange sensation, but it is really aware of nothing. Information is only to be gained by observation, and whose observation can be so accurate as those who know its daily habits, and watch its every movement habitually? A strange voice, the very act of looking at it, will frighten a child greatly; while actual attempts at examination are resented in a way which very often makes investigation impossible. Before a doctor can do anything with a child he must gain its confidence, and a man who is not fond of children never can succeed; but in the mother the child reposes all confidence; to her he looks for protection, to her he clings when alarmed. It is the mother who is really favourably circumstanced to observe the first signs of illness.

The mother
the best ob-
server.

Firmness of
the muscles
and flabbiness.

A healthy child's limbs should feel firm and elastic. In acute diseases there is a sudden pause in nutrition, the first result of which is a soft flabby condition of the muscles; rapid loss of flesh succeeding, if the disease is not checked. In

chronic disorders, the same flabbiness of the muscles, the result of diminished nutrition, is observed to come on gradually, and to be succeeded by slowly progressive emaciation.

Habitual coldness of the extremities (hands and feet) shows an unnatural feebleness of circulation.

It has before been shown that the nervous excitability of infancy and childhood is great. In a healthy child, who suffers from an acute febrile disorder, this excitability is still further heightened; and hence we have an unusual liability to convulsions. But a child who has been reduced by mal-nutrition or otherwise, loses to a great extent its nervous excitability, so that illness creeps upon it almost unobserved, the symptoms being obscured by a sort of apathy of the system, as it were.

The general *demeanour and the expression* of face will frequently give the first signal of indisposition. A flushed or very pale face, a disinclination to play, unusual crossness, and a disposition to loll about, are signs which bespeak illness. When there is abdominal pain or inflammation, a child will lie upon its back with its knees drawn up; and the under lip is then drawn in, very often. The contracted brow, with pulling at the ears, tells us that there is headache. A general restlessness, with periods of prostration, a drawing in of the thumbs upon the palms of the hands, and a tendency to frequent startings, would induce us to apprehend the approach of a convulsion. Squinting, should it come on while the child appears to be generally out of health, should

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Cold hands
and feet.Nervous ex-
citability
increased in
the healthy
and depressed
in the sickly
child.The demean-
our and
expression.

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always be seriously regarded. The expression of a child suffering from bronchitis or inflammation of the lungs, can scarcely be mistaken by those who have any experience,—the dusky colour, the quick breathing, the parted lips and dilated sharpened nostril. A child will frequently grasp at a sick part, as, for example, at its throat in croup. Lividity of the lips and around the eyes indicates imperfect aëration of the blood; but a faintly darkish tint of the eyelids and around the mouth indicates nothing more than a weak circulation, or perhaps only a bad digestion in a weakly child.

The fontanelle—condition of.

The *fontanelle* is the opening which exists between the bones of the head of an infant. When in any illness the skin over this opening is felt to be depressed or saucer-shaped, we may be sure that the child is suffering from severe exhaustion, and that it stands in need of stimulants and supporting nourishment. On the other hand, should the fontanelle bulge upwards, and be felt to throb with force, we may be sure that there is congestion of the brain, and then we use purgatives, cold to the head and baths.

The cry.

The *cry* of a healthy child—loud, broad, and vigorous—cannot be mistaken; the repeated shrill piercing shriek of the child in whose head mischief is working, is quite characteristic. The long low whine of irritation which accompanies deeply seated inflammation, and which no tenderness or care can subdue, is equally well known. A vigorous fit of normal crying, which petting will not overcome, is usually occasioned by flatulency or

pains in the stomach. An infant sheds no tears till it has reached 3 or 4 months of age ; but once the secretion has been established, their disappearance during crying in illness, is a sign of some seriousness of import. On the other hand, their re-appearance, after temporary cessation, is a sign of commencing recovery.

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Tears.

A perfectly tranquil *sleep* is natural to infancy ; unquiet sleep, tossing about, hurried respiration, and waking in a fright, probably caused by dreams, indicates feverishness ; while sudden startings and grinding of the teeth will occur if the nervous susceptibilities are being worked upon. Heavy sleep is sometimes a normal sleep, and should be left undisturbed ; unless, indeed, any popular “soothing” medicine has been administered, when the condition is not to be ignored (p. 383).

The *bowels* of an infant should be moved two, three, or four times a day. During the first couple of days of life the evacuations are of a black colour ; but henceforth they should be of a bright yellow, and thin in consistency, till the time when other food than milk is given, when they should become darker and firmer. A green colour of the motions indicates irritation of the bowels of an infant ; which irritation, if neglected, will pass into diarrhoea. Mucus or slime with the stool indicates greater irritation, and when there are streaks of blood intermingled with the slime, we may be sure we have an actual inflammation to deal with. Sudden and copious watery purging indicates the absorption of malaria or a chill as

Bowels.

CHAP. XV. a cause, and congestion as a result—a symptom which calls for active measures. White constipated motions point to acidity by which the milk has become too densely curdled within the intestine, and the condition is one which calls for a change of diet. Soft putty-like white evacuations indicate liver derangement, with non-passage of bile. Great or unnatural force of the motions argues indigestion, the digesting fluids not acting properly upon the contents of the intestine, but permitting decomposition before its proper time. Bloody motions accompanying fever, are always indicative of an anxious state.

Abdomen. Puffiness and tenderness of *the abdomen* show that gas is being formed by decomposition within the intestines, and that there is a state of great irritation, bordering on inflammation; while a flaccid, retracted belly shows emptiness of the intestines and the absence of inflammation. Marked pain on pressure just above the right groin, shows that irritation is passing upwards; and when there is, with it, chronic diarrhoea or dysentery, it is an anxious sign. If the “abdominal breathing” be increased, that is if the child seems to breathe chiefly or almost wholly with its belly, attention should be at once directed to the chest, which the muscles of the belly are probably endeavouring to relieve. If the belly be wholly motionless, and the chest acting with unusual vigour, very probably there is some inflammatory complication of the abdomen. An enlarged belly may be simply due to flatulency; sometimes it is occasioned by enlargement of the spleen; but

it always indicates something wrong, even though it may be merely the result of bad feeding. CHAP. XV.

The *urine* of an infant when fever is impending is often copious and clear, but when it is actually feverish the urine is passed with unusual frequency, and it stains the napkins of a reddish colour. When there are worms the urine is often quite milky in appearance. Urine.

VOMITING in an infant at the breast may be simply a mechanical act, indicating that too much food has been taken. Improper food may occasion a sudden attack of vomiting with diarrhœa; so may an approaching attack of ague, but then the symptom soon subsides. *Persistent* vomiting is always a symptom of importance. "In children especially, the existence of obstinate vomiting is indicative of head rather than of stomach disease" (Reynolds). The preliminary nausea, the foul tongue, the abdominal griping and obstinate retching being signs of gastric vomiting, and the contrary holding good of head vomiting, serve to distinguish the one kind from the other. Besides these signs, if it be the stomach that is irritated, there is pretty sure to be diarrhœa; but if the head be the cause, there is usually constipation. Vomiting, therefore, is usually either a very trivial or a very important symptom. Vomiting.

From the *pulse* of a young infant, the amateur is not likely to obtain much information. Even the physician seldom troubles to count it except during sleep, because the slightest excitement has a great effect upon its frequency; but the *nature* of the pulse is an important guide to those who have Pulse.

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experience. I will not here attempt to describe a series of nice distinctions, because such cannot be taught by words; but it is not difficult to judge whether or not the beat is comparatively stronger or weaker than it was on the day before. It may be mentioned, lest the amateur should be startled at its frequency, that the infant's pulse beats about 120 times per minute, while even at two or three years of age it will be 100 or more, when the health is perfect. One thing may be said—that a very slow pulse is unnatural to childhood.

Respirations.

The *respirations* bear a definite proportion to the pulse, for the rate at which the blood is driven through the lungs of course regulates the quantity of air which is essential to yield it a sufficiency of oxygen—a certain quantity of blood requiring a certain quantity of air. The pulse beats about three times for each respiration, or 40 times per minute in the sucking infant, but it is not so fast (by some 8 or 10 beats) during sleep. The breathing should be smooth and regular. By carefully listening to it while a child is asleep, much information may often be gained. If it be possible to apply the ear to the naked chest, the full, deep, clear sounds of inspiration and expiration should be very plainly heard both before and behind, from the collar-bone and top of shoulder-blades to the lower edge of the ribs. Sometimes fat, full-blooded children breathe heavily, or with a sort of grunting sound, which can hardly be mistaken for diseased action, but it is as well to bear the fact in mind.

When the breath is drawn in with some difficulty and with a shrill sound, there is evidently

narrowing of the entrance; and if, at the same time, there is a peculiar broken bell-like sound in the cough, probably there is some form of inflammation of the throat. When the lung is inflamed there is quick inspiration, the lips are kept apart, and the child is very restless, thirsty and feverish. In bronchitis the respiration is more or less difficult, sometimes not greatly so, and there is a great deal of "wheezing," which will be heard as a crackling or gurgling sound when the ear is applied to the chest. The breathing may be simply quick from fever; but if rapid and accompanied by movement of the nostrils, there is usually bronchitis or inflammation of the lungs.

Unequal movement of the two sides of the chest—that is, if one side remains motionless while the other expands fully—generally indicates something seriously wrong.

By placing the open hand gently but firmly against the side of the chest, a rattling may often be *felt*, in cases of bronchitis. But if after a good cough, a rattling which previously existed, disappears, the cause no doubt was only a temporary accumulation of mucus. If, however, it remains after coughing, and continues equally marked as before, it is a sign that a good deal of mischief exists.

In health the *tongue* is clean and the *breath* sweet. A whitish tongue indicates derangement of some sort, such as approaching fevers, indigestion, &c. A dark brown condition of the tongue is present in inflammations and severe fevers; when in addition to this latter condition, there is dryness of the organ, we may be pretty sure

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—

there is serious illness. A very red, flesh-coloured, raw-looking tongue indicates gastric or intestinal irritation. The tongue is itself liable to inflammation without any other diseased condition being present, but its swollen state, ruddiness, and the absence of other symptoms, will serve for recognition.

Breath.

Foul breath may have its origin in a simple disordered stomach or fever. Sometimes, with comparative health, the breath remains foul; but there must be something more or less wrong while anything offensive can be detected.

Mouth.

Within the *mouth*, on the sides of the cheeks or lips, the irregular little white patches called "thrush" may occur. An inflamed patch, with an ash-coloured centre on the inside of the cheek, occurring in exceedingly debilitated children, or during a long and prostrating illness, is a most alarming sign, for which medical aid should be sought without delay (p. 235.)

Skin.

The *skin* in the hot weather should always feel moist and cool. A hot dry skin, after exposure to great heat, should always be regarded as illness, and should be treated as such without delay (page 332). A dull, clay-coloured skin often accompanies the sudden accession of illnesses, such as acute diarrhoeas, and agues. A wax-like skin, with transparency of the ears, tells of bloodlessness, and a yellow skin, of jaundice. A flush over the cheek bones on a pallid back-ground, bespeaks hectic or wasting fever.

Bodily temperature

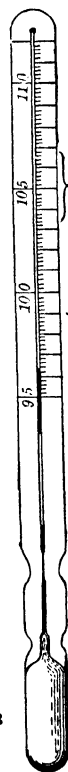
The *temperature* of the body is a matter of great moment for assisting in the recognition of illness. Particularly is this so in the hands of the unskilled in disease, for here we have a matter of fact, free

from all the errors into which mere opinion, judgment, and anxiety are apt to lead, by which we can determine the import of other symptoms; and after a few observations, ascertain whether the case is one of mere indisposition, or whether the patient is suffering from actual disease, long before we could ordinarily guess without such assistance. No estimate of the heat of the body can be made by the hand, indeed the most erroneous impressions may easily be conveyed to it. In the thermometer alone, have we the means of ascertaining the temperature with accuracy.

The ordinary thermometer is useless for the purpose. A clinical thermometer such as is here represented should be in the possession of every one who has the care of children. The instrument is made wholly of glass, upon which the graduations are cut. Between each set of figures there are five degrees (written 5°), each of the longer lines representing 1° , and between each of these latter are five spaces, which therefore show fifths of a degree. It will be observed that the thermometer is narrowed towards its lower end, and that the minute central tube at this

As judged by hand, fallacious.

Thermometer necessary.



Great danger 107

High fever.

Fever 102.
Feverish 101.
Indisposition 100

Natural temperature 99.
Depression 97

Collapse 95.

Kind of Thermometer.

Description of instrument.

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point becomes so fine as to be barely discernible. The object of this is to prevent the portion of mercury (A) which is detached in the tube, from descending into the bulb (B); an accident which would spoil the instrument as a self-registering thermometer. In the diagram the detached portion is observed to register $96\frac{2}{3}^{\circ}$.

How to read it.

If the bulb be grasped in the hand, the mercury will be seen to ascend the tube rapidly till it apparently strikes against the detached portion, which will ascend too, till the highest temperature is marked. Now, if the hand be removed from the bulb, the lower part of the column of mercury will rapidly descend towards the bulb, or into it in the cold weather; but the detached portion will remain stationary, marking the highest temperature which has been attained; hence the instrument is called "self-registering," and the detached portion is called the "index."

To set it.

To set the thermometer for use again, it is merely necessary to grasp it by the upper end, between the forefinger and thumb, and swing the arm sharply around; by which motion the detached portion is jerked somewhere below the figure 95.

To use it.

To use the thermometer; the patient should have been in bed for at least half an hour. One arm should be removed from the sleeve of the night-dress, and all clothes kept away from the arm-pit. This should be done quickly and without exposure of the surface to the draught of a punkah or other cold. It is very necessary that this precaution should be taken, lest the regis-

Caution as to placing it.

tration of a temperature below that of health, should cause the parent to imagine that something terribly wrong had occurred ; or the thermometer might, under such circumstances, record health when fever is actually present ; or at least a lower temperature than it would indicate if fairly treated. The bulb of the thermometer is now to be placed deeply into the middle of the armpit, and the arm itself drawn firmly across the front of the patient's chest. This position, with the thermometer firmly fixed, should be maintained for at the least ten minutes. The thermometer may then be removed and taken to a good light, where it may be read. In doing this the observer should be careful not to allow the bulb to come into contact with his own hand, nor should he read off the temperature in the direct rays of the sun.

Caution as to
reading.

A clinical thermometer is a delicate instrument, and should never be employed to ascertain the temperature of a bath or to do any such like work, which will be sure to spoil it.

Now as to the general information we can derive from the thermometer :—

Information
given by the
thermometer.

(1) In the first place, the temperature of a child's body when in health, is about 99 degrees; one or two sub-divisions more or less either way, will not signify.

(2) Again, the temperature in health always reads a little lower in the mornings than in the evenings.

(3) A rise above 100 degrees is a sure sign of some kind of indisposition, which is deserving

attention; and if the rise is persistent (*i.e.*, if it continue beyond 12 or 24 hours), we may be certain that an illness is coming on.

(4) If the temperature rise steadily at each observation (as compared with the figure obtained at the same hour on the previous day), we may be quite certain that the illness is gaining ground; similarly, a daily decline indicates approaching convalescence. If it goes on increasing daily, till at the end of a week it has attained 104° or more, there is cause for anxiety. Still increasing, there is danger.

(5) A temperature much lower (97°) than the natural heat, is seldom found, unless towards the end of some exhausting illness; and it indicates the necessity for artificial warmth, stimulation, and food.

(6) A very suddenly high temperature occurring in a child, indicates either an attack of ague, or it may arise from exposure to the sun. Unless precautions are taken, convulsions are then imminent. A *sudden* rise from the healthy standard is not of the same seriousness as a gradual increase up to a similar point, except in so far as the liability to convulsions is concerned.

(7) After an illness, though a child may apparently have recovered, he has really not done so until the temperature has become not only natural, but has remained so for several days.

(8) When the evening temperature, during illness, becomes lower than that of the morning, it is a favourable sign.

PART III. .

The Child in Sickness.

DIVISION I.—ON FEVERS.

CHAPTER XVI.

CHAP. XVI.

ON FEVER GENERALLY.

ITS NATURE, TREATMENT AND CLASSIFICATION.

THE term “fever” is a perfectly well understood one, implying a series of symptoms—heat of skin, thirst, a quick pulse, a flushed face and scanty urine. General definition.

But a state of fever may arise as a mere symptom of a local ailment, such as the existence of a boil, the ingestion of improper food, &c. In these cases the febrile state is only a constitutional manifestation of a local complaint, and as such does not now engage our attention. At present we are discussing general fever as a disease in itself. May be of local origin.

Almost all fevers commence in the same manner, without at first any well-marked distinguishing characters. It would only be attempt- Commencement of all fevers the same.

CHAP. XVI. ing an impracticable refinement to endeavour to indicate point-blank, early differences which would serve for the recognition of each kind. It is quite true that there are in India some fevers which are capable of almost immediate detection by the aid of the thermometer and their peculiar symptoms; and of such we shall speak presently. But in the majority of instances we only see before us a patient suffering from a state of fever, whose course we must carefully observe for a couple of days or so, before we find ourselves in a position to pronounce definitely as to its nature. This being so, it becomes very essential that we should have some clearly defined principles of action upon which to proceed to meet the emergency, with the best chances of leading it to a favourable issue.

Nature and effects of fever.

Before we can act intelligently or usefully, we must have some sort of a correct idea of what we are dealing with, how it affects the system, what are the dangers arising out of it, and how may these be best obviated.

What is fever?

A process of combustion.

Fever is an unnatural but veritable burning up of the body, the constituents of which are, through too rapid combustion, wasting away at an undue rate, while at the same time the assimilation of nutriment is so very slight as to be far from compensating for the loss thus endured. Thus results prostration, which is augmented by the increased rapidity of the heart's action driving the blood more quickly through the body, acting as another destroying power, by serving to remove with greater speed the discarded fragments, while

it conveys no renovating substitute, or next to none. It is easy to understand that the offices of the liver, spleen, and all other organs, which are thus deprived of nutrition and obliged to receive

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Nutrition
becomes
affected.

an immense amount of waste which their diminished powers are not able to dispose of, are liable to become impaired. Whence arises further deterioration of the blood, of which all these organs are perfecters and purifiers. From mal-nutrition the brain and spinal cord become disturbed; they no longer are able to exercise complete control over the whole body. When the

Hence ner-
vous disturb-
ance and mus-
cular waste.

galvanic battery is out of order, the telegraph wires are of very little use. Hence the frequency of convulsions and other nervous affections during the fevers of children, whose nervous organization is so much proportionately in excess of that of the adult. Without entering into the theory (which is here unnecessary) of the febrile state, such, in general terms, are the great and salient points to be kept in remembrance by those upon whom the treatment of a fever case devolves; and I would beg particular attention to the above description.

Whatever be the cause of a fever, whatever be the nature of the poison which initiated it, or whether there be a poison or not, the above statement of the case holds equally good; and this is fortunate, for it gives us distinct indications as to the dangers incurred, and the measures we should adopt to meet the emergency and guide it to a proper course.

Necessity for
understanding
this.

The objects of *treatment* then should be as Treatment.
follows :—

CHAP. XVI.

1.Reduce heat.
Dangers of ex-
cessive heat
two-fold.

1. *To reduce the excessive heat of the body.*—

From such heat there are two dangers ; firstly, that which I may call the immediate danger, the effect of heat as heat, by which the temperature of the brain and spinal cord may so be raised that they will no longer act naturally, the result being convulsions or complete paralysis (that is, death). Then, there is the secondary or remote danger of enormous waste, which may proceed past the powers of bodily endurance.

It is perfectly apparent that if we can but reduce the fire, the stove will not become red hot, and less fuel will be consumed. So if we can lessen the bodily heat, we remove or lessen both these perils, the first of which is to be apprehended when the temperature suddenly rises to 104° or over it, or when there are twitchings of the muscles and the other “ warnings ” enumerated under the head of “ convulsions ; ” and the second is always present during the course of prolonged fevers.

The cold bath. When we have indications of the advent of the serious effects of direct heat, the most prompt attention and energetic measures are demanded. By far the most efficient means known for counter-acting this danger is the use of the cold bath, which should be fearlessly resorted to in such cases.

When to be used.

Whenever the temperature rises suddenly to 104°, or whenever nervous symptoms threaten during the course of a fever, it is an imperative duty to resort to the cold bath, which should be administered as follows :—In all cases of pressing emergency, the water should be as cold as it is

**Administra-
tion of.**

possible to procure it, the bath should be deep, the child should be immersed in the water up to its neck, and there detained for a period of from 15 minutes to half-an-hour. Should the emergency not be so great, and the child be extremely easily frightened, the temperature of the water may be raised to a heat five degrees less than that of the child's body, as measured by the thermometer, a blanket or sheet being spread over the bath, so that the water be invisible to the little patient, who is then to be gently lowered into the bath upon the sheet. But the surface of the water should always remain uncovered to hasten cooling, and with the same object the water may be agitated, provided this do not frighten the child.

The effects of the bath so administered are, I may say, invariable. After a few minutes the child's face will brighten up, the nervous twitchings subside, very constantly a motion is voided in the water, and after a short time the child, who before was but semi-conscious, will play with pieces of wood or other toys which have been thrown upon the surface of the water. Whilst seated in the bath, food may be administered, and that which before was persistently and petulantly refused, will now be freely partaken of.

Effects of the
cold bath.

To obtain real benefit of some duration, it will be necessary to keep the patient in the bath for at least a quarter of an hour. As to how much further it may be prolonged, it is well, in most cases, to abstract heat till shivering commence. With the occurrence of this sign, the child should be removed from the water, placed lying upon a

Duration of
the bath.

CHAP. XVI. sheet spread to receive it, and gently dried without rubbing; perfect drying is neither necessary nor desirable. Then, covered by a single sheet, it is to be laid upon the bed, when it will in nineteen cases out of twenty fall into a quiet slumber, such as has been unknown to it since it became ill.

Treatment on removal. Further treatment. After a few hours—perhaps 4, 6, 8, or 10—the heat may possibly again rise to a threatening point. What is to be done? Repeat the bath without a moment's hesitation in precisely the same manner as before. A repetition, even several times within the twenty-four hours, is quite admissible and often very necessary.

Prejudice against the bath. I have entered thus fully into these details, because I know from experience that I am treading upon prejudiced ground in urging this advice. Popular objections to the proceeding seem to be—firstly, because of its comparative novelty; secondly, because of its apparent cruelty; and thirdly, because native opinion (and the ayah has a powerful voice, which she does not, in her ignorance, scruple to use on the distracted parent), is so vehement against either cold water or fresh air in cases of this sort. As to the first objection, it is no novelty, but a well-established medical agent; as to the second, let the effects answer for themselves. The cruelty really lies in denying the means of relief; and as to the third it simply deserves to be ignored. In practice I have found it almost useless to give directions. I almost invariably have had to do the thing myself in the first instance. When mere directions were trusted to, it was found that some excuse for non-performance was urged, or a mere pretence was gone through with the object of justifying a prevarication to the conscience and to the doctor. Here I can only give advice, but I assert that it is culpable to allow a child to be killed by the vehement heat of a fever. Thousands have so died, but their deaths were preventable deaths. With our present knowledge, let not prejudice or ignorance exact more victims.

Sponging the surface.

Sponging the surface of the body with water or

vinegar and water (one part to three) is another means of reducing the temperature, but it is not sufficiently powerful to meet a sudden emergency. In the treatment of prolonged fevers it is however of great value as a means of soothing the system and keeping waste in check. Sponging may often with advantage be employed to keep in check the rising temperature which is so often observed a few hours after the bath has been used. The objections to sponging in the case of young children are, that it is annoying, and prevents that perfect repose which is so desirable. As compared with the bath it abstracts heat in a very minor degree, wherefore it should never be regarded as a substitute.

Drinking freely of cold water, and sucking ice when procurable, are accessory means which should never be neglected. Cold drinks.

The local application of cold to the head is a measure of some value, and one which may be used in conjunction with others. It undoubtedly has a great effect, when properly used, in allaying nervous excitability and relieving head symptoms; but as a cooler of the body generally, it must not be expected to have much effect. The thickly-folded wet cloth which is so commonly applied, is really a source of additional heat, for it soon becomes warm, and then acts like a poultice. A single piece of wetted muslin which will permit of free evaporation, should be used, and an evaporating lotion may be employed (Nos. 16, 42). Cold to the head.

There are certain medicines which have a cooling effect, and which may be administered as symptoms dictate. (No. 70, *et seq.*) Refrigerants.

CHAP. XVI.

Oil frictions. Another valuable means for cooling the body is by using oil frictions. This mode of accomplishing the desired end, ranks next in certainty of results, to the bath. It is a proceeding, the value of which the natives well know. Frequently, after a child has been removed from the bath, or after the interval of sleep which follows the bath, a gentle rubbing of the whole body with warmed oil will be attended with the happiest result; or when the temperature is only moderately high—from 100 to 102°—the proceeding will be found to give great relief. The skin will become soft, the irritability of the patient will subside, and there will be a tendency to perspiration, sleep frequently ensuing. If the patient has not had a bath, the potency of this remedy will be enhanced by a previous sponging of the surface.

Regulation of the bed clothing.

While the body of a fever patient is dry and burning hot, it is the mistaken habit of some people to heap on bed-clothing in the hope of inducing perspiration. From what has been already said it will be understood that to do so is only to court all the dangers of excessive heat. By such a proceeding the accession of perspiration will not be hastened. When perspiration commences naturally about the roots of the hair, on the forehead, and at the bends of the joints, some additional clothing may be drawn over the patient; to be further increased in proportion with the increase of perspiration.

2. Rest.

2. The second point of great importance in the management of a fever is *rest*, and in the case of children it is doubly essential. We have seen

that fever is a great destroyer of the body substance, and we know that exercise is also a destroyer, wherefore it is plain that without rest the patient is not having a fair chance. By rest is meant the most perfect tranquillity of both body and mind. Every movement represents a certain expenditure, and so does every thought. Without tranquillity, a fever may be unduly prolonged; or convulsions, with all its attendant dangers, induced; or serious exhaustion may be brought on at a critical period. Rest represents nourishment indirectly, in that through its instrumentality a certain quantity of body substance which would otherwise be expended, is conserved for future use.

To attain tranquillity with greater certainty, it is often advisable to employ certain medicines, notably the bromide of potassium (No. 10, and p. 387), and opium (pp. 195, 393).

3. The thorough *ventilation* of the apartment 3. Ventilation. occupied is especially necessary, because (*a*) it keeps the body cooler; because (*b*) the disordered blood being less capable of absorbing oxygen from the air, the freest and purest supply is necessary; because (*c*) the chances of infection are thus lessened; and because (*d*) a limited ventilation is proved to increase fever mortality.

4. To endeavour to *restore exhausted nature*, 4. To meet the exhaustion. to supply to an extent compatible with vitality, the deficiency caused by the excessive bodily waste is a point second to none in the management and treatment of a fever. To do this we must chiefly rely upon the judicious administration of food.

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Immense importance of feeding.

Nothing can be of greater consequence than that every possible particle of strength be retained by the patient. Under no circumstances would I advise the parent to risk a low diet. Let the food be as simple as you like, but, except under explicit medical guidance, never in any case of fever pursue a lowering plan. You know not for how long a time the child may have to battle for life. You know not but that a single day's carelessness or mistaken action on your part, may withdraw that small amount of reserved strength which, subsequently being found wanting, may send your child to its grave.

Medicines may materially assist to this end, but they can never, even in ever so small a degree, supplant food.

5. Purify the blood.

5. We endeavour to ensure the speedy *removal of all improper materials from the blood*—whether they be the products of the undue waste or of the nature of a fever poison—by the administration of medicines which will preserve or establish the actions of the skin, the bowels, the kidneys, the liver, &c., as perfectly as possible. Hence we use moderate aperients, fever mixtures, diuretics, &c.

Purgatives.

I would here insert this caution—never use very strong purgatives during a fever without a very good reason for doing so. Never lightly resort to them; the fever poison may co-operate with the medicine and establish a too violent or even a dangerous flux.

6. Stimulants.

6. *Stimulants* are often necessary in the treatment of prolonged fevers; but there are two kinds of stimulants, of vastly different natures, the one

from the other. There is the medicinal stimulant and the alcoholic stimulant. The former (as examples, take camphor and ammonia) are simple pure stimulants in the ordinary sense of the term, and are often admissible comparatively early in a fever when there are signs of depression. They are comparatively harmless. The alcoholic stimulants (wine and brandy) are, as a rule, only useful after the fever has passed away and the body is left exhausted; or towards the end of a prolonged fever, when we observe "typhoid symptoms"—viz., a dry, dark brown tongue, great prostration, trembling of the hands, and perhaps diarrhoea. Under such circumstances, the use of alcohol is not only justifiable, but it is usually essential. How far it is to be continued must depend upon the effects which it produces within half an hour or an hour after administration. A firmer pulse, ability to take more food, the relief of headache, a tendency to sleep, and greater tranquillity of the nervous system, are signs which indicate that it is producing benefit and ought to be continued.

CHAP. XVI.

Medicinal and
alcoholic.When to use
alcohol.

7. We endeavour to *relieve distressing symptoms* such as (a) headache by the application of cold, in the form of a lotion or the douche; or hot fomentations succeeded by the sudden application of cold—a method which often succeeds. Sometimes headache calls for an ammonia draught, sometimes for more potent medicines. (b) Vomiting is relieved by sucking ice, by adding lime-water to the food, by changes of food, by poulticing the stomach with mustard and flour, and by the use of some medicines (72, 9). (c) Diarrhoea is a symptom

7. Relief of
distressing
symptoms.

CHAP. XVI.

which should always be seriously regarded; in fact, it should never be allowed to continue during a fever. For its treatment the reader is referred to p. 281. (d) Delirium at the beginning of a fever is usually an indication of excessive heat, but at the end of a prolonged fever it signifies want of nourishment, and perhaps even of alcoholic stimulation. (e) Sleeplessness is a symptom encountered by the administration of the warm bath, by oil frictions, and by bromide of potassium (10) as medicine.

8. Special
poison.

8. When the nature of a fever has been recognised, we endeavour to *neutralize its special poison* and to meet its peculiarities by the various means which will be described further on.

Classification
of fevers.

When a case of fever arises, the first thing to be done is to act upon the principles above laid down; and the next is to observe carefully the course pursued by the fever as indicated by the thermometer (p. 163) and the general symptoms. By these means we discover the nature of the fever, —whether it be

Continued.

1. Continued—that is, whether it pursues a continuously even course, without interruption or marked daily abatement. Of this kind are—

Simple continued fever (p. 180); ardent fever (p. 184); typhoid fever (p. 187).

Interrupted.

2. Remitting or intermitting—that is, the symptoms ceasing or almost ceasing for an interval daily. Of this kind are the malarial fevers, which are termed—

Remittent fever (p. 196); intermittent fever CHAP. XVI.
(p. 201).

By the expression “remission” is meant a Intermission
marked daily diminution of the fever, which, how- and remission.
ever, is never wholly absent. By “intermission”
is meant a complete abatement of the heat
between the attacks. •

3. Eruptive; of which the child is liable to Eruptive.
the following in India :—

Measles (p. 207); scarlatina (p. 212); small-pox
(p. 217); chicken-pox (p. 225); and dengue
(p. 226).

I. THE CONTINUED FEVERS.

(I) SIMPLE CONTINUED FEVER.

- Definition.** THIS is an affection which runs a short course of from twenty-four hours to two or three days, seldom longer. There is no intermission or remission from beginning to end. Its name implies its nature—it is both simple and continued.
- Causes.** Causes.—Improper food, exposure to the sun, chills during the vicissitudes of the rainy season, and the irritation of teething, particularly when accelerated by one of the other causes.
- Nature.** Nature.—A state of nervous derangement is initiated without the accession of any poison, which is sufficient to create fever. When the exciting cause is removed, and the system, aided by remedies, has had time to recover from the shock, the fever abates and vanishes. This form of fever is very common in England among teething children. It is in no way infectious.
- Symptoms.** Symptoms.—There is usually preceding lassitude, and possibly some chilliness, with headache and pains in the limbs. There is thirst, and the urine is almost always high-coloured. Soon afterwards, usually the same day, the fever comes on,

and the heat may be detected by the hand, though the thermometer will have shown it earlier than this. The temperature rises quickly to 102°, 103°, or even to 104°, but, with the exception of the possibility of convulsions, this forebodes no special danger (p. 166 [6]). The high temperature seldom lasts for more than a single day. It then gradually subsides, and the natural heat is resumed on the second or third day. With the subsidence of the fever there is a feeble perspiration. Not infrequently, when the fever has disappeared, an eruption may be observed on some part of the body, but this is of no importance, further than as a notification that the indisposition has come to an end. The peculiarities of this kind of fever are—the suddenness with which the temperature rises, the brief duration of the high fever, the regularity with which it subsides, and the shortness of the whole illness, if properly managed.

CHAP. XVII.

Peculiarities.

Frequency.—Very common about the time of teething, but occurs at all periods of childhood. Seldom fatal unless mismanaged.

Distinguished

Distinguished from chicken-pox by the absence of eruption; from measles, by the absence of cold in the head and cough; from scarlatina, by the absence of sore throat; from small-pox, by the absence of severe vomiting and pains, and of the eruption. The temperature rises more suddenly than in typhoid fever. From the commencement of remittent fever, it is not easily distinguished, though twenty-four or thirty-six hours' observation will usually suffice to mark the difference.

CHAP. XVII.

Treatment.

Treatment.—The child should be put to bed in a cool and slightly darkened room, and covered only with a light shawl, unless it complains of chilliness, when a blanket may be used till the sensation has passed away, but it should not be employed longer (p. 174). If a full meal has been recently partaken of, an emetic of ipecacuanha, 3 to 5 grains with a sufficiency of sweetened water, should be given. The state of the bowels should then be attended to—a dose of castor oil (58), or Gregory's powder (60), or of senna (62), will usually be found sufficient, unless there be actual constipation, when a stronger medicine (63, 66, 67) may be used with advantage; but excessive purgation should be avoided (p. 176): cooling drinks (70, 72, 73, 74) may with advantage be freely allowed. As the distress increases sponging the surface with lukewarm water, or vinegar and water (1 part to 4) should be employed, and resort had to the cold bath (p. 170) should necessity arise. The diet should be exceedingly simple, consisting of thin arrowroot or diluted milk, for the first day. Afterwards ~~the~~ ^{the} ~~an~~ ^{an} broth should be added to this, and other ~~the~~ ^{the} ~~simple~~ ^{simple} articles of nutriment given as opportunity ~~of~~ ^{of} ~~fr~~ ^{fr}. A starvation system should never be risked. ~~The~~ ^{The} An hour having elapsed from the time the purgative was administered, a fever mixture (43—45) should be commenced, and given every second hour. Under this treatment the fever will usually begin to subside in from twelve to twenty-four hours. The first sign of abatement will be the appearance of a little moisture about the roots of the

Signs of
amendment.

hair. At this moment, or an hour later, it is a good plan to administer a dose of quinine (5 grains to a child a year old, and 10 grains if two years old), for two reasons,—because it possesses the power of reducing febrile heat generally, and because the fever may be of a malarial type, and may therefore at this stage be cut short by quinine. While there is delirium, or a tendency to convulsions, quinine had better be withheld for the time, till the symptoms subside. With the appearance of perspiration the bed covering should be increased in quantity, the additions being made as the bodily heat decreases, and the perspiration increases. If the child be old enough, a draught of warm tea (not strong) may be allowed during the progress of the perspiration.

CHAP. XVII.

Use of quinine.

A cold lotion (16) may be applied to the child's head throughout, provided it do not cause annoyance. Should it happen that a restless, wakeful night is to be apprehended, a tepid bath at bedtime, followed by an oil inunction (p. 174), will be found to exercise a very soothing influence.

Management of restlessness.

THE CONTINUED FEVERS.

(2) ARDENT FEVER.

What is meant by the expression. ARDENT fever is a name which in England has been used synonymously with that of the simple continued fever just described. It may be that the latter is but a minor degree of the former, but it is a condition so serious and so frequent in India, that for practical purposes it is deserving of separation and special consideration. **Dangers of.** Convulsions, heat-apoplexy, or some form of paralysis may result from it, if it be not properly managed.

Symptoms. When a child is attacked with a sudden and violent fever, the temperature running up to 105° , 106° , 107° , or even higher, such a fever is an ardent fever, for the time being at all events. It may be that it will subside in due course as a simple fever does, or it may even be that it will eventually prove to be a violent intermittent or remittent fever;* but it cannot be a typhoid attack, nor yet one of the eruptive class. Let it be what

* At the risk of being charged with elevating a symptom into a disease, as I admit to be here done, the definition is adhered to as being eminently practical for non-professional persons.

it may, the great practical point is that we have to deal with an ardent fever for the time being; and if with the above suddenness and temperature, we do not find twitchings of the muscles, lethargy, or excessive irritability, with or without dilated pupils, and possibly a tendency to delirium, the case will be an exception to the rule which holds good of children under such circumstances. CHAP. XVIII.

In such a case let it be clearly understood that the child's life is in danger while the high temperature lasts, or until it be accompanied by profuse perspiration, which, however, howsoever much it may appertain to the nature of the disease, will require some time for its appearance.

A judicious parent will not wait for the appearance of symptoms, nor will he wait for what are called "warnings." Let the sudden accession of such an amount of heat suffice for all warnings. Delay is dangerous.

For the very serious state of matters we are now considering there is only one efficient remedy in the world, namely, cold water. I need not here repeat that which has been fully explained at page 170, as to the mode of employing this powerful and certain remedy. No drug is to be compared with it in certainty; indeed, in the case of a violent ardent fever there is not time allowed for the action of drugs, so emergent are all the surroundings of the case. Treatment.

The cold bath having been *efficiently* administered, the next thing to be done is to give a full dose of quinine (5 grains to a child a year old, and 10 grains if two years old) during the first interval of cessation which results, or imme-

CHAP. XVIII. diately after the sleep which succeeds the bath. Especially is it necessary to do this, when exposure to the sun has been the active cause of the derangement.

Favourable
results of
treatment.

A genuine case of sun-fever so treated, before actual injury has been sustained by the brain, will seldom be a cause of anxiety beyond a few hours. But should the treatment have been too long delayed, although probably death may be averted, yet the risk of paralysis from brain or spinal injury, through heat, is incurred.

After manage-
ment.

During the progress of recovery the points demanding scrupulous attention are—(a) the most absolute tranquillity ; (b) the free opening of the bowels by means of an enema in the first instance (51, 52) ; and then the administration of a strong purgative (63, 66, 67) ; (c) surrounding the patient with a cool atmosphere, which should be kept in active motion with the punkah ; (d) the most simple diet ; and (e) if there is sleeplessness and unusual crossness, after recovery from immediate danger, the administration for a few days of bromide of potassium (10).

CHAPTER XIX.

CHAP. XIX.

THE CONTINUED FEVERS.

(3) TYPHOID FEVER.

THE typhoid fever of children is the same thing as the infantile remittent fever of England. It is also termed gastric or enteric fever. Other names.

It is a continued fever, of about three weeks' duration, accompanied by a peculiar scanty eruption, which occurs in crops from the eighth to the twelfth days of the fever, and by great prostration and more or less diarrhœa. The force of the fever poison expends itself upon the small intestines, which in severe cases undergo ulceration. The disease having once occurred, conveys protection from a second attack. Definition.

The causes and prevention of this affection have been discussed at p. 148. Let it be remembered that typhoid fever is a *preventable* affection. Causes and prevention.

According to statistics the disease is rare among European children in India—indeed, it is rare amongst the native races. Even in England it is extremely rare before two years of age, and unusual before five. About 6 per cent. of typhoid patients are under 10 years of age (Murchison). Frequency.

Before the actual symptoms commence, a period Symptoms.

CHAP. XIX. — varying from one to two weeks elapses after the imbibition of the poison.

Of milder
form.

The disease may run either a mild or a severe course, and “the differences are so great between its milder and severer form as to warrant our adopting them as a ground for its subdivision into two classes” (West). A case of the *milder variety* will run such a course as the following:—The child becomes listless and disinclined to play. He is drowsy, desires to lie down, and his nights are restless. The skin may now feel dry, but hardly hot, yet the thermometer will show a temperature of 100° or so. On the second day the dryness and heat increase. The thermometer will register a steady daily rise. The urine now becomes high-coloured and scanty, the breath is apt to become offensive, and the back part of the tongue is observed to be thickly furred, while its end is unusually red and bright. Nearly always the bowels are too loose, the motions being of a light yellow ochre colour, and smelling very offensively. The respirations are rapid, and there is sometimes a short hacking cough. The temperature rises steadily till the maximum is attained usually about the fifth day, when about 104 degrees will be reached. There is a constant gurgling of the bowels; particularly is this noticeable after food has been taken; and not unfrequently there is some pain in the spleen. Sometimes, and at irregular intervals, a perspiration may appear on the surface, but it soon passes off and brings no relief. Unless the case is very mild, the tongue, before white, now becomes brown, and the looseness of

the bowels increases. The muscular wasting is considerable. CHAP. XIX.

All the symptoms continue with more or less force till the end of the second week, when the morning temperature (which is usually in sickness, as it always is in health, a little below that of the evening) will be found to have fallen as much perhaps as a couple of degrees. A rather sudden evening rise may be expected, but it will not attain the height of the previous evening.

Thus is initiated the commencement of convalescence, and at the same time the general symptoms begin to abate. But the disease still continues, till the end of the third week, by which time convalescence will have been fairly established. Great prostration and emaciation are left. Termination
of the illness.

In defining the disease, an "eruption" has been mentioned; but I have not laid any stress upon it as a symptom, because, although when it does occur it is absolutely distinctive of the fever, it is often very difficult to discover it, and it is frequently altogether absent in children. It consists of a "few small, very slightly elevated rose-coloured spots, disappearing on pressure, each spot continuing visible for three or four days only." (Aitken). Generally they are to be looked for about the abdomen, chest, and back, between the eighth and twelfth days of the fever. The eruption.

The *severer variety* of typhoid fever sets in with greater violence. There is drowsiness, vomiting, and sometimes a short shivering fit. The temperature may go up to 105° or 106° on the fourth or fifth day, giving rise to much brain disturbance. The severer
form.

CHAP. XIX. The tongue becomes dry, the belly distended and tender on pressure. The diarrhœa is more severe, and the emaciation more rapid. It is often difficult to arouse the child from its lethargic condition. As the disease progresses the teeth and lips become covered with a black dry incrustation. Notwithstanding the greatest care, the prostration is sure to be excessive by the time the crisis has arrived (at the end of the second week). Fortunately convulsions are not nearly so frequent when a high temperature is attained by a gradual process, as happens in this disease, or in the course of a lengthened fever, as when excessive heat supervenes suddenly. Recovery from a severe typhoid is always an exceedingly gradual process.

Distinguished. This disease, after the lapse of a couple of days, is readily distinguished by its symptoms. Commencing in the same way as most other fevers, an immediate recognition is often not possible; but there are special characters of its own which will serve to distinguish it, viz., the preceding languor and drowsiness, the steadily and slowly rising temperature, the abdominal distention, the diarrhœa, the great prostration, and the rash if discovered. From the eruptive fevers it may be distinguished in the same manner as mentioned at page 181 when talking of simple fever.

Favourable and unfavourable signs.

The following may be regarded as being signs of good omen:—a mild commencement, but little diarrhœa, absence of abdominal tenderness on pressure, a morning temperature not exceeding 101° to 103°, an evening temperature not exceeding 104°, and a moist tongue; and during the third

week a morning temperature 3° less than that of the evening, which latter should gradually decline. If the opposite conditions hold, there is cause for anxiety; and if there is bleeding from the bowel or deep stupor, the case is extremely grave. CHAP. XIX.

Those who wish to treat typhoid fever successfully will do well to peruse the chapter on "fever" (pp. 169-179), and to act upon the principles therein laid down. The state of the patient so frequently varies, that if there are not guiding principles which are understood, at command, little good is likely to be done by meddling. Treatment.

But in addition there are points connected with the treatment of typhoid fever which demand special consideration. The first, and by far the most important, is nursing. Nothing that a doctor may do or say will avail without good nursing. The life of the patient *always* depends upon the manner in which this office is performed. The nurse must be sufficiently intelligent to have some idea of the enormous waste of body material which is going on, and that at the same time the bowels are in a state of excessive irritation, if not of actual ulceration. While, therefore, it is of the greatest importance to introduce nourishment, we must be most careful to avoid irritating the bowels. Over-distention of the stomach, whether with food or fluid, should never be permitted. Small quantities used frequently is the rule to observe, the great necessity for supporting the vital powers being ever kept in mind. For the first day or two milk diluted with lime water, and thin arrowroot will suffice. Then we may com- Nursing.
Importance of.
Diet.

CHAP. XIX.

mence chicken or mutton broth. If the bowels are not very irritable a small quantity of a light corn-flour pudding may be cautiously given twice a day, but the existence of severe diarrhoea will prohibit this as well as broth. Every two hours at least, except that the child should never be waked from a sound sleep, food must be given, in the face of all objections on its part, and irrespectively of the trouble it will certainly entail to the nurse. It is a good plan to employ an injection of one teaspoonful of Johnson's fluid beef (p. 400), diluted with a small wineglassful of milk and water, twice or three times a day, before the prostration has become very great, with a view to relieve the stomach and smaller bowels, and keep up the strength. Of course such an enema is to be retained, an object which is easily effected by pressure with a folded towel for a few minutes after the pipe has been withdrawn. Cold water may be liberally allowed, but in small quantities at a time. Barley water will allay the thirst more effectually. Tamarind water should never be given, on account of its purgative properties.

Ventilation
and disinfection.

The ventilation of the room should be thorough ; all evacuations from the bowels should be received on napkins or folded sheets, and such soiled linen should be immediately plunged into disinfecting fluid and removed from the house. Heavy bed-coverings are to be avoided, the room should be kept still, and every effort made to encourage sleep and tranquillity.

Bed sores.

The child's back and buttocks should be daily examined for any red or angry-looking patches,

indicating the threatening of bed sores, which should be guarded against by the use of soft pillows or air cushions; and by painting the inflamed parts with white of egg beaten up with spirits of wine. CHAP. XIX.

To secure sleep, the warm bath (98°) and subse- Sleep.
quently anointing the body with oil, will be found
very useful.

Later on, as the tongue becomes brown and the prostration increases, still greater attention to nu- Increased
trition is required. The beef-essence enema will at nourishment
this stage be most useful, and *small* quantities of the required.
fluid beef may be given by the mouth at intervals.

Towards the end of the second week it will Stimulants.
frequently be desirable to employ wine or brandy, in quantities proportionate to age; a teaspoonful of the latter three or four times a day with four or five times its bulk of water, may be required by a child three or four years old. But should the symptoms become very severe, with great exhaustion, clammy perspiration, prostration, and diarrhœa, the quantity of spirits should be considerably increased, according to the effect produced (p. 396). Tea, as a preventer of waste, may be given in moderation if the child will take it. When there is much exhaustion the food should not be given altogether cold (p. 66).

The child should be spared every possible exertion. Night and day his every want should be instantly attended to. As far as possible, all his whims should be humoured. The nervousness consequent upon excitement, is quite capable of greatly aggravating the symptoms.

CHAP. XIX.

Medical remedies.

Avoid purgatives.

Check diarrhoea.

Bleeding from bowel.

Spongings.

Throughout the whole course of this affection no opening medicine of any kind should be given. With a very moderate diarrhoea we need not interfere, because if we altogether lock up the unnatural excretion it will readily decompose in the intestine, and produce further irritation or inflammation.* On the other hand, we should never, if we can prevent it, allow anything like sharp or constant purging. The number of the motions will, to some extent, guide us; two or three in the twenty-four hours may be permitted, but their nature is a surer pilot. A watery purging should be vigorously checked by astringents and aromatics (35, 36, 37). Scanty slimy motions will seldom benefit by the administration of astringents, but an occasional enema of tepid water will greatly relieve the condition. Aromatics (9) will be useful by relieving flatulency and distension; but chiefly to a careful diet must we trust to regulate the bowels generally. Poulticing the abdomen often proves very beneficial under these latter circumstances. Should the symptom (diarrhoea) persist, the addition of a single drop (not more, and then only for a child over one year of age) of laudanum to one of the injections, which should be small with the intention of its being retained for a time, may judiciously be made.

Should there be bleeding from the bowel, the utmost quietness must be observed; the patient should never be moved or raised into the erect position, and prescription No. 38 should be given every hour till the symptom has ceased.

Cold or tepid spongings of the surface frequently,

followed by oil inunctions, will be of essential service by reducing the temperature and imparting a sense of comfort. CHAP. XIX.

Distension of the abdomen and pain on pressure should always be treated by fomentations and light poulticing. Fomentations.

At the outset of the disease the fever mixture (45) may with advantage be given, but it need not be continued long, and only used subsequently during periods when the heat is high. Fever mixture.

When depression sets in, after the tenth or twelfth day, a stimulant mixture (76, 75) will be found very useful in conjunction with wine or brandy as previously described. Stimulants.

Delirium and inability to sleep, if not overcome by the spongings and inunctions, will frequently yield to opium, (a single drop of laudanum for every year of age completed. *Never more* in twenty-four hours). Delirium met by opium.

As the fever subsides, the stimulants and nutriment ought to be increased, but very cautiously. Solid food should not be allowed for a week after all active symptoms have disappeared. Meat is not to be ventured upon for at least a month after complete recovery. Great caution as to food after recovery.

During convalescence, quinine in tonic doses, (77) will be found useful. Chest attacks are not infrequent after typhoid fever, unless precautions against cold be taken.

From beginning to end of the disease measures for disinfection laid down at pp. 138 and 148 should be carried out. Disinfection.

II. FEVERS IN WHICH THERE IS A CESSATION
OF THE HEAT, TEMPORARILY.

(1) REMITTENT FEVER.

Causes. THIS illness is caused by absorption of the malarial poison (p. 141). Chills may act as exciting causes of attacks in those who have been previously exposed to malarial influences. It would seem that the usual outlet (the perspiration) being cut off by cold, a sufficiency of the poison is accumulated to develop an attack.

Symptoms. Suddenness and violence usually characterize the commencement of this form of fever. There is very little warning of its approach—at least, not such as the child is able to appreciate. Pains in the limbs, loins, and head are, however, not infrequent, and vomiting is a pretty constant symptom. Sometimes there is a violent attack of copious watery diarrhœa. A shivering fit is very seldom noticed, though the hands and feet may be felt to be cold. In a few hours the body is burning hot. There may be a drowsiness, or a tendency to convulsions. The high temperature will probably remain for eight, ten, or twelve hours, when there will be observed a perceptible diminution of the fever,

—perhaps by 3 or 4 degrees, though it will not completely disappear. The decline is generally accompanied with some amount of perspiration; but this is not always so, and it usually occurs in the morning. Early in the afternoon a rise again commences, abatement setting in early in the night. The length of the remission, (p. 179) and the period of the day at which it occurs, are variable. Generally, however, there are six or eight hours of abatement, and the time of relief includes the morning and forenoon. When the paroxysm is at its height there is a good deal of restlessness, possibly delirium, and convulsions if precautions be not taken. Thirst is always great, the tongue is coated, the breath foul, and the respirations extremely rapid. The paroxysms, as described, repeat themselves until checked by treatment.

A very high temperature, a dry brown tongue, much delirium and trembling of the hands, are anxious signs. Improvement may be either gradual or sudden. If the former, it will be ushered in by increased length of the remissions, and diminished height of the thermometer-reading during the hot stage, while at the same time a general sense of relief is experienced, and the nervous symptoms become less conspicuous.

Favourable
and unfavourable
signs.

Remittent fever sometimes assumes a low type; so much so that without the aid of the thermometer, it might not be known that there is any fever present.

Low type.

This form of fever observes no definite duration. Upon treatment chiefly will depend the length of the illness.

Duration.

CHAP. XX. Prospects.	The prospects of the case are usually favourable. In 1875, 915 (or 74 per 1,000 of strength) soldiers' children suffered from this form of fever, of whom 42 (or 3·4 per 1,000 of strength) died. It is, therefore, a common and a serious affection. Excluding cholera, it ranked sixth in order of fatality.
Distin- guished.	Remittent fever is distinguished from typhoid fever by the suddenness with which it comes on, by the absence of persistent diarrhœa, abdominal symptoms and rash, and by its very marked remissions. From simple continued fever it is known by the markedness of its remissions. From the eruptive fevers by the distinctions noted on p. 181.
Treatment.	Nervous disturbance is to be apprehended very early in this complaint. Our first indication, therefore, is to guard against the effects of overheating, in the manner described at pp. 170—
Preliminary management.	174. If natural purging has not already occurred, the bowels should be freely opened (Nos. 62, 63, 66). Shortly after the aperient, the
At the com- mencement of the fever.	fever mixture (45 or 43) should be begun and given every hour. The bed-clothing should be light, and the ventilation of the room perfect. The utmost simplicity as regards diet should be observed. Much benefit will be derived from the use of the tepid bath at night as a sedative, and cold may be applied to the head if it proves grateful.
Quinine. Proper time for adminis- tration.	With the first well-developed signs of remis- sion, the bed-covering may be increased, and a full dose of quinine (No. 78) administered. By

the first signs of remission, I mean when moisture is felt upon the forehead, and when the temperature has declined about 2° from the highest point it had reached. The fever mixture may now be omitted.

Not infrequently these means will cure the fever in its first stage, but more usually a second paroxysm occurs, though probably it will be of less intensity. Without treatment, the second paroxysm is as a rule more severe than the first.

Quinine should not be given while the temperature is rising. During its decline, and when there is some perspiration, no matter how slight, is the proper time; but it is a serious mistake to wait till the fever has altogether disappeared, before resorting to quinine; and it is an almost equally serious mistake to employ it in only small doses.

When not to give quinine.

At no period is the strength to be allowed to decline. Here we have no abdominal complications as in the fever (typhoid) last described, so we are in a position to administer food as liberally as we can prevail upon the patient to take it. Of course solid meat, and other articles difficult of digestion, should not be given, even if the patient could be induced to eat them.

Should what are called "typhoid symptoms" * (dry brown tongue, hard dry lips, great prostra-

When to give stimulants.

* A general term applicable to this series of symptoms occurring in the course of any disease. The expression should not convey any impression that these are exclusively symptoms of typhoid fever.

CHAP. XX. tion, and black incrustations upon the teeth) supervene, as they sometimes will when the fever persists for a few days, stimulants should be used in the shape of wine or brandy, and a stimulant mixture (75, 76). Then, too, egg-flip and beef-tea should be given frequently.

How often to give quinine.

As a rule, there is only opportunity for a single dose of quinine daily, during the severity of the attack. If, therefore, a fully sufficient dose is not administered, clearly we cannot hope for benefit from the drug. But as the fever declines, the interval of remission lengthens,—then we had better divide the dose, giving the medicine twice a day, half the original quantity each time. Even after the complete cessation of the fever it is right to continue quinine as a single half-dose daily for at least a week or ten days. It may then be omitted, and chiretta (81, 82) substituted for it.

Substitute for quinine.

Should quinine not be at hand, “atees” (80) should be used instead.

After treatment.

If, after the sickness, debility persists, and the patient remains pale and worn, quinine and steel (79), or the syrup of iodide of iron (84), may, with great advantage, be used and persisted in for a month or six weeks.

CHAPTER XXI.

CHAP. XXI.

FEVERS IN WHICH THERE IS A CESSATION OF THE HEAT, TEMPORARILY.

(2) INTERMITTENT FEVER, OR AGUE.

THE causes are the same as those of remittent fever. There is a cold, a hot, and a sweating stage, succeeding which there is a complete intermission of the heat and of all the symptoms.

The younger the child, the less the regularity observed by the symptoms. Frequently there is an absence of anything like shivering,—indeed, it is unusual, unless the child be over three or four years of age. Occasionally, but rarely, the attack subsides without sweating. The stages generally are of shorter duration than in the case of the adult, and sometimes even two paroxysms occur in the twenty-four hours. The hot stage is, however always well marked.

The premonitory symptoms are very slight, often not sufficient to attract any attention. The child does not actually feel ill, but he yawns, refuses food, and lolls about. In most cases I have observed that an attack is preceded by an unusually copious flow of urine, but after the fever has become established the urine is red and scanty. The fit begins with a feeling of cold; the skin becomes pale, shrivelled and rough ('goose-skin'). The finger nails may be of a bluish colour. The skin

Causes.

Symptoms.

Peculiarities
of—in the
child.

Course of an
attack.

CHAP. XXI. feels cold, though the thermometer will even now show an unnatural rise of temperature, and the internal organs are congested from the blood being driven in. Shivering may ensue. This stage may last from a quarter of an hour to two or three hours, and then succeeds the hot stage. A couple of hours after the fever has commenced, the temperature may rise to 105° , 106° , or even more, and the hot stage lasts from two to four hours. The decline down to the natural standard, or even a little below it, is equally rapid; according to the amount of perspiration, so will be the rate of cooling.

Intermittent fever, when untreated, usually observes periodicity; returning every day at the same hour, every other day or every third day. When recurring daily, the cold stage is short and the hot stage long; and when every third day, the opposite holds good.

Distin-
guished.

When a child, who immediately before was in its usual health, is observed to decline its food, to yawn, to loll about, and yet not to complain of feeling actually ill; if at the same time the hands are felt to be cold while the thermometer shows the bodily heat to be greater than usual,—we may be pretty sure an attack of ague is coming on. The extreme suddenness of the fever heat without any warning symptoms is sufficient to distinguish it.

Prospects.

An attack of ague is not in itself usually dangerous; but it should never be disregarded, because it is an indication that the child has come under the pernicious influence of the climate, by which, if he be neglected, much constitutional injury may eventually be effected. Indirectly, the effects of ague cause an immense amount of mischief to children in

India; indeed these effects are really much more fatal numerically than cholera, but because an attack is not immediately dangerous, such cases are ignored.

CHAP. XXI.

In 1875, 100 out of every 1,000 children of soldiers in India were treated for ague. The direct death-rate was small, only 3 per 1,000; but how many of the debility, diarrhœa, and other deaths were really due to the effects of malaria, it is impossible to say.

Frequency.

While the child complains of feeling cold, let it be well wrapped up; a bottle of hot water rolled

Treatment.

in flannel may be put to its feet, and some warm tea given. If the bowels be confined, a dose of castor oil (58), or Gregory's powder (60) had better be administered. When the heat of body begins to cause inconvenience, the bed clothing should be removed, and great attention devoted to the effects of the heat upon the nervous system, the means for reducing temperature (p. 170 *et seq.*) being put into practice as necessity demands. As to food and nursing, the rules recommended for the management of remittent fever are to be observed. From the commencement of the hot stage, the fever mixture (45 or 43) should be given every hour till the perspiration has been freely established. Now is the time for quinine. It is most important that this particular period be seized upon for the administration of the medicine in a very full dose (78).

During the cold and hot stages.

Time to give quinine.

The old rule of waiting till an hour or so before the next attack is due, is an extremely bad one. The quinine then increases the irritability and nervousness, while it produces very little effect upon the disease.

Mistakes as to quinine.

There need be no hurry in changing the clothes which have been wetted with perspiration. To

As to clothing.

CHAP. XXI.

do so prematurely risks chill and suspends further action of the skin.

Repeat the quinine.

Eight or ten hours after the first dose of quinine, the medicine should be repeated. The chances are that the attack will not return, if, in the meantime, the child has been kept warm.

Management after cure.

A repetition of the attack is to be treated in the same way as above, and after complete cessation, the quinine should be continued in diminishing doses twice a day for 10 days or a fortnight. The greatest care must be taken to avoid chills.

After effects of malarial fever.
Tendency of the public to regard country-fevers too lightly.

THE SUBSEQUENT EFFECTS OF MALARIAL FEVERS.—Because these fevers are not attended with immediately serious consequences, they frequently meet with but little attention. Attack succeeds attack, at more or less long intervals. Each is “cured,” and no more is thought of it till the next occurs, when it meets with a similar amount of consideration. In the meanwhile the changes which are at work are not observed, because they are so gradual in their outward manifestations. They are slow, it is true, but they are very certain.

Constitutional effects.

Almost every organ in the body is involved. Internal congestions are the earliest mischief. The spleen may become more or less enlarged. Intercurrent attacks of diarrhoea and dysentery are not infrequent. The child becomes pale and flabby. Possibly dropsy or jaundice may occur. The quality of the blood suffers in a most marked manner. It becomes watery, and contains but feebly nutritious qualities. In short, a persistently deleterious influence everywhere pervades the body, resulting in steadily advancing deterioration of the health.

Up to a certain point, this condition is quite capable of remedy ; but beyond that point, remedies are of no avail ; a stage of blood destruction may be reached which cannot be passed with any hopes of recovery. Many such patients die, and their deaths are attributed to "diarrhœa," "debility," "atrophy," or whatever condition most attracts the attention at the moment.

CHAP. XXI.

Seriousness.

Throughout the whole course of the obscure illness, or general constitutional depression which succeeds agues, or which without agues, indicates the malarial state, the thermometer should be regularly used. It will usually be found that the evening temperature rises to some point over 100°, it may be to 101°, but seldom more. So long as this is the case we may be sure evil influences are at work. In the stage of recovery there usually occur intervals of a few days without a high temperature, which, however, may again recur and persist for other periods of some days, the intervals becoming longer, till there ceases to be any elevation. If after a fair trial of remedies the temperature persists without alteration, we may be certain the illness is gaining upon us.

Information
from the
temperature.

The treatment of this state of malarial saturation is very important and very simple. • It may be summed up in a few words : milk, quinine, iron, warmth of body, non-exposure, and, if need be, change of climate.

Treatment.

I look upon it as most important that in these cases the diet should consist largely of milk. It is a remedy which here possesses great value, and one without which the child is not having a fair chance. An attempt should be made to induce a

Milk diet.

CHAP. XXI. child of four or five years of age to consume a seer of milk daily.

Quinine. Quinine should be employed in full doses (78) twice daily, so long as any signs of active fever remain. As soon as these are overcome the quantity may be reduced, and it should subsequently be given in combination with iron (79) for about three months. Should this prescription seem to irritate the bowels, the syrup of iodide of iron (84) may be substituted; but in such a case, quinine must still be given in the intervals between the doses, twice a day.

Diarrhœa. Diarrhœa should always be at once checked (35, &c.).

Exercise and sleep. Moderate exercise during safe hours of the day, is essential. Fatigue should never be incurred. Plenty of sleep should be indulged in, and if the child feel so inclined, he may be permitted to spend his mornings in bed. The exhaustion which the early morning walk is apt to induce, proves hurtful in these cases; besides which, the cold of the morning air, if great, will be injurious.

Change of climate. If after a fair trial, of say a month, the febrile state remains constant, as shown by the thermometer, the case ought to be removed from the locality—to sea, if possible; if not, to the hills. From a mere change of climate from one district to another but little good need be expected, though it sometimes is useful.

Of all conditions of health appertaining to the climate of India, this kind of chronic illness is *the* one calling for removal from the country to Europe.

CHAPTER XXII.

CHAP. XXII.

III. THE ERUPTIVE FEVERS.

(I) MEASLES.

THIS is an infectious continued fever, accom- Definition.
panied by a copious characteristic eruption.

The disease is spread only by infection from Cause.
person to person, either directly or through the
medium of a third person. When the skin is
scaling off, is the time of greatest capacity for
spreading the complaint. The occurrence of this
illness usually protects from a second attack. A
period of from 10 to 14 days elapses from the time
of exposure to infection till the disease commences.

A sense of chilliness, with headache, thirst, a Symptoms.
foul tongue, and feverishness are the earliest signs
which show themselves. At the same time the
child seems to be suffering from a cold in the
head; he sneezes, his eyes are watery, there is
usually some cough, and the eyelids are puffy. The
feverishness and general symptoms increase. On
the fourth day of their continuance, the rash The rash.
makes its appearance, first on the forehead and
face, from which it gradually extends over the
whole body. This rash is of a dark brick-red

CHAP. XXII. colour, consisting of innumerable small flea-bite-like spots, slightly elevated above the surface.

Progress. The fever does not diminish with the appearance of the rash; it may, indeed, increase, but the cold and cough either wholly vanish, or become greatly lessened at this period.

Duration of the rash. The rash lasts for three days before it begins to fade, and with its decline the fever and other symptoms subside gradually, till on the ninth day of the illness they have all disappeared, leaving behind only redness and scaling of the skin.

Conclusion of case. Sometimes itching of the skin is almost intolerable, either when the eruption is at its height or when the scaling commences. Occasionally the glands of the neck become greatly enlarged in the early stage of the illness, and then there is usually a good deal of sore throat—the latter being most common when the eruption is fading.

Seldom severe in India. In India, measles rarely assumes a malignant type. Should the eruption be copious and of a purple colour, should the tongue become dark and brown, the prostration great, and the chest symptoms severe, the disease has assumed a very grave form.

A bad sign. Sudden disappearance of the eruption is a sign of significance, generally indicative of bronchitis or other lung complaint.

Distinguished. Measles is easily distinguished from other complaints by the character of the eruption and the time of its appearance. Distinct elevated red papules appear on the fourth day, whereas the eruption of scarlatina is a diffused red blush, appearing on the second day, and the more distinct elevations of small-pox appear on the third day.

Unlike small-pox, the fever does not subside with the appearance of the eruption. The watery eyes, sneezing, cough and swelled face are very characteristic of measles, as early symptoms. CHAP. XXII.

In India the prospects are believed to be decidedly favourable. Measles, however, caused 49 deaths of soldiers' children in 1875, or more than 7 per cent. of the total number treated. In England only 3 per cent. of the total number attacked, die, according to Dr. West, but this rate includes all ages; a single year's Indian figures are not conclusive. The severest mortality occurs between one and three years of age. The affection is common enough in India. In 1875 there were 684 soldiers' children treated for measles, or 55 per 1,000 of strength. These figures at all events prove that the disease is one to be dreaded in India. Prospects.
Frequency.

From the earliest moment, the child should be confined to bed in a room properly ventilated but free from draughts. In the cold weather it will be advisable to light a fire in the room to preserve the temperature at about 65°. It is very important to guard against cold, but a higher temperature should be avoided, lest we add to the bodily fever-heat. The fever mixture (43) will soothe the cough and promote the action of the skin. The inhalation of steam from over a jug is grateful and lessens coughing. The fever drink (74) may with advantage be allowed. Sponging the surface (p. 172) with vinegar and water allays irritation of the skin, and generally exercises a sedative influence. Purgatives, as a rule, are to be avoided, Treatment.

CHAP. XXII. the bowels being apt to become irritable. From beginning to end a starvation system should be avoided, though the diet should include only light and easily digested articles.

Stimulants. Should the severer symptoms manifest themselves, it will be necessary to resort to stimulants, both in the shape of medicines (75, 76) and wine or brandy; and to the administration of nourishment, the greatest attention must be given.

Chest complications. Troublesome cough and hurried breathing should be encountered with large poultices to the chest, followed by turpentine stupes. It may also be necessary to give an emetic (46) to assist in the expulsion of phlegm. The danger of measles "depends almost exclusively upon its complications, and as in their absence there is little to excite alarm, so there is little to call for treatment" (West). Disinfection should be carried out as recommended at pp. 138 and 147.

Complications. The complications which sometimes accompany or follow measles (though less frequently in India than in England) are—(a) Convulsions, occurring from overheating of the blood, usually appearing at the commencement of the case, when they are not of such serious import as if they appeared later, as they sometimes do. They are to be treated as laid down at page 322. (b) Bronchitis or inflammation of the lungs is the most dreaded of all complications, but the climate of India is unfavourable to such development. (c) Ophthalmia of a painful nature is sometimes very troublesome; but by strict attention to cleanliness, the allowance of a liberal diet with wine and

tonics, and the almost hourly use of the ordinary eye lotion (27), a rapid cure will be effected. CHAP. XXII.
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(d) Discharges from the ear are not very common, but when they do occur they are most troublesome. They most usually happen when the disease is disappearing, and are probably caused by cold. For treatment see p. 352. (e) Chronic congestion of the throat with a husky voice, and possibly some tendency to diphtheritic symptoms (p. 215). (f) Without the occurrence of any one of these complications, measles sometimes produces a profound impression upon the constitution, which may not become re-established for a long time, varying from a few months to as many years. The most constant indications of this state are a pale, bloodless appearance, duskiness of skin, flabbiness of the muscles, languor, cessation of the progress of dentition, crossness, and very disturbed nights. Such symptoms should meet with prompt attention, lest disease steal insidiously into the child's vitals. A life almost wholly in the open air, a generous diet, careful protection from cold, the allowance of wine in moderation, and the administration of cod-liver oil and iron (84), are the remedies to adopt. Constitutional
impression
left behind.

Management
of this state.

When a child falls into this state of health, from which he cannot very quickly recover, the temptation to send him to a colder climate may arise. It is not, however, advisable to do so, unless the heat of the place at which he is already resident be so great as to occasion exhaustion, and the climate which it is proposed to adopt be very moderate indeed. Caution as to
change of
climate.

CHAPTER XXIII.

CHAP. XXIII.

ERUPTIVE FEVERS.

(2) SCARLATINA.

Confusion of names. SCARLATINA and scarlet fever are different names given to the same disease. The former word does not express any minor form of the affection, as is sometimes supposed.

Definition. Scarlatina is a highly contagious continued fever, accompanied by a red blush of the skin. The force of the disease is expended upon the throat.

Cause. Scarlatina only arises from infection—generally directly from a sick person; but the disease may

Incubation. be conveyed by clothes or in milk. The disease commences about five or six days after infection. If more than a week elapses without symptoms, after known exposure, we may reasonably conclude that the child has escaped.

Symptoms. The symptoms vary greatly according to the intensity of the attack. There may be a mere indisposition with the characteristic redness of the skin; or there may be a furious onset, accompanied with delirium, a scanty rash, a dry brown tongue, and violent inflammation of the throat.

An ordinary case commences with the usual symptoms of fever, which are accompanied with

vomiting, pains in the limbs, and brief shivering. CHAP. XXIII.
 Attention is soon called to the throat by complaints of soreness and difficulty of swallowing. The tonsils will be found to look red and angry, behind the furred tongue. Very probably one or two of the glands of the neck will enlarge and become painful.

The appearance of the tongue soon changes, the whiteness giving place to bright redness, through which will appear numerous light-coloured spots, a condition known as the "strawberry tongue." Peculiarity of the tongue.

On the second day the eruption appears; first on the neck and upper part of the body, whence it extends over the whole trunk and limbs. With the manifestation of the rash the bodily heat increases, and as it progresses the throat becomes somewhat worse. Rash on second day.

The rash is uniformly red, it disappears on pressure, but almost instantly returns. It lasts but a short time, reaching its height by the end of the third or beginning of the fourth day of the illness, and totally disappearing on the sixth day. Description of rash.

Simultaneously with the rash, the throat soreness and the fever disappear, and shedding of the skin (desquamation) commences, in the form of bran-like scales, except from the soles of the feet and palms of the hands, where it separates in large pieces. Desquamation may last any time from eight to twenty days (Steiner), and it must be remembered that till the process is complete the patient is intensely capable of propagating the disease. Disappears on 4th day.
Fever & local symptoms subside together.
Desquamation.
period.

Broadly speaking, the danger to a case may be

CHAP. XXIII. estimated by the violence of the throat affection.

How to estimate the danger.

Rapidly destructive ulceration of the throat is attended with very great bodily prostration, delirium, a weak pulse, a dry fissured tongue, and a scanty eruption. The patient's condition is then very critical.

The kidneys.

However mild a course the disease may run, it should be borne in mind that the kidneys suffer more or less in all cases, and that actual disease of these important organs may be excited by exposure to cold or errors in diet, and that this danger is at its height just as the child seems to be perfectly safe,—when all symptoms have vanished, during the third week.

Caution most required when it seems least necessary.

Distinguished.

Scarlatina is recognised by the throat affection and the character of the eruption. Measles commence as a cold in the head a couple of weeks after exposure to infection; scarlatina with sickness, high fever, and sore throat. The eruption does not appear till the third or fourth day in measles; on the second day in scarlatina, and when it is seen there can be no confusion.

Prospects.

The prospects of the case will depend upon the presence or absence of those symptoms mentioned above as indicating a serious state of matters. The mildest case of scarlatina is, however, attended with some danger, more from the subsequent effects than from the disease directly.

Frequency.

Happily, in India this disease is extremely rare; indeed, till late years, it was alleged that it was wholly unknown in the country, but this is not so.

In England scarlatina is, with the exception of

convulsions and diarrhoea, the most fatal of all infantile affections. Rigid isolation for the safety of others, and the freest ventilation compatible with the absence of actual cold, both for the patient's own sake, and to obviate the chances of conveyance of the infection by or to others, are matters of primary importance. Confinement to bed is essential in all cases. Sucking ice will relieve the thirst and throat, cool the body, and check the vomiting. Lemonade (70) or conjee water may be liberally allowed. A very simple diet of arrow-root, milk diluted with lime water, and chicken broth, to which, later on, it will be necessary to add stronger soups, should be given. The inhalation of steam from over a jug will be grateful to the throat. When the throat is troublesome, Waring recommends inhalation of the fumes of hot vinegar. Sponging the surface with tepid water is useful and pleasant to the patient. The worse the throat is, the more concentrated should be the nourishment; should it proceed to ulceration, and the tongue become dry, brandy or wine must be given in addition, without stint.

Dr. West speaks very highly of inunctions of suet into the whole surface twice a day, as being more effectual, and giving more permanent relief than spongings. In any case, oil or suet inunctions should be practised during the stage of skin-scaling, daily after a tepid bath.

As to *medicines*, a mild case requires very little interference. Even in a tolerably severe case it is not well to be in too great a hurry to rush to active measures. When the fever is at its com-

CHAP. XXIII

Treatment.

Food.

Stimulants.

Inunctions.

Medicines.

CHAP. XXIII. mencement the fever mixture (45) should be used.

Application
to throat.

Only in case of necessity is it right to give a purgative, and then it should be of the simplest nature (castor oil or Gregory's powder). Should the throat be very sore, it is a good plan to brush it with a solution of equal parts of tincture of steel and water. As the fever declines the mixture may be discontinued, and a stimulating medicine (76) substituted for 3 or 4 days, when it, in its turn, should be replaced by quinine (77) or chiretta (81).

Complica-
tions.

Unfortunately the troubles of scarlatina do not end with the attack. Dropsy, inflammations of the ear, abscesses of the glands of the neck, and general debility of a serious nature may succeed.

Dropsy, when it occurs, appears during the period of skin-scaling, and is generally the result of cold, the child having been allowed up too soon. The vapour bath (p. 386), with saline purgatives, such as Epsom salts and senna, or Seidlitz powder, together with steel and quinine (83, 79), are to be employed to meet this emergency, while, at the same time, the most stringent precautions against cold are taken (see "*Dropsy*," p. 336).

Inflammation of the ear is to be treated upon general principles (p. 353).

Swellings and abscesses of the glands are to be treated with fomentations and poultices till they subside, or are lanced by a competent person; while the best nutriment, such as beef tea, egg-flip, milk, and so forth, must be given with no sparing hand, and quinine and steel (79) administered persistently.

As after measles, so after scarlatina, though CHAP. XXIII.
with even greater intensity, a state of *constitutional debility* may become established, and months if not years of judicious care may be required to induce a return to perfect health.

N.B.—For a long time after recovery from Caution.
scarlatina, the greatest caution must be exercised in permitting the child to go out of doors, even when the air is only cool the convalescent should be kept in-doors, and in avoiding errors of diet.

The special measures regarding the prevention and disinfection of this extremely contagious complaint should be attended to throughout (pp. 138 and 147).

ERUPTIVE FEVERS.

(3) SMALL-POX.

- Cause.** THIS disease is only propagated by means of infection. It is a most virulently infectious complaint, which may be multiplied during the course of the malady by particles contained in the exhalations from the lungs or body of the patient so long as any of the scabs remain adherent to the body. It may be carried from person to person by the clothing, or conveyed through bedding. The germs will retain their vitality for a long period, and may live in wall paper, old clothing, &c., for months, if not for years. About twelve days elapse from the time of exposure to the infection till the disease makes its appearance.
- Incubation.**
- Varieties.** There are two varieties of small-pox, termed the *distinct* and the *confluent*. In the former the pustules remain distinct the one from the other. In the latter they run together into large patches. These so-called varieties are really only differences in degree of severity, the seriousness being proportionate to the quantity of the eruption, unless complications arise.
- Stages of the complaint.** The course the disease runs will be better understood by dividing it into stages as follows:—The *first* stage is that of fever, and lasts from about forty-eight to sixty hours; the *second* is that of eruption, and lasts for eight days or so;

and the *third* is that of the secondary fever, CHAP. XXIV.
which lasts for three or four days.

First Stage.—The earliest symptoms are those Symptoms of 1st stage.
which are common to other febrile disorders, but shivering is more marked than in any except ague. Vomiting and headache are usual. In elder children, pain in the back is so severe as to be almost characteristic, but in those of tender years it is so slight as hardly to attract attention. The temperature runs up to 103° or 104°, the tongue is furred, and the urine thick and scanty. These symptoms continue with increasing intensity till the third day, when the eruption appears Eruption on 3rd day.
—at first on the forehead and face, then on the wrists, and subsequently upon the body and limbs.

Second Stage.—Before the eruption is plainly Symptoms of 2nd stage.
visible it can be detected by passing the finger over the forehead, where the rough feel of the hard pimples beneath the skin may be at once recognised. With the eruption comes relief, the fever greatly subsides, and all the symptoms are mitigated. At first the rash consists only of a number of simple red elevated papules, which come up through the skin, and do not merely lie upon its surface. They are peculiarly hard, nor do they contain any fluid till they are forty-eight hours old, when a whey-like liquid makes its appearance at the top of each. The surface of each vesicle, instead of being conically distended, is centrally depressed or saucer-shaped. After the lapse of another period of forty-eight hours each pock becomes of a yellow colour, the clear fluid contents having been converted into matter. Fever subsides when eruption appears.
On the eighth day from the commencement of Description of eruption.

CHAP. XXIV.

Swelling of
the skin.

the disease the rash has attained its height. During the process of ripening—that is, while the vesicles are changing from white to yellow—the skin swells more or less, so much so that the eyes may become closed, and the whole appearance be dreadfully distorted. The eruption may involve the interior of the mouth and throat, sufficient to cause the patient distress, but the amount of fever throughout this stage is not great.

Symptoms
of 3rd stage.

Third Stage.—The eruption has reached maturity on the eighth or ninth day of its age, or eleventh of the disease. The pustules now burst and discharge their contents, with the result that the fever returns, but with something less than its original intensity. For three or four days this state of affairs continues, then the scabs begin to fall off, leaving the skin of a spotted red colour—a condition which not infrequently lasts for a fortnight.

Secondary
fever.

Confluent
small-pox.

In CONFLUENT SMALL-POX the general symptoms and stages are as above related, but this form of the affection runs a much more violent course. The primary fever is more severe; there is much vomiting and not infrequently convulsions. The eruption comes out earlier; it matures more rapidly; it is much more profuse, and is so closely packed together as to show no intervals of sound skin between the vesicles. When the pustules break the matter runs together, forming large brown or black scabs, which have an abominable smell. Of course such a great drain upon the constitution produces seriously depressing effects. With the secondary fever, which sets in earlier than in an ordinary case, there is liability to complications; delirium and cough being the most frequent.

Once the eruption has appeared, there of course CHAP. XXIV. is no longer any doubt as to the nature of the case; Distinctions. but in the earlier stages the distinction is not so easily made. The following points will help to elucidate the question somewhat. Vomiting as an early symptom is very constant in small-pox, and more severe than in *measles*; the back-ache and high rise of the temperature before the rash appears, do not happen in measles. Then there is the absence of cold in the head and cough, which are constant symptoms in measles. From *chicken-pox*, small-pox may be known by the mild fever of the former. The rash of the former complaint comes out within twenty-four hours, and that of small-pox not for at the least forty-eight hours. The eruption of chicken-pox is a large white, rounded bleb, which never becomes mattery; that of small-pox is not so large, it is saucer-shaped on the surface, and its contents soon become mattery.

The prospects of a case depend (1) chiefly upon Prospects. the fact of previous vaccination or the reverse. Even imperfect vaccination will in all probability modify the attack and render it comparatively harmless (p. 105). (2) A mild introductory fever indicates a mild attack. (3) A scanty eruption is proof to the same effect, and the liability to complications is then small. (4) The most favourable age for an attack is between the tenth and fifteenth year (Marson), and of course (5) in a disease of such exhausting suppuration, a previously strong constitution will justify us in auguring more favourably than when a subject of an opposite state of health is attacked. (6) Confluent small-pox is always dangerous, and when occurring in

CHAP. XXIV. the non-vaccinated it is very fatal, about 50 per cent. dying. (7) Chest complications indicated by difficulty of breathing, cough, and hoarseness, must always cause anxiety.

Most dangerous period. From the ninth to the twelfth days are those of most danger. Convulsions are very rare during

Frequency. small-pox. • Among children of European soldiers in India small-pox is very uncommon, because of the great precautions which are taken in the matter of vaccination. In 1875, out of a total of 12,359 children, only two cases occurred, and both recovered. As to the mortality which ensues among the unvaccinated, &c., see pp. 101 and 105.

Treatment. Isolation and disinfection must be rigorously carried out (138, 139, 147). Ventilation and a cool surrounding atmosphere, though without cold or draughts, are matters of importance. The bed-clothing should be light; by heaping on clothes, considerable harm may be done. In this, as in all other fevers, sponging the surface has a soothing effect. There need be no dread that by doing so the eruption will be "driven in." Water may be freely allowed, as also may the fever drinks (73, 74), or lime-juice and water (70). The

Diet. diet should at first consist of milk and arrowroot, gruel, bread and milk, and a little beef tea. The vital powers must never be allowed to flag, for the exhausting stage of suppuration has yet to be encountered. Under such simple management alone, most cases of distinct small-pox will proceed satisfactorily; but in the confluent variety strong beef-tea and milk, with the yolk of egg, will have to be given from an early stage. And should signs of vital depression manifest themselves, it will be

Never allow powers to flag.

necessary to give wine or brandy with a liberal hand. Against the danger of great prostration, which sometimes supervenes with suddenness, "the greatest care and watchfulness are required; and if at any time the pulse becomes quicker and feebler, the surface pallid, and the pustules assume a flabby, half-empty appearance, if at the same time there be increased restlessness and delirium, then we must push our alcoholic remedies with increased vigour" (Tanner) as well as when typhoid symptoms (p. 199, note) supervene. CHAP. XXIV.

The eyes should always be carefully looked to, lest they become damaged. Careful ablution with the eye lotion (27), and the application of simple ointment to the edges of the lids if they stick together, will generally be sufficient to effect this object.

Do not purge the patient, though by all means see that moderate action of the bowels is established by mild medicines (58, 60) at the commencement of the case. The ordinary fever mixture (45) may be given during the primary fever, but need not be continued during the second stage, when the febrile heat is moderate. In the third stage, or that of secondary fever, benefit will be obtained from a stimulant mixture (76 or 75); but prevention of irritability of the bowels then claims most attention from medicines. Prescription No. 39 will probably be found the most beneficial in such a necessity, particularly if there be, at the same time, delirium; otherwise a simple astringent such as No. 35 or 36 will answer the purpose. Stimulants.

Convalescence from small-pox is not usually a prolonged process. Once the patient has completely passed through the disease, recovery is Medicines.

Convalescence.

CHAP. XXIV. steadily progressive ; but it will be well in most cases to administer a tonic (71, 81, or 79).

Prevention of pitting.

For the prevention of pitting a great many nostrums have been proposed. Equal parts of olive oil and lime water, well shaken together into a thick emulsion, and smeared twice daily over the surface, certainly proves to some extent beneficial, but the local application of turpentine or carbolic acid is much more effectual ; both, however, especially the latter, are not without danger if extensively applied, in that they may be absorbed into the system, and produce symptoms of poisoning. If the application be restricted to the face and hands only, no such danger need be apprehended. The manner of using them is as follows :—Turpentine one part, olive oil four parts, shaken together, and applied night and morning by means of a feather ; or carbolic acid twenty minims, glycerine one drachm and a half, and zinc ointment six drachms, mixed thoroughly together, are to be painted over the face and hands every second day.

Complications.

The complications which may arise from small-pox are inflammation of the lungs, bronchitis, and ophthalmia, which, when they occur, are to be treated as if they had arisen under ordinary circumstances.

Modified small-pox.

Modified Small-pox is a name applied to the disease as it occurs in a person who had previously been vaccinated. In such a case the whole course of the disease is so modified as to convert it into a trivial complaint, requiring no treatment ; but the important point to know is that it is as infectious, and as capable of propagating the worst kind of small-pox, as is the most malignant form of that disease.

As dangerous as any as to infecting powers.

CHAPTER XXV.

CHAP. XXV.

ERUPTIVE FEVERS.

(4) CHICKEN-POX.

THIS is a trivial though infectious complaint, which Nature. appears three or four days after exposure to infection. It is very common in India, where its attacks are by no means confined to childhood.

For about twenty-four hours there is more or Symptoms. less fever, seldom much, and indisposition. Then the rash appears, and with it the fever almost goes away. The rash commences as a number of little red pimples, which on the second day begin to fill with fluid. On the third or fourth day they have attained their maximum of size, and present an appearance as though the patient had been subjected to a shower of boiling water, which had left behind a number of small almost clear blisters. On the fifth day the vesicles burst and the contents form hard crusts. On the eighth or ninth day the crusts commence to fall off; and the disease has come to an end, leaving the patient but little the worse for it.

Sometimes successive crops of vesicles appear every twenty-four hours, and may go on forming for ten or twelve days; but this is more common when the affection attacks the adult.

The illness usually occurs only once in the same individual, most commonly during childhood; but it conveys no protection from small-pox.

The very slight fever, and the large rounded Distinction.

CHAP. XXV. clear vesicles, with only watery contents, distinguish it from small-pox (*vide* p. 219).

Treatment. Recollecting that the complaint is contagious, it is as well to isolate a child so attacked. Little or no actual treatment is necessary. The child should be kept within doors for a few days, abstain from animal food, and take a gentle purgative once or twice.

(5) DENGUE.

Manner of commencement. In children, this fever comes on with little warning. There may perhaps be some little malaise of a day previously. This is followed by acute pain in one or two joints, and chills and flushings for a few hours, which symptoms are succeeded by violent fever (104° to 105°) of some twenty-four hours' or more duration, the pains in the joints increasing in number and intensity all the while. The younger the child the fewer the warnings: in a great many cases the accession of violent fever is the first symptom. The fever is accompanied by a peculiar mottled red rash or efflorescence on the palms of the hands, soles of the feet, neck, and cheeks, extending to the chest and trunk, and not infrequently there is some soreness of the throat. With the total decline of the fever (on the second day of its duration) this rash disappears. For a succeeding period of about forty-eight hours the child is comparatively free from pains, and completely so from fever. There is nothing more than weakness left behind; but the affection has not yet run its course. A second eruption, which exactly resembles that of measles, now succeeds, and with it a slight amount of fever and restlessness; all of which

Symptoms.

First rash.

Second eruption.

symptoms last for about twenty-four hours, frequently less. The after pains, so common in the adult, seldom cause much trouble to infants and young children. Recovery is rapid, and no prolonged ill effects remain.

The recognition of the complaint is easy. In the first place it only occurs in epidemics, never in isolated cases. The primary eruption is like that of scarlatina, but the rarity of scarlatina in India, and the fact that the fever and eruption appear almost simultaneously, are sufficient to prevent confusion. The secondary eruption is very similar to that of measles, but the previous occurrence of another form of eruption, and the cessation of the fever temporarily, are quite sufficient distinctions.

The prospects are almost always favourable. The only danger is from the great and sudden heat of the first twenty-four hours, when infants are liable to convulsions.

Dengue is an affection which, like the other eruptive fevers, must run its course. Drugs, therefore, cannot cut it short. Upon proper management, rather than medicines, we must rely. In the first instance it will be desirable to give a mild aperient (58, 60, 62, 63). During the febrile stage a fever mixture (43, 45) should be given. The important point in the case of young children is to moderate the bodily heat by means of spongings (p. 172), the cold bath (p. 170), or oil inunction (p. 174), as the symptoms may demand. During the absence of fever no medicines need be given. A few doses of the fever mixture may be administered when the secondary fever appears. No medicines are required during convalescence.

DIVISION II.—AFFECTIONS OF THE MOUTH.

CHAP. XXVI,

CHAPTER XXVI.

THRUSH.

Definition. THRUSH is one of those affections of early infancy (rare after the third month, except during the first dentition) which ought never to occur, and which will not occur in a well-managed infant. It is a disease of mismanagement, which is characterized by little white patches within the mouth. In itself it is a trivial complaint, though it is indicative of a depraved state of the digestive organs, unfavourable to assimilation.

Causes and Nature.

The chief cause of thrush is an unsuitable diet, which, producing a disordered state of the system, originates an unhealthy condition of the mucous membrane of the mouth, and renders it a fitting soil for the lodgment and growth of a peculiar vegetable parasite. The parasite thus suitably planted, there develops and causes spots of inflammation which present the appearances known as "thrush."

A dirty, sour state of the feeding-bottle or its nipple will also nourish the plant, which may thus become lodged in the child's mouth.

The affection is particularly common in the hot weather, which favours the growth of the plant. CHAP. XXVI.

At first there is merely redness and some tenderness inside the mouth, which if carefully examined will show numerous very minute transparent blebs. These (spots of lodgment of the parasite) inflame, burst, and form white specks, each perhaps only the size of the head of a pin, with a very narrow red surrounding. The interior of the mouth now becomes angry-looking. It is at this stage that the affection usually for the first time attracts the attention of the mother or nurse. The size of the patches next slightly increase, presenting an appearance as though minute portions of curd adhered to the inside of the cheek or lips; but it will be found that they cannot be moved about as could mere particles of food; nor can they be dislodged without some little force, and if removed, they leave behind little ulcers, which bleed slightly. Symptoms.
Appearances.

Near the corners of the mouth, the inside of the lips, and the under surface of the tongue, are the most frequent situations; but the spots may extend over the roof and back of the mouth, even to the tonsils and throat. Situation.

Almost always there is some watery diarrhoea accompanying this state, which not infrequently, on account of its irritating nature, excoriates the buttocks. Diarrhoea.

The affection seldom occurs in a child who has not for some time previously been out of health. The healthy mouth will not nourish the seed even Occurs only in children who are out of health.

CHAP. XXVI. if introduced, the soil being unsuitable. Acidity of the stomach and bowels is usually present, the child has not been thriving, and it is thin.

Treatment.
General.

Thorough cleanliness is the first essential. After each meal the mouth should be washed out with a little warm water. The bowels should be regulated by a few doses of the red mixture (59); but if there is much diarrhoea it may be necessary to give an astringent (35). To the milk, lime-water should be liberally added. A minimum of sugar should be allowed. The child must be fed frequently, because the efforts at sucking may be so painful as to interfere with nutrition.

Local.
Destroy the
parasite.

The next thing to be done is to destroy the parasite. This is easily accomplished by the application of borax and glycerine (18) within the mouth. If glycerine be not obtainable, honey may be used, but it is not nearly so useful. Another capital application is the hyposulphite of soda (one drachm to one ounce of water), which very quickly destroys the vegetation, but it may not always be easy to obtain the drug.

When the
throat is
involved.

When the mouth is extensively affected, particularly if the throat be involved, it will be desirable to give a mixture of chlorate of potash (3).

CHAPTER XXVII.*

CHAP. XXVII.

INFLAMMATION OF THE MOUTH.

INFLAMMATION of the mouth is of three kinds—simple, severe, and dangerous.

1. SIMPLE INFLAMMATION OF THE MOUTH.—^{1 Simple. Nature, &c.}
This is a trivial affection, engaging only the mucous membrane, and it in many respects resembles thrush in appearance; but it is a different disease, ^{Different from Thrush.} and does not depend upon the presence of a parasite. While thrush is exclusively an affection of early infancy, this inflammation never occurs at that period of life. It is most common between the ages of one and five years.

Its cause lies in a state of constitutional ^{Cause.} debility, accompanied by disorder of the stomach. Sometimes it follows measles, when it not infrequently assumes some of the characters of diphtheria, and then of course it becomes a serious affair.

The child is out of sorts; he is peevish, and he ^{Symptoms.} suffers from offensive diarrhœa for two or three days. The mouth then becomes sore, red, and hot. On inspection numerous spots of a dirty white colour are observed within the cheek, upon the tongue and throat. These spots soon form ulcers.

CHAP. XXVII. Feeding is painful. Saliva dribbles freely from the mouth. As one crop of ulcers heal another comes on, and thus, if unchecked by remedies, the affection may run a prolonged course.

Treatment.

Attention to the cleanliness of the mouth, regulation of the diet (p. 97) and of the bowels, by the red mixture (59); and the use of an alum gargle (half a drachm to six ounces of water) will usually effect a ready cure; or borax may be used (18) instead of the alum. Should any ulcer become large, it is well to touch it rapidly and gently with caustic, but this should not be repeated without an interval of two or three days. A vegetable tonic such as chiretta (81, 82), or quinine (77), should be given during and after convalescence.

**2. Serious.
Attacks the
gums.**

2. SERIOUS INFLAMMATION OF THE MOUTH.— Attacks chiefly the gums. It usually occurs in children who are debilitated, and who at the same time occupy close, unhealthy rooms, and obtain inappropriate, bad, or insufficient food. Among the natives it is common enough, and sometimes it is seen in neglected European children,—not that the occurrence is absolute proof of neglect, though certainly strongly presumptive of it.

Symptoms.

On examining the mouth the affected portion of gum is seen to be swollen and of a dark violet-red colour. It is covered with a soft greyish deposit, which admits of easy removal, and the part bleeds easily. The amount of constitutional derangement which precedes this state of the gum is very variable, but as a rule it is not proportionate to the gravity of the case, or greater than

**Not commensurate with
seriousness.**

that which ushers in the simple variety of mouth inflammation. Indeed, not infrequently the first thing that attracts attention is the offensively smelling breath and some swelling of the upper lip, which leads to the discovery of the state of the gum. At the same time the glands under the jaw at the affected side are apt to become sore and enlarged. The cheek next swells and becomes boggy to the feel; the impression of the teeth on the inside, being retained. Soon afterwards ulceration of the gum commences at the base of the teeth, from which point it proceeds with variable rapidity. Very foetid saliva, streaked with blood, flows from the mouth. Those portions of the cheek which come into contact with the diseased gum may ulcerate to a small extent. If the ulceration of the gum is extensive, the teeth will loosen, and even fall out. When the ulceration has ceased to spread, recovery is initiated; the swelling diminishes, the surface of the sore becomes clean, the flow of saliva diminishes, and the deposit on the gum lessens till it finally disappears.

CHAP. XXVII.

The cheek and gums.

As a rule cases properly treated recover, and the patient is convalescent at the end of a week or ten days.

The utmost cleanliness of the parts must be observed. The mouth should be constantly washed out with warm water and salt, or with a weak solution of Condyl's fluid (one drachm to eight ounces of water). The diet should consist of beef-tea, milk, raw egg and milk, and such like nutritious articles as the child can be induced to

Prospects.

Local.

Diet.

CHAP. XXVII. take. The bowels should be carefully regulated, neither constipation nor diarrhoea being permitted (59).

Bowels.
Chlorate of
potash a
specific.

From the commencement the chlorate of potash mixture (3) should be given and persisted in till recovery has been completely established. This medicine is most valuable in these cases, and if not at hand at the moment, should be procured in the crystalline form, by post, with as little delay as possible.

During convalescence a tonic (such as 79, 84) should be given till the strength be completely recovered, and it will be well to allow the child a little claret and water with its meals.

3. Dangerous,
or "cancrum
oris."

3. DANGEROUS INFLAMMATION OF THE MOUTH affects the cheek. This most formidable kind of inflammation and mortification of the cheek is known under the name of *cancrum oris*. It only attacks those who are in a very bad state of health and suffering from debility, and is most common between the ages of two and five years. Amongst the poverty-stricken and half-starved native children it is comparatively common as a sequence of the ordinary malarial fevers of the country. Sometimes it occurs in unhealthy children after measles. Dirty poverty and foul air will do much in such cases to initiate this calamity. European children sometimes suffer from it after very debilitating diseases.

Class at-
tacked.

Frequency.

In 1875 four cases of *cancrum oris* occurred among the children of European soldiers in India; —all four proved fatal. There is very little general

illness to indicate what is coming. There is, CHAP. XXVII
 moreover, very little, if any, local pain. The first Symptoms.
 thing observed will probably be a swollen, shiny Come on mildly.
 cheek; "it looks as if the surface had been
 besmeared with oil, and in the centre of the
 swollen part there is generally a spot of a brighter
 red colour than that around" (West): The cheek
 feels hard. The breath is very foetid, offensive
 saliva flows profusely, the glands under the jaw
 swell, the gums become spongy, and perhaps the
 teeth may loosen.

Inside the mouth, opposite the red external The ulcer.
 spot, an ulcer will be detected—a dirty, ash-
 coloured, irregular sore. This ulcer increases in
 size, the red spot on the cheek becomes black, and
 the stench is great. High fever, much general Great consti-
 disturbance and prostration accompany the pro- tutional sym-
 gress of the mortification, but there is no con- pathy.
 siderable local pain.

Beyond the blackness will be observed a ring Portion of
 of bright redness. The black portion now begins cheek dies.
 to separate at the edges, till finally becoming
 detached, it leaves a hole through the cheek,
 opening into the cavity of the mouth—if the child
 has lived so long.

The disease is of a most dangerous nature; Prospects.
 recovery is the exception. Should the patient Recovery th
 survive the ordeal, very great deformity is sure to exception.
 result; but after the complete restoration of the
 general health, operative surgery may be able to
 accomplish much in remedying this.

In the absence of a surgeon the best thing Treatment.
 that can be done is to support the patient's

CHAP. XXVII. strength by every means in the power. From the earliest moment jugged soups, the juice of raw meat (p. 400), egg beaten up with brandy, and such highly concentrated nutriment, must be given with a liberal hand and at short intervals. Johnson's fluid beef (p. 400) if procurable will prove a valuable auxiliary. Night and day nutrition and stimulation are to be administered with only about one hour's interval, except during actual sleep, which unfortunately is of rare occurrence. Emphatically life cannot be saved without energy and perseverance in this matter.

Local. The parts should be repeatedly washed with some non-poisonous fluid, such as salt and water, or Condyl's fluid properly diluted (p. 233). A small light poultice, made chiefly of pounded charcoal, will mitigate the stench.

Opium. When there is a tendency to delirium, total inability to sleep, and great restlessness, much benefit will be derived from a timely dose of opium (one drop of laudanum for every year of age completed); but caution must be observed not to produce depression by the use of this drug.

After recovery. Should recovery eventuate, a tonic of steel and quinine (79) will prove valuable. Considerable deformity is sure to be left; but when the child's health has been entirely re-established, after the lapse of some months the surgeon may be able to do much to remedy it.

DIVISION III.—AFFECTIONS OF THE THROAT.

CHAPTER XXVIII.

CHAP. XXVIII.

(1) QUINSY OR TONSILLITIS.

THIS is the ordinary inflammatory sore throat. It is an unusual complaint in children under ten, and it is rare under five years of age. Age of occurrence.

It is caused by cold. By some it is believed to be infectious. Cause.

Slight chilliness succeeded by fever ushers in this complaint. Soon some soreness of the throat is complained of, the tongue is very furred, and the face is flushed. Swallowing is difficult and painful. Upon inspecting the back of the mouth, the tonsils will be seen swollen and red. After thirty-six or forty-eight hours', most probably the disease will resolve itself. Sometimes, though seldom in the child, an abscess may form in the tonsil, and then, of course, the distress will be great and prolonged till it has burst. Symptoms.

Deafness may sometimes be a symptom, but it is of no importance, being due simply to the swollen tonsils blocking up the little ear tubes from the mouth temporarily.

Difficulty of breathing is a possible but rare

CHAP. XXVIII. occurrence, when an abscess is forming; though indeed it may happen without any suppuration being present. The symptom is one which need not give anxiety; the child will not suffocate.

Prospects. There is never any danger. Repeated attacks may bring on chronic enlargement of the tonsils, and its attendant evils.

Treatment. The treatment need only be of the simplest kind. Rest in bed, light diet, cooling drinks, and a brisk saline purgative (one drachm of Epsom salts in some water). The inhalation of steam from over a jug, fomentations to the throat, and after twelve hours, swabbing the throat out with a solution of nitrate of silver (10 grains to one ounce of distilled or rain water) will effect a ready cure.

In the rare case of an abscess forming, if surgical assistance cannot be obtained, it must be left to burst. No attempt should be made by an amateur to open it.

(2) CHRONIC ENLARGEMENT OF THE TONSILS.

Causes. The important point to know about quinsy, is the possibility of chronic enlargement of the tonsils resulting from repeated attacks, and the constitutional effects of such enlargement. But unfortunately chronic enlargement occurs sometimes in children who never have had quinsy, an unhealthy constitution being apparently sufficient cause in these cases.

Symptoms. The tonsils will be found projecting so far as to touch or nearly to touch each other, thus partly

obstructing the entrance of the air into the wind-pipe. As a result, the child snores loudly during sleep, the voice is thick, and there may be partial deafness. Almost always there is chronic cough, caused by the irritation; sometimes there may be actual difficulty of breathing. CHAP. XXVIII.

Children so affected do not thrive. The narrowed orifice sufficiently impedes swallowing, even though there be no pain, to prevent the consumption of sufficient nutriment; consequently we have emaciation. The difficulty of breathing prevents the full expansion of the chest, and the result is flattening, which remains permanent throughout life. Even should the condition be subsequently remedied, it is not always that the articulation becomes natural, or that the hearing will be as acute as it otherwise would have been. Effects.

This condition calls for special attention to all matters connected with the hygiene of the child. Treatment.
A life in the open air and an abundance of animal food are essentials. Cod liver oil and iron (84) should be administered persistently. Each day the tonsils should be freely brushed over with a solution of nitrate of silver (20 grains to 1 ounce of rain or distilled water). The enlargements will frequently, under this treatment, subside. But should they remain, or continue to increase, the child should be sent to a surgeon, who will remove the tonsils in whole or in part by a comparatively simple operation.

(3) CROUP.

Varieties. THIS is a disease of the throat either wholly spasmodic, or partly spasmodic and partly inflammatory in its nature.

Upon the absence or presence of inflammation, will depend the absence or presence of serious symptoms, and the intensity of the accompanying fever. For practical purposes, therefore, it is important to classify the disease into (a) spasmodic croup; (b) inflammatory croup.

Spasmodic. 1. SPASMODIC CROUP, is a comparatively mild complaint. It may commence either with

Symptoms. symptoms of a slight cold, cough, and perhaps slight fever, or it may be ushered in at once without any introductory symptoms, by a sudden attack of difficulty of breathing.

Usually, however, there is a hoarse cough, some general indisposition, a foul tongue, and a quick pulse. The respiration soon becomes crowing—that is, at each endeavour to draw air in through the spasmodically narrowed orifice of the throat a peculiar sound is produced—a symptom which is unmistakable. An attack of difficulty of breathing follows; it occurs as a sudden paroxysm,

usually at night, and it may last for an hour or longer. After the attack the child is tolerably well, the voice perhaps remaining a little hoarse, but that is all. A similar attack may occur on the following night, if not sooner. Throughout, the fever, if at all present, is but slight; and it subsides after the attack, leaving the child comparatively well and able to run about, free from all throat symptoms. Of the cause of this complaint we know nothing more than that cold is sufficient to induce it in those who are predisposed. An emetic of ipecacuanha wine (47) had better be given as soon as the case comes under observation. Steam should be inhaled, an alterative purgative (66, 67) administered, and the child, when the paroxysm commences, should be put into a warm bath. A dose of mixture No. 9 is often very useful at this stage. After an hour the emetic may be repeated if needful, as also may the bath. The air of the room should be rendered warm and damp (by putting water in a kettle, whose spout projects into the room, on the fire), but not overheated: as a rule, the room is made much too hot. Fomentations to the throat in the shape of a sponge wrung out of hot water and applied, will also prove useful. The paroxysm having passed, the bromide of potassium mixture (10) should be commenced, and continued steadily for two days or so after the complete recovery of the child. Non-exposure to cold, and careful regulation of the diet and bowels, are points demanding special attention for some time following.

Upon the re-appearance of any acute symptoms,

CHAP. XXIX. a few drops of ipecacuhana wine should be given every hour, so as to produce and perpetuate nausea, till they subside.

Child-crowing. There is a form of spasm of the throat called CHILD-CROWING, which is most frequently met with during teething between the ages of six and nine months, but sometimes later. It is more frequent among hand-fed children than others, and among the weakly than the strong. A drooping infant on waking from sleep, when sucking or crying, makes a strange crowing sound, at first not very loud. After a time this increases to paroxysms of difficulty of breathing, which may be so severe as to produce lividity of the face. At the end of a few moments, however, the spasm yields, air is drawn in through the narrowed chink with a shrill crowing sound, and the paroxysm is over. But it recurs again and again at intervals, of perhaps a few hours, perhaps not for days. Sleep usually succeeds an attack, after which the infant is apparently as well as ever till a recurrence happens.

Causes. This affection is more of the nature of a convulsion of the throat than anything else. It is particularly common during teething, which often causes it; over-feeding and constipation are other causes. A condition of health below par is, however, a necessary preliminary.

Prospects. These cases usually do well, but if the attacks increase in frequency and severity they may wear a child out, till exhaustion and general convulsions ensue, and lead to a fatal termination in a small number of cases.

During an attack we should proceed as when CHAP. XXIX.
restoring a stillborn child, by slapping it, dashing Treatment.
cold water upon it, exposing it to a cold current of
air, pulling the tongue forward, and, if necessary,
employing artificial inspirations (p. 36). The warm
bath should always be used. In the intervals we
should endeavour to remove the cause by lancing
any pressing tooth, and by attending to the diet
and nursing, as laid down at pages 43 and 89.
The bowels should be kept moderately loose (see
Constipation, p. 272). Bromide of potassium (10)
should be used when an attack threatens, or till
the excitement following it, has subsided. Tonics
are very essential, and of these the iodide of iron
and cod liver oil (84) is the best form of exhibition,
but of course the active symptoms must first have
been controlled. The child should, contrary to
the general idea, be kept in a cool atmosphere.

2. INFLAMMATORY CROUP is a serious affection. 2. Inflammation.
By many great authorities it is believed to be the
same affection as diphtheria, only expressing itself
differently by spasmodic symptoms because a
lower part of the throat is affected. However this
may be, it is quite certain that this form of croup Relation to diphtheria.
is sometimes capable of infecting the healthy with
diphtheria, and *vice versa*.

It consists of an inflammation of the mucous Nature.
membrane lining the top of the windpipe As a
result of the inflammation, swelling and the
exudation of a white incrustation or "false mem-
brane" ensue, which so block up the narrow air
aperture as almost or altogether to close it. At
the same time spasms of the throat occur at inter-

CHAP. XXIX. vals, producing paroxysms of cramp and difficulty of breathing.

Symptoms.
Preliminary.

At first there are all the symptoms of a common cold, with fever, thirst, drowsiness, and running at the nose. The child complains of his throat, at which he clutches when swallowing. Hoarseness comes on, to which after a time is added the hoarse ringing cough. The fever increases, and these symptoms continue for some twenty-four or thirty-six hours. At night an attack of difficulty of breathing causes the child to awake in a fright, gasping for breath. The paroxysm passes, and during the rest of the night the metallic cough, crowing, and impeded respiration continue; leaving the child exhausted in the morning, restless, flushed, and the voice is almost extinct. A slight improvement succeeds, and a little sleep may be obtained, but the amendment is only temporary. As the day goes on the force of the fever again increases, and the paroxysm returns with greater violence than before. Perhaps the face may become livid, and the natural tint may not even be recovered between the paroxysms. If the flesh between the ribs becomes depressed at each respiration we may be sure but little air is entering the lungs. Cold, clammy sweats, a rapid weak pulse, drowsiness, and lividity of the face, indicate a fatal termination. *

Prospects.

This kind of croup is always serious; but so long as the symptoms last mentioned are absent there is every room for hope.

Distinction.

It may be known from the spasmodic variety by the preliminary fever, the hoarseness, the feeble or

extinct voice, the continuousness of the fever, the increasing difficulty of breathing, and chiefly by the fact that the croupal sound continues during the intervals between the paroxysms. CHAP. XXIX

As soon as it is suspected that a child has croup he should be placed in a warm bath for a quarter of an hour, the whole skin should be rubbed with oil (p. 174), and he should then be put to bed in a room the air of which is warm and moist. By Treatment.
Bath and
inunction.

attaching a tube to the spout of a kettle which is kept boiling on the fire, the steam will be led into the room, and if the tube be long enough it may be led close to the child underneath a blanket tent (one side of which is left open), constructed over the bed. An emetic (46, 47) should now be given, Moist air.

or if the symptoms have been urgent, it ought to have been the first thing done. The bowels, which are usually costive, should be acted upon after the emetic by a brisk purgative (66, 67.) Emetic.

A large sponge wrung out of hot water should be applied to the throat and alternated with another till the skin becomes red and irritated. The inhalation of steam is soothing, and therefore useful; and it is a good plan to add about half a teaspoonful of carbolic acid to the hot water of each inhalation. Bowels.
Fomentation
and inhala-
tions.

After some four hours or so it is well to repeat the emetic, and in the meantime the child should have been kept slightly nauseated by means of ipecacuanha (5 drops or less of the wine each hour upon a lump of sugar will answer) or by the frequent use of mixture No. 43. Keep up
nausea.

Troublesome cough at this stage is frequently Poultice

CHAP. XXIX. much relieved by poulticing the chest effectually before and behind.

These means
usually suffi-
cient.
If not pre-
scribe No. 2.

Very frequently the above measures or a repetition of them will cut short an attack of croup. But should the case still continue to proceed badly the mixture is to be omitted, and an alterative and antispasmodic substituted in the form of mixture No. 2, of which one teaspoonful should be given every second hour night and day.

Diet. The diet at first should be very light, and consist chiefly of slops; but as we omit the depressing medicines a more liberal allowance must be given, pretty rapid advance being made so as to anticipate the accession of constitutional depression. Beef tea and wine ought to be given upon the slightest appearance of typhoid symptoms (p. 199, note).

Operation. Sometimes croup demands the performance of an operation to save a child's life. Should a surgeon propose to do so, the mother ought not to oppose his advice. No surgeon will lightly undertake a task of such responsibility, and one which is not calculated, in these cases, to prove largely successful. A mother's plea for a little more delay may be the death-warrant of her child.

Frequency. In 1875 there were sixty-four cases of croup (kinds not specified) among soldiers' children, of whom seventeen died.

CHAPTER XXX. .

CHAP. XXX.

(4) DIPHTHERIA.

THIS most formidable disease is characterized by Definition.
inflammation of, and exudation upon, the back
of the mouth and throat. The whole constitution
suffers under great prostration ; and after recovery,
paralysis or other nervous phenomena are common.

It is highly contagious, and usually prevails Infectiousness
epidemically. A child cannot be deemed altogether
free from infection till a month has elapsed since
complete recovery. After exposure to infection, Incubation.
the disease may commence within 36 hours or
even less, but more usually five or six days elapse.
A week's freedom from symptoms, after exposure,
may be regarded as evidence that infection has
not been incurred.

Diphtheria is usually disseminated through Modes of spreading.
direct infection. The germs are given off chiefly
from the throat with the breath or expectoration,
but in severe cases the membrane lining the
intestine also becomes affected. Hence the infection
may be spread, through the influence of gas from
privies into which the excreta have been thrown,
if they have not previously been disinfected
(p. 146) ; or through the air in the immediate
vicinity of the patient, or his foul linen ; as well

CHAP. XXX. as by direct implantation, such as may occur by the act of kissing, or by transferring a feeding-bottle from an infected to a healthy child.

Illustration. "On one occasion, when called to investigate a case at a detached and perfectly isolated house in the country, I," writes Dr. Thursfield, "found that the patient had been to a neighbouring town, and had entered and been exposed to sewer gas in a house on a short line of sewer, which I knew had become specifically contaminated by diphtheria. The owner of the property instructed a surveyor, residing some little distance off, to examine this sewer. He did so, and for that purpose had it opened, and was much exposed to the gas, and the second or third day after I received information that he was struck down with an attack of diphtheria, from which and from its remote sequelæ he suffered severely."—(*Lancet*, August, 1878).

Milk which has been kept in a house infected with diphtheria is another mode of spreading the disease.

The infection is portable. A visitor may convey it from house to house.

Is preventable. It will thus be seen that although the modes of dissemination are numerous and subtle, they are all capable of being controlled by disinfection (pp. 138, 146); or they are easily avoided.

Symptoms. Even though the disease occur in its mildest form, there is always exceedingly great constitutional depression, as the result of the blood poisoning upon the nervous system.

Premonitory. For one or two days there is fever, lassitude, and pains in the limbs, but these symptoms need

Throat. not necessarily be severe. Some soreness of throat is now noticed; the tonsils and all the back of the mouth are seen to be very red, with here and there small patches of white lymph upon them. Soon all these parts become covered with a film of

greyish-white substance; there is difficulty of breathing; the glands of the neck enlarge; the tongue is red at its tip and foul behind. The temperature rises to 104° or 105° by the second day, and begins to fall on the fourth day. breath is very offensive. There is difficulty of swallowing, and the patient suffers from a constant "hawking," caused by the endeavours to get rid of the tenacious secretion. The white substance becomes greyish, dense, and shreddy; perhaps separating in places, and showing a raw, ulcerated surface beneath. There may be a good deal of nasal discharge. The general prostration is intense. At this point, either recovery begins or the child sinks. If the former, the false membrane separates, the raw surface heals, and convalescence commences. If the latter, the difficulty of breathing increases; should the membrane become detached, another rapidly forms, stupor comes on, and death ensues. Sometimes, though happily rarely, sudden death occurs from clotting of the blood at the heart, without any warning symptoms.

CHAP. XXX.

Tongue.

Temperature.

False membrane.

Signs of recovery and of death.

Diphtheria is always a dangerous affection. Scanty urine, difficult breathing, and extreme prostration are bad signs. A rise of temperature after the fifth day is ominous. Diarrhœa during the latter stages indicates danger.

Prospects.

Diphtheria cannot well be mistaken for croup; the absence of paroxysms of difficult breathing, and the condition of the throat as actually seen, are sufficiently distinctive.

Distinction.

For scarlatina it might be mistaken in its very

CHAP. XXX.

early stages, but the absence of rash after the second day and the throat incrustation, will be evidence enough.

Treatment.
Cold locally.

The child should be put to bed in a large, well-ventilated room. He should be allowed to suck ice freely, and a bladder containing ice or freezing mixture should be applied externally to the throat, with the object of keeping down the inflammation.

Further
objects.

The further treatment has two objects in view—
(1) to support the patient's strength, and (2) to relieve the throat.

The most
concentrated
nourishment
from the
beginning.

From the very commencement concentrated nourishment must be given; the strongest juggled beef soup, Brand's essence of meat, Johnson's fluid beef, (p. 400), eggs beaten up with milk, and occasionally egg and brandy should be sedulously given at short intervals. Stimulants are essential from the beginning, and they are to be given liberally. Without such feeding and stimulation no treatment can avail. If there is difficulty in accomplishing the administration of nutrition by the mouth the substances named should be injected into the bowel, an ounce at a time, and retained there by pressure.

Avoid
purgatives.

Unless there is actual constipation it is better not to trouble the child with purgatives.

Position of
patient.

When the pulse shows signs of failing, the patient should be kept very quiet in bed, with his head low; and he should never be allowed to assume the erect posture while this state lasts, lest fainting, which might easily prove fatal, be induced.

Moist and
heated air.

When the breathing is becoming impeded, or

when the false membrane is seen to become dense CHAP. XXX. and thick, the directions as to placing the patient under a blanket tent, which is supplied with moist and heated air, as described in the last chapter (p. 245), should be observed. The object now is to cause the membrane, by the aid of heat, to detach itself, cold having failed to check the inflammatory process. With this object, inhalations of steam frequently repeated, and the application of a warm moist sponge externally, are likely to prove beneficial. To each pint of the hot water, used for the inhalations, it is desirable to add half a teaspoonful of carbolic acid.

Should the membrane begin to separate, these measures must be persevered in with increasing assiduity.

As to medicinal agents, so soon as any signs Medicines and applications. of the film or exudation become noticeable on the throat or tonsils, these parts should be thoroughly swabbed over with an application composed of equal parts of tincture of steel and glycerine; and the following mixture should be prepared with accuracy in the manner below described:

Take of chlorate of potash, 30 grains; strong hydrochloric acid, half a drachm; quinine, 12 grains; tincture of steel, 40 minims; syrup and waters sufficient to complete up to 10 ounces.

Place the potash in a ten-ounce empty bottle; pour upon it the strong acid, and cork the bottle *loosely*, or cover it *lightly*. When the bottle is full of gas, as it will be in a few minutes add the water little by little, shaking the bottle each time. Finally add the syrup, quinine and iron.

Of this mixture give two teaspoonfuls every fourth hour to a child five years of age.

CHAP. XXX.

Between each dose some of the mixture should be employed as a gargle, if the child be old enough to be able to use it thus.

Should the prostration be at all considerable, three or four additional drops of tincture of steel may be added to each dose of the mixture.

In the event of the film or exudation showing a disposition to increase rapidly, the application of the tincture of steel and glycerine to the throat, by means of a small portion of sponge securely tied to the end of a thin piece of whalebone, is to be repeated after the lapse of two or three hours.

By proceeding in this way the remedies are brought into actual contact with the parts at short intervals; and the medicine is rapidly introduced into the blood.

The above is, in the main, the system of treatment pursued at the Children's Hospital, Great Ormond Street, London, where a considerable measure of success is attained.

Should strong hydrochloric acid not be at hand, the mixture may be prepared in the same manner, substituting three times the amount of tincture of steel for the quantity ordered above.

The debility of
convalescence.

The weakness of convalescence is best met with tincture of steel and cod liver oil administered together internally, and by change of air. A sea trip, when possible, is always advisable.

Paralysis as a
complication.

Diphtheria not infrequently is followed by paralysis — generally partial — involving various parts of the body. Generally this condition is recovered from, being amenable to treatment by steel, quinine, fresh air, and good food. The

muscles of the palate are usually the first to be thus affected; the voice then assumes a nasal, drawling, monotonous character; fluids pass through the nose when attempts are made to drink, and the child experiences great difficulty in expectorating. The eyes are, next in order of frequency, affected; confusion of sight and giddiness being the chief symptoms. If the legs become affected, a trembling and uncertain gait soon discovers the fact.

CHAP. XXX.

The amount of paralysis which may succeed a case bears no proportion to the severity of the primary disease.

This complication may last for from six weeks to a year; but, as stated, the natural tendency is towards recovery.

As a complication of measles, a diphtheritic state of the throat may occur, sometimes simultaneously with the measles itself, more frequently as recovery from the latter is taking place. In such a case the affection should be treated in all respects as though it were a case of pure diphtheria.

Diphtheria
complicating
measles.

In 1875 three soldiers' children were attacked with diphtheria in India, and two of these died. In England, in 1870, 2,414 children under fifteen years of age died of diphtheria, of which number 1,500 were under four years of age. Instances of very fatal local outbreaks are not wanting in India.

Frequency.

(5) MUMPS.

- Nature.** THERE is a contagious affection termed mumps, which, though not really a disease of the throat, had better be mentioned briefly here. In very young children, those under six years, it is not common. The affection is an inflammation of those glands which secrete the saliva, the largest of which are situated one at either side of the face just beneath the ear.
- Cause.** Mumps seldom attacks the same person twice. It is spread only by infection, after exposure to which perhaps a fortnight will elapse before symptoms appear.
- Symptoms.** A feverish cold and stiffness of the jaw are the earliest observed symptoms. Then appears a painful hard swelling in the neighbourhood of the cheeks and ears, extending beneath the chin. The child is unable to open its mouth. Any motion of the jaw is painful, the face is distorted. The fever and swelling increasing, reach their maxima on about the third day; from which time all symptoms gradually diminish, till complete recovery is attained by about the eighth or tenth day.
- Sometimes a hardness and some small amount of swelling remains for a considerable time after recovery.

A singular fact about mumps is the liability of the inflammation to leave the salivary glands, and transfer itself to the testicle of a boy or breast of a girl. CHAP. XXXI
Migration of
inflammation.

Rest in bed, a brisk purgative (64, 66), fomentations, and perhaps a few doses of fever mixture (45), together with restriction to a light diet, is all the treatment that is essential during the febrile stage. Subsequently painting the hard swellings with iodine (33), or rubbing in the iodine ointment (32), and a short course of tonics (77, 81, 82, 85) will complete the cure. Treatment.

DIVISION IV.—AFFECTIONS OF THE CHEST.

CHAP. XXXII.

CHAPTER XXXII.

COUGH.

Really a
symptom.

COUGH is in reality but a symptom, it is not a disease in itself. It is, however, such a constant and early symptom that it primarily attracts attention in cases of chest affection. Cough may indicate very little or it may mean a great deal. We are familiar with the expressions, "slight cough," "bad cough," and so forth, and we understand the great differences in their signification.

Mortality and
frequency.

No less than one-fifth of all the children under five years of age who die in London, succumb to diseases of the organs of respiration. In India there is not the same liability to these complaints, and when they do occur they run a milder course; still we find that in 1875 no less than 460 soldiers' children were treated for bronchitis, of whom 34 died, and 20 for inflammation of the lungs, of whom 5 died; or taking all such diseases, $44\frac{1}{2}$ per 1,000 of strength were admitted, and nearly 5 per 1,000 died.

Ordinary cold.

An ordinary COUGH AND COLD is a trivial affair, consisting of irritation of the membrane lining

the nose, eyelids, and upper part of the throat. CHAP. XXXII.
 It is not necessary to occupy space by entering
 into a description of the symptoms of this affec-
 tion, which are known to all; or to detail the
 simple household treatment which effects a ready
 cure.

There are two other forms of unimportant
 cough which must be alluded to, lest their nature
 be mistaken. (1) The first is the SPASMODIC Spasmodic
 COUGH, or stomach cough, as it has been called, cough.
 from which children may suffer as a result of
 gastric or intestinal derangement. This cough is
 loud, barking, and hoarse; the child is in its
 usual health, the only thing noticed is that it
 suffers from occasional fits of severe coughing.
 None of the symptoms of an ordinary cold are pre-
 sent, nor yet any of the symptoms to be described Symptoms.
 further on, showing that the chest is engaged.
 Upon examining the throat it will be found
 slightly irritable and red, and probably the uvula
 (or small pendulous portion of flesh) will be seen
 to be unusually red, elongated, and possibly
 slightly tumefied. It is easy to cure this kind Treatment.
 of cough. In the first place a mild aperient had
 better be used (58, 60), and this should be followed
 for some days by the use of the red mixture (59).
 The subsequent employment of tonics (81, 82, 85),
 and the daily application of the glycerine of
 tannin (30) to the throat, together with proper
 regulation of the diet, will soon remove the local
 irritation which is responsible for the symptoms.
 (2) Children not infrequently are affected with
 NIGHT-COUGH, particularly at the time of teething. Night-cough.

CHAP. XXXII.	It is a short dry cough, which commences soon
Symptoms.	after the child has been put to bed, causing much annoyance, and disturbing the rest. After a couple of hours or so it ceases altogether, and the child passes the remainder of the night quietly. The general health is not much affected, though children so suffering appear to be somewhat out of health. This cough is wholly of a nervous nature, and may be removed by pursuing a course of good living, with a little stimulation in the shape of largely diluted wine at dinner-time, if the child be old enough. Tonics (81, 82, 85, 84) should at the same time be given and persisted in for some time after the symptom has ceased. But the chief means of securing immediate relief is by the aid of the bromide of potassium mixture (10), which should be given twice a day.
Nature.	
Treatment.	

Inflammation of chest.

To be able to discriminate between such unimportant complaints, and the more serious condition of INFLAMMATION OF THE CHEST, whose presence is also notified by the existence of cough, is very important.

It is not necessary here to attempt any division into bronchitis, pleurisy, inflammation of the lungs, and so forth, for the all-sufficient reason that the treatment which non-professional persons have it in their power to adopt, differs not in any of these cases, and that the difficulty of discriminating each accurately would to them be insurmountable in the majority of instances.

Causes.

Chills, the result of improper exposure, are the

most constant causes of these attacks. Want of proper ventilation will do much as a predisposing cause. There is a special liability among those who have once suffered from a chest inflammation to a recurrence of such attacks upon the slightest exposure. A child who once gets bronchitis is pretty sure during its childhood to the repetition of the ailment unless special precautions be adopted. Boys are more frequently attacked than girls, probably because they are more exposed. The age of the child has a good deal to say in the matter; strange though it appear, considering their extreme delicacy, it is a fact that during the first two months of life, infants are singularly free from liability to these affections of the chest. Exposure of such young infants will tell upon the liver and bowels, and it will cause very severe "cold in the head," an affection to which they are peculiarly liable; but it will not usually cause a chest complaint. Even up to three or four months there is lessened liability, but from this age till eighteen months the susceptibility increases, again to diminish as childhood advances. At teething periods, when the nervous excitability is at its height, children are particularly liable to chest inflammation if exposed. As a consequence of measles and some other fevers, chest affections may occur, and then generally in a most insidious and dangerous form.

CHAP. XXXII.

Exemption of
young infants.

Periods of
greatest
liability.

When from any cause there is reason to believe that the chest is affected, an examination into the points enumerated at p. 160 should be made without any undue exposure. This having been done,

CHAP. XXXII. we proceed to consider the symptoms which notify such an occurrence.

Symptoms. The child suffers from what is deemed to be an ordinary cold, perhaps for a day or two. But, instead of recovering, the cough becomes aggravated and distressing, the skin hot and dry, and the breathing hurried. A sucking infant will drop the nipple, cough more or less violently for a time, and make another futile attempt to suck. The heat of skin increases towards night, the breathing will probably be wheezing, and the little patient becomes restless, thirsty, and unable to sleep. As morning approaches, perhaps from sheer weariness, a little sleep is obtained; but, upon waking, the suffering from difficulty of breathing and coughing is much greater than before, owing to the accumulation of secretion in the air-tubes. After prolonged and exhausting efforts, which perhaps may induce vomiting, the passages are closed and these symptoms subside. Expectoration is seldom observed, because children swallow it as soon as it reaches the mouth (a matter of no consequence); but if there has been vomiting, the ejected substance will be seen to contain much slimy mucus. In other cases, where the tubes are not so much engaged as the substance of the lung itself, we notice at this period, very high fever with a dry, catching, painful cough; a flushed face; dilated nostril; panting respiration; and an unusually bright eye. The urine is thick, the bowels constipated, the tongue coated behind and red at the tip. As time passes the face becomes heavy, pale, and of an earthy tint. Notwithstanding that the

restlessness is extreme and the child tosses from side to side, there are intervals of drowsiness. If after five or six days the symptoms do not become markedly alleviated, if there is a sunken, pallid, or livid face, with increased restlessness, rapid panting, or loud wheezing, the body being hot while the hands and feet remain cold, and if occasional cold, clammy perspirations happen, the case is going to the bad.

CHAP. XXXII.

Symptoms of
bad omen.

One of the more severe forms of chest inflammation commenced with a short, sharp, shivering fit, followed by intense fever, hurried respiration, a short, dry, rapid cough, and vomiting. Sometimes in these cases convulsions occur at an early stage.

Symptoms of
severe in-
flammation.

Chest inflammations which follow measles, &c., frequently approach so gradually and insidiously as to escape detection.

The fever, vomiting, and headache, with which a severe chest complaint is introduced, may sometimes be mistaken as indicating some affection of the head, a suspicion which the occurrence of a convulsion would be held to confirm. It therefore behoves us to be able to discriminate between the two. The vomiting, restless nights, talking in the sleep, fever, and constipated bowels, may originate the misconception; but in chest affections the vomiting is short and decisive, and nausea does not exist. In head affections nausea and irritability of the stomach are constant. The sudden rise of temperature when the lung is at fault, and the quickened breathing, uniform in its rapidity, not jerky, and only quick by starts, are sufficiently distinctive.

Distinction
from head-
affections.

CHAP. XXXII. It is hardly possible in ordinary cases to confound chest inflammation with croup; the paroxysms of the latter, the husky voice, and the crowing respirations, ought to remove all doubt.

From whooping cough.

Nor can the cough well be mistaken for that of whooping-cough with its characteristic whoop, its intervals of complete relief and absence of wheezing (p. 268). The presence of wheezing, either heard or felt, will distinguish bronchitis from either of the two last-named affections.

Prospects.

Obviously if both lungs be affected, the danger is greatly increased. The temperature is a good guide as to the amount of danger present; a heat of 104° or 105° , if it continues for more than a day, is sufficient to occasion grave anxiety. An inflammation of the substance of the lung (pneumonia) is always a more serious affair than inflammation of the lining of the air-tubes (bronchitis); but both conditions are frequently commingled. As an indication of seriousness, the following distinctions may therefore be noted:—

PNEUMONIA.

1. Temperature from 103° to 105° .
2. Skin always hot and dry.
3. Tongue and lips bright red.
4. Cough dry and hard.
5. Breathing difficult and rapid, but not wheezing or rattling.

BRONCHITIS.

1. Temperature seldom above 102° .
2. Skin frequently moist.
3. Tongue and lips natural.
4. Cough loose and moist.
5. Breathing wheezing or rattling throughout.

Pathology.

In *bronchitis* the lining of the air-tubes is inflamed, and it pours forth additional mucus, the air still entering to some extent, and producing in its passage the wheezing or rattling

sounds. It may affect only the larger tubes, and is then not nearly so serious as when it spreads to the smaller tubes. In *pneumonia* the substance of the lung is inflamed. The lung may then become solid like a piece of flesh, when it is, of course, unable to admit any air into the affected part. When recovery is taking place this solidity breaks down or dissolves, forming a thick matter which elder children will expectorate; and when this softening occurs, we have a rattling sound. CHAP. XXXII.

The child, clothed in flannel, should be put to bed the moment it is discovered that its chest is affected. An emetic of ipecacuanha (46, 47) should then be administered. The affected side of the chest both before and behind may be enveloped in a large bran poultice. Treatment.
Emetic.
Poultices.

The mixture No. 56 or 43 should at once be commenced, and if it produces slight nausea so much the better; but should it occasion vomiting the dose should be reduced to one-half. Complete rest to the patient, and surrounding quiet, are matters of much greater consequence than usually imagined. The room had better be slightly darkened, and as little conversation as possible held with the child. If there be marked pain at any one spot, and if with this there be much fever, it is an excellent plan to take three or four strips of sticking-plaster, each about $1\frac{1}{2}$ inch broad, and sufficiently long to reach more than half-way round the body. Taking one of these, one end should be fixed to the skin two inches beyond the spine; the strip is now to be pulled forcibly over the painful part, taking care to compress the ribs while this is being done, and the other end is to be secured two inches beyond the breast-bone. Similarly the other strips are to be fastened, each being made to Medicine.
Rest.
The room.
Prevent movement of the affected side of chest.

CHAP. XXXII. overlap its neighbour by about a quarter of an inch. By this means the movements of the ribs are restricted, and rest to the inflamed parts secured.

Difficult breathing to be met with emetics.

Should difficulty of breathing occasion annoyance, the ipecacuanha emetic (47) may with advantage be repeated,—indeed, it is well to do so if the secretion of mucus be copious, whether there be difficulty of breathing or not; and if the difficulty be accompanied with a dry, hacking cough, no wheezing, and with high fever, flour poultices with which mustard has been mixed, should be substituted for those of bran, and they should be frequently renewed. Blisters or mustard alone, should never be employed.

Mustard poultices.

Bowels.

The condition of the bowels is a matter not to be neglected. Constipation is usual; it should be relieved by castor oil (58) or some other appropriate medicine (60 or 64); but in the course of the disease diarrhoea is not uncommon, and should be met without undue delay, by an astringent (35, 36, 39). The air of the room should be kept fresh, warm, and of a uniform temperature. The inhalation of steam is useful and allays irritation.

Ventilation.

Steam inhalation.

Diet and drink.

The diet should be very simple, consisting at first of mere slops. It is of more importance than may be thought that the child be permitted to drink bland fluids, such as barley water, toast water, milk and soda water; or even plain water, freely; whereby the skin may be induced to act, and the naturally scanty urine augmented. Milk and arrowroot is a good food at first.

When stimulants are to be commenced

After twenty-four hours at most, or less if the acute symptoms (high fever, restlessness, and

great thirst) have passed away, the antimonial CHAP. XXXII. mixture should be discontinued, and No. 57 (2) substituted for it if there be much depression; but if merely the cough be the chief symptom, No. 57 (3) will answer the purpose better.

Now veal or chicken-broth, or beef-tea and such like simple nutritious diet, should be adopted. Food and medicine during convalescence.

As the cough becomes loose and the fever slight, the child though better, still being weak, the diet must be made more liberal; a little largely diluted wine may be given twice a day with or after food, and the stimulant mixture (No. 76) used instead of the cough medicine.

Symptoms of a typhoid nature (p. 199, note) are Typhoid symptoms. always to be met with liberal stimulation, constant feeding, and great attention to all details of nursing.

In every case the teeth must be examined, and Lance gums. any part of the gums requiring it should be freely lanced (p. 78).

During recovery tonics (79, 84) ought to be Tonics. given.

CHRONIC BRONCHITIS

Is generally the remains of an acute attack. The Cause. Symptoms. cough continues; it is soft and moist in its nature, but at night it becomes distressing. The pulse is quick, there is a tendency to night sweats, the child remains emaciated, the face continues pale, the eyes hollow, and the lips are dry and cracked. The patient picks at his nose constantly. If old enough to expectorate, frothy white sticky mucus

CHAP. XXXII. is spat up. These symptoms may go on for weeks if not checked, and may reduce the child to an alarming state of debility and emaciation. With care, however, a return to complete health may be looked for.

Nature of expectoration. **Treatment.** An occasional emetic may be necessary to free the tubes of mucus, but the general treatment must be of a stimulating and invigorating nature. When the weather permits it with absolute safety, the child should be sent out of doors; when in the house he should be kept out of draughts, and as much as possible confined to a room or rooms of equable temperature. The chest should be rubbed night and morning with the turpentine and camphor liniment (22), or with heated mustard oil till pimples appear. Wine should be given twice a day with the meals, and a stimulating expectorant (57 [3]), prescribed. By every means in the power, the strength should be kept up by good food, without overloading the stomach. The addition of pepsine (87) to the food will be found greatly to aid nutrition and to increase the appetite. As soon as the child is able to eat fairly well, the mixture may be omitted, and the iodide of iron and cod liver oil (84) substituted for it.

To be of a stimulating nature throughout.

CHAPTER XXXIII.

CHAP. XXXIII.

WHOOPING-COUGH.

THIS is an infectious disorder, most common during childhood. A single attack protects the constitution for the rest of life, with few exceptions. About seven days is the period of incubation.

There is a tendency to ignore whooping-cough as being an unimportant affection ; but as a matter of fact it is one of the most fatal diseases of childhood in England,—only convulsions, diarrhœa, scarlet fever, and inflammation of the lungs preceding it in fatality. In 1875, 139 soldiers' children were treated for whooping-cough, or 11 per 1,000 of strength ; and of these 7 died, or about 1 for each 2,000 children.

The affection is most common before the age of three ; after five it is less frequent, and after ten it is rare. Strange to say, girls suffer more from it than boys. Frequently it occurs as an epidemic, and it is spread by contagion.

Whooping-cough commences as a common cold, with sneezing, running at the nose and eyes, tickling of the throat, and an irritating cough, together with slight feverishness. All these symptoms soon abate, except the cough, which becomes

CHAP. XXXII. intensified, especially at night. Attacks of more

The "fit" of
coughing.

May be in-
duced by
emotions.

Duration.

Signs of
decline.

Complica-
tions.

or less severe spasmodic coughing succeed in a few days. Each attack consists of fitful spasmodic expirations, after which comes a loud crowing inspiration. During the process, which may last from half a minute to two or three minutes, the face becomes purplish, and the veins of the head and neck swell out. An attack of vomiting will probably succeed, and thereby a quantity of tenacious mucus is ejected. In the intervals between the attacks the child is comparatively well, and he will return to his play. Paroxysms are easily induced by emotions, such as anger, excitement, laughing, crying, or hasty eating or drinking. The vomiting, which will occasionally occur, is purely mechanical, for immediately afterwards the child will ask for more food. From the time the first whoop is heard it may be expected that the child will become worse for about a week, and the whoop will continue probably for from three to six weeks.

The decline of the affection is notified by the lessened frequency and severity of the paroxysms. The whooping inspiration disappears, or occurs only seldom; the cough, however, remaining for two or three weeks longer. During the illness the child is pretty sure to become emaciated.

The complication most to be dreaded is inflammation of the chest (p. 258). Convulsions occasionally follow a paroxysm; indeed, the over distension of the brain with blood may sometimes, though rarely, occasion inflammation of the brain. Bleeding of the nose is not infrequent. A disordered

condition of the bowels, as evidenced by a foul tongue, offensive breath, distended belly, and foetid stools, should be attended to very carefully. Collapse of the lung, due to the plugging of one of the air-tubes with tenacious mucus (p. 161), is a most formidable, usually a fatal occurrence. CHAP. XXXII.

When free from complications, whooping-cough is seldom fatal. From the number of paroxysms which occur each twenty-four hours an estimate may be formed of the severity of the complaint;—twenty indicates a mild, thirty a tolerably severe, and over forty a grave attack of the disease. Lung and head complications are always dangerous. Prospects.

Whooping-cough is one of those affections which will run its course. We know of no remedy which will cut short the disease, therefore our business is to guide the patient safely through it. In treating the affection we must recollect that we are not dealing with an inflammatory disease, but with a nervous complaint which expresses itself spasmodically. During the *first* stage, or that of ordinary cough and cold, the fever mixture (43), to which a few drops of ipecacuanha wine may be added, will be useful; and in addition, the ordinary precautions as to non-exposure, attention to the bowels and warmth of clothing, which will suggest themselves, are to be adopted. From the commencement the diet should be nourishing, though simple. Treatment.

During the *second* stage, or that of “whooping,” we rely upon anti-spasmodic medicines to relieve the paroxysms; we endeavour to check the ex- First stage. Second stage

CHAP. XXXIII. cessive secretion of mucus, to allay throat irritation, to keep the air-tubes as free as possible, and to support the patient's strength. To accomplish these objects the bromide of potassium* (10) should be given when the paroxysms are severe. Alum (11) will act similarly, and it has the additional advantage of checking the secretion of phlegm. Very frequently it will be found a good plan to alternate these medicines, the one with the other every few days if their continuous use is necessary. The application of a solution of nitrate of silver (20 grains to one ounce of rain water), or the glycerine of tannic acid, to the throat, will be found useful in suppressing secretion and allaying irritation. Should mucus accumulate sufficiently to impede respiration, an emetic of ipecacuanha wine (47) is to be employed. Attacks of difficulty of breathing at night will be relieved by the hot bath and mustard poultices to the top of the chest. Each day the chest and spine should be sponged with cold water, and afterwards rubbed with the turpentine and camphor liniment (22, 21). Should there be wheezing between the paroxysms, a stimulating expectorant (57) may be used with advantage.

Outdoor
exercise.

Gentle exercise in the open air, if the weather is sufficiently fine to admit of it, is not only allowable, but desirable.

* In cases of exceptional severity, it is justifiable to administer a couple of doses of chloral (5 grains, each dose) to a child of four or five years of age, in the day, in addition to the above measures: but the remedy must not be long continued. Dr. Murchison advocates the use of this drug.

In every possible way causes of mental excitement should be avoided. CHAP. XXXIII.

During the *third* stage, or that of abatement, Avoid excitement.
 the emaciation and debility are best met Third stage.
 by the employment of cod liver oil and iodide of
 iron (84).

Should a complication arise, whatever be its Complications.
 nature, be careful to abstain from anything like
 a lowering system of treatment or diet.

DIVISION V.—AFFECTIONS OF THE BOWELS.

CHAP. XXXIV.

CHAPTER XXXIV.

CONSTIPATION.

**Frequent in
India.**

CONSTIPATION of the bowels of children is an extremely frequent condition in India, and it is one which is perhaps more often mismanaged than any other ailment, yet the treatment of these cases is both simple and rational. Like everything else in the world, it is necessary that we should understand something about it before we can interfere successfully; otherwise the too common notion of rushing to powerful purgatives for relief, is apt to be accepted and acted upon,—a very serious mistake indeed.

Significance.

The first fact which it is very desirable to bear in mind is this, that as diarrhoea always represents a danger, constipation is a condition which we can afford comparatively to ignore. It is seldom important, except when occurring as a symptom of head affections.

**General
symptoms.**

Of the symptoms there need be little said. The bowels do not act with regularity. The motions are almost always too light in colour, because the solidity of the mass has not permitted

the penetration of the bile. Sometimes the motions may be partially fluid, that is, we may have hard lumps ejected forcibly in the midst of coloured water; the lumps having then acted as an irritant, and caused increased exudation from the intestine. Sometimes a thin flattened tape-like portion is evacuated, indicating that the bowel is still loaded, but that a narrow passage exists through or beside its hardened and stationary contents. There are no general symptoms; neither headache, feverishness, or other such troubles arise. Not infrequently a few drops of blood may be passed at the end of a hard motion, but this need not occasion any alarm. It is due to the forcing having ruptured one of the very minute and delicate veins near the orifice, and it is not of the slightest consequence, being very different in significance from a dysenteric stool.

It is only by understanding the cause of a case of constipation that we can hope to treat it successfully. We therefore proceed to consider the causes and treatment together.

1. *In infants at the breast* constipation is common. The child is in good health, there is simply infrequency and hardness of the motions. During the first two months of life constipation is as common as diarrhoea is rare. The stools are more than usually white in colour; because being so hard, the bile and other colouring matters cannot penetrate them. In these cases the fault almost invariably is with the milk of the mother, who by reforming her ways, taking more exercise, and eating more vegetables, may generally effectually

CHAP. XXXIV.

Causes.
Special
symptoms.
Treatment.
1. Infants at
breast.

The mother's
fault.

CHAP. XXXIV. cure her child. It may be necessary to cause
 Management. the mother to take an occasional seidlitz powder
 or a dose of Epsom salts. Sometimes, but very
 seldom, a small quantity of manna (about half
 a drachm) may be added to the child's bottle
 each day, in order to help to initiate natural
 regularity, but it should not be continued long.
 Care should be taken that the exercise of the child
 itself (p. 110) be properly attended to.

2. Constipation of debility.

Only in delicate children.
 Treatment.

2. *The constipation of deficient tonicities*, that is, of weakness of the muscular coating of the bowel, is not infrequent in India among young children, whose general health has been impaired by climate. Sometimes it occurs as a sequence of fevers, the general debility involving the intestine as well as the muscles of the system generally. Children so affected are out of health, look pale, and probably their teething is rather backward. Everything must be done to improve the general health. The addition of oatmeal to the diet is desirable. A combination of aloes and iron (69), used in conjunction with the above measures, will in most cases be found to be a specific. After a short time the dose may be reduced to one-half with equal effect, and finally it may be discontinued altogether. Frictions over the abdomen with an aloes and soap liniment (34) may be employed in addition to the foregoing, but frequently it will not be found necessary.

3. Of sluggish liver caused by chill.

3. *A sluggish action of the liver*, producing an insufficiency of bile, which is nature's purgative, may occasion constipation. This form is frequently the result of chill in a weakly child, and

it is usually temporary in its nature. Possibly it may be accompanied with slight jaundice, nearly always there is languor and sleepiness, the appetite is gone, and the stools are clay-coloured and foetid. Warm clothing, frictions with mustard oil over the liver, the use of a flannel binder, a light diet, and the employment of podophyllin (68) will generally set matters right in a short time.

CHAP. XXXIV.

Is temporary.

Management.

4. *Improper food* may occasion constipation as well as diarrhoea. In infancy, when the motions consist of hard white lumps, each lump being coated with slime, the cause usually is either that the milk has been given insufficiently diluted, or that farinaceous food has been too soon commenced, or wrongly prepared. Here the food proves to be an irritant; the irritation causes the intestine to throw out additional mucus (slime) to protect itself, this coats the half-digested mass and prevents its further digestion. By pressure the mass becomes harder, and its slimy surface is so slippery that the intestine fails to push it along. This condition is apt to alternate with one of semi-diarrhoea, the stools being partly hard lumps, partly greenish water, slimy and offensive; in fact, let irritation proceed a little further, and a state of active diarrhoea will be established. Manifestly, a reform in the matter of diet, and conformity to the principles and rules already laid down (pp. 54, 89) are called for; but it will be necessary to commence the treatment with an aperient; Gregory's powder (60) will answer admirably. The bowels having been evacuated of all

4. Constipation of improper food.
Explanation of occurrence.

Frequent preliminary of diarrhoea of irritation.

Treatment.

CHAP. XXXIV. offending matter, the proper regulation of the diet will probably be all that is further required; but it may be as well to employ the red mixture (59) for a few days subsequently.

5. Constipation of elder children. 5. *Want of sufficient exercise, or of a sufficient variety in the food* may, in elder children be an occasional cause of constipation. The bowels are not moved sufficiently frequently, and the stools are harder than they ought to be; otherwise there are no particular symptoms. Air, exercise, the use of oatmeal and brown bread, and an allowance of treacle, baked apples, or ripe fruit, will generally suffice to restore healthy action of the bowels. If medicine is necessary let it be wholly vegetable, and of a tonic nature; for instance, senna-tea one-third part, and infusion of chiretta two-thirds; of which half a wineglassful or more may be given twice or three times a day (or 62).

General points. Enemata. *Note.*—Enemata may always be employed with safety in any case of constipation. By such means, only the lower part of the bowel is emptied, but room is thus made for the progression of the contents of the upper gut. In using an injection great care should always be taken that the tube be well oiled, and that no force whatever be employed; and it is to be remembered that the gut inclines slightly to the left side. The careful introduction of the pawn stalk or pieces of soap are always admirable and frequently very useful. Suppository. Friction. Simple friction to or mulling of the belly is useful in most cases by helping to move onwards the contents of the bowel. A glass of cold water on rising each morning is a simple plan which not

infrequently cures trifling cases. The employ-
ment of purgatives, except when combined with
tonics as above directed, is not only useless but
hurtful, and certainly the results will prove dis-
appointing. Aromatics and carminatives (9) may
always be given in moderation when there is
flatulency (p. 297).

CHAP. XXXI

Purgatives.

Aromatics.

DIARRHŒA.

Frequently
mismanaged.

WE now come to speak of an affection the existence of which is at once recognised even by the most unskilled, but which nevertheless is in a great number of cases popularly mismanaged. That there is an unnatural flux is self-evident, and with this knowledge occurs but the single

The prevailing
idea,—to rush
to astringents.

prevailing idea—the use of astringents. Now it cannot be too clearly understood that this notion may often prove to be a disastrous one. Astringents exclusively, will, as often as not, aggravate the complaint, or very possibly convert an easily managed diarrhœa into a severe inflammatory affection ; but, on the other hand, it is sometimes desirable to employ astringents at once and with energy.

Dangers of
the notion.

Seriousness.

A state of diarrhœa is one the existence of which we should never ignore ; it always represents a danger. It is the most fatal of all the diseases with which the child has to contend in

Frequency.

Mortality.

India. In 1875, 179 soldiers' children died of it, or more than one-fifth of the total number of deaths from all causes was produced by diarrhœa ; and of those who so died, nearly one-half had not

attained one year of age. Most probably the disease was even more fatal than this, and that it was indirectly responsible for some of the deaths attributed to convulsions and debility. Even in England diarrhœa ranks third as a cause of death of children under five years of age. CHAP. XXXV.
—

Let it be a maxim that children's diarrhœa in India should always be checked whatever be its nature or whenever it occurs. Heed not the old women's advice to allow diarrhœa to progress while teething is going on. Firmly take your stand, and act upon the opposite principle; more particularly in the case of chronic diarrhœa, that form of the disorder in which temporizing is popularly most commended. It is not desirable to induce actual constipation when dentition is in progress; but do not for a moment believe that constipation, even during teething, is the fatal thing it is represented to be, or that it is a state fraught with all the dangers of convulsions. Through diarrhœa rather than through constipation, it is that we court convulsions when the child is teething. Never to be ignored.
Even in "teething."

Diarrhœa may be produced by almost innumerable causes, of which, no doubt (1), errors in diet are by far the most frequent (pp. 63, 64). (2) Dentition is popularly supposed to be a very prolific cause, but I believe the assertion to be far from a fact. No doubt diarrhœa is most common between the ages of six months and two years, that is, within the period of active dentition; and no doubt the intestines are then undergoing a stage of development which renders them Constipation accused of the dangers of diarrhœa.

CHAP. XXXV. Peculiarly intolerant of irritation. The susceptibility is, it is true, greater; and in delicate children, dentition *per se* may be sufficient to cause diarrhoea, but it is a natural process, which does not give rise to disease in the healthy. (3) Atmospheric conditions, such as the damp and cold of the rains. Sudden vicissitudes, &c., as undoubted causes affect the child itself directly, and indirectly through its food.

Mr. Turner, of Portsmouth, writes:—"Given a certain percentage of infants in a town who receive other nourishment than breast-milk, the annual state of the town being the same, the mortality from diarrhoea will be entirely ruled by meteorological conditions. . . . It is not so much the effect of the temperature on the infant itself which influences the mortality,—indeed, it is very rarely fatal to the child nourished upon human milk; but it is the influence of the temperature on the child's food which determines in the highest degree the number of deaths."

(4) A polluted air, such as may be caused by want of drainage, malaria, foul surfaces, or water-closets, is another cause. (5) Worms are an occasional cause (see also p. 149).

The treatment not to be based upon the cause which is seldom known but upon the nature of the evacuation.

The causes chiefly affect the question of diarrhoea as indicating the proper measures for prevention (p. 149); but so far as treatment is concerned, adhering to the practical view of the matter, it is rather by the nature of the stools and symptoms, indicating as they do faithfully the internal conditions of the intestine (p. 157), that we must be guided. Even if it were otherwise, the cause is often difficult of discovery. It is all very well to talk of "removing the cause," but it is very impracticable advice.

In the first place we divide diarrhœa into the *acute* and the *chronic*, using these terms as they are popularly understood.

HAP. XXXV.

Acute and
chronic.

(1) ACUTE DIARRHŒA.

Acute diarrhœa occurs in four very distinct and very easily recognised varieties, each requiring a different kind of treatment. It becomes, therefore, a matter of importance to be able to discriminate correctly between them; but, as stated, there is not the slightest difficulty in doing so. The simplest practical classification is—

Varieties.

1. Simple diarrhœa, which is merely ordinary relaxation of the bowels.

2. The curdy diarrhœa of irritation, in which there are frequent undigested and acid motions.

3. Violent watery diarrhœa.

4. Inflammatory or febrile diarrhœa.

1. *Simple diarrhœa* may be due to a variety of causes, improper food being perhaps the most frequent. The ordinary motions are thin, watery, and numerous; the colour is either natural or nearly so. There may be vomiting at the commencement, and possibly griping. The negative symptoms and appearances are, however, just as important; there is no fever (unless the diarrhœa be a mere symptom of a fever), the motions are not scanty, nor are they like curd or pap thrown into discoloured water; they are not acid to litmus paper, and they do not consist almost wholly of greenish water. There is nothing formidable about this kind of diarrhœa, which will yield rapidly to the following treatment:—In the

Symptoms.

Treatment.

CHAP. XXXV. first instance a dose of castor oil (58), or, better still, of Gregory's powder (60), should be given. The diet should be spare and very simple, no meat or vegetables being allowed. With younger children it is just as well to leave off milk for a short time, and to give chicken broth instead for a day or two. If the child be teething, the gums may be examined, and any tooth distinctly pressing should be set free with the gum lancet. Warmth is very essential, particularly over the abdomen, in this as in all forms of diarrhœa; indeed, without it other means will often go for nothing. Confinement to the house and restriction of exercise should be adopted. This simple plan is sufficient to cure a majority of cases.

If, however, the diarrhœa still continues, an astringent should be employed. Catechu with an aromatic (36), or catechu and chalk (35), will be found to answer the purpose admirably. The precautions mentioned should be continued for a couple of days after a cure has been effected.

2. Curdy.
Symptoms
and nature of
stools.

2. *The curdy diarrhœa of irritation* is more important. The food is quickly passed, nearly unchanged, through the bowels. The motions are curdy, as though bread-pap had been thrown in amongst it, and they are acid to litmus paper. Vomiting is common, and griping not infrequent. The contents of the bowel are hurried along before they can come fully into contact with all the secretions, and therefore they are expelled in a state of semi-digestion.

Information
thus gained.

The nature of these stools informs us that there is great irritation (whether arising from exposure

to cold, improper diet, &c., being of no consequence), causing the intestines to work with undue energy; and the absence of fever tells us that there is no inflammation. CHAP. XXXV.

This much being understood, the treatment becomes apparent. First of all it is necessary to get rid of all the irritating curdy contents * of the bowel, and then we have to assuage the irritation of the intestine which produces its over-action. Treatment.
Rationale.

To accomplish the first of these indications we employ, as in the former case, either castor oil or Gregory's powder; but we must not stop here. Remove
irritation by
purgatives.

It is necessary to maintain a gentle purgation by means of the red mixture (59) for from twelve to twenty-four hours. At the same time we must be most careful to avoid giving anything but the simplest and most easily digested food, and that of a fluid nature for the most part. The second indication is fulfilled by employing opium, alkalies, and carminatives. But it is a very critical thing to use opium in the case of children. If the child be under one year of age the paregoric elixir is the best means of administering opium. The following prescription will meet all requirements:— Soothe the
irritated parts
by opium.

Paregoric elixir—two drachms.

Bicarbonate of soda—one and a half drachms.

Caraway water—two ounces.

To this a little essence of ginger may be added if it be at hand. Of the mixture one teaspoonful should be given three times a day, but not oftener.

* Through imperfection in digestion they have become "irritating," even though the food given may not have deserved to be so classed.

CHAP. XXXV. In the case of an older child more benefit will be derived from the use of prescription No. 39. Improvement will very soon result, and when the evacuations have become free from acidity as tested by litmus paper; and quite natural in appearance, except that they be too loose, a simple astringent (37, 35, 36) may be ventured upon, but not sooner.

Then stop
discharge by
astringent.

All the precautions as to diet, &c., mentioned as being necessary to the treatment of chronic diarrhœa, are here imperatively called for.

3. Watery.

Symptoms
alarming and
sudden.

3. *Violent watery diarrhœa* is fortunately not very common. From six months to two years of age is the most usual period of occurrence. The onset is sudden, and often accompanied with vomiting. Frequent copious motions, which seem to consist almost altogether of greenish coloured water, are voided. The hands and feet become cold, the face pale, shrunk, and wizened, and the lips thin. In a few hours, or perhaps less in a very severe case, the child will have all the appearance of an aged person. A most important characteristic symptom is the inability of the child to sleep, or even to rest; he moans, frequently shrieks, and is never quiet a moment (p. 317). The exhaustion is so rapid, by the draining away of the fluids, that a convulsion is very likely to ensue if treatment be not strenuously adopted.

Obviously here there is not a moment to be lost.

Objects of
treatment.

The objects of treatment are (1) to stop the purging, (2) to allay nervous irritability, and (3) to sustain the vital powers. (1) To check the purging

we use gallic acid (38), or, in its absence, catechu CHAP. XXXV. and sulphuric acid (40), to the first dose of which (the first *only*) one drop of laudanum for every year of age the child has fully *completed* should be added, none being given if the patient is under one year of age. The mixture should then, without any more opium, be administered after every motion till the purging has ceased; or has become so checked as to be no longer dangerous. (2) To soothe the nervous system is a matter not one degree of less importance; and it is accomplished by the bromide of potassium (10), which should be given every hour in conjunction with the gallic acid mixture, till sound sleep is produced. (3) The strongest jugged soup, the juice of raw meat (p. 400), and milk with equal parts of lime-water must be given at short intervals, and in small quantities at a time. A few drops of brandy may be added when the prostration becomes very great, but it is to be used sparingly; much might produce torpor and increase the risks (see also p. 323).

Very likely constipation will succeed this attack. Constipation may ensue. If so, do not meddle with it, but rest satisfied with a restriction to the simplest diet as the only further treatment necessary.

4. *Inflammatory or febrile diarrhœa* commences 4. Inflammatory. Symptoms. with decided fever. There is a violent fluid purging: at first of a curdy nature. The motions soon become much less copious, but more or less slimy and tinged with blood, with curdy substances floating upon them. The child in a short time looks pale and worn, but its attention is easily attracted, and the degree of prostration is not so great as

CHAP. XXXV. might be expected. There is thirst, the tongue is at first moist, but it soon becomes red and dry.

Danger of
error in
identification.

A stage beyond the irritation of curdy diarrhoea has been passed, and inflammation has occurred. It is important to distinguish this form of diarrhoea, for here astringents would increase the inflammation by confining the acrid secretions within the intestine, where they would undergo decomposition, causing distention of the belly with the gases evolved, and producing pain, great misery, and other harm.

Treatment.

To remedy this state of things the castor oil emulsion (61) may be relied upon as being almost a specific when given in very small doses. In a couple of days the motions will lose their slimy, bloody, and curdy appearance; and this being accomplished, a few doses of bismuth with the aromatic chalk and opium powder (39) will complete the cure.

The oxide of zinc is a remedy which has proved very useful in these cases. After the castor oil has been administered two or three times, it may be replaced by the zinc in two grain doses, given in a little fresh mucilage (never with sugar) to a child six months old.

CHAPTER XXXVI.

CHAP. XXXVI.

(2) CHRONIC DIARRHŒA.

WHEN chronic diarrhœa becomes firmly established during the first two years of life, it is difficult to arrest. Even when checked, a long time is required to restore the intestines to proper working order. In older children it is less serious and more easily managed. Very serious in young children.

The case may have commenced in many ways : Symptoms.
when firmly established the child becomes thin and pale, but he is tolerably lively, and he takes his food fairly well. The motions, of a pale colour and a putty-like consistency, are voided four or five times a day or oftener with pain and straining. As time passes, the child's condition will vary ; sometimes he is much better for a day or so, sometimes he is worse. On the whole things do not go on satisfactory, the motions gradually become more frequent ; at times they may be like mere dirty water, and then again they may change to a mud-like substance. The child wastes, he becomes paler, and the skin assumes an earthy tint. He lolls about, lying down frequently, and he soon wears the aspect of an old man if things continue to go on badly. The motions The motion.
may now become like chopped spinach, and they

CHAP. XXXVI. contain much slime. If recovery is to take place the first intimation of improvement will be the appearance of bile in the motions, which, as the bile increases, will become less offensive.

**Bile in stool,
the first sign
of improve-
ment.**

**Great value
of the
thermometer.**

In the chronic diarrhoea of children the temperature should be accurately measured by the thermometer (p. 163) for a few days. If the temperature be above that of health, and it remain so day after day, we may fear some fixed disease has become established. If the contrary is the case, the temperature being at or a little below the standard of health, a hopeful view is justified.

Prospects.

Chronic diarrhoea is always serious, and the more so the younger the child. When it occurs as a sequel to other affections, as measles, scarlatina, &c., the case is anxious. The thicker the stools the more hopeful the case, no matter how offensive the motions may be. It is always a favourable sign if dentition continue to proceed naturally, for if a great impression has been made upon the constitution, teething will be suspended.

Treatment.

In the treatment of this affection scrupulous attention to hygienic conditions is a matter of the greatest importance, beside which drug-giving is quite a secondary consideration. An equable temperature, free ventilation night and day, warm flannel clothing, especially around the abdomen, and very careful regulation of the diet, all of which matters have been previously discussed, are to be carefully attend to. If the child be very young, the quantity of milk should either be greatly restricted or milk should be altogether excluded from the dietary, and in its place non-fermentable

The food.

foods substituted, such as chicken broth, whey CHAP. XXXVI and barley-water. Large quantities of food should never be given at once; the more severe the purging, the smaller and more frequent should be the amount of food given. Copious drinks should be forbidden. Even for older children, those nearly a year old, only very small quantities of farinaceous foods are allowable, but we may use any one of the intermediate class of foods (p. 66) with great safety; and it may be mixed with whey or barley-water, milk being almost or altogether excluded from the diet. Children who are still older should not be allowed to touch such easily fermentable articles as potatoes, sweet biscuits, and farinaceous matter generally, sugar, jams, &c.; but bread and milk, fresh broths, a little fresh meat, green boiled vegetables and custard-pudding may be allowed (Eustace Smith).

Great benefit will always be derived from the Baths. daily use of the hot bath, followed by an inunction of oil (p. 174).

Abdominal griping and tenderness will be greatly relieved by poultices to which mustard has been added, or by mustard alone (p. 384), or turpentine (p. 385) as outward applications. Mustard poultices.

If the case be seen sufficiently early the stools Medicines. will possess all the characteristics of those of the curdy diarrhœa of irritation (p. 282), and the If seen early. symptoms too will be much the same, except that they are of a chronic nature. We then commence treatment as before, with Gregory's powder (60), and a short course of the red mixture (59) followed by bismuth and opium (39) for a couple

CHAP. XXXVI. of days only. As improvement takes place, the latter medicine may be omitted and Bael fruit (41) used instead.

Should, however, the looseness, now reduced to simple diarrhœa, still continue, we must resort to pure astringents (35, 36, 37).

When signs of inflammation appear.

If, on the other hand, the motions become scanty, shreddy, of very offensive odour, and contain blood, we must avoid astringents, and use the castor-oil emulsion (61) with aromatics, such as powdered cinnamon and caraway, persistently, until the symptoms yield: an astringent not being substituted until the tongue has become clean, and the motions reduced to the nature of those of a simple diarrhœa.

A cure having been effected, the greatest precautions as to diet, clothing, exercise, &c., must be adopted for some time, a relapse being very easily induced.

Medicine in convalescence.

During the period of convalescence, iron in the form of the "*Liquor Ferri Pernitratis*," as obtainable at a druggist's, in doses of five drops three times a day, in half a wineglassful of water, after food, is a valuable medicine.

Pepsine always.

In all cases of chronic diarrhœa, the pepsine wine or powder (87) ought to be added to the food a short time before its consumption.

Medicines not to be hastily used.

Finally, I would recommend the dietetic plan, together with the use of pepsine, to be tried fairly before having recourse to medicine.

Recovery gradual.

A sudden improvement should not be expected to follow treatment. That any degree of amendment is daily observable ought to satisfy the most sanguine. The mischief which weeks of disease has accomplished cannot be remedied without time.

CHAPTER XXXVII:

CH. XXXVII.

DYSENTERY.

OF all known diseases, dysentery is that one which will least bear neglect. In other words, dysentery when properly treated in its earlier stages is one of the most manageable of all sicknesses, but if it has been allowed to become a chronic condition it is an exceedingly formidable and fatal affection. This being so, it is unnecessary to urge further the great importance of early attention to a case. Great importance of early attention to a case.

In 1875, 296 soldiers' children, or 24 per 1,000 of strength, were treated for dysentery, and of these, 37 or nearly 3 per thousand of those living, died; that is, more than 12 of every hundred treated died. Frequency and fatality.

Dysentery is an inflammation of the glands of the large or lower intestine, which glands ulcerate as the disease progresses, and from them the inflammation and ulceration may extend to the lining of the intestine. In chronic cases the gut becomes very much thinned. Nature.

The disease is capable of propagation by impure water; indeed, this is the commonest mode of its spreading (p. 69, 149). It should ever be remembered that the effluvium from dysenteric Mode of propagation.

CH. XXXVII. stools may propagate the disease, wherefore it should be a strict rule to remove all such from the house immediately, and it is a good plan also to disinfect the motions (p. 146) so soon as passed.

Prospects. As to the prospects of a case, all depends upon the stage at which treatment has been commenced. If ulceration has had time to become firmly established, the case is always critical. If it be otherwise, a recovery, under proper treatment, may with confidence be predicted. Real dysentery is uncommon before the first year of life has been completed.

Symptoms. Dysentery usually commences as a griping diarrhœa. Straining and scanty motions soon succeed. Marked lassitude is invariable, and there is always some amount of fever (as ascertained by the thermometer) present. The bowels act with increasing frequency, but with diminishing results, till after a time almost nothing but bloody slime is voided, and that with great pain and straining. Ordinary fæcal matter is either absent altogether or almost entirely so. Shreddy mucus and blood compose the whole stool, which has a peculiar very foetid sickly odour. Pressure into the lower part of the belly will cause pain. The amount of straining is in proportion to the proximity of the mischief to the lower end of the intestine, and the griping and abdominal pain bear a ratio to the intensity of the disease. Improvement is first intimated by the re-appearance of fæcal matter in the stools, and by marked mitigation of the straining and pain.

Treatment. We must commence our treatment precisely as

we do in inflammatory diarrhoea, by clearing out the bowels of all offending matter, for which purpose castor oil is to be preferred; and then preventing the further ingress of food not capable of ready absorption, by following the directions as to diet which are detailed on page 288. Particular attention should be given to preserving the warmth of the abdomen by using the flannel binder constantly. Sufficient time having elapsed to allow of the efficient action of the purgative, an interval of marked relief is sure to succeed. This is the period to seize upon for the next step, which is to administer ipecacuanha, a drug which is nothing short of specific in its action, when the case is recent.

CH. XXXVII.

Castor oil.

Diet.

Abdominal warmth.

Ipecacuanha a specific.

But there is great difficulty in introducing the drug into the system in the ordinary way, on account of the emetic properties of the medicine, and the absence of sufficient fortitude on the part of the child to resist the sensation of coming sickness. Therefore I have been in the habit of giving the ipecacuanha in the form of an enema. To a child of one year ten grains mixed with about one ounce of thin mucilage, may thus be given; the enema being retained by pressure with a napkin for a quarter or half an hour till the child has become drowsy, or the sensation of desiring to defecate has passed away. By seizing upon a time when the child is in the habit of sleeping, we shall be materially assisted. Vomiting is thus never produced, the most that occurs being very slight temporary depression, and that rarely.

How to administer it

By enema.

In the case of an older child a *single* drop of laudanum for each two years of age completed,

Opium for older children.

CH. XXXVII. may be added to the first enema so administered, and the quantity of ipecacuanha may then be increased to fifteen grains.

Frequency of enema.

If the enema be thoroughly retained, none of it having been wasted during administration, and if no motion has followed for a space of three or four hours, it will not be necessary to repeat it till the following day, unless the symptoms be very severe; but at least once each day it should be given till the cure, which usually occurs in two or three days, is completed.

Ipecacuanha also by mouth.

In addition to the enema we may administer by the mouth one grain of ipecacuanha with a couple of grains of bicarbonate of soda, twice or three times a day, if no sickness of stomach is thereby caused.

Ipecacuanha wholly by mouth.

But a proper enema apparatus may not be at hand. Then we are compelled to give the ipecacuanha wholly by the mouth. Two grains with an equal quantity of bismuth or soda may be given thus twice a day to a child a year old. If no sickness result, an additional grain may be tried; but unfortunately a reduction of the dose is more frequently necessary on account of the sickness. An attempt should, however, always be made to introduce as much of the drug as possible,—an endeavour in which we shall be materially assisted by selecting a time when the stomach is empty and just before the hour of sleep.

The "Ipecacuanha stool."

When the ipecacuanha has had time to act, its effects will be rendered apparent by the appearance of a tolerably copious, fæculent, loose motion; while at the same time the straining and pain almost vanish, and the blood and slime soon afterwards disappear almost altogether.

Till the evacuations become quite healthy this treatment should be pursued. CH. XXXVII.

Turpentine stupes (p. 384) to the abdomen, in case of much pain, will be found to produce wonderful relief. Length of treatment.

“When the stools have become fæculent and almost completely destitute of blood, mucus, or slime, the chalk mixture with catechu (35, 36) should be used to moderate the remaining looseness” (Ewart); but let there be no hurry in resorting to astringents (p. 278). • Astringents to be used cautiously.

Tonics (77, and afterward s79) will perfect the cure. Tonics and pepsine.

Pepsine (87) should be used for some time subsequently, to assist the weakened digestion.

In the event of excessive straining occurring throughout the course of the illness, an enema of tepid water, and the administration of a very small dose of castor oil by the mouth at the same time, will with great certainty afford complete relief from this distressing symptom. Straining.

In all cases of dysentery, Bael fruit (41) may be freely used throughout, when all inflammatory symptoms have ceased, and it may most conveniently be administered in the form of a demulcent drink. Bael.

Note. It is of great importance that the ipecacuanha be fresh. When old, the drug is as useless as saw-dust. Should a fresh and reliable supply not be at hand, the native medicine “mudar” (49) may be employed as an excellent substitute, the dose and mode of administration being the same. Waring also speaks highly of native ipecacuanha or anta-mùl (46). Substitute for Ipecacuanha.

PROTRUSION OF THE BOWEL.

- Causes.** IN long-continued bowel complaints; and indeed sometimes without such disease, in delicate children, the bowel may protrude from the fundament at each evacuation. Habitual constipation in weakly children who are allowed to strain much at stool is another cause, and the irritation of worms is not infrequently associated with prolapse.
- Recognition.** The condition cannot be mistaken when observed, and it is not likely to remain long concealed, in consequence of the pain occasioned by it. The inverted gut will be seen to protrude as a purplish-red, thick ring, from the fundament.
- Importance.** There exists no cause for alarm. Reduction may be readily effected, and complete relief thus given. On the other hand, to allow the protrusion to remain unreduced for any length of time would be to incur a risk, because the pressure of the edge of the fundament might strangle it and cause mortification.
- How to reduce it.** Having thoroughly lubricated the surface with sweet oil, the protrusion, protected by a handkerchief, should be grasped with the points of the fingers, steadily squeezed for about half a minute to empty it of blood, and then pressed towards

the body. After a few moments of such pressure, CH. XXXVIII.
the prolapse will slip out of sight. The child
should be kept lying down for some time subse-
quently.

Should the protrusion recur, it will be well, Recurrence.
before the oiling and reduction, to sop the parts
with a solution of alum (a large teaspoonful to a
pint of water will answer); or to smear the ex-
posed surface with gall's ointment (23), which,
however, is open to the objection that it causes
a little smarting.

Prevention is the proper treatment. Let the Prevention.
constipation, the diarrhoea, or the debility be
removed, and the accident will cease to happen.
But to accomplish this end, time is required. In
the meanwhile the child should not be permitted
to sit long at stool, indeed it may be necessary to
prohibit the sitting posture wholly, the patient
being taught to evacuate its motions upon a
napkin or sheet placed under it.

In addition to the above measures, in a case of Iron injection.
persistent protrusion, a couple of ounces of cold
water in which six or eight grains of sulphate of
iron (obtainable in the bazaar as Heera-Kusees)
has been dissolved, should be injected into the
bowel, twice a day.

COLIC AND FLATULENCY.

This condition is more of the nature of a Really a symptom.
symptom than a sickness. It consists of a spas-
modic pain or griping of the intestine. "When an
infant screams and draws up its legs, and is free

CH. XXXVIII. from fever, the hands and feet being rather cold than otherwise, it is probably griped or affected with colic" (Ewart). The stomach is usually distended and hard—possibly there may be vomiting and a greenish motion or two may be passed.

Causes. Flatulency with or without colic is one of the commonest accompaniments of indigestion, due to excess of food or errors in the diet of the infant, or to some indiscretion on the part of a nursing mother. The gases evolved from the undigested food distend the intestine and produce pain.

Treatment. The first thing to be done in such a case is to administer ten drops of the sweet spirits of nitre in a teaspoonful of caraway or aniseed water; or to give a dose of prescription 9. In a few minutes an eructation of wind will follow this draught, the flow of urine after a short time will be increased, and the distress will cease temporarily. A dose of castor oil (58), or a stronger aperient (66) if there is constipation, should then be given. Either of these medicines may be aided in their action by an enema (51, 52). The warm bath followed by bran poultices to the stomach, will much aid in hastening relief. Should these means not give complete relief a mixture composed of forty grains of bicarbonate of soda, half a drachm of sal volatile, and two ounces of caraway water should be made, and two teaspoonfuls of it given every second hour.

Diet. So much having been accomplished, we should set about rectifying the diet, which, in any case, for a few days following, should be of the simplest nature.

CHAPTER XXXIX.

CHAP. XXXIX.

CHOLERA.

THIS terrible disease is very unusual among Age. children under one year of age, but as the child grows older the liability to cholera gradually increases (p. 131 *et seq.*).

Concerning the mode of origin of cholera, the Causes, &c. means of prevention and disinfection, the reader is referred to page 143.

There may be some premonitory diarrhoea. Symptoms. Soon, vomiting and purging of a material closely resembling rice-water in appearance, supervenes. The vomiting varies greatly in its intensity in different cases, but the purging always sets in and continues with great fury. Shortly afterwards succeeds coldness of the limbs, and frequently cramps of the muscles, a feeble pulse, coldness and lividness of the lips, cold tongue and breath. The eyes are sunken, the breathing difficult and oppressed, restlessness is intense, and thirst unquenchable. No urine is secreted. A cold, clammy perspiration covers the body. The whole appearance is appalling, the voice is lost altogether, and the pulse ceases to be perceptible at the wrist.

The only affection which at all resembles cholera Distinction.

CHAP. XXXIX. is the violent watery diarrhœa, which has been already described (p. 284). The resemblance may sometimes be close between the two, but the stools of the latter never resemble rice-water; they are greenish. The clammy perspiration of collapse does not succeed. Vomiting is not persistent if it occurs at all, and the pulse is never wholly absent as it is in cholera. The breathing is oppressed in cholera, but free in diarrhœa. The lividity of cholera is supplanted by pallor in diarrhœa. Watery diarrhœa is well known in England, whereas cholera is there unknown except at long intervals and in brief epidemics. We have cramps in cholera, none in diarrhœa. Convulsions seldom terminate a cholera case, whereas when watery diarrhœa ends fatally it is usually by convulsions. The issue is hopeful in diarrhœa, whereas the contrary holds of cholera. But if in the early stage there is confusion between the two, as may be, no harm is done, the treatment of one case being applicable to the other.

Treatment.

"Out of the large number of drugs and methods of treatment which have been recommended for cholera, not one has yet proved of specific value, and all our efforts must therefore be directed against the various symptoms as they appear" (Steiner). For the relief of the vomiting, ice or iced soda water may be given. To relieve the thirst, water should be freely allowed, even though it be immediately and invariably rejected. An attempt should be made to check the purging with astringents (38, 40), given very frequently, to the first dose of which one drop

of laudanum may be added for every year of age the child has completed, but opium is not again to be administered throughout the whole case. When lividity and great exhaustion occur, a stimulant mixture (75, 76) should be employed in conjunction with brandy. If there be drowsiness and collapse, apply mustard poultices to the calves of the legs, to the back of the neck, and over the heart. Milk and lime water may be tried as food, and afterwards arrowroot and chicken broth, if indeed the stomach will tolerate anything.

Note. If all the precautions previously mentioned (p. 138 143,), regarding the disinfection of the stools, the room, the bedding, &c., be adopted; and other matters which have been also alluded to, be attended to, no fears need be entertained that the disease will spread from the patient, either to the attendants or others.

CHAP. XXXIX.
Prevention of spreading.

CHAPTER XL.

WORMS.

THERE are three kinds of worms which infest the intestines of children, namely, the thread worm, the round worm, and the tape worm, all of which are accurately depicted by Dr. Lewis in the accompanying plate.

Description
of thread
worm.

The *thread worm* varies in size from one-sixth to one-third of an inch, or even more, in length, the male being smaller than the female. They appear precisely as represented in fig. 3, upon the surface of the child's motion, where they move briskly about. They reside in the lower end of the bowel; they are never found in the sucking infant, but among older children they are the most common of all kinds.

Description of
round worm.

The *round worm* (fig. 2) varies in length from four inches to a foot, the male being shorter than the female. It is smooth, of a white colour, and its body tapers off gradually to a point at either end. These worms inhabit the commencement of the intestine. Sometimes they make their way into the stomach, and they may even be vomited from the mouth. They are most common in children between the ages of three and ten years.

Habitat.

Fig.1.

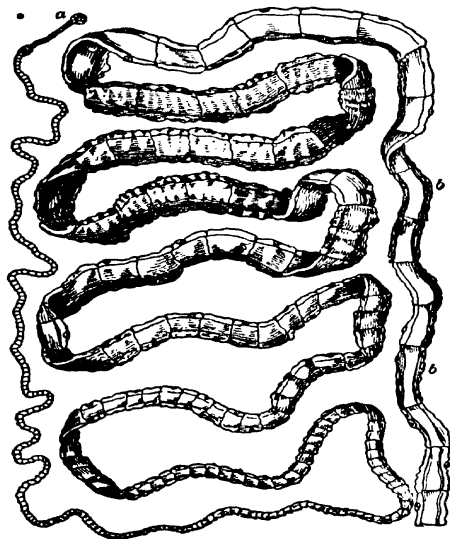


Fig.2.



Fig.3.



CHAP. XL.

Perhaps only two or three may be present at the same time in the body; it is seldom that their number exceeds twenty, but sometimes many more are found.

Description of
tape worm.

The *tape worm* (fig. 1) varies in length from about ten to thirty feet, and its breadth is about one-third of an inch at its widest part. The round head, which is only about the size of the head of a pin, is provided with a proboscis, armed with a double row of hooklets. The neck, narrow, and only half an inch in length, is joined to the larger part of the body by a long portion as thin as the neck itself. All this intermediate length is marked with transverse lines, and the whole of the broader part of the body is divided into plainly marked segments. Each segment (being bisexual) when detached from the rest of the worm, has the power of producing fresh lengths of the parasite. A fully developed tape worm numbers "about 1,100 of these joints" (Cobbold). This worm inhabits the small intestine, or that end which is nearest to the stomach.

Wonderful
reproductive
powers.

Habitat.

The mode by which the various worms gain access to the body, and the precautions to be adopted to avoid their occurrence, have been already described (see p. 152).

General
symptoms.

Not positive.

The symptoms are unsatisfactory, in that there is no sign or set of symptoms which renders it certain that worms are present. We may be led to believe by symptoms that probably these pests are in the body of a child, but ocular demonstration is the only means of certainty. One of the most constant signs is the passage of a quantity of

jelly-like mucus with the motions, while at the same time the bowels are disordered and the general health is unsatisfactory. The child usually becomes pale and flabby, there are dark marks under the eyes, the breath is offensive, and nervous disturbance is manifested by restlessness at night, grinding the teeth, and startings during sleep; and by drowsiness during the day-time. There frequently is a short, dry cough; the belly is usually tumid and the appetite precarious, sometimes hunger being unnatural, at other times no food will tempt the child. Picking at the nose and itching of the fundament are usual. Such are the general symptoms, which are, however, by no means positively distinctive of worms.

When there are thread worms in the bowel, itching of the anus, picking at the nose, and straining at stool are the most frequent symptoms. The round-worm causes abdominal pain, vomiting and nervous symptoms, which may terminate in convulsions.

Symptoms
special to
each kind.

The tape-worm gives rise to a sensation of "gnawing" in the belly, and to attacks of colic, a ravenous appetite, and progressive emaciation.

Thirty-seven cases of tape-worm, and forty-three of round worm were treated among soldiers' children in 1875. The cases of thread-worms were, no doubt, treated for the most part out of hospital.

When there is good reason to suspect the presence of worms, the stools should be carefully examined, after the employment of an aperient medicine. If the suspicion be verified, the no

Examine the
stools.

CHAP. XL.

less important information as to the kind of worm is also obtained by the inspection.

The folly of patent worm-medicines.

The public have an unfortunate habit of concluding that worms must be present when a child continues to fall off unaccountably; the result being that the unfortunate patient is dosed with quack nostrums, quite irrespectively of the nature of the worm, if any exist, and perhaps to the great injury of health.

Must know the kind of worm to attack.

Before we can properly treat a case it is essential to know the kind of worm we are to deal with: armed with this information the treatment becomes both simple and efficient.

Objects of treatment.

The objects of treatment are (1) to kill the worms, (2) to expel them, and (3) to remedy the bowel and general derangement which their presence has caused.

Treatment of threadworms.

For the *thread-worm*, a brisk purgative (66, 67) should be given early in the morning, or if there be much bowel irritation, a dose of castor oil (58) will suffice. Throughout the day the diet should be of the lightest description, and in the evening a large enema ($1\frac{1}{2}$ to 2 pints) of soap and warm water should be injected so as to wash the bowel thoroughly out. This having been accomplished, we should at once inject about 4 ounces of strong infusion of quassia, to which 30 drops of the tincture of steel have been added; or in the absence of these medicines, a teaspoonful of common salt dissolved in 4 or 5 ounces of pure water will answer the purpose (or 50). It may be necessary to repeat this treatment for two or three days running, either with or without the previous

use of the purgative, as circumstances may indicate. CHAP. XL.

The *round-worm* is destroyed as follows:—A dose of castor oil (58, 61) is to be given very early in the morning, and nothing but a scanty quantity of simple semi-liquid food allowed throughout the day. In the evening another dose of oil is to be administered. By this means the worm is laid naked, and exposed to the action of the santonine powder (6), which should be given early the next morning, on an empty stomach; or the powdered santonine may be sprinkled on a small slice of bread and honey, in doses of one or two grains, twice or three times a day. A cure is frequently effected by a single dose of this drug, but the treatment may be repeated every second day if the presence of more worms is suspected. Treatment of round-worm.

Santonine causes the urine to become of a dark colour, and it may occasion the patient to see objects as though they were of a yellowish colour. These peculiarities of the drug are, however, of no consequence, and they vanish when the medicine is stopped. Peculiar effects of santonine.

The *tape-worm* is, in the natural course of events, frequently expelled in portions, but as each segment which remains behind is capable of reproducing itself, it is obvious a case is not cured till the whole worm has been expelled. The segments are always detached from the tail end, wherefore it is a good rule not to rest satisfied till the head has been voided. The head and neck are so very small (see fig. 1), that unless carefully looked for they may elude observation. Treatment of tapeworm.
Not cured till head has been expelled.

CHAP. XL.

Many yards may be expelled, but a case is not cured until the head has left the intestine.

But the head
is well
protected.

But the head is exceedingly tenacious of its hold, and being so small, and the intestine in these cases, usually containing much mucus which protects the minute head from direct assault, it is necessary, for a few days previously to the administration of the worm destroyer, that the patient be put upon a non-farinaceous diet, from which potatoes, vegetables, pastry, and cakes should also be excluded; meat, eggs, and milk in moderate quantities constituting almost the sole food; very little bread, and that little toasted, being allowed. After two or three days of this food a dose of castor oil is to be given at night; and on the following morning, as soon as the bowels have been relieved, forty drops of the liquid extract of male fern (8) floating upon a teaspoonful of caraway water, should be administered. Four hours subsequently a second dose of castor oil is to be given. A very essential point is that no food be allowed from the time the first dose of the oil has been given till the worm has been expelled, which will usually be about the middle of the following day.

Must be
exposed by
special diet.

And castor
oil.

Then the male
fern is given.
Oil repeated.

No food
given.

Use pome-
granate if no
male fern.

In the absence of the male fern extract, pomegranate may be used in the manner directed (7). The objection to its use is the large quantity of fluid required to be drunk, and the fact that griping sometimes follows its administration: still it is well to have an efficient bazaar substitute at hand.

Subsequent
management.

(3) To remedy the bowel and general derange-

ment, we must exclude, as far as possible, starchy food for a time from the diet, especially potatoes ; but at the same time the diet should be nourishing. Infusion of chiretta with a couple of grains of bicarbonate of soda in each dose will check the excessive secretion of mucus. If irritability of the bowels still remains, the castor oil emulsion (61) or the red mixture (59) may be used for a few days till regularity has become established. Tonics (such as 79, 85) may be given after all the local symptoms have subsided, with a view to the restoration of the general tone.

CHAP. XL.

No starchy food.

Chiretta and soda to check mucus.

Tonics.

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less important information as to the kind of worm is also obtained by the inspection.

The folly of patent worm-medicines.

The public have an unfortunate habit of concluding that worms must be present when a child continues to fall off unaccountably; the result being that the unfortunate patient is dosed with quack nostrums, quite irrespectively of the nature of the worm, if any exist, and perhaps to the great injury of health.

Must know the kind of worm to attack.

Before we can properly treat a case it is essential to know the kind of worm we are to deal with: armed with this information the treatment becomes both simple and efficient.

Objects of treatment.

The objects of treatment are (1) to kill the worms, (2) to expel them, and (3) to remedy the bowel and general derangement which their presence has caused.

Treatment of threadworms.

For the *thread-worm*, a brisk purgative (66, 67) should be given early in the morning, or if there be much bowel irritation, a dose of castor oil (58) will suffice. Throughout the day the diet should be of the lightest description, and in the evening a large enema ($1\frac{1}{2}$ to 2 pints) of soap and warm water should be injected so as to wash the bowel thoroughly out. This having been accomplished, we should at once inject about 4 ounces of strong infusion of quassia, to which 30 drops of the tincture of steel have been added; or in the absence of these medicines, a teaspoonful of common salt dissolved in 4 or 5 ounces of pure water will answer the purpose (or 50). It may be necessary to repeat this treatment for two or three days running, either with or without the previous

use of the purgative, as circumstances may indicate. CHAP. XL.

The *round-worm* is destroyed as follows:—A dose of castor oil (58, 61) is to be given very early in the morning, and nothing but a scanty quantity of simple semi-liquid food allowed throughout the day. In the evening another dose of oil is to be administered. By this means the worm is laid naked, and exposed to the action of the santonine powder (6), which should be given early the next morning, on an empty stomach; or the powdered santonine may be sprinkled on a small slice of bread and honey, in doses of one or two grains, twice or three times a day. A cure is frequently effected by a single dose of this drug, but the treatment may be repeated every second day if the presence of more worms is suspected. Treatment of round-worm.

Santonine causes the urine to become of a dark colour, and it may occasion the patient to see objects as though they were of a yellowish colour. These peculiarities of the drug are, however, of no consequence, and they vanish when the medicine is stopped. Peculiar effects of santonine.

The *tape-worm* is, in the natural course of events, frequently expelled in portions, but as each segment which remains behind is capable of reproducing itself, it is obvious a case is not cured till the whole worm has been expelled. The segments are always detached from the tail end, wherefore it is a good rule not to rest satisfied till the head has been voided. The head and neck are so very small (see fig. 1), that unless carefully looked for they may elude observation. Treatment of tapeworm.

Not cured till head has been expelled.

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Many yards may be expelled, but a case is not cured until the head has left the intestine.

But the head
is well
protected.

But the head is exceedingly tenacious of its hold, and being so small, and the intestine in these cases, usually containing much mucus which protects the minute head from direct assault, it is necessary, for a few days previously to the administration of the worm destroyer, that the patient be put upon a non-farinaceous diet, from which potatoes, vegetables, pastry, and cakes should also be excluded; meat, eggs, and milk in moderate quantities constituting almost the sole food; very little bread, and that little toasted, being allowed. After two or three days of this food a dose of castor oil is to be given at night; and on the following morning, as soon as the bowels have been relieved, forty drops of the liquid extract of male fern (8) floating upon a teaspoonful of caraway water, should be administered. Four hours subsequently a second dose of castor oil is to be given. A very essential point is that no food be allowed from the time the first dose of the oil has been given till the worm has been expelled, which will usually be about the middle of the following day.

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Subsequent
management.

(3) To remedy the bowel and general derange-

ment, we must exclude, as far as possible, starchy food for a time from the diet, especially potatoes ; but at the same time the diet should be nourishing. Infusion of chiretta with a couple of grains of bicarbonate of soda in each dose will check the excessive secretion of mucus. If irritability of the bowels still remains, the castor oil emulsion (61) or the red mixture (59) may be used for a few days till regularity has become established. Tonics (such as 79, 85) may be given after all the local symptoms have subsided, with a view to the restoration of the general tone.

CHAP. XL.

No starchy food.
Chiretta and soda to check mucus.

Tonics.

VOMITING.

Import. VOMITING in infants is a very common occurrence; it may be of very little significance, or it may be of most serious import. The habitual so-called vomiting of young infants soon after they have taken the breast is really not vomiting at all, but a simple emission of an unnecessary quantity.

An easy process in the child.

There is no doubt that vomiting is easier in the child than in the adult; that it is accomplished with less effort, less distress, and less depression, probably because of the straighter position of the stomach.

Temporary attacks.

Slight and temporary attacks of vomiting, lasting seldom beyond a few hours, are not uncommon in young infants. More severe attacks, lasting for twelve or twenty-four hours, accompanied with feverishness and disordered bowels, are also well-known results of irritation; but they yield to emetics, gentle purgation, and a carefully regulated diet (p. 94), the only result being that the muscles become a little flabby (p. 154); after a few days the full strength being regained.

When chronic is serious.

But when vomiting is persistent, when, in fact, it becomes a chronic state, accompanied by wasting

and prostration, the case is to be regarded as CHAP. XLII. serious in its nature.

At first nothing but curdled sour-smelling milk, Symptoms. mixed with bile, is rejected ; but after a time only clear water is voided ; the little patient's belly becomes tumid, the bowels are constipated, or alternately constipated and relaxed, the looser motions being very offensive. Fœtid wind is eructated from the mouth, and the belly gurgles. All food is rejected shortly after being swallowed ; even the water which is so greatly craved for is vomited. The child emaciates, he becomes pinched, pale, and clay-coloured, and he is cross and irritable. The skin is dry but cool, and the mouth is parched or clammy.

A child may go on in this way for months if May become very dangerous. not attended to. He is of course but a shadow of his former-self, but the decline may not have been so rapid as to have attracted great attention. Should the fontanelle (p. 156) become depressed, and the head symptoms of bloodlessness (p. 315) appear, the danger is great and immediate.

The signs of approaching recovery are, lessened Signs of recovery. frequency of vomiting and restoration of the natural functions of the bowels.

The causes of this distressing and dangerous Causes. condition are to be found in departure from the laws which should govern diet and general hygiene. Premature weaning is one cause ; over-crowding of sleeping apartments, and insufficient and irritating food are others.

It is very important to ascertain the temperature Value of the thermometer. with the thermometer (p. 163) in these cases,

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because persistent vomiting is sometimes a symptom of the approach of inflammatory diseases of the chest or brain. In chronic vomiting, as a condition in itself, the temperature is always low, generally only about 97° , whereas in inflammatory affections of course there will be some fever present.

Treatment of
simpler cases.

Treatment of
obstinate
cases.

Diet.

Frictions.

During con-
valescence.

In the simpler cases a cure may be effected by withdrawing all fermentable articles of food from the dietary and applying the suggestions made at p. 94. But should the case prove obstinate, the stools and breath continuing to smell sour, and the vomiting persisting, we must adopt more active measures. When the child is being artificially fed, a wet nurse should be immediately procured. Very frequently a cure will be thus effected. But if this cannot be done, or if the child be too old to allow the idea to be put into practice, he should be fed upon equal parts of whey and weak broth, or barley-water and broth. All food should be given cold and in small quantities at a time, a spoon being used and not the bottle, because the act of sucking seems to encourage vomiting. To the belly, frictions of mustard oil, followed by poultices, should be employed. Oil inunctions over the whole body will do much to re-establish the functions of the skin, to promote comfort and encourage sleep.

Not till the vomiting has ceased for two or three days should any milk be allowed, and then it is only to be given in small quantities, diluted with twice or three times its bulk of barley-water to which some cinnamon or caraway water has

been added. Starchy food should be avoided for some time, but Mellin's food may with advantage be gradually introduced. CHAP. XLI

Should the fontanelle become depressed, brandy and sal volatile must be used. Five drops of the former every hour or oftener, in a teaspoonful of water, often proves very beneficial as a sedative as well as acting as a stimulant. Stimulants.

Should the vomiting not yield readily to the above remedies, half a drop of Fowler's solution of arsenic with three grains of bicarbonate of soda in a teaspoonful of carraway water should be given three times a day ; or, the Fowler's solution not being at hand, substitute the same quantity of ipecacuanha wine. Of course it is understood that such a medicine as arsenic must be compounded and administered with the greatest caution. Arsenic and soda in very obstinate cases.

*DIVISION VI.—DISEASES OF THE NERVOUS
SYSTEM.*

CHAP. XLII.

CHAPTER XLII.

HEAD SYMPTOMS.

THE expression "head symptoms" is one which is frequently used, and on the whole its signification is pretty well understood.

Head
symptoms of
fever.

When a child is suffering from any acute febrile complaint, as has been noted under each separate heading, certain signs of nervous disturbance may arise from the excessive heating of the brain and spinal cord, and it has been shown that the undoubted dangers thus arising are capable of control by means of cold properly applied (p. 170).

We, however, speak now not of head symptoms due to a previously existing febrile disease, but of symptoms arising independently of such a condition.

Early
symptoms of
brain mischief.

A child who has, perhaps, up to the present moment, been in his usual health; or who may only have been falling off a little for a short time previously, without being considered actually ill, suffers from disturbed sleep; he grinds his teeth at night, he vomits and becomes restless

and irritable; the bowels are deranged, nearly always constipated; the look is haggard, the appetite is gone, the head is hot, the child is annoyed by noise and light, he starts up from his sleep in a state of terror, is generally feverish, and complains of pain in the head. Such are the earlier signs of commencing brain mischief.

These signs may, however, have attracted but little attention, notwithstanding that they have occupied several days perhaps. It may be that the child's condition has not been noticed till there is a knit brow, persistent vomiting, stupor, twitchings of the muscles, some fever, squinting, alternate flushings and pallor, and occasional shrieking and excitement from which the patient soon again lapses into drowsiness, to be followed perhaps by delirium and convulsions. The fontanelle, or opening in the bones of the head of younger children, will be felt prominent, bulging, and perhaps throbbing.

These are the head symptoms which usher in inflammatory affections of the brain. But symptoms resembling them in many respects may arise under totally different circumstances, and from a wholly different cause, importing a different disease, and requiring a diametrically opposite kind of treatment. A case of the kind may be described as follows:—A child has been under treatment for a serious diarrhoea, he becomes heavy and drowsy, but he does not sleep, he lies back upon the nurse's lap unwilling to raise his head, the eyes remain half open; perhaps there is vomiting, and the face is wan

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Progress of
the case.Similar
symptoms
may be due to
an entirely
opposite cause
viz., bloodless-
ness of the
brain, without
any disease of
the brain.

CHAP. XLII.

and pinched ; every now and again he starts with a piercing shriek, which subsides as a series of shrill diminishing moanings or whinings, till the patient resumes for a short time his previous lethargic state. Noises startle the child. The body is cool, frequently cold. If the fontanelle has not closed, it will be found to be depressed. A convulsion is apt enough to succeed this state if relief be not afforded, and should it unfortunately occur, no very hopeful view of the issue is justifiable. Here, again, the child is suffering from "head symptoms;" but let us note the difference between these and those previously alluded to.

A.

REAL BRAIN AFFECTION.

1. There has been no previous acute illness.
2. Always distinct fever as measured by the thermometer.
3. Constipation.
4. Frequent flushings of the face.
5. Intolerance of light.
6. Squinting and well-marked general head symptoms from the beginning.
7. Vomiting almost always present.

B.

SIMULATED BRAIN AFFECTION.

1. Always occurs in the course of some exhausting sickness, or after premature weaning, either of which has greatly reduced the child.
2. Never fever, usually a lower temperature than that of health.
3. Diarrhoea.
4. Always pallid.
5. No intolerance of light.
6. Absence of head symptoms till exhaustion has become great.
7. Vomiting only occasionally present.

Distinction
between the
two.

Vital
difference.

The difference between the two cases is really
latter the brain has been so drained
of nutriment, it is in danger of suspending its

functions; and in the former the brain is so congested that its functions are in immediate danger. CHAP. XLII.

The causes of the one (A) may be (1) constitutional predisposition, which has been called into activity by bad hygiene or exposure to the sun; (2) blows on the head may suffice; (3) disease of the bones of the ear extending to the brain. Of the latter (B) there is but one cause, viz., great exhaustion of the vital powers. Premature weaning has caused it. Causes.

It cannot require any further remarks to make clear the necessity for a different treatment in either case. Treatment.

(A) Symptoms indicating congestion or the earlier stages of inflammation require to be met with a light diet, active purgation, absolute quiet of body and mind, cold to the head, and sedative medicines; whereas (B) symptoms of brain bloodlessness are to be treated with concentrated nourishment, stimulants, astringents, and the bromide of potassium as directed on page 285. Of this latter no more need here be said than to quote a caution as given by Dr. West. "If," he says, "in a case of this kind you fall into the error of regarding the head symptoms as signs of active disease, and withhold the medicines that might have checked the diarrhoea and soothed the irritability, while you apply cold lotions to the head and give the child nothing more nutritious than barley-water in small quantities, because the irritability of the stomach, which results from weakness, seems to you to be the indication of Of real brain symptoms.

Of spurious brain symptoms.

CHAP. XLII.

disease in the brain, the restlessness will before long alternate with insensibility, and the child will die either insensible or in convulsions."

Detailed
treatment of
the first.

To enter more into details regarding (A) the commencement of active mischief within the head, the treatment should be as follows:—If the stomach is at all loaded, we should begin with an emetic of ipecacuanha (46, 47); indeed, this is a safe proceeding in any case. Then, with as little delay as possible, a strong purgative (66, 67) should be given, and at the same time an enema (52) administered. Of a mixture composed of two drachms of Epsom salts, twenty grains of nitre, half an ounce of syrup, and an ounce of water, two teaspoonfuls should be given twice a day to keep up the purgation.

In the meantime the child should have been put to bed in a darkened and cool room, and the diet should consist only of light slops. That the most perfect tranquillity should surround the child is a matter of the highest importance; no one should play with him, or even speak with him, and irritability on his part should be controlled by means of the tepid bath, and the administration of the bromide of potassium mixture (10). Cold should be applied to the head by means of ice or cold lotions (16, 42), and the room should be well ventilated.

By strict attention to these directions a serious attack may frequently be averted.

Frequency.

In 1875, thirty-nine soldiers' children were treated for acute brain diseases, of whom twenty-five died: most of the cases occurred within the first year of life.

CONVULSIONS.

Symptoms. MANY allusions have been made to convulsions on previous pages.

“Warnings.” The phenomena of an attack are well known. Sometimes, but not always, there are “warnings” of the approach of a fit, such as convulsive twitchings of the face, startings during sleep, inward bending of the thumbs upon the palms of the hands, the fingers being doubled over them; a somewhat similar condition of the toes, and squinting.

Symptoms. When a fit occurs the child becomes deadly pale, the features are distorted, the eyes stare and are rolled about, the breathing is irregular and catching, the body becomes rigid, and the hands are clenched. All this may happen in a minute or less, or it may occupy five minutes, a quarter of an hour, or even more. The more violent the convulsion, the shorter the attack usually is, and *vice versa*. When the fit is over the child comparatively resumes the appearance of health, a perspiration succeeds, and he falls into a sound sleep.

Dangerous
symptoms.

A child seldom dies in a fit, but of such a catastrophe there is danger when spasmodic closure of the air passages takes place. In that event the

face becomes purple, the head is bent backwards, violent efforts are made to breathe, a crowing noise like that of croup is made as the air tries to pass through the narrow chink, but it becomes fainter and fainter till it eventually ceases altogether, or a louder and prolonged sound proclaims relief. CHAP. XLIII.

The causes of convulsions may for practical simplicity be divided as follows :— Practical classification.

1. Convulsions the result of *over-heating of the blood*, and through it of the brain and spine. Such are the convulsions which we have seen frequently occur during a state of high fever, without any special warnings, except the elevated temperature of the body.

2. The convulsions of *bloodlessness of the brain*. It will be recollected that this form of convulsions occurs only in children who have been subjected to exhausting illness, and that it comes on with marked head symptoms (pp. 284 and 316).

3. Then there are the convulsions of actual *brain disease*, which commence with well-defined head symptoms which usually have existed and attracted attention for some days before the seizure occurs (p. 315).

4. Finally, there are what may be termed *simple convulsions*; that is, the fit occurs without the previous existence of any illness. Teething, for instance (which is held responsible for almost all results of neglect, is considered to be very culpable in the case of convulsions), in weakly children, may no doubt, (the nervous excitability being then augmented), increase the liability to convulsive disturbance. Fright has been known

CHAP. XLIII. to cause convulsions, so has the sudden drying up of a scalp eruption; but the latter I believe to be a very rare cause. Mental suffering or shock on the part of the mother is a sufficient cause. Worms occasionally give rise to convulsions. The children of epileptic parents are certainly more liable to convulsions than other children. Impropropriety in the matter of diet is a very frequent cause. It is said that the children of those who marry very early or very late in life are unduly liable to the affection.

Necessity for
classification.

When a case of convulsions comes before you there can be no hesitation in at once classing it under one of the foregoing heads, and this is very essential, because the treatment is different in each instance.

Facility of
distinction.

Has the child strong fever? No. Then the case is at once excluded from No. 1. Is he undergoing any exhausting disease? is he being severely purged? If not, and the child has been comparatively well till seized, No. 2 is excluded. Has he suffered from previous head symptoms (p. 315), which cannot be mistaken, without any debilitating complication having existed? If not, the brain itself is not the origin of the present seizure. But if in the absence of these three a child is seized with convulsions, the case must necessarily fall into the fourth class, and it becomes evident that some easily removable cause has temporarily deranged the working of the nervous machinery.

Treatment.

No. 1. The treatment of a case of convulsions due to heat of body consists in reducing the tem-

perature by immediately placing the child in cold water up to its neck, and pouring cold water over its head as described at p. 170. No time should be lost in undressing the child and in making preparations, but clothes and all, just as he is, he should be immersed in the bath (p. 185). Consciousness will soon return and sleep be secured. The subsequent treatment is to consist of the adoption of the means detailed on pages 172-174, conjoined with the special treatment recommended for the particular form of fever from which the child is suffering.

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(1) Convulsions of fever.

No. 2. Convulsions due to sudden exhaustion are rather to be prevented by the means described at p. 284. When a seizure arises from this cause it is always of very serious import. The child should be put into a hot bath to which mustard has been liberally added; he should be handled with the greatest gentleness, subjected to no sudden jerks; he should not be placed in the sitting posture, and care should be taken to keep the head low. Removed from the bath, we should endeavour to get him to swallow a little brandy and water, to which from five to ten drops of sal volatile have been added. Plasters made of one part of mustard and two of flour should then be applied to the calves of the legs. Rolled in a blanket, the child should be placed close to a good fire if the weather be at all cold. If the weather be damp, even though so hot that it be necessary to keep the windows open, a fire should be kept up in the room. Should consciousness return, we must pursue actively the administration of nourishment and stimulants, the latter, however,

(2) Convulsions of exhaustion.

CHAP. XLIII. only with much liberality while great depression lasts. So much having been gained, we resume the preventive treatment detailed on page 284.

(3) Convulsions of brain disease.

No. 3. Here again we hope for most from preventive measures. But when a fit occurs the child is to be put into a warm bath (about 98° temperature), and cold applied to the head, either in the form of ice, if available, or of a cold lotion (16, 42). A couple of grains of calomel may be placed upon the back of the tongue. As soon as the power of swallowing is regained, a dose of bromide of potassium mixture (10), to which may be added a grain of chloral (if it be at hand) for each year of age of the child. Subsequently a dose of the bromide mixture without any more chloral should be given each hour till all disposition to a return of the fit has passed away, and then the treatment described at page 317 should be resumed.

(4) Simple convulsions.

No. 4. For a simple convulsion the child is to be put into a hot bath (temperature 104° or 105°), and while there cold water is to be poured upon the head. As soon as possible, while the child is in the bath if it can be managed, administer an enema (52). When capable of swallowing, an emetic (46, 47) should be given to empty the stomach and cause the skin to act. A strong purgative (66 or 67) should follow at the first convenient opportunity. The gums should be examined, and if anywhere angry and swollen by a pressing tooth, the gum-lancet should be brought into requisition. A dose of the bromide of potassium (10) should then be given and repeated at intervals of an hour till all undue excitement

has subsided. Should the bowels not have acted CHAP. XLIII.
within three or four hours, a draught of Epsom salts
and senna (63) should be given, as it is a matter of
great moment to relieve the bowels thoroughly.

Great pains should be taken to encourage the General measures.
sleep which usually succeeds convulsions. By
means of the bromide of potassium sleep should
always be ensured in cases where restlessness suc-
ceeds the fit, and a grain of chloral for each
year of the age of the child may be added to the
first dose. Till sleep is procured there is always
immediate danger of a recurrence of the seizure.
The most perfect quiet should be observed. No
attempts should be made to play with the child or
to amuse him after he has recovered his senses.
Subsequently for a few days he should be kept
upon a spare diet, and the bowels should be caused
to remain rather loose, except in class No. 2, when
constipation, if it be induced, is to be encouraged.
A cool surrounding atmosphere is essential. If
the cause of the seizure has not before been
apparent, every effort should now be made to dis-
cover it, for however well the patient may seem
after the fit, there certainly was some cause which
has probably not been permanently removed by
the management which has been adopted during
the fit. It may have been improper food, indiges-
tion, worms, flatulency, fright, or so forth, against
any of which, when the accusation has once
been established, precautions should be taken
during the whole remainder of childhood.

In 1875, 176 soldiers' children were treated in Frequency.
hospital for convulsions, and of these 133 died.

INFANTILE LOCK-JAW.

Frequency
and fatality.

THIS affection, though rare among European infants, had better be noticed here, on account of the alarm and sense of helplessness which its occurrence is sure to occasion. Only three cases among soldiers' children occurred in 1875, but all three died. Among the children of natives the disease is unfortunately very common, and it is the chief cause of the terrible infant mortality of Calcutta. It is much more frequent in hot than in cold or temperate climates.

Occurs only
during the
first days of
life.

The affection usually occurs between the third and tenth days after birth ; though it may happen within twelve hours of life, and still more rarely it may make its appearance after the ninth or tenth day.

Symptoms.

Though the disease runs a rapid course, yet there are always premonitory symptoms, such as restlessness, whimpering, broken sleep, yawning, and hasty snatches at the mother's breast, which, however, the infant soon relinquishes. Most probably the first thing which attracts the mother's attention will be inability on the part of the infant to take the breast, a fact which the mother will

at first be inclined to attribute to some fault of her nipple unless she happens to examine the infant's jaws, which will be found to be more or less stiff. After a few hours the jaws become fixed and the features undergo alteration, the lips are drawn tightly over the gums, the corners of the mouth are pulled downwards, and the half-closed eyes assume a peeping expression. The limbs and spine soon become partially or wholly stiff, the hands are clenched, and the head is bent backwards. At intervals a spasm may pass throughout the whole body, a symptom the frequent repetition of which indicates a rapidly fatal ending ; or the infant may go on for some days without spasm till it dies exhausted. From the commencement the temperature of the body is high—103° or 104°.

Terrible and fatal as is this affection, the infant's condition is not altogether hopeless, though it must be admitted that recovery is the exception.

As to cause, it has been conclusively proved that poisonous air (pp. 41, 114) is the means by which the disease is most frequently originated. Chills during these days of tender life have been accused, and probably with some truth, of being a cause ; so has bad management of the navel-string, by which it has been pulled and irritated. To the employment of too hot water for the bath the disease has also been imputed (p. 119).

That the disease is preventable by avoidance of the causes above enumerated is the most important point to bear in mind concerning it, for unfortunately treatment has not led to any satis-

CHAP. XLIV.

factory results. The great difficulty in the management of such a case is, of course, as regards the introduction of nourishment. The jaws must be separated by means of the end of a spoon, or a small piece of wood protected by linen rolled around it, and drop by drop some of the mother's milk, or a little milk and lime-water, is to be admitted cautiously from a spoon. An enema of a teaspoonful of the same every hour may also be tried, a small glass syringe being used with the utmost gentleness. The warm bath may be tried, and half a grain of chloral and one grain of bromide of potassium, dissolved in half a teaspoonful of water, should be given every four or six hours.

INFANTILE PARALYSIS.

Is happily
rare.

This also is one of those diseases which, though happily rare, comes upon the child with such suddenness, that it is essential the parent who is out of reach of medical aid, should know something of it, in order to obviate that despair which total ignorance in the presence of a catastrophe is sure to engender.

Paralysis in
child not so
serious as in
the adult.

Paralysis—that is, loss of the power of motion over one or more of the limbs—is always an anxious affair; but it will be a satisfaction to the parent of a child so struck down to know that in the child its import is not nearly so serious as in the adult.

Symptoms.

The symptoms are few; often there is nothing more than loss of motion to be observed. Sometimes with this there is an increased degree of

feeling in the helpless parts; sometimes, but seldom there is diminished sensibility. Most frequently the legs are affected, but it may be the arms, or an arm. CHAP. XLIV

Paralysis may follow a sun-stroke, it may occur in the course of a violent brief attack of common fever, or during the course of the eruptive fevers. Children have been born paralysed. Diseases of the brain and spine are other causes. Most commonly it occurs after a brief attack of apparently causeless fever, the discovery only being made when it is attempted to place the child upon his legs. Causes.

The prospects of a case will depend chiefly upon the fact whether or not the paralysis is the result of brain disease, which will be ushered in by the symptoms already described (p. 315). For such, and for children born paralyzed, there is obviously not much chance of a good result; but in all the other cases there is much room for hope. Sometimes the paralysis disappears after the lapse of a month or so. Few cases recover which have persisted for five or six months. Nearly always, however, when not due to brain or spinal disease, some improvement upon the original condition takes place, but deformities and contractions are a pretty certain subsequent event, for which orthopædic surgery and the mechanist may be able to do much; otherwise the condition of the child is pretty satisfactory, its growth and education advance, the mental development is not impaired, and the sleep and appetite remain natural. Prospects

CHAP. XLIV.

Frequency.

Treatment.

In 1875, three soldiers' children were treated for paralysis, of whom one died.

Medical aid should be procured as soon as possible, but in its absence the parent should seek out all possible causes of nervous irritation, and endeavour to remove them; the teeth should be examined and lanced if necessary, the possibility of the presence of worms considered, the bowels regulated, every minor matter thought of and every clear conclusion acted upon. The iodide of potassium mixture (1) should be given for about a week following the attack, and then iron, either as steel and quinine (79) or the syrup of the iodide (84), should be substituted and persisted in for a long time. The affected limbs should be well shampooed daily with a stimulating liniment (21, 22) or mustard oil. The diet should be liberal, and the child should live as much as possible out of doors. Galvanism is a remedy which, at the proper time, the physician is pretty sure to employ.

May be of
malarial
origin.

In case the patient has been previously much the subject of malarial fevers, quinine in small doses should be given in addition to the other remedies, and a change of air sought without delay. A sea voyage is always calculated to benefit these cases.

CHAPTER XLV.

CHAP. XLV.

SUN-STROKE AND HEAT-STROKE.

SUN-STROKE is really nothing more than a very sudden and aggravated attack of ardent fever (p. 184), produced by the heat of the sun's rays.

Fever has been stated to be a burning up of the body. So it is; but what originates the combustion? A poison has entered the blood, which produces its earliest effect upon the most tender point, namely, the nervous system. Thus we have shivering, depression, and other symptoms. Through the nervous system nutrition is impaired (p. 169), and disintegration of the muscles is caused, whereby preter-natural heat is produced. Now ardent fever represents the effect upon the nervous system without the previous intervention of a poison, such as we know is introduced in measles, small-pox, ague, and so forth. Sun-stroke represents a still more severe nervous shock, by which the nervous currents are even still more violently interfered with. We have, in fact, the climax of the febrile state produced instantaneously almost, secretion and excretion are suspended, and all the natural means of getting rid of heat are in abeyance. Accumulation of heat is the natural result, and the limit of temperature beyond which life is possible may be speedily reached; and, if passed, paralysis of the heart and muscles of respiration succeed, and death is the result.

Exposure to the direct rays of the sun or great heat in a confined atmosphere, particularly if a free supply of drinking water be not available, are the causes of the attack.

CHAP. XLV.

Natural heat is produced within the body by chemical changes, which evaporation from the surface regulates, and "so beautifully is this balance preserved, that the stability of the animal temperature in all countries has always been a subject of marvel. If, however, anything prevents this evaporation, radiation and the cooling effects of morning winds cannot cool the body sufficiently in the tropics. Then, no doubt, the temperature of the body rises, especially if in addition there is muscular exertion and production of heat from that cause" (Parkes).

Excessive external heat is the sole cause, whether the patient be instantly struck down by the sun (sun-stroke), or whether he be less suddenly attacked by accumulated heat (heat-stroke).

Symptoms. Of the symptoms there is little to be said. The patient is insensible, the eyes are fixed, the pupils of the eyes contracted, the whites of the eyes are of a red colour, the breathing is rapid and after a time noisy, the heart may be observed to beat tumultuously against the chest, the skin is burning hot, and the patient appears as if dying. Convulsions may or may not occur.

Warnings. These symptoms may be preceded by certain *premonitory* signs, such as thirst, suppression of the perspiration, giddiness, faintness, and suppression of the urine.

Treatment.
Preventive.

Preventive. Non-exposure to the sun, properly ventilated rooms, the use of the punkah, an abundance of cold drinking water (p. 67), and loose and light clothing, are the proper preventive measures. Upon the occurrence of premonitory symptoms, or indeed after any exhausting exposure to great heat, a cold bath should be given,

CHAP. XLV.

During
attack.

After treatment.

*DIVISION VII.—AFFECTIONS OF THE KIDNEYS
AND BLADDER.*

CHAP. XLVI.

CHAPTER XLVI.

DROPSY.

Definition. DROPSY signifies the accumulation of a watery fluid, either in the abdominal cavity, or in the loose fat which lies immediately underneath the skin, throughout the whole body. It may involve the abdomen and the body generally at the same time, or it may be only partial, the legs below the knees being the only parts affected. .

Not so serious as in England. Dropsy among children in India is not so serious a complaint as it is in England, because the majority of the Indian cases are of malarial origin (p. 204), and are simply a sign of general debility, whereas in England, scarlatina by damaging the kidneys (p. 216) is the most constant cause.

Symptoms. The countenance is the first part to appear puffy and swollen if the child has recently been much in the recumbent position ; if otherwise, the feet are the first to swell. The swelling of a dropsical limb may be known by pressing the point of one of the fingers steadily into it for a few moments, the

pit so caused will remain after the pressure is removed. The belly at the same time will probably begin to enlarge, and the child assumes a pasty appearance.

For practical purposes dropsy had better be divided into two classes, viz., (1) those which are due to malarial debility, and (2) those which arise from kidney affections. The first (1) may be known by the fact of the child having been a sufferer from malarial fever, which has left him weak and debilitated, the spleen may be enlarged, and the other signs mentioned on p. 204 will be present, without there being any appearance of kidney disease; the second (2), by the occurrence of a distinct febrile attack accompanied with pain across the loins, and a very scanty flow of urine, having ushered the attack in, or the fact of its having followed upon an attack of scarlatina.

As to the prospects of these cases, dropsy is always to be regarded as a serious complication, but the majority of the malarial cases recover under proper management.

The second class of cases is much more serious. So long as the quantity of urine voided remains scanty, and while at the same time the dropsy goes on progressing, anxiety will justly be great; but I have seen many very formidable cases of dropsy in India in which the kidneys were severely affected, recover; and I cannot but think the proportion of recoveries is greater than in England, on account of the climate, which increases so greatly the facilities for preserving or re-establishing the action of the skin.

CHAP. XLVI.

Classification.

(1) Malarial.

(2) Kidney disease.

The first is very amenable to treatment.

The second serious.

CHAP. XLVI.

Treatment.

Re-establish
functions of
skin.

Vapour bath.

Purgation.

Diet.

Poulticing
kidneys.

As to treatment:—(1) The dropsy of malarial debility, being only a result of a general condition, is to be treated in the way laid down at page 205, which in the majority of cases will yield a cure. (2) The dropsy which springs from the injured kidneys not being able to draw away sufficient water from the body, is to be treated upon somewhat different principles. The great point here is to re-establish the functions of the skin, and to cause it to act as much as possible; in fact, we endeavour to get the skin to do a great part of the work of the kidneys, which thus obtain rest, while at the same time the noxious materials ordinarily got rid of through the kidneys are withdrawn through the skin, and blood poisoning is prevented. From the commencement therefore we keep the child in bed and as warm as possible. A vapour bath (p. 386) should be given daily, or even twice a day if the child be strong enough to bear it, and a copious perspiration should be induced on each occasion. The bowels should be kept moderately loose by the use of seidlitz powders (71) occasionally, or by mixture No. 65. The diet should be light but nourishing, consisting chiefly of milk and farinaceous foods, such as bread and butter and puddings. Light broths may also be allowed, but not much meat till there is some improvement. On no account should alcoholic stimulants of any kind be given. A large bran poultice should be prepared and placed upon the bed, the child should then be laid upon his back so that the poultice envelop the whole of the loins; this may be

done for an hour, morning and evening; or longer on each occasion, if the child have patience to bear it. By these means the acute symptoms will be overcome, the feverishness will diminish, and the quantity of urine increase. As soon as this is effected a diuretic mixture (45) will be of great service, but not before. When convalescence is fairly established, a course of tonics (79) may be commenced. It may be judicious to combine the tonic with an aperient (83) for a time, to ensure and prolong the relief to the kidneys.

CHAP. XLVI.

The acute symptoms overcome, give diuretics. Subsequently tonics and aperients.

INCONTINENCE OF URINE.

Children sometimes suffer from inability to retain their urine except for very short periods. In most cases it is only at night that the annoyance occurs, but occasionally it happens both day and night.

Generally happens at night.

Very often the cause is simply bad management, by which a dirty habit has been engendered, and which may become more or less naturalized and difficult of removal. Acidity of the urine, the presence of worms in the intestine, and even general constitutional weakness, are each of them sufficient to produce this effect.

Causes.

To remedy this state of things is frequently not easy; but whatever efforts be made, without the assistance of a careful nurse no good need be hoped for. No fluid should be allowed for two or three hours before bedtime. The child should be taken up two or three times, and made to

Trustworthy nursing essential.

CHAP. XLVI. urinate, during the night. Upon each occasion
Its details. he should be thoroughly roused up, so that the
act be wholly voluntary on his part. He should
lie upon a hard bed, and be prevented from lying
upon his back, by fixing a cotton reel behind, by
means of a string passed through the hole, and tied
around the waist; this will cause him to awake
or move again on his side, should he happen to lie
upon his back.

Correct
urinary
acidity. The acidity of the urine should be tested with
litmus paper. If it be great, three grains of bi-
carbonate of potash or soda may be given in a
little water three times a day.

Caution. The urine, it is to be recollected, is naturally acid, therefore
the litmus paper ought to turn slightly red, but it should not
become instantly of a bright red colour. On no account should
the medicine be continued long. It would be wrong to
neutralize the acidity altogether.

Diet all im-
portant. But it is chiefly by a very careful regulation of
the diet that a healthy state of the urine is to be
maintained. Entire withdrawal of meat from the
diet has been known to cure many cases. Cold
sponging to the spine just before bedtime is some-
times useful if it be not too annoying to a sleepy
child. These preliminaries being settled, the child
Medicine. should be put upon steel and quinine (79), unless
he be of a particularly weakly constitution, when
the iodide of iron and cod liver oil (84) will suit
better. Constant outdoor exercise should be
enjoined, and every means to improve the general
health adopted.

There are other medicines which are of great
value in these cases, but they are of a nature
which precludes their use by any but medical men.

DIVISION VIII.—SKIN DISEASES.

CHAPTER XLVII.

CHAP. XLVII.

NETTLE-RASH, ECZEMA, PRICKLY-HEAT,
HERPES, ITCH, RINGWORM.

1. NETTLE-RASH may be caused by improper food, such as a child may surreptitiously obtain; for instance, unripe fruit, cucumber, pickles, and so forth. The rash consists of a number of elevated, itching, and burning points, very like in appearance the effects produced by the sting of a nettle, it seldom lasts more than a few days, and requires for its management the simplest treatment,—an emetic, if there is likely to be any offending food in the stomach; purgation (60, 62, 65), careful regulation of the diet, and the administration of three or four grains of bi-carbonate of soda in some infusion of chiretta after each meal, for a few days. Locally, tepid sponging or the warm bath affords almost instantaneous relief; oil should be applied to the part afterwards.

Description
and treat-
ment.

2. ECZEMA is often a troublesome affection. It usually selects the bends of the elbows and knees, the scalp and the cheek, for its position. A number of minute watery vesicles appear, the surrounding skin being irritable, red, and hot. The

2. Eczema.
Very trouble-
some.

The eruption.

CHAP. XLVII. contents of the vesicles soon become whitish, the irritation increases, and the child is sure to scratch and break them. The discharge still further irritates the surrounding skin,—indeed, it seems almost to burn it and to remove the thin outer skin. After a short time the discharge hardens into a yellowish crust, which cracks in many places, and from these cracks more of the clear irritating fluid exudes, as well as from under the outer edges. Portions of the crust may even become detached, leaving behind a raw, angry, moist surface. When of a mild form the crops of vesicles die away naturally, the skin of the affected part scaling off afterwards; but fresh crops of vesicles are apt to recur.

Mild form.

Causes.

Eczema is caused by defective digestion, and it indicates debility. The affection is not contagious.

Treatment.
Local.

The objects of treatment are to relieve the local distress and to improve the general health. A poultice should be applied to the scab, and repeated until the latter be detached; the inflamed surface thus exposed should not be washed or wiped, but the exuding fluid may be sopped up by a little bit of sponge. Over the raw surface the oxide of zinc ointment, which has been diluted with glycerine sufficient to make the compound thin enough to be dabbed on with a dossil of lint, is to be freely applied without any rubbing. A piece of rag should be lightly applied over the ointment. While any crust or inflammation remains this treatment should be persisted in.

Diet.

The child's diet should be nourishing but simple, consisting chiefly of milk, light puddings, and soups.

An aperient should always be given at the commencement, if there is any constipation. In any case it is well to give the red mixture (59) for four or five days to ensure the healthy action of the digestive organs. Afterwards tonics, of which the iodide of iron and cod liver oil (84) will best suit most cases, but in the event of the child being comparatively robust a vegetable bitter may prove most useful (77, 81, 82, 85), or if the child has recently suffered from any malarial affection steel and quinine (79) is to be preferred. In cases of obstinacy arsenic (4) alone will prove of benefit. The use of pepsine (87) will much help the cure.

3. PRICKLY-HEAT is a well-known affection due to congestion of the skin from heat, and to excessive perspiration. The appearance is too well known to need description. As a rule no treatment is needed further than to avoid the use of flannel next the skin, but when troublesome the ordinary dusting powder composed of oxide of zinc and starch (14) is sufficient to effect a cure or to give relief. If not, a little powdered sulphate of zinc, in the proportion of 20 grains to each ounce of the dusting powder, may prove effectual; a lotion of borax, half an ounce in eight ounces of water, often is found very useful in allaying the irritation; but the most effectual remedy of all is a solution of sulphate of copper (10 to 20 grains to each ounce of water), which should be sopped lightly upon the affected parts after the morning bath, the lotion being allowed to dry spontaneously on the surface. There is no truth in the assertion that prickly heat is a good thing, and that it

CHAP. XLVII.

Medicinal.

3 Prickly-heat.

Cause.

Treatment.

The fallacy
that prickly

CHAP. XLVII. should not be "driven in." The fact is that heat ought to be encouraged. it seldom appears much upon debilitated subjects, whose skins are deficient in blood; it affects more readily the healthy skin, but it in no way contributes to health; on the contrary, the function of the affected skin is, for the time being, impaired.

4 Herpes. 4. A Vesicular Eruption, termed SHINGLES, or *herpes*, sometimes occurs. It may appear as a number of little blebs about the lips, mouth, and forehead, especially after attacks of fever, and then it is of such a trivial nature as to require no treatment. But when a number of rather large vesicles, filled with clear fluid, resting upon an inflamed base, pass halfway round the body as a sort of half-belt, which seldom encroaches at all upon the opposite side, are observed, we have to deal with a case of shingles. Of course the eruption may be much more limited than this in extent, but its peculiarity is that it confines itself to its own side, almost never passing the spine or the breast-bone. On the fourth or fifth day the blebs dry up and form dark scabs, which fall off. The appearance of the eruption is ushered in with a good deal of fever and general disturbance, and more or less severe shooting pains in the neighbourhood of the rash.

Care to prevent friction. Treatment. It is important to prevent children from scratching and rubbing off the heads of the vesicles. If the eruption is very painful and hot, the application of cold in any shape will be found to relieve it. Mild saline laxatives (65), such as seidlitz powders (71), or the effervescing citrate of mag-

nesia, with occasional warm baths, and the use of a plain and somewhat low diet, will frequently be found sufficient treatment. The eruption should be protected by being dusted with the oxide of zinc and starch, (14) covered with a layer of cotton wool, the air being as far as possible excluded. A course of tonics should be commenced after a few days.

5. THE ITCH is a contagious affection, dependent upon the presence of an animal parasite, which burrows beneath the skin and produces by its irritation the appearances which characterize the affection. The favourite positions of the parasite are between the fingers, at the elbows, and on the insides of the thighs ; but they may carry on their ravages elsewhere. Intolerable itching, particularly after the child has become warm in bed, is the most annoying symptom ; the scratching which results removes the tips of the minute pimples which mark the positions of the insects, and sores may even be caused, which may prove troublesome to treat.

CHAP. XLVII.

5. Itch.
Caused by a
parasite.

Symptoms.

A child affected with the itch should be isolated from all others. All clothes which he has recently worn should be boiled before being washed. All the affected parts of the skin should be thoroughly and liberally rubbed with the sulphur ointment (24) night and morning for three or four days. The child should be clad in some old flannel garments of little value, which should be destroyed subsequently.

Treatment.

6. RINGWORM is also the produce of a parasite, which in this case is a vegetable. It is contagious, and appears either on the head or body. It occurs in circular patches, varying in size from

6. Ringworm.
Due to a
vegetable
parasite.

CHAP. XLVII. that of a two anna piece to that of a rupee. The surface of these patches is covered with scales of a dirty whitish colour, the margins being reddish and elevated. When the scalp is attacked, the hairs break off a little above the surface, so that patches of baldness result ; but when the disease is cured the hair grows again.

Treatment. The affected parts should be washed twice a day with carbolic soap and water. All hair in the vicinity of the patch should be clipped close to the skin, and the sulphurous acid lotion (19) should be thoroughly sopped upon the parts three times a day ; a piece of folded rag, which has been saturated with the lotion, being subsequently applied and retained in position by a bandage. Should this remedy not be at hand, the patches may be painted with strong acetic acid about every third or fourth day, diluted citrine ointment being applied in the intervals.

Bazaar remedies.

As bazaar remedies Dr. Waring recommends borax one drachm dissolved in two ounces of vinegar, as an application ; or the following ointment :—sulphate of copper powdered, 20 grains ; powdered galls, 1 drachm ; lard, 1 ounce ; mixed thoroughly and rubbed into the diseased part. He also speaks well of the leaves of the cassia (or ringworm shrub) ; the plant is named by the natives *dádmurda* or *dád-ká-pát*. The fresh leaves should be bruised with lime-juice into a thick paste and thoroughly well rubbed into the affected part twice daily till a cure is effected.

*DIVISION IX.—AFFECTIONS OF THE EYES
AND EAR.*

CHAPTER XLVIII.

CHAP. XLVIII.

INFLAMMATION OF THE EYES.

THIS is an extremely common disease among soldiers' children ; no less than 1,684 were treated for some form of ophthalmia in 1875, but it is essentially a military disease, the children of other Europeans in India not being peculiarly liable to it ; the soldiers' children congregate together, and the disease in its severer forms being infectious, spreads rapidly among them. Native children, too, suffer largely from the complaint, particularly those of the poorer classes, who live in small huts without any means of ventilation.

Newly born infants are subject to an inflammation of the eyes (p. 30) from causes which are, for the most part, easily preventable. Cold is capable of originating an unimportant form of the affection. Dirt, squalor, and poverty combined are the most frequent causes among the native children. Debility, acting upon an unhealthy constitution, may originate a formidable sort of ophthalmia. Most cases are probably contracted by contagion.

CHAP. XLVIII.

Very contagious.

When purulent.

Symptoms.

Heat and itching.

Discharge of water.

Signs of severity.

Not only is the mattery discharge of ophthalmia contagious if introduced directly into other children's eyes, as it may be by the use of a towel, common to all ; but the minute particles of matter which become detached, dry up, and floating in the atmosphere, are capable of infecting other eyes with which they come into contact. A simple watery discharge is not contagious, but a yellow mattery discharge is generally highly so. Infants sometimes contract ophthalmia at birth by their eyes coming into contact with acrid discharges from the mother.

The symptoms of ophthalmia, or inflammation of the eyes, are sufficiently obvious to make themselves apparent ; but they may vary considerably in severity. The affection usually commences with heat and smarting of the eye, and a sensation as though a grain or two of sand had got under the lid, causing the child to rub the organ with violence ; tears flow copiously, and the thin membrane covering the white part of the ball is seen to be of a pink colour and permeated with enlarged blood-vessels. A discharge, at first watery, but subsequently semi-thick and yellowish, takes place, and causes the lids to adhere during sleep. Most properly treated cases will not pass this stage, but if the case becomes worse there is intolerance of light, so much so that the child will lie upon its bed with its face dug into the pillow. The eyelids are sure to swell considerably ; indeed, the upper lids may puff out like a pair of soft balls of a purplish colour. This last-named appearance is indicative of very severe inflammation. If at this

stage one or two little white pimples appear upon the cornea (or clear part of the eye) the case must be considered as more or less serious, for upon bursting they leave little ulcers behind, which, if deep, will heal into a white spot, which may interfere with clear vision. Visible blood-vessels running into the cornea show that the inflammation is very severe, and brow-ache is another bad sign. An amount of febrile disturbance commensurate with the inflammation is always present. When the child's eyelids are separated, profuse gushes of scalding tears, with which matter is mingled, will take place. The white spots which remain after healing of ulcers of the cornea, usually diminish with time and as the child's general health improves.

In all cases of ophthalmia the most scrupulous cleanliness is a matter of the greatest moment. Almost continually, washing and bathing should go on; in mild cases with simple warmed milk and water. A little sweet oil or soft simple ointment should be smeared upon the edges of the lids to prevent their sticking together and retaining the irritating tears or discharge in contact with the eye, during sleep; and the alum and poppy-lotion (27) should be used as frequently as possible, every two hours at the least, always taking care that a drop or two actually gets between the lids on to the eyeball. Should it so happen that the lids do adhere, no violent attempts should be made to separate them, but with the utmost patience they should be bathed with warm water or milk and water till they open of their own accord. The

CHAP. XLVIII.

Ulcers of
cornea.

Fever.

Treatment.

Cleanliness.

Alum and
poppy lotion.Use no force
to separate
the lids.

CHAP. XLVIII.	child should be encouraged to move about as much
Fresh air.	as possible in the open air, if the intolerance of light be not too great, the eyes being protected by a green shade; but even if there be considerable intolerance of light, the room in which the child is confined should be most thoroughly ventilated. A hot, close room will surely aggravate the disease.
Bowels.	The bowels should be kept open. The diet should always be liberal, but plain. The bowels should be kept in a state of regularity by simple laxatives, active purgation is never necessary; nor are other medicines as a rule required, unless the child be manifestly below par, when a suitable tonic,—such as steel and quinine (79) for children who have suffered much from climate, a simple vegetable tonic (77, 81, 82, 85) for those whose digestive apparatus is deranged, or the iodide of iron and cod liver oil (84) for those of unhealthy constitution—should be prescribed.
Diet.	
Tonics.	
In severer cases.	The severer forms of ophthalmia, particularly when there is any appearance of ulceration of the cornea, require to be treated with stimulants, wine or brandy, strong soups, and the most nutritive diet which can be devised. The bowels should receive particular attention, the nature of the stools being examined, and if found unhealthy, restored to normal condition by the red mixture (59). A tonic as above described should be given in all cases. The child should be wholly confined to a darkened but well-ventilated room. In all cases, when possible, a lotion of the extract of belladonna (three grains to one ounce of water) should be dropped once a day into the eye till all
Stimulants and tonics.	
Dark but ventilated room.	
Belladonna.	

acute symptoms, particularly pain and fever, have subsided. CHAP. XLVIII.

A small quantity of the extract might in most cases be obtained by post from the nearest dispensary. It is very desirable that this should be done, because if the inflammation is extending to the deeper parts of the eye the application of belladonna is a most powerful means of checking its further progress. But it must be recollected that belladonna is a great poison, and therefore care must be taken to keep it out of the way of children, and not to smear the extract around the eye as is often done in the case of an adult, because the child may get its finger into it and convey some to the mouth. Caution as regards belladonna.

While continuing the alum-wash as above described, caustic drops should be used as follows: Alum wash. Caustic drops.
—Six grains of caustic should be dissolved in an ounce of rain or distilled water, and each morning after the eye has been thoroughly cleansed, the eyelids should be separated and a couple of drops of the solution let fall upon the ball of the eye from the end of a quill or little piece of stick, which should not be allowed to approach the eye too closely lest the child should struggle and cause itself an injury.

Great care is to be observed in opening the eye. On no account should any pressure whatever be made upon the ball; but a thumb of one hand should rest upon the cheek-bone while two fingers of the other hand are placed upon the brow; gentle traction can thus be made from fixed bony bases, without the possibility of pressing upon the eyeball. An ulcerated eye has been burst by pressure being injudiciously made in endeavours to force the lids apart. How to obtain a view of the eye.

In cleansing the eye some recommend the use

c

CHAP. XXXII. of a small glass syringe, whereby the secretions
Syringing the may be effectually washed out, from under the lid.
eye. With adults and elder children, who may be relied
upon to keep perfectly quiet, this means is very
effectual ; but with younger children I should fear
to recommend it, lest a struggle inflict irreparable
injury. A stream of water let into the eye from
a distance of a couple of inches from a small
piece of sponge will answer sufficiently well, the
lids being held apart as above described.

CHAPTER XLIX.

CHAP. XLIX.

INFLAMMATION OF THE EAR.

THE ear, as is well known, is of the nature of a drum. There is an external curved tubular opening, which is terminated by a tense thin membrane; from the back of the throat comes the eustachian tube, which admits air to the other side of the membrane. The first of these divisions is termed the *external* ear, which conveys the sound to the drum and causes it to vibrate; and the second is called the *internal* ear, which is supplied with the machinery by which the sound is conveyed to the brain. When the internal ear is closed by the enlarged tonsils of a sore throat, temporary deafness results, because the air confined in the space will bulge the drum out and prevent its free vibration.

1. *Inflammation of the External Ear* may be occasioned by cold, accumulated wax, by the presence of foreign bodies, or it may succeed measles or scarlatina.

Inflammation.
1. External
ear.

The symptoms are simple: a throbbing heat and itching, pain when the point in front of the external opening is pressed upon; increased pain at night, feverishness and restlessness. Moving

Symptoms.

CHAP. XLIX. the jaw, crying, and sneezing increase the pain. The interior of the ear will appear red and swollen, and from it, after a short time, a thick discharge is secreted. The pain greatly diminishes with the appearance of the discharge, which after a time becomes watery.

Treatment. The removal of a foreign body (p. 378) will naturally suggest itself if any be present. Superfluous wax should be got rid of by gentle but persistent syringing with warm water, and glycerine dropped within the ear subsequently, still further to soften the wax for the next syringing. The child should be put upon a spare diet, and moderate purgation induced. Warm poppy-head fomentations should be assiduously employed, and these should be succeeded by hot linseed-meal or bread poultices. The very gentle injecting of warm water will remove the accumulated discharge. But should the inflammation degenerate into a—

2. Chronic.
Requires
great atten-
tion.

2. *Chronic Discharge* from the ear, very serious attention should be given to the case, for if it be allowed to run on indefinitely the bones inside the ear may be denuded of their covering, and become diseased, carrying actual danger to the brain. A mother should never allow an ear discharge to continue, notwithstanding any old women's tales she may have heard regarding the dangers of checking it during teething, and so forth.

Treatment.
First cleanse
the parts.

The ear should first be syringed for the purpose of cleansing it thoroughly, and then an examination of the tube should be made in a good light. By pulling the lobe of the ear with the finger and

thumb, the curvature of the tube will be removed, and a much better view obtained. A portion of a visiting card rolled into a cone, and slightly oiled on the outer side, will assist the view, if inserted gently into the ear. Should a piece of flesh (called a "polypus") be found obtruding into the tube, surgical aid alone can avail; but a foreign body, such as a pea or a piece of stone, or a quantity of hardened wax may also be discovered. The former should be removed by the means described at p. 308, and the latter by repeated syringing and the application of glycerine.



CHAP. XLIX.
How to examine the ear.

Nearly always the general health is affected in these cases, wherefore a tonic, such as steel and quinine (79), or iodide of iron and cod liver oil (84) are needed from the commencement.

With gentleness the ear should be syringed out twice a day, after which a drop of the glycerine of tannin (30) should be allowed to fall into it, or a camel's hair pencil may be used to anoint the sides of the tube with this application. In the absence of the above, a solution of alum or of tannic acid, (6 grains to 1 ounce of water) should be similarly used. Then the orifice should be gently plugged with a soft pellet of cotton wool saturated with glycerine, or in its absence with sweet oil.

Should the case still prove obstinate, let a small blister be applied behind the affected ear.

3. *Inflammation of the Internal Ear* is extremely painful. It is accompanied with much fever, and

3. Inflammation of internal ear.

CHAP. XLIX.	sometimes with convulsions. Hearing is inter-
Symptoms severe.	ferred with, there is headache and buzzing in the ears. The orifice of the small tube entering the
Deafness.	mouth becomes blocked up, the matter which forms is therefore pressed forcibly against the drum, which is very apt to be thereby ruptured, and thus immediate relief is obtained; but irre-
Management.	parable mischief has been inflicted. In the absence of medical aid all the parent can do is to follow the instructions given upon the previous page in so far as they are likely to be useful;
Seriousness of neglect.	but as soon as the condition is recognised every endeavour should be made to place the child under the care of a surgeon, for not only may permanent deafness result by the breaking of the drum, but more serious injury may be inflicted by the bones becoming implicated.

DIVISION X.—ACCIDENTS.

CHAPTER L.

CHAP. L.

BRUISES, BLEEDING, WOUNDS, BURNS AND SCALDS, AND SPRAINS.

(1) BRUISES.

WHEN a part is bruised it turns "black and blue," because the minute blood-vessels beneath the skin have been ruptured by the force employed, and the blood flows into the loose fat which underlies the skin. The more blood that has been thrown out, the greater the intensity of the coloration. If, in addition to discoloration, there is heat of the part, then inflammation accompanies the bruise.

By treatment we endeavour to prevent any more blood being effused, to prevent or allay inflammation, and to induce absorption of the blood already effused. The application of cold in the shape of ice, or of a cold lotion (16, 42), will usually effect the first and second of these objects. The arnica lotion (17) will accomplish the latter and subdue pain. A piece of folded rag, saturated with the lotion, should be firmly and

CHAP. L.
—

evenly bandaged upon the injured part. Leeches should never be applied to a bruise, they would only increase all the mischief. Subsequently, when only some hardness and discoloration remain, rubbing the part once or twice daily with the soap liniment (15), or with brandy and oil mixed in equal parts, or with a stimulating liniment (21), will prove useful.

(2) BLEEDING.

Means of
checking.

Bleeding from wounds is usually unimportant and rarely dangerous. (1) Pressure and (2) cold are the two chief means by which bleeding may be arrested ; but there are medicaments known as (3) styptics, which are also often very useful ; and finally there is (4) the ligature.

Adaptation of
edges of
wound.

It is usually found that when the edges of a wound have been brought together, and the part firmly bandaged, all bleeding ceases or nearly ceases ; any little oozing may be stopped by the application of cold water.

Pressure of a
pad.

Should these means not prove sufficient, a thick small hard pad of linen placed over the bleeding spot, and secured there by a firmly adapted bandage, will nearly always completely staunch the flow. By and by the tightness of the bandage may be relaxed, say after two or three hours ; but should bleeding then recur, it will be necessary again to tighten the bandage, taking care that the limb be bandaged from its extremity upwards to beyond the wound.

A jet of bright
blood indi-

Should a jet of blood spout from a wound : at


once press the point of the finger upon the bleeding point, and keep it there till preparations are completed for dressing the wound properly, when by placing the edges in apposition, and applying a pad as above described, success will probably be attained. Cold should then be applied, and the child should be kept extremely quiet for a couple of days, during which time the pad, if removed for the purpose of cleansing and dressing the wound, should be replaced with the original care.

CHAP. L.

cates wound of
an artery.
Pressure with
finger, pad,
bandage and
colds.
Quiet.

Should a jet of blood issue forcibly the instant the finger is removed, a ligature should be applied. By means of a forceps or pair of tweezers seize the piece of flesh from which the blood is issuing, including, of course, the bleeding orifice—a por-

Ligature may
be necessary.

tion about so large  only, need be pinched

How to
apply it.

up. Then, while still holding it tightly with the forceps, a piece of thin cord or stout silk should be passed around the raised part at the place shown by the dotted line, and tied as tightly as possible by an assistant: one end of the cord should be cut off short, and the other left hanging from the wound. In a few days it will become detached, and allow of removal.

Removal of.

Should it be impracticable to apply a ligature, a handkerchief should be tied around the limb between the wound and the heart, while pressure with the pad is still to be made upon the wound itself. It may be difficult to tighten the handkerchief sufficiently; in such a case, by passing a short piece of stick underneath it, and giving the stick a

A ligature
being imprac-
ticable, use
to urniquet.

CHAP. L. few twists round, tightening to any extent may be made. But it is dangerous to keep up a severe tightening for any length of time; the circulation is thus stopped, and mortification might ensue. Very severe tightening is seldom essential, and if it be, gradual loosening should be made after a short time to ascertain how far the handkerchief may with safety be relaxed.

Danger of too prolonged constriction.

Oozing from a cut or torn wound usually yields to the free application of cold, but should it persist notwithstanding, the surface may be sopped with a strong solution of alum or of tannin, or in case of urgency with the pure tincture of steel.

Oozing of blood.

Bleeding from a vein is known by a copious flow of dark-coloured blood. This is not of anything like the same seriousness as bleeding from an artery. Pressure is almost always sufficient to arrest it. Should direct pressure upon the wound not prove sufficient, then pressure should be made with the handkerchief and stick between the wound and the end of the limb—that is, below the wound, not above it.

(3) WOUNDS.

Classified.

Wounds are divided into (1) clean-cut or incised wounds, (2) lacerated or torn wounds, and (3) punctured wounds.

1. Incised.

1. *Incised* wounds are easily treated unless they bleed much, in which case the means just enumerated are to be employed to check the hemorrhage. The next thing to be done is to cleanse the surfaces most thoroughly, and to remove

all particles of foreign substances, such as pieces of gravel or glass. For this purpose a stream of cold water and a small piece of clean fine sponge are to be employed. It is a matter of great importance that the sponge employed be thoroughly clean, new if possible, otherwise unhealthy inflammation or even erysipelas may be brought on. Carbolic acid (28) may with advantage be added to the water; the strength of the solution should not exceed about one part to forty of water, but one to one hundred will suffice.

CHAP. L.

Check bleeding.

Clean the surface thoroughly.

Bleeding having been checked, except perhaps some little oozing which will remain while the wound is open, the sides are to be brought accurately together. In simple cuts a strip of sticking-plaster or of court-plaster to keep the edges together will be sufficient. Sticking-plaster should never be made to encircle a limb wholly, yet the strips should be sufficiently long and broad to grasp the skin firmly. Each strip must be attached first to one side of the wound, then the free end is to be pulled firmly with one hand (while the other hand is employed keeping the wound together) and fixed firmly on the opposite side. Unless the cut be very small, each strip had better be about half an inch broad and sufficiently long to go a little more than half-way round the limb. When preparing the strips it is a good plan to double each upon itself and cut a

Adapt edges.

How to apply sticking-plaster.

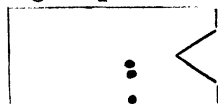


FIG. A.

piece as in Fig. A from its centre, so that when opened it will appear as in Fig. B, the aperture being

CHAP. L.

placed directly over the wound to permit of the



FIG. B.

escape of any discharge from it. Each strip when applied should

slightly encroach upon the edge of its neighbour.

Bandage.

A bandage may be applied over all with just sufficient tightness to support the parts thoroughly.

Cold, if inflammation.

If painful, cold water may be applied to the bandage. The sticking-plaster need not be removed till it has become loose, in which case the sides of the wound should be held together till the plaster be renewed.

Wounds of palm of hand.

Wounds of the *palm of the hand* may be accompanied with severe bleeding. The best thing to do, pending the arrival of a surgeon, is to place a hard wooden ball or a cork in the hand, which should then be closed and bandaged firmly upon the ball or cork, while at the same time the elbow should be bent as much as possible, and so retained by means of a bandage.

2. Lacerated, liable to suppuration.

2. *Lacerated* wounds seldom bleed much, but they are especially liable to inflammation and suppuration. There may be a great deal of difficulty in thoroughly cleansing them, but this must be effectually and patiently done, the carbolic lotion (28) being employed for the washing. The deeper parts, if they cannot be got at, ought to be syringed out with the lotion. This done, we may bring the edges together with sticking-plaster as before, except that the plaster is not to be pulled tightly, lest the escape of matter be impeded. A piece of lint, doubled twice upon itself, and saturated with carbolic oil (29), should now be applied

Do not confine the matter.

so as to cover more than the extent of the wound ; over this a piece of plantain leaf is to be laid, and the whole bandaged loosely. CHAP. L.

Should the discharge become very free, and the wound smell, every second strip of plaster should be removed, and the wound syringed out twice daily with the carbolic lotion or carbolic oil. Should the edges become red, livid, and pouting, the discharge being copious and offensive, it is better to remove all the dressings, and apply a large poultice with which powdered charcoal has been mixed. When once again healthy in appearance, that is of a bright red colour and presenting a clean surface, water-dressing only should be applied. Syringe with carbolic lotion.

A poultice may be necessary.

3. *Punctured wounds*, that is, wounds which are produced by sharp, long, narrow instruments penetrating the flesh, such as might be produced by treading upon a nail, or falling upon a splinter of wood, are often troublesome. The great thing is to allow the orifice to remain completely and freely open, not necessarily to the air, but for the free discharge of matter. Of course, should any portion of a foreign substance remain imbedded in the wound, every endeavour should be made to remove it with the forceps, the orifice being enlarged for that purpose if necessary. Carbolic lotion should then be injected into the wound, and a large poultice should be applied; and when healing, a folded piece of lint, saturated with carbolic oil (29) should continually but loosely cover the aperture. 3. Punctured.

c.
Allow free exit to matter.

Inject carbolic lotion.
Poultice.
Carbolic oil.

CHAP. L.

(4) BURNS AND SCALDS.

Great constitutional shock.

Burns and scalds. A severe burn or scald is chiefly dangerous on account of the shock it occasions to the whole system. The great pain is accompanied with violent shivering, a pallid face, and cold hands and feet.

Dangerous situations and times.

The amount of danger to be apprehended from an injury of this kind is dependent of course upon its extent, but the depth to which it has penetrated is also of importance. The nearer burns are to the centre of the body the greater the danger, and the most dangerous period is the first five or six days after the accident. But it is not only the immediate danger that is to be considered; there are others of a more remote nature to which the accident renders the child unduly liable; these are ulceration of the bowels on about the tenth day, producing most serious inflammation of the abdomen; and inflammations of the head or chest which may occur a little later on.

Remote dangers.

Treatment, objects of.

In treating a burn there are three matters requiring immediate attention, viz., to relieve the pain, to counteract the shock, and to protect the injured surface from contact with the air. If the patient be seen immediately after the accident, give a dose of wine into which laudanum to the extent of one drop for each year of age the child has completed has been put. Then deluge the parts with carron oil (which is made by shaking together equal parts of lime-water and any bland oil, such as sweet or linseed oil, till they form a

Administer a stimulant with opium.

Apply carron oil.

thick white emulsion); or should there be any delay in obtaining this, dust the parts thickly over with flour. Whichever application be used the whole parts should be at once enveloped in large quantities of cotton wool, kept in position by very lightly applied bandages.

Should flour have been employed, it is well to prepare the carron oil at leisure, and to apply it subsequently, because when the blisters burst their fluid mixing with the flour forms a hard, dirty cake, which is difficult of removal.

The child should be put to bed as soon as possible, with hot bottles wrapped in blankets applied to his feet and sides. More wine may be administered if the shivering and depression continue, and as soon as possible a little warm beef-tea may be given.

The greatest gentleness is required in handling the child lest the injured surface be abraded. The clothes should be removed by cutting them off with a pair of scissors, if undressing would at all disturb the patient.

When blisters appear they are to be pricked with a needle, great care being taken not to remove the elevated skin.

The first dressings are not to be removed till necessity obliges for cleanliness' sake; every time the surface is dressed, there is, of necessity, a fresh exposure to the air, the very thing we wish to avoid. In removing the dressing, if the surface injured is extensive, the removal and renewal should be done piece-meal. The less often the burn is dressed the better; and before the old

CHAP. L.

Or flour.

With cotton wool.

Carron oil to be preferred.

Warmth.

More stimulant if necessary.

Beef tea.

Cut off the clothing.

Prick the blisters.

Length of time the first dressings are to remain on.

Mode of dressing.

CHAP. I.

dressings are removed the new ones ought to be quite ready to be put on.

Caution as to
over stimulation.

It may be necessary to repeat the administration of stimulants once or twice within the first twenty-four hours, but reaction will by that time probably have been fully established, and therefore we must be very guarded in the exhibition of wine lest the excitement produced prove injurious.

Subsequent
dressings.

The carron oil may be employed till the healing be well advanced, when the zinc ointment (20) or resin ointment (25) may be substituted for it, an occasional change for a day or two to carbolic oil (29) being often beneficial.

Proud flesh.

Should proud flesh, elevated above the line of the skin, form, such places should be touched lightly every second day with the solid bluestone (sulphate of copper). The liability to contractions occurring during the healing of a burn should always be kept in mind. A limb should invariably be bandaged in the straight position.

Position of
the limbs.

Mr. Swain considers the *collodium flexile* of the Pharmacopœia, to be "by far the best local application for burns. This should be painted on smoothly with a large brush. It will frequently prevent vesication, if it has not already taken place. If there are vesications the serum should be let out through small openings, and the surface painted over with collodion."

(5) SPRAINS.

Nature.

A sprain is a twist of a joint, which stretches

and perhaps partly tears the ligaments which bind the bones together. CHAP. L.

Upon the occurrence of the accident there is Symptoms.
a sickening pain experienced, and there is inability to bear weight upon the limb ; swelling succeeds, and perhaps the skin becomes "black and blue."

If a sprain be neglected, chronic inflammation of May inflame
the joint may succeed, which may result in per- a joint.
manent stiffness of the part.

The great principle upon which a sprain is to Treatment.
be treated is, rest. As soon as possible after the accident, immerse the injured foot or hand in a basin of hot water for ten minutes, and then in a basin of cold water for a similar period. Then apply a wet bandage rather tightly from the toes or fingers well up beyond the injury ; put the child to bed, and insist upon the most perfect rest. The bandage should be wetted at intervals, and a plantain leaf applied over all to prevent its becoming dry too rapidly. When all pain and inflammation have subsided, the joint should be rubbed with a stimulating liniment. Caution should be observed in allowing the child to resume play.

SNAKE-BITES, STINGS OF INSECTS, AND BITES
OF ANIMALS.

Not so in-
variably
dangerous as
supposed.

“SNAKE-BITES are always productive of alarm, but they are more rarely dangerous than is supposed, because they are generally inflicted by innocent snakes” (Ewart).

Fayrer's
directions.

The following remarks as to treatment are summarized from Dr. Fayrer's great work:—

(1) Apply liga-
ture.

(1) Apply at once a ligature of cord around the limb, about two or three inches above the bite.

Twist with
stick.

Introduce a piece of stick under the ligature, and by twisting tighten it as much as possible.

(2) Three other
ligatures.

(2) Apply two or three other ligatures above the first one, at intervals of a few inches, and tighten them also.

(3) Scarify.

(3) Scarify the wound, by cutting across the tooth-puncture to the depth of a quarter of an inch, and let it bleed freely.

(4) Burn the
wound.

(4) Apply either a hot iron or live coal to the bottom of these wounds, or explode some gun-powder upon the part, or allow a few drops of carbolic or nitric acid to fall into them.

(5) Suck the
wound.

(5) If the patient himself, or any one else, will suck the wound forcibly, while the fire or caustic is being obtained, so much the better.

(6) If the bite be on a part where a ligature cannot be applied, pinch up the skin over the bite, and cut out a circular bit as large as the finger nail, and from $\frac{1}{4}$ to $\frac{1}{2}$ an inch in depth. Then to the raw surface apply a live coal, or a caustic as stated, or explode gunpowder in it. CHAP. LI.
—
(6) If ligatures impossible, cut out part and burn.

(7) Keep the patient quiet, but administer brandy and sal volatile every quarter of an hour, to the extent of three or four doses. Intoxication should not be induced. (7) Quiet.
Brandy.
Sal volatile.

(8) Should no symptoms of snake-poisoning appear in half an hour, the ligatures should be relaxed, or the parts will mortify from the strangulation. If, however, poisoning symptoms appear, the ligature should not be relaxed until the patient be recovering, or the parts become cold and livid. (8) When to relax ligatures.

(9) If the patient becomes low, apply mustard poultices and hot bottles. Encourage and cheer the patient, stimulate him throughout. Keep him quiet, and do not make him walk about. (9) Mustard poultices and hot bottles.
Cheer patient.

Dr. Fayrer has recorded many instances where serious symptoms of prostration have been wholly due to fear, the snake which had inflicted the bite having been killed and proved to be harmless. There is, too, another hope: an exhausted snake, one which has recently bitten at other objects, is but feebly poisonous for the time, though perhaps deadly by nature. Symptoms due to despair
Snake may be innocent or exhausted.

“The measures suggested are, no doubt, severe, and not such as under other circumstances should be entrusted to non-professional persons. But alternative is so dreadful that, even at the Severe measures necessary.

risk of unskilful treatment, it is better that the patient should have this chance of recovery." (Fayrer.)

STINGS OF VENOMOUS INSECTS

In young children may not be altogether unattended with some danger.

Treatment. Extract the sting if it can be seen, suck the wound, and then apply a plaster made of ipecacuanha powder and water. Sal volatile and brandy may be given if there is faintness.

BITES OF ANIMALS.

Because a dog bites not necessarily mad. Of persons bitten by mad dogs only half suffer from hydrophobia. Clothing a protection.

But a very small proportion of dogs or other animals which bite people are affected by hydrophobia; and even of all persons who have been bitten by undoubtedly rabid animals not half suffer from hydrophobia.

When a bite is inflicted through clothing, it is not nearly so dangerous as when a naked part has been bitten.

Animals liable to hydrophobia. The dog, the jackal, the wolf, the cat, and the fox are the only animals known to suffer from hydrophobia. A dog which has bitten a person should not be killed at once, because it will then be impossible to determine whether the animal really was or was not mad at the time of the attack,—a matter which may be decided very soon if the dog be tied up and allowed to live.

Dog should not be killed.

Treatment. Immediately after the bite the wound should be well sucked. Caustic should then be applied, a

little water dressing put on, and no more thought of the matter. If, however, there be evidence that the dog is mad, and if the patient be seen immediately, the best thing to do is to proceed precisely as directed under Nos. 3, 4, 5, and 6 (p. 366) for the treatment of snake-bite, except that the ligature need not be kept on longer than after the application of the cautery or caustic, nor is it necessary to apply more than one ligature. A thin stick of caustic inserted directly into the bite down to its bottom is an excellent proceeding. A stout iron wire, heated and driven to the bottom of each tooth wound, is also an effectual mode of cauterising the wound. It must be recollected that the wound is much deeper than that inflicted by the snake, and that therefore the incisions must be deeper, and the caustic very effectually applied.

CHAP. LI.

Suck the wound.
Ligature.
Burn or use caustic or excise the part.

The caustic must penetrate to the bottom of wound.

FRACTURES.

Signs of fracture.

A BONE is known to be fractured when there is unnatural mobility in its length, when there is such deformity of the limb as could not occur unless the bone were broken, and by the sensation of grating produced by the broken ends rubbing together when the limb is grasped both above and below and slight movement made.

Caution as to movements.

When it is suspected that a bone is broken, the greatest care must be taken, lest by incautious movements one of the ends be made to penetrate the skin.

Management.**At moment of occurrence.**

The moment after the accident the limb should be gently drawn down; and if the patient is at any distance from home, a dozen or so straight bamboo twigs should be cut and rolled in grass or pieces of cloth (a native's puggery, for instance, torn into pieces), and placed at intervals around the limb, and there secured by tying them with a couple or three pocket handkerchiefs moderately tight. This done, the child may with safety be carried home, and a surgeon summoned, if one be available, even from a distance. The straw cases in which wine bottles are usually packed, serve excellently for these tempo-

rary splints, one being placed at either side of the fracture. CHAP. LIII.

Assuming that it be not possible to obtain surgical aid :—The child having been placed upon a perfectly level and rather hard bed, an assistant should grasp the sound part of the limb above the fracture, while the operator gently and slowly but firmly pulls from the lower end in the straight direction of the limb, that direction which is natural to it, all jerking being avoided. The limb is thus brought into its natural position, a fact which may be verified by comparison with the opposite limb. The sooner after the occurrence of the accident that reduction is made the more easy will it be of accomplishment.

If surgical aid not available.
"Set" the fracture.

The next step is to retain the injured limb in the natural position to which it has been reduced, by means of splints which must be sufficiently firmly applied to insure immobility while pressure on prominent points must not be too great. The most simple form of splints consists of pieces of thin light board cut to about the length of the broken bone. One of these well padded should be placed at either side of the broken limb, and if desired a third may be placed behind for it to rest upon. With three straps or pieces of bandage they should be bound firmly, but not too tightly, in position around the limb.

Apply splints.

If the broken bone has been reduced to perfect position, and if it be, during the remainder of treatment, retained in this position without the possibility of any movement, nothing further is required, nature will do the rest.

Objects of treatment.

CHAP. LII.

Splints not to be moved till union has taken place.

Inflammation to be subdued by cold or irrigation.

Many fractures require special treatment.

Compound fractures.

It may be necessary to tighten the straps or bandages from time to time; but the splints should not be removed, or even 'loosened, for ten days or a fortnight, and not even then except in case of necessity. It will be necessary to wear splints for about three and a half weeks.

Inflammation in the neighbourhood of a fracture is to be subdued by the application of cold lotions, or ice, or by irrigation (that is, a basin of water is to be placed on a stand higher than the limb; into the water is put a skein of cotton, which is allowed to hang over the edge; the water will drop rapidly from the cotton upon the part, producing great cold).

These directions are of the simplest nature; many fractures require special apparatus, but the limits here available do not permit of more than the most general allusion to the subject. In all cases it is very desirable that a surgeon should inspect a fracture as soon after its occurrence as possible, even though a few days should have to elapse.

A compound fracture, that is, when the broken bone has penetrated the skin and made a wound which communicates with the break, is to be treated in the same way—by reduction and splints,—the wound being treated upon general principles (p. 360).

CHAPTER LIII.

CHAP. LIII.

INJURIES OF THE HEAD.

CHILDREN bear blows upon the head with extraordinary impunity as compared with the adult. Not so serious in childhood.

A severe blow will render a child giddy and confused, or it may completely stun him. A very severe blow may produce insensibility of a most serious nature, the child lying cold, clammy, and pale, with a feeble, slow pulse, and an eye insensible to light. After a time, varying with the force of the blow from a few minutes to perhaps several hours, he begins to revive, the skin becoming warmer and the pulse stronger. Then vomiting, which is always a good symptom, sets in, and sensibility gradually returns. Of course, improvement may take place, the patient may go on from bad to worse, or there may be partial recovery, succeeded by symptoms of inflammation of the brain (p. 315). Symptoms of concussion. Trivial and severe.

At first the child should be laid in a warm but well-ventilated place, mustard plasters should be applied to the calves of the legs, the arms and body should be rubbed with brandy or turpentine or a stimulating liniment (21, 22). A couple of grains of calomel are to be placed upon the back of the Treatment. Initiate reaction. Purge.

CHAP. LIII. tongue, a purgative enema (51, 52) administered,
Cold to head. and cold applied to the head (16, 42).

Upon revival So soon as symptoms of revival set in, give a
a warm drink warm drink of tea or milk, to which a little sal
but no brandy. volatile may be added, or the latter may be given

alone. Do not administer brandy or wine. An

Aperient. aperient powder (66) may next be given, and the

rest of the treatment resolves itself into perfect
Perfect quiet quietude in a darkened and cool room, a very light
in dark cool room.

Keep up and simple diet, preserving the bowels in a state
purging. of laxity, and keeping cold to the head, until the

Subsequent child has completely revived. For some time
precautions. subsequently care should be taken to prevent the

child joining in active or boisterous play, to keep
the bowels open, to avoid exposure to the sun,
and to maintain a simplicity of diet.

Should inflammation of the brain occur, the
treatment should be conducted as laid down on
page 318.

CHAPTER LIV.

CHAP. LIV.

ACCIDENTS WITH FOREIGN SUBSTANCES.

(1) SWALLOWING FOREIGN SUBSTANCES.

MARBLES, plum-stones, and such like rounded substances are frequently swallowed by children, but such an accident need not cause any alarm. The substances thus swallowed will become impacted in the fæces and pass with the ordinary stools. In these cases it is not a good plan to give aperient medicines; on the contrary, a diet of a constipating nature ought to be adopted, so that the substance may become impacted and thus carried along the bowel. Purgatives delay the expulsion by rendering the fæces so fluid that they pass over the heavier substance, which subsides and remains stationary.

Rounded substances not serious.

Avoid purgation.

A button, a copper coin, or other substance which is likely to produce harm because of its nature, may safely be removed by an emetic, if we learn of the accident immediately after its occurrence, and sulphate of zinc (48) is the best medicine then to give, but mustard will also answer very well (p. 391). If too long a time has elapsed to allow of the emetic being of use, we must treat the case as above, on the constipation

Substances of injurious nature.

Emetic if seen at once.

Otherwise encourage constipation

CHAP. LIV. plan, astringent medicines being employed if necessary. The chances of injury ensuing will then be very slight.

A pin
swallowed.

It is a common occurrence that a pin placed in the mouth, accidentally slips down the throat. "Not unfrequently this happens with children; and the mother, in her anxiety to do something, immediately doses the little patient with castor oil, and *then* seeks medical advice. In such an accident it is far better to avoid purgatives; and rather allow the patient to eat plentifully, so that the foreign body may have the best chance of being carried through the intestinal canal, imbedded in and surrounded by fæculent matter. It were better to encourage costiveness than establish relaxation of the bowels." (Geo. Pollock.)

Purgatives
dangerous.

Actively
encourage
constipation.

When the
substances
stick in
throat.

Should it happen that any substance has stuck in the back of the throat, the occurrence will be notified by immediate symptoms of distress and alarm. In such a case the child should be placed with its face to a good light, its mouth having been opened, a piece of cork or wood should be placed between the back teeth and the substance looked for. If it can be seen, it may be grasped with a forceps and removed. If it is not visible, it should be felt for with the finger passed well down the throat, and if detected it may be worked loose if it be a small object such as a fish-bone or the like; or sickness may be induced by putting the finger down the throat, and thus the offender may be rejected, or an emetic (p. 391) may be given with the same object.

Remove with

If not vi-
sible, feel for it
with finger.
Attempt to
work it loose.

Or emetic.

(2) FOREIGN SUBSTANCES IN THE AIR-PASSAGES.

Instead of passing into the stomach passage, the substance may enter the windpipe or passage to the lungs. Fortunately the air-passage is so effectually guarded by a peculiar valvular arrangement that such accidents are not common, but they are always serious.

Happily an infrequent accident.

Most serious.

There is, when such an accident happens, an immediate sense of impending suffocation, the difficulty of breathing may be most intense, and a spasmodic cough occurs. Sudden death may possibly happen. When the substance has taken up its permanent position a calm ensues, and the subsequent symptoms will depend upon the position occupied; but they are sure to be very distressing, and fraught with great danger.

Symptoms.

Unfortunately there is nothing which can be relied upon as efficient treatment within the power of the parent. Instantly a surgeon should be informed of the occurrence, with a view to his performing an operation if necessary.

Treatment.

Send for surgeon.

In the meantime place the child upon its back upon a small table, and standing at his feet, grasp them against the edge and turn the table over, the child's head being downwards, till nearly at right angles to the ground. When in this position let an assistant endeavour to excite vomiting by passing a feather into the throat; and then turning the child partly over, while still in the hanging position, let him be slapped firmly upon the back.

Invert the body.

Excite vomiting.

These measures failing, after a full and fair trial, it is best to put the child to bed in whatever position it seems most at ease, and await the surgeon's arrival.

Slap the back.

Do not attempt too much.

CHAP. LIV.

(3) FOREIGN SUBSTANCES IN THE EAR AND NOSE.

Violent or painful efforts unjustifiable. Foreign substances should be removed from either of these situations, provided no pain be occasioned to the patient in doing so. "When it is remembered that if left alone the foreign body generally becomes loosened, and escapes without surgical interference of any kind, we have a very strong argument against the adoption of any means involving suffering." (Holmes Coote.)

The ear.
Shape of the ear tube.

The ear tube is widest at its outer part, it narrows in the centre, and as it approaches the drum it again becomes wide. As a child seldom manages to introduce a substance beyond the narrower portion, great care must be taken not to thrust it further back in the efforts at removal, for not only is the difficulty of extraction then greatly increased, but by pressing upon such a delicate membrane as the drum, ulceration and penetration may possibly occur, and the substance passing into the internal ear may there cause inflammation, or even disease of the bone of the skull.

Danger of pushing the substance past the narrower part.

No need for hurry, therefore only gentle efforts to be made.

Seeing that such serious consequences may possibly happen, and that nevertheless there is not the slightest need for hurry or alarm from immediate consequences, the best plan when far from medical aid is to make gentle efforts to remove the substance, and these failing, to send the child to a surgeon. If the substance is visible and if it presents a rough surface which can be grasped, it may be extracted with the forceps. In the case

With forceps.

of a small and round substance, the effects of position may as well be tried, by placing the child upon its side upon a table, and then raising the legs of the feet end about one foot from the ground. Neither of these simple plans succeeding, it is better to restrict further efforts to the use of the syringe. First drop some oil into the ear, and insert a small pledget of cotton, saturated with oil, gently into the orifice. Three or four hours having elapsed, the wax will have become softened; then some warm soapsuds are to be injected with moderate force, rather in the upward direction, in the hope that the stream getting behind the substance will force it out of the ear, as it very frequently will do.

CHAP. LIV.
Position.

Syringing.

Foreign substances in the *nose* cannot excite the same dangers as in the former situation.

The nose.

“Let it be remembered that, in children especially, there is no cause for anxiety or haste; the extraneous body will work its own way out, the surrounding parts receding so as to widen the passage by which it entered.” (Holmes Coote.) A discharge from the nostril must of course occur, and it will probably be of a foetid, mattery nature. Unless the substance can be grasped, and removed by the forceps, it is better to wait quietly till the services of a surgeon can be obtained. There is not the slightest need for hurry.

The substance
will loosen
itself.

If not removable by
forceps do not
interfere further.

RUPTURE.

Definition. BY rupture is meant a protrusion of a portion of intestine through the muscles of the belly, causing a soft swelling underneath the skin.

Varieties. There are two common localities of rupture,—(1) at the navel, and (2) at the groins. Children are often born with ruptures.

1. Navel rupture. Either at the time of birth or shortly after the separation of the navel-string, a soft, round swelling may be observed at the navel. The

Symptoms. swelling subsides when the child is placed upon its back, but a fit of crying or sneezing will cause it to reappear. Gentle pressure with the fingers will push back the protrusion out of sight, and then probably the circular edge of the opening through which it has passed may be felt with the tip of the finger. There is no pain of any kind.

2. Groin rupture, signs of. Groin rupture is usually confined to male children. The mother notices that the scrotum of her infant is of unusual size, that it is soft, compressible, and often semi-transparent. At times, when the child is at rest, the swelling wholly disappears, again to show itself when he cries.

There is usually no danger attending these cases in infancy, but if not then cured by simple mechanical means, they are apt to remain permanent throughout life, a remark which especially applies to groin rupture; and they are sure ever afterwards to be a source of continual annoyance, and sometimes probably of actual danger.

CHAP. LV.

Prospects.

The treatment of navel rupture is simple. A pad made of a flat piece of thick gutta-percha or solah, covered with two or three folds of linen, should be secured to the centre of an elastic binder, and should be continually worn night and day around the belly by the infant: this is all that is required. A convex pad should never be used, because although it pushes the bowel back more effectually, it at the same time pushes into and enlarges the opening, instead of helping to close it. After a few months recovery will probably be complete, the aperture having closed up.

Treatment.

1. Navel rupture.

Properly arranged pad.

A groin rupture is not so simply managed. Here there is no need for great hurry, and therefore, even if there be a delay of a few weeks, it is better to wait for the opinion of a surgeon, because there are one or two easily cured affections of the parts involved which closely resemble rupture,—so closely that the mother may not be able to discriminate. A long delay should never be permitted, because it is only during infancy that cure without operation is possible. If the case is pronounced to be rupture, the instrument maker will, upon the precise measurements, &c., being supplied to him, furnish a proper truss, an apparatus which is essential to efficient treatment.

2. Groin rupture not so easily managed.

At leisure a surgeon's opinion should be obtained as to exact nature.

Curable during infancy without operation.

A truss the only cure.

PART IV.

On the Administration and Application of Remedies to Children.

CHAP. LVI.

CHAPTER LVI.

Medicines
may usually
be supplanted
by dietetic and
other means.

It has often been said, and with great truth, that the less medicine children take the better. carefully regulated diet, together with attention to the other details of general hygiene, are the surest means of attaining this desirable end. As a matter of fact, drugs are very seldom necessary, in any form, throughout childhood, if the general management be good.

In sicknesses
of childhood,
drugs speci-
ally powerful.

But drugs and proper medical treatment are especially powerful for good in the sicknesses of childhood. Very many of the diseases of early life may be arrested by the simplest means, if taken in time.

Protest
against patent
medicines.

Patent or other medicines of unknown composition should never, under any circumstances, be given to a child. Only drugs which may be administered with absolute safety should be thought of.

Whatever medicine be considered necessary it should be made to occupy the smallest possible bulk, and pains should be bestowed upon making it as little objectionable in taste as is compatible with its nature.

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Medicine should be small in bulk and as little nasty as possible.

Opiates are especially dangerous in the case of infants; so much so that the amateur should never, under any circumstances, give even the most minute dose of any opiate in any form to an infant under six months of age, and after that age *only* as directed in the foregoing pages, where it will be observed that on every occasion upon which opium is recommended, a special caution as to the exact dose and mode of administration is inserted. Godfrey's Cordial or Dalby's Carminative should never be permitted within a nursery. They, and other preparations of the same class, contain opium.*

Opiates. Danger of.

Patent "soothing" medicines.

Mercury is only recommended in one form and for one purpose, namely, calomel, in a moderately purgative dose. No other preparation of mercury for this or any other purpose should ever be used by non-professional persons. Grey powder, which is, or was, such a favourite in the nursery in

Mercury.

Only as a purgative as "calomel" in rare cases.

* "Godfrey's Cordial is made of infusion of sassafras, treacle, and tincture of opium. It contains about one drachm of the latter in six ounces, or half a grain of opium in an ounce. Half a teaspoonful has been known to cause the death of an infant. Dalby's Carminative is composed of essential oils, aromatic tinctures, carbonate of magnesia, and tincture of opium. It contains one-eighth of a grain of opium in every ounce. Forty drops have been known to kill an infant. Half a teaspoonful of Paregoric Elixir has been fatal to an infant."—SWAIN'S *Surgical Emergencies*.

CHAP. LVI. England, is especially to be avoided in India, because under the influence of climate it becomes changed in its nature into an actively poisonous substance.

A few words concerning the remedies advised in these pages may be here inserted with advantage :—

- Alteratives.** “ALTERATIVES are medicines which promote secretion and exhalation generally, soften and loosen textures, check inflammation, lessen inflammatory effusions, and promote re-absorption.”
- Action of.** (Tanner.) In fact, they are remedies which change diseased action by acting on the blood. Only four alterative prescriptions have been included in this book, and concerning them there is no need for further instructions than those entered under each. Of course the dose of any medicine containing arsenic must be very carefully regulated, and great care taken that it be only administered immediately after food. A number of
- Caution as regards arsenic.**
- Applications.** APPLICATIONS are mentioned, the mode of employment of each being explained in the text. There are, however, a few others, which perhaps need some comment. Poultices, for instance, are frequently employed. Before any poultice is applied the skin should be oiled to prevent sticking. A pure mustard poultice should never be applied to a young child ; it is too strong, and is likely to blister, and therefore should be diluted with twice or three times its quantity of flour or linseed. The effect of this remedy in relieving abdominal and chest pain is extraordinary, and can hardly be accounted for by the fact that the temporary con-
- Mustard poultices.**

gestion of the skin draws away blood from the neighbouring affected part. About a quarter of an hour is a sufficient time for a mustard poultice to remain on. CHAP. LVI.

The linseed, or other simple poultice may be applied to the surface after the removal of the mustard poultice, to perpetuate its action, or it may be employed alone. A linseed poultice retains its warmth longer than a bread poultice. Ordinary
poultices.

Neither blisters nor leeches should ever be applied to a child except under direct medical advice. Blisters and
leeches.

Violet powder or a dusting powder of some kind is necessary as an application to the child's skin, particularly in India. The common corn-flour makes an excellent dusting powder, but a combination of oxide of zinc and powdered starch is the most useful of all (14). Ordinary violet powder obtained from a respectable chemist answers all purposes admirably, but it is not a good plan to purchase the article from the box-walla, for it has been proved that adulteration in its worst form has of late included violet powder. Professor Foster discovered no less than $4\frac{1}{2}$ grains of arsenic in 100 of some powder purchased from "a respectable chemist in the north of London" (*Lancet*, May, 1878), and shortly before that a wholesale case of poisoning through skin absorption occurred in London. Violet
powder.

Hot-water fomentations are very useful in many cases. The water should be as hot as the patient can bear it. Two thickly folded and large flannels should be used, one being removed from the hot water and wrung out should be applied to the Fomentations.

CHAP. LVI. part; after an interval of two or three minutes the second should be similarly applied upon the removal of the first, and the process continued for half an hour if possible.

Turpentine
stupes.

Turpentine stupes may be applied by sprinkling a little turpentine upon the flannels when they are wrung out of the hot water, before application, as above.

Cold.

Uctions.

Of the application of cold to the surface of the body enough has already been said (p. 170); oily frictions to the skin have also been alluded to at page 174.

Throat appli-
cations.

In making applications to the throat, a large soft camel's-hair brush, securely fixed to its handle, should be used, and it should be pushed well down the throat, out of sight, deliberately and cautiously, with a rotatory motion, so as to distribute the application to all the parts.

Vapour bath.

The vapour bath is valuable in cases of dropsy. The child, quite naked, should be seated upon a cane-bottomed chair; a blanket, reaching to the ground on all sides, should then be thrown around the patient, and tied at the neck, so as to leave no aperture. A chattie or other open vessel of boiling water having been placed under the chair, sweating soon commences, and it should be kept up for a quarter of an hour at least. The child should then be rapidly and thoroughly dried, and put into a warm bed.

Hot and warm
bath.

A hot bath usually has a temperature of about 105°, and the warm bath a temperature of 98° or 100°. To be of use, the water should be deep enough to reach to the child's arm-pits. It is not

of any consequence whether drying be effected completely, but it is important that it be done rapidly. The child should be wrapped in a blanket and put to bed, whether with or without his night-dress matters not, provided it has been warmed previously to being put on. Irritation and pain are thus subdued, and probably perspiration induced.

ANTHELMINTICS are medicines which have been proved to possess the power of destroying the life of intestinal worms. That remedy which is poison to one kind is harmless to another, hence the absurdity of the so-called worm tablets, lozenges, &c.

ANTISPASMODICS and SEDATIVES are most important medicines. Of this class the bromide of potassium is a most effectual and at the same time perfectly safe medicine for the parent to handle. With it harm can hardly be done, unless there be utter recklessness and disregard of the effects it produces. Strictly speaking, it ranks more as a sedative, a preventive of spasm, rather than a means of relieving it on the moment.

Chloral is a most powerful sedative, but it is one which must be used with great caution; the rule which has been adopted with regard to it is the same as that which has been recommended regarding laudanum—namely, one grain or drop for each year of age the child has completed; a quantity which is never to be exceeded in any twenty-four hours, and it is always well to give it in combination with bromide of potassium. Ether is a pure antispasmodic; the sulphuric ether (called also spirits of ether) in doses of 3 to 6 drops to a

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Anthelmin-
tics.Anti-spas-
modics and
sedatives.
Bromide of
potassium.

Chloral.

Caution as to.

Ether.

CHAP. LVI. child; the spirits of chloroform is another preparation of ether, of great value and power as a stimulant antispasmodic: it may be given in doses of 1 to 2 drops to a child a year old.

The ordinary sweet spirits of nitre is another and excellent antispasmodic when given in doses of five to ten minims. It also acts as a sweat-producer and urine-increaser, as will be presently shown.

Carminatives. CARMINATIVES are most useful for flatulency, and when combined with aromatics and soda they

Value of. are of great value, both in colic and certain kinds of diarrhœa. Some formulæ have been inserted to enable the parent to make suitable carminative fluids from bazaar sources, but the distilled

Bazaar carminatives. waters, as obtainable from the chemist, are always to be preferred.

Astringents. ASTRINGENTS constitute one of the best known and most abused of all classes of remedies. They vary much in their mode of action, and consequently the kind of case for which it is proposed to employ an astringent must always be carefully discriminated before its administration; for in-

Act variously. stance, chalk acts mechanically by coating the delicate mucous membrane, and thus protecting it, as well as being an antacid; therefore when the actual irritant is removed, chalk acts beneficially. Gallic acid, on the other hand, is a pure and direct astringent, contracting the smaller vessels, and preventing them pouring out fluid; hence it is used in violent watery discharges from the bowels, and to check bleeding. Similarly catehu is a pure astringent, but not of equal power.

Bael. Bael fruit is classed among the astringents,

but it is almost more an alterative, its astringent powers being but slight. "In irregularity of the bowels, presenting alternations of diarrhœa and constipation, one draught (see prescript. No. 41) taken early in the morning often exercises a most beneficial effect in regulating the bowels," says Waring, who issues the following caution :—

"In bazaar specimens, the wood-apple (fruit of the *Feronia elephantum*) is often substituted for bael. Though they bear a close resemblance externally, they can easily be distinguished by opening them. In the true bael there are in the centre of the pulp a number of cells, from five to eighteen each, containing one or more seeds and glutinous mucus, whilst in the wood-apple there are no cells, and the seeds are embedded in the pulp."

Ice is useful as a local astringent. It should be tied in a bladder, and so applied. In its absence the freezing mixture may be substituted with nearly equal results (42).

DIAPHORETICS create perspiration. It is seldom that a very young child perspires freely under any treatment or during any sickness. There is moisture, but not perspiration. By promoting the skin action, internal congestions are obviated, and the circulation thereby relieved. The warm bath used in conjunction with this class of medicine much helps their action.

The most common, and perhaps the most useful diaphoretic, is the sweet spirits of nitre, in doses of from five to ten drops every few hours to a child a year old, and twice that quantity to a child who is above two years. It should never be given undiluted, and usually it is combined with other medicines, which experience has proved

CHAP. LVI.

Spurious articles sold.

Ice and freezing mixture.

Diaphoretics. Child seldom perspires freely.

Action of.

Assisted by warm bath.

Sweet spirits of nitre.

CHAP. LVI. assist in producing the desired end. The amount of urine secreted is also considerably increased by the use of the sweet spirits of nitre (otherwise called spirits of nitrous ether).

Nitre. Common saltpetre or nitre, or nitrate of potash, is a valuable diaphoretic, and it has the advantage of being attainable in the bazaars, under the name of shórâ. To be fit for internal use it should be pure, in large white colourless masses, and possess a saline cooling taste.

How to purify it. If impure, "to fit it for internal use, it should be purified by dissolving it in boiling water, removing the scum after the liquid has been allowed to settle, straining the solution through calico, and setting aside to crystallize." (Waring.)

Mindererus, spirit. The solution of acetate of ammonia is the old and well-known "spirits of mindererus," a bland and efficient diaphoretic, which may be given in doses of from twenty to sixty drops, but it is never prescribed alone.

Emetics. Emetics are medicines which are used to produce vomiting. They are given when we wish to empty the stomach of its contents, to depress the patient temporarily, and to augment secretion and excretion. Emetics are precluded when there is great debility. This class of medicines is especially useful in the diseases of children, because so much less distress results from their employment than in the case of the adult.

Uses.

When precluded.

Cause little distress in children.

How to administer. Unless there is urgency, and that immediate vomiting is desired, an emetic should not be given in too large a dose at first. To obtain the full effect it is best to repeat the dose every ten or

fifteen minutes till vomiting is induced, and it is also desirable to administer it before the usual hour of rest, because the sleep and perspiration which follow the action of the medicine are thus perpetuated; but, of course, it is not always that there is a choice in this matter. CHAP. LVI.
Time.

At the beginning of croup, when convulsions are threatened, and in commencing inflammations of the lungs, emetics are invaluable; so in bronchitis and obstruction of the throat with mucus in croup and whooping-cough, &c. Value of.

The most common emetics are ipecacuanha, mustard, alum, sulphate of zinc, and sulphate of copper. The most
common.

Ipecacuanha is a universal medicine. In the case of infants it is best to employ the powder, but for older children the wine is more convenient: a grain of the former, or a teaspoonful of the latter given every quarter of an hour till vomiting results, is the usual and best means of employing the drug. Ipecacuanha also assists expectoration, besides acting on the skin. Ipecacuanha.

Mustard is a good stimulating emetic; it neither causes depression at the time, nor leaves any behind: for this reason it is best suited to cases where the object is merely to evacuate the contents of the stomach, as in cases of poisoning, &c., and it is unsuitable to cases where we desire the physiological effects of emetics, viz., increased secretion, subjection of the pulse and nervous system, subjugation of the fever and depression. The bulk of the dose (a teaspoonful in half a tumblerful of luke warm water) is a great objec-

CHAP. LVI. tion to its employment for children—in fact, it is only adapted for elder children.

Alum. In the absence of ipecacuanhá, alum (phitkari of the bazaar) may be used as an emetic (see formula, No. 46) of the non-prostrating class.

Zinc. Sulphate of zinc in doses of a couple or three grains dissolved in water may be given to a young child; double this quantity being required for children of over three or four years of age, and it should be repeated every ten minutes while necessary. It is quick in its action, and does not occasion depression.

Copper. Sulphate of copper is a powerful emetic, which is sometimes necessary in urgent cases, where milder emetics refuse to act or are not likely to act, and where it is desired to avoid depression.

Country ipecacuanha. Country ipecacuanha (anta-mul) is a good substitute for the imported article, though not so thoroughly to be relied upon.

Caution as to ipecacuanha. There is no medicine that deteriorates more certainly than ipecacuanha under exposure. A fresh supply should be obtained every year.

Mudar. Mudár is a native drug which has been entered under the head of Emetics, though it is seldom or never employed for that purpose. For dysentery it is held in deservedly high repute.

Directions for collection of. "The only part employed in medicine is the root-bark, and it is necessary carefully to attend to the subjoined directions for collecting and preparing it for medical use, a disregard of them having been, in some instances, the apparent cause of the failure of the remedy. The roots should be collected in the months of April and May, from sandy soils, and all particles of sand and dirt having been carefully removed by washing, they should be dried in the open air, without exposure to the sun,

until the milky juice contained in them becomes so far dried that it ceases to flow on incisions being made. The bark is then to be carefully removed, dried, reduced to powder, and preserved in well-corked bottles." (Waring.)

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ENEMATA have been recommended in four Enemata. different forms in the foregoing pages, viz., Purposes of. purgative, sedative, astringent, and nutritive. Whatever kind of enema be employed, it is Cautions as to important that no force whatever be used in administration. the introduction of the tube, which should be thoroughly well oiled or greased, and introduced with a gentle rotatory motion; the fact that the intestine slightly inclines to the left side being borne in mind. "For an infant at the breast an Bulk of. enema should not exceed one ounce in quantity; from one to five years, three or four ounces; and from five to ten or fifteen years, about six ounces." (Tanner.) Sedative, astringent, and nutritive enemata must be of very small bulk, it being intended that they be retained by the patient. To accomplish retention, select a time when the child is about to go to sleep, or after it has passed a motion: introduce the fluid, and upon withdrawal of the tube press with a folded towel against the fundament for a quarter of an hour, till the sensation produced by the introduction of the tube has passed away.

The sustaining effect of nutritive enemata, Nutritive enemata. if properly and sufficiently frequently administered, is simply wonderful. By their aid a child may often be able to tide over an illness to which it would otherwise certainly succumb.

Opium administered by the bowel acts with

CHAP. LVI. greater power than when given by the mouth,

Opium—special caution when injected.

wherefore it is a good plan to give only half the usually prescribed quantity when it is contained in an enema.

Expectorants. EXPECTORANTS are medicines which increase the secretion of phlegm or mucus, which by being made thinner are more easily coughed up.

Action of. This class of medicines acts with great certainty.

Varieties of. They vary much in their nature: the depressing expectorants are given in the early stages of inflammatory affections of the chest; under this

1. Depressant. head are included ipecacuanha and antimony.

2. Stimulant. The stimulating expectorants are given in the latter stages of chest affections, and they include squills, senega, carbonate of ammonia, and one or two others. Judicious combination of these with various other drugs as given in the formulae, greatly enhances their action.

Paregoric elixir contains opium.

The compound tincture of camphor, or paregoric elixir, is a most useful expectorant of a sedative nature; but it is to be recollected that it contains a small proportion of opium, one quarter of a grain in every sixty drops, and therefore is to be used with great caution in the case of younger children.

Assafoetida. Assafoetida ("hing" of the bazaars) is a good and useful stimulating expectorant, which may supply a want when other drugs are not at hand. By rubbing down in a mortar five drachms of assafoetida in a pint of hot water, straining and setting aside to cool, a mixture may be prepared, of which a teaspoonful may be given four or five times a day. (Waring.)

PURGATIVES are a much mis-used class of medicines ; yet in childhood there are few things more pernicious than their constant administration.

CHAP. LVI.

Purgatives.
Abuse of.

For all ordinary purposes the child should be restricted to castor oil and rhubarb when an aperient is necessary, these medicines being mild and unirritating in their action. Some purgatives act with great violence, and if handled injudiciously may cause irritation bordering upon inflammation.

Those most
suitable.

Other irri-
tants.

Many fruits and simple and pleasant articles possess a laxative action, which will be made use of by a thoughtful parent before rushing to the medicine chest : such are figs, prunes, tamarinds, honey, treacle, and manna.

Fruits as
laxatives.

Rhubarb, in addition to its aperient properties, also acts as an astringent after its purgative action has ceased, or when given in very small doses its astringent action alone is exerted. Hence it is not to be used in cases of habitual constipation, and it is most valuable where we wish merely to empty the bowels and afterwards secure their quietude.

Peculiar
action of.

Senna is a good and simple aperient when we desire watery evacuations, but it sometimes gripes a good deal, wherefore it should always be mixed with an aromatic or carminative.

Senna.
Special action.
Always with
aromatic.

Castor oil is the blandest of all purgatives ; it acts thoroughly without producing any irritation or flatulency.

Castor oil.

Some of the other purgatives included in the formulæ are of a powerful nature, such as aloes, scammony, calomel, and podophyllin, and are

The more
powerful
aperients.

CHAP. LVI. only to be employed upon the occasions notified in the text.

Epsom salts. Epsom salts, or sulphate of magnesia, is not a medicine to be used frequently, except in special cases. It is too lowering in its effects. When the object is to withdraw watery fluid from the system, then it is very valuable.

Refrigerants. REFRIGERANTS are a class of medicines which give great comfort in fevers, allaying thirst, and cooling the body generally. Some of them are aperient in their action, a fact which should be remembered. Some being agreeable to the taste, there may be a temptation to use them habitually. Thus abused they are hurtful, and induce poverty of blood.

Stimulants. STIMULANTS of a medicinal nature are not much required in the treatment of the diseases of childhood. They increase the force of the heart's action, and produce a feeling of warmth and energy temporarily. Ammonia, ether, and camphor are the chief stimulants which are employed in cases of exhaustion and debility.

Alcohol. Alcoholic stimulants are to be administered to children with great caution, because their free use is succeeded by serious depression. In some affections of great exhaustion, as, for instance, violent watery purging, if used to excess, alcohol produces a narcotic depression, which greatly enhances the danger to the patient. Whenever the fontanelle (p. 156) is depressed, stimulants are always indicated.

Tonics. TONICS are a very numerous class of drugs.

Definition of. They increase the tone or power of the nervous

system, and are broadly divided into vegetable tonics and mineral tonics.

CHAP. LVI.

Classified.

Action of.

Some tonics, such as iron and cod-liver oil, act more as food than medicine, as they are directly absorbed and improve the quality of the blood, whereby the body is better nourished. The mistake people make concerning this class of medicine is that they expect too immediate an action in the first place, for which reason tonics of this nature are often too readily abandoned; and secondly, they seldom continue them sufficiently long to allow of a permanent impression being made. As a rule, such medicines should be persisted in for three or four months. From a stimulant we expect an immediate effect, from a tonic, never.

Tonics should almost never be given to a child whose bowels are disordered, for if given they are not likely to be of any service, absorption being too imperfect. Some tonics, notably iron, may act as direct irritants, and increase the mischief in these cases. In short, they are medicines for convalescence, when they will increase the appetite, the force of the pulse, and the muscular strength.

When not to give.

Cod-liver oil, as stated, is more a food than a medicine; but there is a very common mistake made regarding it, namely, that it is usually given in doses far too large. The stomach is capable of digesting but a very small quantity of this oil, and if more be given than the stomach can dispose of, the remainder passes off unchanged by the bowels, and it may then be both seen and smelt in the stools. "For a child under two years of age ten

Proper mode of administration.

CHAP. LVI.

drops will be a sufficient dose at first. The quantity, after the first few days, can be gradually increased, but a careful watch must be kept upon the stools, and the appearance of any oil unchanged in the evacuations is a sign that the quantity must be reduced. For a child of this age we can seldom go beyond thirty drops for the dose three times in the day. If it be found to impair the appetite, or to interfere in the slightest degree with digestion, its use should be immediately discontinued." (Eustace Smith.)

Vegetable
tonics.

Certain tonics, such as quinine and bark, act chiefly upon the nervous system, bracing up the system and increasing the appetite. Others, such as chiretta, hemidesmus, and gentian, act upon the stomach and digestive organs, and through them improve the general tone.

SOME FORMULÆ CONNECTED WITH ALIMENTATION.

1. *Lime Water.*

Add two ounces of slaked lime to one gallon of pure water, in a stoppered bottle, shaking well for several minutes. Allow the bottle to stand without any agitation till the superfluous lime be deposited at the bottom, the solution above being perfectly clear. The bottle should stand for twenty-four hours before the clear solution is drawn off for use. Water is capable of dissolving a certain proportion of lime, the proper proportion to constitute "lime water" being just so much as the water can dissolve.

A bottle containing lime water should always be kept well corked; access of air spoils lime water.

2. *Saccharated Solution of Lime.*

Take of slaked lime one ounce, and of powdered white sugar two ounces.

Mix them carefully into a powder in a mortar. Transfer the powder to a bottle, and add one pint of water, shaking the bottle well.

The dose of this is from fifteen to twenty drops of the clear solution.

3. *Barley Water.*

Two teaspoonfuls of washed pearl barley, one pint of water. Put into a saucepan, and boil down to two-thirds. Strain.

4. *Gelatine Solution.*

A teaspoonful of good gelatine or isinglass.
Half a tumblerful of cold water.

Mix. Allow to stand for three hours. Turn into a cup. Stand the cup in a saucepan full of water, and boil till the gelatine is dissolved.

When cold this forms a jelly, of which a teaspoonful is to be added to half a bottleful of milk and water food to prevent curdling in the stomach.

5. *Beef Tea.*

Put half a pound or a pound of rump steak, cut up into small pieces, into a copper-covered saucepan, with one pint of cold water. Let it stand by the side of the fire for four or five hours, and let it then simmer gently for two hours. Skim well, and serve.

The meat should be as fresh as possible—the fresher the better,—and should be cleansed beforehand of all fat and gristle. If this precaution be neglected, a greasy taste is given to the beef tea, which cannot afterwards be removed by skimming. Iron saucepans, if used, should be enamelled.

In re-warming beef tea which has been left to cool, care must be taken to warm the tea up to the point at which it is to be served, and no higher. It should on no account be allowed to boil. (Eustace Smith.)

6. *Juice of Raw Meat.*

Take a pound, or whatever quantity required, of the best rump-steak, free from all fat. Cut it into the finest mince. Put it into a bowl. Add cold water, to which a few drops of diluted muriatic acid and a pinch of salt have been added, just sufficient to moisten the mass. Set aside to stand for four hours, during which time it may occasionally be stirred. Strain through a coarse cloth, using pressure. The pulpy mass of flesh ought to be nearly bleached, while the liquid should be of a port wine colour.

7. *Johnson's Fluid Beef.*

The *Lancet* writes: "The peculiarity of this preparation is that the ordinary extract is mixed with a portion of the muscular

fibre in a state of such fine division that the microscope is required to identify it." The actual food value is very greatly increased by this admixture, and there now exists a fluid meat which is comparable in nutritive power with the solid food itself. The flavour, too, is excellent.

8. *Brand and Co.'s Fibrous Extract of Beef*

Is also excellent. The sediment is albuminous and highly nutritive.

9. *Chapman's Entire Wheat Flour.*

The characters which render this preparation especially valuable have already been alluded to (p. 96). The following are Dr. Eustace Smith's directions as to its preparation for use. A pound of the flour, tied up tightly in a pudding-cloth, is placed in a saucepan of water and allowed to boil constantly for two hours. Afterwards, when cold, the outer softer covering of the ball of flour is cut away, and the hard interior is reduced to powder with a fine grater. For each meal one teaspoonful of the prepared flour is rubbed up with a tablespoonful of cold milk into a smooth paste. A second spoonful of cold milk is then added, and the rubbing is repeated until the mixture has the appearance of perfectly smooth cream. A quarter of a pint of hot milk or milk and water is then poured upon the mixture, stirring briskly all the time, and the food is ready for use.

But many persons simply prepare the flour as is done with any of the ordinary corn flours, by boiling a proper quantity with milk or milk and water for ten minutes.

PRESCRIPTIONS.

ALTERATIVES. (p. 384.)

1. Iodide of potassium mixture.

Take

Iodide of potassium, twelve grains.

Water, one ounce. Mix.

Dose—One teaspoonful three times a day for a child one year old.

2. Alterative and sedative.

Take

Iodide of potassium, twelve grains.

Bromide of potassium, half a drachm.

Water, one ounce. Mix.

Dose—One teaspoonful every third or fourth hour.

3. Chlorate of Potash mixture.

Take

Chlorate of potash, one drachm.

Water, three ounces. Mix.

Dose—Two teaspoonfuls every third or fourth hour.

4. Alterative and tonic.

Take

Iron wine, half an ounce.

Syrup of tolu, half an ounce.

Fowler's solution of arsenic, twelve minims.

Dill water, one ounce. Mix.

Dose—One teaspoonful three times a day, after meals.

According to Erasmus Wilson, this is almost a specific in eczema of children.

Or,

Cod-liver oil, two ounces.

Yolk of egg, one ounce.

Fowler's solution of arsenic, forty-four minims.

Syrup, two drachms.

Pure water, four ounces. Mix.

Dose—One teaspoonful three times a day, immediately after meals.

ANTHELMINTICS. (p. 387.)

5. Jalap and scammony.

Take

Compound powder of scammony, four grains.

Aromatic powder, four grains. Mix.

The powder to be taken at bedtime.

Useful in cases of threadworm.

6. Santonine.

Take

Santonine, from two to four grains.

White sugar powdered, ten grains.

Mix.

The powder to be taken as directed at page 307.

Santonine is a specific for round worms.

7. Pomegranate.

Take of fresh-sliced pomegranate root-bark, two ounces. Of water, two pints. Boil down to one pint and strain. Of this, one to two table-spoonfuls should be taken fasting,

early in the morning, and repeated every half-hour until four doses have been taken. An aperient should be given subsequently—castor oil being the most suitable. The worm will probably be expelled in about twelve hours (*vide* p. 308).

8. Male fern.

Take
Liquid extract of male fern, forty minims.
Syrup of ginger, one drachm.
Mucilage, two drachms.
Water, half an ounce. Mix.
The draught to be taken as directed at p. 308.

ANTISPASMODICS, SEDATIVES, AND CARMINATIVES. (p. 387.)

9. Stimulant antispasmodic.

Take
Spirits of ether, forty minims.
Spirits of chloroform, forty minims.
Compound tincture of cardamoms, two drachms.
Spirits of nutmeg, half a drachm.
Oil of Caraways, three minims.
Peppermint water, four and a half ounces. Mix.
Dose—One or two teaspoonfuls every three hours, for a child two years old, in colic, flatulency, and spasm (Tanner). This should be kept ready made up.

10. Bromide of potassium.

To be of any service as a sedative, this medicine must be used in large doses. At least ten grains should be given every three hours to a child three years old if it is desired to ward off convulsions. The following is a useful formula.
Take of

Bromide of potassium, half a drachm.
Sweet spirits of nitre, one drachm.
Syrup, two drachms.
Water, ten drachms.
Dose—Two teaspoonfuls every second hour.

11. Alum.

Take
Alum, twenty-four grains.
Syrup, two drachms.
Water, ten drachms. Mix.
Dose—Two teaspoonfuls every fourth hour.
In hooping-cough.

12. Caraway seed water.

“A perfectly useful caraway water may be made in the nursery by boiling two teaspoonfuls of crushed caraway seeds, enclosed in a little muslin bag, in a pint of water, until the quantity is reduced to one-half” (E. Smith).

13. Dill water.

A useful dill water for the nursery in the absence of the distilled preparation, as obtainable from the chemist, may be made as follows:—
Take of Indian dill seeds (Soyah or shulpha of the bazaars), three drachms.
Hot water, half a pint.
Infuse till cold and then strain.
Dose—A dessertspoonful slightly sweetened with sugar.
Its efficacy is often much increased by the addition of a teaspoonful of lime water (Waring).

APPLICATIONS. (p. 384.)

14. Dusting powder.

Take
Oxide of zinc, one part.
Powdered starch, three parts.
Mix thoroughly in a mortar. (p. 385.)

15. Soap liniment.

Take
Soft soap, one pound.
Boiling water, one gallon, or similar
smaller proportions.
Dissolve thoroughly.

16. Cold lotion.

Take
Nitre, two ounces.
Sal ammoniac, two ounces.
Water, a quart. Mix.
An excellent application for i
flamed bruises, or for the head in
fever.

Or,
Take of vinegar, brandy, and water,
equal parts, and mix.

17. Arnica lotion.

Take
Tincture of arnica, six drachms.
Rain water, eight ounces. Mix.
To be used as a lotion for sprains and
bruises (p. 355).

18. Borax application.

Borax, half a drachm.
Glycerine, one drachm.
Water, one ounce.
Applied to the throat in thrush, this
is a specific.

19. Sulphurous acid.

Take
Sulphurous acid, one ounce.
Water, six ounces.
Is not to be confounded with sul-
phuric acid. Is a destroyer of
vegetable parasites in the skin.

20. Zinc ointment.

Take
Oxide of zinc, eighty grains.
Fresh lard, one ounce.
Rub together.

21. Stimulating liniment.

A useful camphor liniment may be
made by dissolving one ounce of
camphor in six ounces of cocoa-nut
or any other bland oil.

22. Turpentine liniment.

Camphor, one part.
Turpentine, sixteen parts.
Soft soap, two parts.
Rub together till thoroughly mixed.

23. Galls ointment.

Take
Galls (mai-phal of bazaars) powdered,
one and a half drachm.
Ghee, one ounce. Mix.
Very useful in piles and protrusion
of the bowel.

24. Itch ointment.

Take
Sulphur, one ounce.
Lard, four ounces.
Rub together.

25. Resin ointment.

Take
White damar (sufed damar), five
ounces.
Lard or kokum butter, eight ounces
Wax, two ounces.
Melt with a gentle heat, stirring
briskly as it cools (W

26. Turpentine ointment.

Take
Turpentine, one ounce.
White or black damar, sixty grains.
Yellow wax and lard, half an ounce.
Melt well together, stirring it, while cooling.
An excellent application for indolent and ill-conditioned ulcers (Waring).

27. Eye lotion.

Take
Alum, twelve grains.
Sulphate of zinc, six grains.
Infusion of poppy-heads, six ounces.
Mix.
To be used constantly.

28. Carbolic lotion.

Take
Carbolic acid (rendered fluid by a gentle heat if it be solid), one part.
Lukewarm water, forty parts.
Shake well together.

29. Carbolic oil.

Take
Carbolic acid (fluid), one part.
Any bland oil slightly heated, eight parts.
Shake thoroughly.

30. Glycerine of tannic acid.

Take
Tannic acid, one drachm.
Glycerine, four drachms.

31. Ointment to reproduce scalp eruptions.

Take
Powdered ipecacuanha, one drachm.
Lard, one ounce.

Rub thoroughly together. Apply some, with friction, to the part every third hour. In from twelve to twenty-four hours an abundant eruption will appear (West).

32. Iodine ointment.

Is useful for the dispersion of swellings, and in cases of enlargement of the spleen.

33. Iodine paint.

As supplied by the chemist.
This should be painted over swellings of the glands, when acute inflammation has subsided, by means of a camel's-hair pencil, night and morning. If the child be very young, the paint should be diluted with brandy.

34. Aloes liniment.

Take
Tincture of aloes, half an ounce.
Soap liniment, one ounce. Mix.
To be rubbed daily for five minutes into the belly. Should not be employed in the case of a child under two years of age.

ASTRINGENTS. (p. 388.)

35. Simple aromatic astringent.

Take
Aromatic chalk powder, twenty grains.
Tincture of catechu, thirty minims.
Mucilage, two drachms.
Peppermint water, one ounce. Mix.
Dose—Half a teaspoonful three or four times a day under six months of age; two teaspoonfuls between twelve and twenty-four months. Very useful in simple diarrhoea.

Or,

36. The same.

Take

Aromatic confection, twenty grains.
 Bicarbonate of soda, twelve grains.
 Acacia powder, ten grains.
 Tincture of catechu, thirty minims.
 Syrup of ginger, one drachm.
 Peppermint water, six drachms. Mix.

Dose—One teaspoonful every three or four hours till relaxation ceases. For a child of one year.

37. Catechu (Kath) mixture.

Take

Catechu powder, four grains.
 Cinnamon powdered, four grains.
 Mix.

The powder to be taken three times a day.

Or,

Bruised catechu, three drachms.
 Bruised cinnamon, one drachm.
 Boiling water, half a pint.
 Macerate for two hours and strain.

Dose—One dessert-spoonful to a tablespoonful three times a day.

38. Gallic acid.

Take

Gallic acid, one drachm.
 Mucilage, half an ounce.
 Water, two ounces. Mix.

Dose—One teaspoonful after every watery motion.

Or,

Galls (mai-phal, or mazuphal of the bazaar) may be substituted, the dose then being doubled.

39. Bismuth and opium.

Take

Bismuth, twelve grains.
 Bicarbonate of soda, twelve grains.

Compound powder of chalk with opium, twelve grains.

Mix thoroughly, and divide into six equal powders.

Caution.—Each powder contains one-twentieth of a grain of opium. Therefore this prescription should not be used for children under six months of age, and not more than one powder should be given to a child of under nine months in the course of twenty-four hours. Two in the twenty-four hours should not be given till a full year of age has been completed, and so on, two powders for each year of completed age being allowable.

This medicine may be used in conjunction with any pure astringent.

40. Sulphuric acid.

Take

Diluted sulphuric acid, eighteen drops.

Tincture of catechu, thirty-six drops.
 Syrup of ginger, two drachms.
 Water, nine drachms. Mix.

Take two teaspoonfuls every fourth hour.

If the tincture of catechu be not at hand, gallic acid, twelve grains, may be substituted; or the solid catechu, eighteen grains, if it can be obtained tolerably pure.

41. Alterative astringent.

Bael fruit (the half-ripe fruit, if procurable, is best; but the dried fruit also answers) is a very valuable remedy in cases of diarrhoea and dysentery when febrile symptoms have subsided.

Take of the soft gummy interior, two ounces. Mix with three or four ounces of water; sweeten to the taste. Take one-fourth part twice or three times a day. (Caution, see p. 388.)

42. Cold.

Ice broken into small pieces, and put into a bladder, applied to the head in cases of fever with headache, or of inflammation of the brain, is a valuable remedy. It may also be used in lumps or pulverised, to prevent bleeding from wounds, or to moderate swellings and inflammations.

Or,

The freezing mixture

Consisting of five ounces of sal-ammoniac, five ounces of saltpetre, and ten ounces of water mixed together and enclosed in a bag, will cause the thermometer to sink from 50° to 10°.

DIAPHORETICS, OR SWEATING MEDICINES. (p. 389.)

43. Sweating mixture.

Take

Nitrate of potash, ten grains.
Ipecacuanha wine, two drachms.
Syrup, two drachms.
Barley water, two ounces. Mix.

Dose—One teaspoonful every second or third hour, for a child under six months of age. Two teaspoonfuls up to twelve months. A dessert-spoonful beyond this age, up to the second year, after which a tablespoonful may be given in common colds and fevers.

44. Fever mixture.

Take

Sweet spirits of nitre, one drachm.
Sal-volatile, thirty-six minims.
Syrup, two drachms.
Water added to complete to one and a half ounces. Mix.

Dose—Two teaspoonfuls every third hour, for a child between one and two.

45. Fever mixture.

Take

Solution of acetate of ammonia, half an ounce.
Nitrate of potash, twenty grains.
Sweet spirits of nitre, one drachm.
Syrup, three drachms.
Water, three ounces. Mix.
Dose—Same as No. 43.

EMETICS. (p. 390.)

46. Simple emetic.

Take

Ipecacuanha powder, one grain.
Sugar, three or four grains. Mix.
This powder may be given to the youngest infant every quarter of an hour, till vomiting results.

Or,

Country ipecacuanha (anta-mul of the bazaar), the powdered dry leaves, of which three or four grains will cause vomiting. In larger doses it may be substituted for ipecacuanha in treating dysentery.

Or,

Alum may be used in the absence of ipecacuanha. Three drachms should be dissolved in one ounce of syrup. Of this one-third part may be given every quarter of an hour or ten minutes.

47. Stimulating emetic.

Take

Ipecacuanha powder, eight grains.
Ipecacuanha wine, one ounce. Mix.
Dose—One teaspoonful every quarter of an hour, till vomiting is produced.

48. Powerful emetic.

Take
Sulphate of copper, two to six grains.
Water, half an ounce. Dissolve.
One quarter part every ten minutes
in rice water till vomiting occurs.
Useful in the third stage of croup,
after one year of age.

Or,
Sulphate of zinc (see p. 392).

49. Mudár. (p. 392.)

Is an admirable substitute for ipecacuanha in the treatment of dysentery (p. 295). If not given with the usual precautions, it will cause vomiting. The dose and mode of administration are the same as of ipecacuanha.

Turpentine, two drachms.
Tincture of assafœtida, half a drachm.
Rice-water, three ounces. Mix.
Very useful in convulsions.

53. Astringent enemæ.

Take of
Tincture of catechu, half a drachm.
Laudanum, half a drop for each year of age completed.
Turpentine, half a drachm.
Rice-water, one ounce. Mix.
To be injected gently, and to be used only once in twenty-four hours, unless the laudanum be omitted, when it may be employed night and morning.

EXPECTORANTS. (p. 394.)

ENEMATA. (p. 393.)

50. Worm injection.

Take
Table salt, one to two teaspoonfuls.
Olive oil, half an ounce.
Conjee water, three ounces. Mix.
Useful for killing and expelling thread worms.

51. Purgative enema.

Take
Castor oil, two drachms.
Thin warm gruel, three ounces. Mix.
Useful in ordinary constipation.

Or,
Aloes, ten to twenty grains.
Boiled milk, three ounces. Mix.
Useful when castor oil is insufficient.

52. Purgative and antispasmodic.

Take of
Castor oil, two drachms.

54. Sedative and expectorant.

Take of
Spirits of nitric ether, one drachm.
Compound tincture of camphor, thirty-six minims.
Ipecacuanha wine, twenty-four minims.
Syrup, three drachms.
Water, one and a half ounce. Mix.
Dose—One teaspoonful every fourth hour.

Caution.—This mixture contains a little more than one-eighth part of a grain of opium.

55. Squills.

Take of
Oxymel of squills, forty minims.
Compound tincture of camphor, twenty drops.
Sweet spirits of nitre, twenty minims.
Water, one ounce. Mix.
Dose—One teaspoonful four or five times a day.

56. Depressing expectorant.

Take of
Ipecacuanha wine, two drachms.
Antimonial wine, one drachm.
Syrup, one and a half drachm.
Solution of citrate of ammonia, half an ounce.

Camphor water to complete to two ounces. Mix.

Dose — One teaspoonful every fourth hour.

Useful in the early stages of inflammatory chest affections.

57. Stimulating expectorants.

Take of

(1) Carbonate of ammonia, eight grains.

Ipecacuanha wine, one drachm.
Tincture of senega, two drachms.
Oxymel of squills, three drachms.
Water, three ounces. Mix.

Dose — One teaspoonful every second hour for an infant under one year of age. Double this quantity for between one and two years. A dessert-spoonful after the latter age. Useful in the obstinate coughs of weakly children.

Or,

(2) Ipecacuanha wine, thirty - six minims.

Carbonate of ammonia, five grains.
Syrup, two drachms.
Water, ten drachms. Mix.

Dose — Two teaspoonfuls every fourth hour, for a child of two years.

Or,

(3) Carbonate of ammonia, twelve grains.

Tincture of squills, seventy-two minims.

Chloric ether, forty-eight minims.
Tincture of tolu, half an ounce.
Water, three ounces. Mix.

Dose — Two, teaspoonfuls every third or fourth hour.

PURGATIVES. (p. 395.)

58. Castor oil.

Dose—Half a teaspoonful for a child under one year of age. A full teaspoonful is sufficient for a child of any age.

59. Red mixture.

Take of

Rhubarb, ten grains.
Carbonate of magnesia, thirty grains.
Sal volatile, half a drachm.
Aniseed oil, two drops.

Water, two ounces. Mix.

Dose—A teaspoonful, repeated every fourth hour till it operates.

60. Gregory's powders.

Take of

Rhubarb, two drachms.
Magnesia, six drachms.
Ginger, one drachm. Mix thoroughly, and pass through a fine sieve.

Dose—Five to twenty grains.

61. Castor oil emulsion.

Take of

Powdered acacia, three drachms.
Powdered loaf sugar, three drachms.
Oil of peppermint, two drops.
Castor oil, one ounce.

Rub the acacia sugar and oil of peppermint together into a powder; add about six drachms of water; then add the castor oil by degrees, with a little more gum or a little more water, as may be necessary to make a perfect emulsion. Then add water slowly to bring the quantity to four ounces. Of this mixture one tablespoonful equals one teaspoonful of castor oil (Parrish).

Dose—As an aperient, one table-spoonful. For inflammatory diarrhoea, a teaspoonful every fourth or sixth hour.

Or,

Castor oil, one drachm.
Gum acacia, twenty grains.
Sugar, half an ounce.
Caraway water, nine drachms.

Dose—One drachm every fourth hour.

62. Senna.

Take of

Senna leaves, one ounce.
Bruised ginger, half a drachm.
Bruised cloves, half a drachm.
Boiling water, ten ounces.
Stand for half an hour.

Dose—For a child of two years, one tablespoonful. The simple infusion without the aromatics may be given with sugar and milk, when it can hardly be distinguished from ordinary tea.

63. Salts and senna.

Take of

Sulphate of magnesia, one drachm.
Infusion of senna, one ounce.

The draught, to be taken by a child of ten or twelve.

64. Epsom salts draught.

Take of

Sulphate of magnesia, twenty grains.
Syrup of ginger, one drachm.
Peppermint water, three drachms.

The draught, for a child above a year old.

65. Continuous purgation.

Take of

Sulphate of magnesia, two drachms.

Nitrate of potash, twenty grains.
Syrup, half an ounce.
Water, one ounce. Mix.

Dose—Two teaspoonfuls twice or three times a day, when it is desired to keep up purgation, as in head affections.

66. Strong purgative.

Take of

Calomel, one grain.
Jalap, five grains.
Powdered ginger, two grains. Mix.

The powder, suitable for a child of eight or ten years. This should be followed by a dose of senna or Epsom salts in a few hours.

67.

Take of

Scammony powder, two grains.
Jalap powder, two grains.

Powdered ginger, one grain. Mix.
The powder to be given every fourth hour till it operates.

68. Podophyllin.

Take of

Podophyllin, one grain.
Alcohol, one drachm. Dissolve.

Dose—One to two drops in twice or three times a day (Ringer).

69. Aloes.

Take of

Powdered aloes, one drachm.
Syrup, one ounce. Mix.

Dose—One teaspoonful every third hour till a satisfactory result be obtained.

Or,

By adding to the above, sulphate of iron, two grains, a mixture is formed which is most valuable in some forms of constipation (p. 274).

REFRIGERANTS. (p. 396.) 73. Fever drink.

70. Lemonade.

Five or six limes sliced, added to one pint of boiling water. Allowed to stand till cool, then strained and sweetened to taste.

Or,

Tamarinds, one ounce.
Water, one pint.

Make an excellent cooling drink, but it must be recollected that it possesses aperient properties.

Nitrate of potash (nitre), ten grains.
Barley water, one pint.

A wineglassful occasionally to quench thirst.

74. Fever

Take of

Chlorate of potash, thirty grains.
Rice water, one pint. Mix.

A wine-glassful to be taken from time to time to quench thirst.

STIMULANTS. (p. 396.)

71. Seidlitz powder for children.

Take of

Bicarbonate of soda, ten grains.
Tartrated soda, thirty grains.
Dissolve in one ounce of water, adding a little syrup and essence of Lemon. Then in another glass dissolve eight grains of tartaric acid in one tablespoonful of water. The contents of the glasses should be poured together, and the whole drank while effervescing. An agreeable, mild aperient in the warm weather for strong children, but it is not one which should be frequently used.

75.

Take of

Diluted hydrochloric acid, sixteen minims.
Spirits of chloroform, sixteen minims.
Camphor water, one ounce. Mix.
Dose—One teaspoonful every two or three hours.

76.

Take of

Carbonate of ammonia, twelve grains.
Chloric ether, half a drachm.
Infusion of cloves, four ounces. Mix.
Dose—One drachm to a dessert-spoonful three times a day.

72. Effervescing draughts.

Take of

Bicarbonate of potash, one drachm.
Water, sweetened and flavoured with syrup of lemon, three ounces.
Mix, and put into a bottle; then dissolve forty-two grains of citric acid in three ounces of water in another bottle.

One tablespoonful of each thrown together will form a refreshing draught.

TONICS.

77. Quinine tonic.

Take of

Quinine, four grains.
Lime juice, twenty drops (or four drops of diluted sulphuric acid).
Infusion of orange peel, two ounces. Mix.

Dose—Two teaspoonfuls three times a day, shortly before food.

78. Antiperiodic.

Take of

Quinine, forty grains.

Lime juice, two teaspoonfuls (or forty drops of diluted sulphuric acid).

Syrup, two drachms.

Water, one ounce. Mix.

Dose—One eighth-part once a day for a child a year old. Double that quantity for a child of two years. Strong doses of quinine should, as far as possible, not be given on an empty stomach.

79. Steel and quinine tonic.

Take of

Tincture of steel, twenty-four drops.

Quinine, four grains.

Water, one ounce. Mix.

Dose—One teaspoonful three times a day after meals, for a child of two years.

80. Atees.

May be used as a substitute for quinine, but it should be given in double the doses.

81. Chiretta wine.

Take of

Bruised chiretta, two ounces.

Sherry wine, one bottle.

Allow to stand for a week.

Dose—One to two teaspoonfuls two or three times a day.

82. Chiretta infusion.

Take of

Bruised chiretta, one ounce.

Cold water, one pint.

Bruised cloves or cinnamon, one drachm.

Infuse for six hours and strain.

Dose—A dessert-spoonful to a table-spoonful twice or three times a day, before food.

83. Aperient tonic.

Take of

Tincture of steel, forty-eight minims.

Epsom salts, one drachm.

Quinine, six grains.

Water, six ounces. Mix.

Dose—One tablespoonful three times a day for a child of from six to eight.

A valuable tonic in the dropsy following material poisoning, when there is also a tendency to constipation.

84.

Take of

Syrup of iodide of iron, ten to thirty minims.

Cod liver oil, half a drachm.

To be given three times a day, after food.

Or,

The syrup of iodide of iron may be given alone.

Or,

The syrup of the phosphate of iron, twenty to thirty drops three times a day after meals.

Or,

Wine of iron, ten to thirty drops as above.

Or,

Parrish's chemical food, a quarter, half, or a full teaspoonful in as much water, to children of two, five, and ten, respectively.

85. Country sarsaparilla.

Take of

Hemidesmus root (called in the bazaar Hindi-Sal-sa or jungli chaubelli), bruised, one ounce.

Boiling water, half a pint.

Infuse in a covered vessel for half an hour and strain.

Dose—One to three tablespoonfuls three times a day. The efficacy of the medicine is much increased by taking it when warm. Sugar and milk added to it make it so like tea that children will readily take it. Waring says it is a “particularly useful tonic for the pale weakly offspring of Europeans in India.”

86. Cod-liver oil.

For mode of administration, see page 397.

87. Pepsine.

The dose of the wine is a quarter to half a teaspoonful given with meals

Of the powder, half a grain to two grains given in water with a drop of hydrochloric acid, three times a day, with meals.

TABLE OF WEIGHTS AND MEASURES.

SOLID MEASURE.

				Marked thus.
20 grains* make	...	...	one scruple	ʒj
3 scruples „	...	...	one drachm	ʒj
8 drachms „	...	...	one ounce	ʒj
12 ounces „	...	...	one pound	℔j

FLUID MEASURE.

60 drops or minims make 1 drachm, equal to one ordinary-sized tea-spoonful.

8 drachms make 1 ounce, equal to two ordinary-sized table-spoonfuls.

16 ounces make 1 pound or pint.

* The grain weights are usually marked with dots corresponding to their numbers, thus: $\left| \begin{array}{c} 0 \\ 0 \end{array} \right| \begin{array}{c} 0 \\ 00 \end{array}$ &c., &c.

APPENDIX.

No. I.

Quoted from the Sanitary Commissioners' Report.

CHILDREN OF EUROPEAN REGIMENTS, 1875.

TABLE showing the SICKNESS and MORTALITY among the CHILDREN of the EUROPEAN REGIMENTS composing the ARMY of INDIA during the Year 1875, and the prevalence of the principal Diseases in each Month of the Year.

MONTHS.	Average Strength.	Average Number Daily Sick.	Number Daily Sick per 1,000 of Strength.	Number of Deaths in each Month.	Death rate each Month per 1,000 of Strength.	CAUSES OF DEATHS.												Died per 1,000 of Strength.							
						Cholera.	Smallpox.	Measles.	Whooping-Cough.	Scarlet Fever.	Enteric Fever.	Intermittent Fever.	Remittent and Continued Fevers.	Apoplexy.	Dentition.	Convulsions.	Meningitis and Hydrocephalus.	Typhus Mesenterica.	Phthisis Pulmonalis.	Dysentery.	Diarrhoea.	Anæmia and Atrophy.	Bronchitis and Pneumonia.	Croup and Diphtheria.	All other Causes.
January	12,216	249	20.4	41	3.36	...	...	3	1	...	1	...	1	...	...	9	1	2	...	...	...	5	1	3	6
February	12,602	234	18.5	32	2.53	...	...	...	...	...	...	...	...	...	...	5	1	1	...	...	...	6	1	2	...
March	12,483	296	23.7	71	5.69	...	...	12	1	...	...	...	...	...	...	7	15	4	...	...	...	11	6	3	...
April...	12,338	391	31.7	89	7.21	...	...	8	1	...	...	2	5	1	10	10	5	2	...	...	...	20	12	3	...
May...	12,260	398	32.5	64	5.22	...	...	6	2	...	...	...	...	...	12	11	4	2	...	...	...	8	6	3	...
June...	12,364	425	34.4	83	6.71	...	...	7	...	...	...	...	...	...	9	12	4	2	...	...	...	13	10	3	...
July...	12,391	467	37.7	99	7.99	...	...	...	2	...	...	...	...	...	20	12	...	3	...	...	32	8	3	...	
August	12,434	535	43.0	115	9.25	...	...	1	...	...	...	...	...	...	20	12	...	2	...	...	26	8	4	...	
September	12,523	522	41.7	99	7.91	...	...	...	...	...	...	...	...	...	7	10	1	4	...	...	...	13	8	3	...
October	12,394	448	36.1	58	4.68	...	...	...	...	...	...	...	...	...	3	7	1	...	...	...	5	4	1	...	
November	12,376	357	28.8	64	5.17	...	...	...	...	...	...	...	...	...	10	3	1	...	...	...	2	4	9	...	
December	11,889	227	19.1	47	3.95	...	...	4	...	...	...	...	3	1	2	9	1	5	...	...	...	4	9	1	...
						63	...	49	7	...	1	4	42	12	86	137	25	29	...	37	179	87	41	25	38
For the year...	12,359	379	30.7	862	69.75	5'10	...	3'96	57	...	08	3'72	97	6'96	11'09	2'02	2'35	...	2'99	14'48	7'04	3'32	2'02	3'07	

CAUSES OF ADMISSION.	NUMBER OF ADMISSIONS INTO HOSPITAL IN EACH MONTH.												Total Admitted during the Year.	Admitted per 1,000 of Strength.	Died out of each hundred treated.
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.			
Cholera	...	...	...	1	1	2	25	23	24	6	1	...	83	67	75'90
Smallpox	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...
Measles	40	85	125	87	86	154	49	22	...	...	9	21	684	55'3	7'16
Whooping-Cough	...	14	13	14	15	23	35	7	1	2	1	...	139	11'2	5'04
Enteric Fever	...	...	...	...	2	...	...	1	117	166	...	...	5	4	20'00
*Intermittent Fevers	55	29	59	83	74	128	104	137	117	192	...	88	1,232	99'7	3'32
Remittent and Continued Fevers	43	28	68	82	80	98	85	98	86	96	117	34	915	74'0	4'59
Apoplexy	...	...	2	3	1	4	1	2	1	3	3	1	21	1'7	57'14
Dysentery	9	3	22	29	12	28	27	48	41	37	22	18	296	24'0	12'50
Diarrhoea	...	40	145	138	89	88	157	254	124	84	94	35	1,287	104'1	13'91
Hepatitis	...	1	...	1	8	...	...	3	2	2	...	...	17	1'4	...
Spleen Disease	3	3	2	4	2	2	1	1	4	2	3	2	29	2'3	...
Respiratory Diseases	44	59	63	33	55	54	36	67	56	59	85	53	653	53'0	10'08
Eye Diseases	16	5	64	144	84	75	204	422	311	220	100	41	1,688	136'4	...
Anæmia and Debility	85	69	96	81	91	100	76	97	99	91	85	91	1,061	85'8	8'20
Tubercular Diseases	5	10	3	12	10	6	5	9	13	2	11	7	93	7'5	31'18
Meningitis and Hydrocephalus	1	3	5	9	4	5	4	...	2	2	2	2	39	3'2	64'10
Convulsions	...	9	15	17	14	16	25	13	22	10	17	11	186	15'0	73'66
Dentition	10	17	50	49	46	77	47	66	41	25	37	22	493	39'9	17'44
Abscess and Ulcer	...	8	12	15	30	34	19	25	11	11	13	7	131	15'5	...
Injuries	14	6	19	17	12	14	13	24	21	14	15	6	175	14'2	1'44
All other Causes	37	63	70	43	52	49	32	42	41	39	43	22	533	43'1	...
	440	443	833	862	769	955	945	1,360	1,024	880	850	461	9,822		
Admitted per 1,000 of the Average Strength in each Month.															
	36'0	35'0	66'7	69'9	62'7	77'2	76'3	109'4	81'8	71'0	68'7	38'8	794'7		

No. III.—Ratio of Mortality at different Ages.

	ARMY OF BENGAL, 1875.				ARMY OF INDIA, 1875.				ARMY OF INDIA, 1874.	
	Strength.	Deaths.	Ratio per 1,000.		Strength.	Deaths.	Ratio per 1,000.		Deaths.	Ratio per 1,000.
AGES AS AT 1st JULY, 1875.										
Under 6 months	397	135	340.05		710	211	297.18		181	200.89
Between 6 months and 1 year	502	108	205.18		970	176	181.44		168	162.79
" 12 " 18 months	477	94	197.07		902	165	182.98		123	139.43
" 18 " 2 years	462	40	86.58		816	66	80.88		54	65.53
" 2 " 3 "	665	44	66.17		1,181	75	63.51		63	51.94
" 3 " 4 "	612	47	76.80		1,086	64	58.98		27	23.87
" 4 " 5 "	569	19	33.39		1,047	29	27.70		21	20.21
" 5 " 6 "	547	16	29.25		943	17	18.03		15	15.23
" 6 " 7 "	467	12	25.69		851	17	19.98		10	12.08
" 7 " 8 "	462	10			791	13			6	
" 8 " 9 "	390	8			630	9			3	
" 9 " 10 "	379	8			629	9			5	
" 10 " 11 "	269	2			482	4			2	
" 11 " 12 "	263	1	12.13		440	2	10.63		1	5.70
" 12 " 13 "	225	3			355	4			2	
" 13 " 14 "	175	1			289	1			1	
" 14 " 15 "	125	...			195	
" 15 and upwards	82	...			199	...			1	
	7,007	538	76.78		12,456	862	69.20		632	54.50

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