The Care and Feeding of Children eBook

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Contents

The Care and Feeding of Children eBook....1

Contents....2

Table of Contents....5

Page 1....8

Page 2....11

Page 3....13

Page 4....15

Page 5....17

Page 6....19

Page 7....21

Page 8....23

Page 9....25

Page 10....27

Page 11....29

Page 12....31

Page 13....33

Page 14....35

Page 15....37

Page 16....39

Page 17....41

Page 18....43

Page 19....45

Page 20....47

Page 21....49

Page 22....51

Page 23.....53
Page 24.....55
Page 25.....57
Page 26.....59
Page 27.....61
Page 28.....63
Page 29.....65
Page 30.....67
Page 31.....69
Page 32.....71
Page 33.....73
Page 34.....75
Page 35.....77
Page 36.....79
Page 37.....81
Page 38.....83
Page 39.....85
Page 40.....87
Page 41.....89
Page 42.....91
Page 43.....94
Page 44.....97
Page 45.....100
Page 46.....102
Page 47.....104
Page 48.....106

Page 49.....108
Page 50.....110
Page 51.....112
Page 52.....114
Page 53.....116
Page 54.....118
Page 55.....120
Page 56.....122
Page 57.....124
Page 58.....126
Page 59.....128
Page 60.....130
Page 61.....132
Page 62.....134
Page 63.....136
Page 64.....138
Page 65.....140
Page 66.....142
Page 67.....144

Table of Contents

Table of Contents

Section	Page
Start of eBook	1
II. INFANT FEEDING	1
III. THE DIET OF OLDER CHILDREN	1
IV. MISCELLANEOUS	1
THE CARE AND FEEDING OF CHILDREN	1
PART I	1
BATHING	1
GENITAL ORGANS	2
EYES	2
MOUTH	2
SKIN	3
CLOTHING	3
NAPKINS	4
NURSERY	5
AIRING	6
WEIGHT, GROWTH, AND DEVELOPMENT	7
DENTITION	9
PART II	10
NURSING	11
WEANING	13
ARTIFICIAL FEEDING	15
THE SELECTION AND CARE OF MILK USED FOR INFANT FEEDING	15
THE MODIFICATION OF COW’S MILK	17
FOOD FOR HEALTHY INFANTS[3] —THE EARLY MONTHS	20
FOOD FOR HEALTHY INFANTS—-THE LATER MONTHS	23
GENERAL RULES FOR GUIDANCE IN THE USE OF THE FORMULAS GIVEN	25
THE ADDITION OF OTHER FOODS TO MILK	27
OVERFEEDING	28
LOSS OF APPETITE	29
THE CHANGES IN THE FOOD	30

REQUIRED BY SPECIAL SYMPTOMS OR CONDITIONS
COMMON MISTAKES IN MILK MODIFICATION AND INFANT FEEDING 34
PREPARATION OF COW'S MILK AT HOME 35
DIRECTIONS FOR FEEDING INFANTS 36
INTERVALS OF FEEDING 37
REGULARITY IN FEEDING 37
STERILIZED MILK 38
MODIFIED MILK OF THE MILK LABORATORIES 39
PEPTONIZED MILK 40
FEEDING DURING THE SECOND YEAR 41
FEEDING DURING THE THIRD YEAR 43
PART III 44
MILK AND CREAM 44
EGGS 45
MEAT AND FISH 45
VEGETABLES 46
CEREALS 46
BROTHS AND SOUPS 47
BREAD, CRACKERS AND CAKES 47
DESSERTS 47
FRUITS 48
INDIGESTION IN OLDER CHILDREN 49
GENERAL RULES TO BE OBSERVED IN FEEDING 50
FOOD FORMULAS 51
PART IV 54
THE BOWELS 54
SLEEP 54
EXERCISE 56
THE CRY 56
LIFTING CHILDREN 57
THE TEMPERATURE 58
NERVOUSNESS 58
TOYS 59
KISSING 59
CONVULSIONS 60
FOREIGN BODIES 60

COLIC 60
EARACHE 61
CROUP 61
CONTAGIOUS DISEASES 62
SCURVY 64
CONSTIPATION 64
DIARRHOEA 65
BAD HABITS 65
VACCINATION 67

Page 1

II. INFANT FEEDING

Nursing
Weaning
Artificial Feeding
Selection and Care of Milk Used for Infant Feeding
Modification of Cow's Milk
Food for Healthy Infants—The Early Months
Food for Healthy Infants—The Later Months
General Rules for Guidance in the Use of the Formulas Given
Addition of Other Foods to Milk
Overfeeding
Loss of Appetite
Changes in Food Required by Special Symptoms or Conditions
Common Mistakes in Milk Modification and Infant Feeding
Preparation of Cow's Milk at Home
Directions for Feeding Infants
Intervals of Feeding
Regularity in Feeding
Sterilized Milk
Modified Milk of the Milk Laboratories
Peptonized Milk
Feeding During the Second Year
Feeding During the Third Year

III. THE DIET OF OLDER CHILDREN

Milk and Cream
Eggs
Meats and Fish
Vegetables
Cereals
Broths and Soups
Bread, Crackers, and Cakes
Desserts
Fruits
Indigestion in Older Children
General Rules to be Observed in Feeding
Food Formulas

IV. MISCELLANEOUS

Bowels
Sleep
Exercise
Cry
Lifting Children
Temperature
Nervousness
Toys
Kissing
Convulsions
Foreign Bodies
Colic
Earache
Croup
Contagious Diseases
Scurvy
Constipation
Diarrhoea
Bad Habits
Vaccination
Weight Charts

THE CARE AND FEEDING OF CHILDREN

PART I

THE CARE OF CHILDREN

BATHING

At what age may a child be given a full tub bath?

Usually when ten days old; it should not be given before the cord has come off.

How should the bath be given?

It should not be given sooner than one hour after feeding. The room should be warm; if possible there should be an open fire. The head and face should first be washed and dried; then the body should be soaped and the infant placed in the tub with its body well supported by the hand of the nurse. The bath should be given quickly, and the body dried rapidly with a soft towel, but with very little rubbing.

At what temperature should the bath be given?

For the first few weeks at 100 deg. F.; later, during early infancy, at 98 deg. F.; after six months, at 95 deg. F.; during the second year, from 85 deg. to 90 deg. F.

With what should the bath be given?

Soft sponges are useful for bathing the body, limbs and scalp. There should be a separate wash-cloth for the face and another for the buttocks.

What are the objections to bath sponges?

When used frequently, they become very dirty and are liable to cause infection of the eyes, mouth or genital organs.

Page 2

Under what circumstances should the daily tub bath be omitted?

In the case of very feeble or delicate infants on account of the exposure and fatigue, and in all forms of acute illness except by direction of the physician. In eczema and many other forms of skin disease much harm is often done by bathing with soap and water, or even with water alone.

GENITAL ORGANS

How should the genital organs of a female child be cleansed?

Best with fresh absorbent cotton and tepid water, or a solution of boric acid, two teaspoonfuls to the pint. This should be done carefully at least once a day. If any discharge is present, the boric-acid solution should invariably be used twice a day. Great care is necessary at all times to prevent infection which often arises from soiled napkins.

How should the genital organs of a male child be cleansed?

In infancy and early childhood the foreskin should be pushed back at least twice a week while the child is in his bath, and the parts thus exposed washed gently with absorbent cotton and water.

If the foreskin is tightly adherent and cannot readily be pushed back, the physician's attention should be called to it. The nurse or mother should not attempt forcible stretching.

When is circumcision advisable?

Usually, when the foreskin is very long and so tight that it cannot be pushed back without force; always, when this condition is accompanied by evidences of local irritation or difficulty in passing water.

EYES

How should the eyes of a little baby be cleansed?

With a piece of soft linen or absorbent cotton and a lukewarm solution of salt or boric acid,—one half of an even teaspoonful to one pint of water.

If pus appears in the eyes, what should be done?

They should be cleansed every hour with a solution of boric acid (ten grains to one ounce of water). If the lids stick together, a little vaseline from a tube should be rubbed upon them at night. If the trouble is slight, this treatment will control it; if it is severe, a physician should be called immediately, as delay may result in loss of eyesight.

MOUTH

How is an infant's mouth to be cleansed?

An excellent method is by the use of a swab made by twisting a bit of absorbent cotton upon a wooden toothpick. With this the folds between the gums and lips and cheeks may be gently and carefully cleansed twice a day unless the mouth is sore. It is not necessary after every feeding. The finger of the nurse, often employed, is too large and liable to injure the delicate mucous membrane.

What is sprue?

It appears on the lips and inside the cheeks like little white threads or flakes. It is also called thrush. In bad cases it may cover the tongue and the whole of the inside of the mouth.

Page 3

How should a mouth be cleansed when there is sprue?

It should be washed carefully after every feeding or nursing with a solution of borax or bicarbonate of soda (baking soda), one even teaspoonful to three ounces of water, and four times a day the boric-acid solution mentioned should be used.

SKIN

How should the infant's skin be cared for to prevent chafing?

First, not too much nor too strong soap should be used; secondly, careful rinsing of the body; thirdly, not too vigorous rubbing, either during or after the bath; fourthly, the use of dusting powder in all the folds of the skin,—under the arms, behind the ears, about the neck, in the groin, *etc*. This is of the utmost importance in very fat infants.

If the skin is very sensitive and chafing easily produced, what should be done?

No soap should be used, but bran or salt baths given instead.

How should a bran bath be prepared?

One pint of wheat bran should be placed in a bag of coarse muslin or cheese-cloth, and this put in the bath water. It should then be squeezed for five minutes until the water resembles a thin porridge.

How should a salt bath be prepared?

A teacupful of common salt or sea salt should be used to each two gallons of water.

How should the buttocks be cared for?

This is the most common place for chafing, as the parts are so frequently wet and soiled; hence the utmost pains should be taken that all napkins be removed as soon as they are wet or soiled, and the parts kept scrupulously clean.

If the parts have become chafed, what should be done?

Only bran and salt baths should be used, and in very severe cases even these may have to be omitted for a day or two. The parts may be cleansed with sweet oil and a little absorbent cotton, and the skin kept covered with a dusting powder composed of starch two parts, boric acid one part.

What is prickly heat, and how is it produced?

It consists of fine red pimples, and is caused by excessive perspiration and the irritation of flannel underclothing.

How should it be treated?

Muslin or linen should be put next to the skin; the entire body should be sponged frequently with equal parts of vinegar and water, and plenty of the starch and boric-acid powder mentioned should be used.

CLOTHING

What are the most essential things in the clothing of infants?

That the chest shall be covered with soft flannel, the limbs well protected but not confined, and the abdomen supported by a broad flannel band, which should be snug but not too tight. It is important that the clothing should fit the body. If it is too tight it interferes with the free movements of the chest in breathing, and by pressing upon the stomach sometimes causes the infant to vomit soon after swallowing its food. If the clothing is too loose it is soon thrown into deep folds or bunches, which cause much discomfort. No pins should be used, but, instead all bands about the body should be basted. The petticoats should be supported by shoulder straps.

Page 4

How should the infant be held during dressing and undressing?

Nothing is more awkward than to attempt to dress a young baby in a sitting posture. It should lie upon the nurse's lap until quite old enough to sit alone, the clothing being drawn over the child's feet, not slipped over the head.

Of what use is the band?

It protects the abdomen, but its most important use is to support the abdominal walls in very young infants, and in this way to prevent the occurrence of rupture.

How long is this band required?

The snug flannel band, not usually more than four months. In healthy infants this may then be replaced by the knitted band, which may be worn up to eighteen months. The band is an important article of dress in the case of thin infants whose abdominal organs are not sufficiently protected by fat. With such, or with those prone to diarrhoea, it is often advisable to continue the band until the third year.

What changes are to be made in the clothing of infants in the summer?

Only the thinnest gauze flannel undershirts should be worn, and changes in temperature should be met by changes in the outer garments. The greatest care should be taken that children are not kept too hot in the middle of the day, while extra wraps should be used morning and evening, especially at the seashore or in the mountains.

Should older children be allowed to go with their legs bare?

If strong and well there is no objection to this in very hot weather. In cold weather, however, it is doubtful if any children are benefited by it, particularly in a changeable climate like that of New York. Many delicate children are certainly injured by such attempts at hardening.

What sort of underclothing should be worn during cold weather?

Never the heaviest weight, even in winter. Four grades are usually sold, the next to the heaviest being thick enough for any child.

Do little children require as heavy flannels as older people?

Not as a rule. They usually live in a warm nursery; their circulation is active; and they always perspire easily during their play. When they go out of doors, the addition of coats and leggings renders thick flannels unnecessary.

Are not many little children clothed too thinly for the ordinary house?

Very few. The almost invariable mistake made in city homes is that of excessive clothing and too warm rooms. These two things are among the most frequent reasons for their taking cold so easily.

NAPKINS

How should napkins be taken care of?

They should he immediately removed from the nursery when soiled or wet. Soiled napkins should be kept in a receptacle with a tight cover, and washed as soon as possible.

Should napkins which have been only wet be used a second time without washing?

Page 5

It is no doubt better to use only fresh napkins, but there is no serious objection to using them twice unless there is chafing of the skin. Clean napkins, changed as soon as wet or soiled, are of much importance in keeping the skin healthy.

What are the important things to be observed in washing napkins?

Soiled napkins should not be allowed to dry, but should receive a rough washing at once; they should then be kept in soak in plain water until a convenient time for washing,—at least once every day,—when they should be washed in hot suds and boiled at least fifteen minutes. Afterward they should be very thoroughly rinsed or they may irritate the skin, and ironed without starch or blueing. They should never be used when clamp.

NURSERY

What are the essentials in a good nursery?

The furnishings should be very simple, and unnecessary hangings and upholstered furniture should be excluded. As large a room as possible should be selected—one that is well ventilated, and always one in which the sun shines at some part of the day, as it should be remembered that an average child spends here at least three fourths of its time during the first year. The nursery should have dark shades at the windows, but no extra hangings or curtains; about the baby's crib nothing but what can be washed should be allowed. The air should be kept as fresh and as pure as possible. There should be no plumbing no drying of napkins or clothes, no cooking of food, and no gas burning at night. A small wax night-light answers every purpose.

How should a nursery be heated?

Best by an open fire; next to this by a Franklin stove. The ordinary hot-air furnace of cities has many objections, but it is not so bad as steam heat from a radiator in the room. A gas stove is even worse than this, and should never be used, except, perhaps, for a few minutes during the morning bath.

At what temperature should a nursery be kept during the day?

Best, 66 deg. to 68 deg. F., measured by a thermometer hanging three feet from the floor. Never should the temperature be allowed to go above 70 deg. F.

At what temperature during the night?

During the first two or three months, not below 65 deg. F. After three months the temperature may go as low as 55 deg. F. After the first year it may be 50 deg. or even 45 deg. F.

At what age may the window be left open at night?

Usually after the third month, except when the outside temperature is below freezing point.

How often should the nursery be aired?

At least twice a day—in the morning after the child's bath, and again in the evening before the child is put to bed for the night. This should be done thoroughly, and the child should be removed meanwhile to another apartment. It is well to air the nursery whenever the child is out of the room.

Page 6

What symptoms are seen in a child who is kept in too hot a room?

It becomes pale, loses appetite, shows symptoms of indigestion, occasionally vomits, stops gaining in weight, perspires very much, and takes cold easily because of this and also because of the great difference between the indoor and outdoor temperatures. Its condition may be such as to lead one to suspect very serious illness.

AIRING

How early may airing indoors he commenced and how long may it be continued?

Airing in the room may be begun, even in cold weather, when the child is one month old, at first for only fifteen minutes at a time. This period may be gradually lengthened by ten or fifteen minutes each day until it is four or five hours. This airing may be continued in almost all kinds of weather.

Is there not great danger of a young baby's taking cold when aired in this manner?

Not if the period is at first short and the baby accustomed to it gradually. Instead of rendering the child liable to take cold, it is the best means of preventing colds.

How should such an airing be given?

The child should be dressed with bonnet and light coat as if for the street and placed in its crib or carriage which should stand a few feet from the window All the windows are then thrown wide open, but the doors closed to prevent draughts. Screens are unnecessary.

At what age may a child go out of doors?

In summer, when one week old; in spring and fall, usually at about one month; in winter, when about three months old, on pleasant days, being kept in, the sun and out of the wind.

What are the best hours for airing out of doors?

In summer and early autumn a child may be out almost any time between seven in the morning and sunset; in winter and early spring, a young child only between 10 or 11 A.M. and 3 P.M., although this depends somewhat upon the climate. In New York and along the Atlantic coast the early mornings are apt to be damp and the afternoons raw and cloudy.

On what kind of days should a baby not go out?

In sharp winds, when the ground is covered with melting snow, and when it is extremely cold. A child under four months old should not usually go out if the thermometer is below freezing point; nor one under eight months old if it is below 20 deg. F.

What are the most important things to be attended to when the child is out in its carriage?

To see that the wind never blows in its face, that its feet are properly covered and warm, and that the sun is never allowed to shine directly into its eyes when the child is either asleep or awake.

Of what advantage to the child is going out?

Fresh air is required to renew and purify the blood, and this is just as necessary for health and growth as proper food.

Page 7

What are the effects produced in infants by fresh air?

The appetite is improved, the digestion is better, the cheeks become red, and all signs of health are seen.

Is there any advantage in having a child take its airing during the first five or six months in the nurse's arms?

None whatever. A child can be made much more comfortable in a baby carriage, and can be equally well protected against exposure by blankets and the carriage umbrella.

What are the objections to an infant's sleeping out of doors?

There are no real objections. It is not true that infants take cold more easily when asleep than awake, while it is almost invariably the case that those who sleep out of doors are stronger children and less prone to take cold than others.

What can be done for children who take cold upon the slightest provocation?

They should be kept in cool rooms, especially when asleep They should not wear such heavy clothing that they are in a perspiration much of the time. Every morning the body, particularly the chest and back, should be sponged with cold water (50 deg. to 60 deg. F.).

How should this cold sponge bath be given?

The child should stand in a tub containing a little warm water, and a large bath sponge filled with cold water should be squeezed two or three times over the body. This should be followed by a vigorous rubbing with a towel until the skin is quite red. This may be used at three years, and often at two years. For infants a little higher temperature (65 deg. to 70 deg.) may be used.

WEIGHT, GROWTH, AND DEVELOPMENT

Of what importance is the weight of the child?

Nothing else tells so accurately how well it is thriving.

During the first year a record of the weight is almost indispensable; throughout childhood it is of much interest and is the best guide to the physical condition. It will well repay any mother or nurse to keep such a record.

How frequently should a child be weighed?

Every week during the first six months, and at least once in two weeks during the last six months of the first year. During the second year a child should be weighed at least once a month.

How rapidly should an infant gain in weight during the first year?

There is usually a loss during the first week of from four to eight ounces; after this a healthy child should gain from four to eight ounces a week up to about the sixth month. From six to twelve months the gain is less, usually from two to four ounces a week.

Is it to be expected that bottle-fed infants will gain as rapidly as those who are nursed?

They seldom do so during the first month; after that time under favourable circumstances the gain is usually quite as regular, and during the latter half of the first year it is likely to be more continuous than in a nursing infant, because the latter usually loses weight at the time of weaning.

Page 8

Why do they not gain so rapidly at first?

It takes a few weeks for the stomach to become accustomed to cow's milk, and until this is accomplished it is necessary to make the milk very weak or the child's digestion will be upset.

For a child of average weight at birth (seven to seven and a half pounds) what should be the weight at the different periods during the first year?

At three months it should be twelve to thirteen pounds; at six months, fifteen to sixteen pounds; at nine months, seventeen to eighteen pounds; at one year, twenty to twenty-two pounds. At five months a healthy child will usually double its weight, and at twelve months it will nearly treble its weight.

Do all healthy infants gain steadily in weight during the first year?

As a rule they do; yet it is seldom the case that one gains every week for the entire year. With most infants there are from time to time periods of a few weeks in which no gain is made. These are more often seen from the seventh to the tenth month and frequently occur when the child is cutting teeth, sometimes during very hot weather.

Is it true that every infant who gains rapidly in weight is thriving normally?

Not invariably. Some who are fed upon prepared infant foods increase rapidly in weight but not in strength, nor in their development in other respects.

Is the weight of as much value in the second year as a guide to the child's condition?

After the first year, the gain in weight is seldom continuous; there are many interruptions, some depend on season, and others often occur without apparent cause.

At what age should the fontanel close?

The average is about eighteen months. It seldom closes earlier than fourteen months, and it should not be open at two years.

At what age should a child hold up its head?

As a rule during the fourth month, and often during the third month, the head can be held erect when the body is supported.

When does an infant first laugh aloud?

Usually from the third to the fifth month.

When does it begin to reach for toys and handle them?

Usually from the fifth to the seventh month.

At what age should a child be able to sit and to stand alone?

At seven or eight months a healthy child is usually able to sit erect and support the body. During the ninth and tenth months are usually seen the first attempts to bear the weight upon the feet, and at eleven or twelve months most children can stand with assistance.

When should a child walk alone?

The first attempts are generally seen in the twelfth or thirteenth month. At fifteen or sixteen months the average child is able to run alone.

What conditions postpone these events?

Prematurity, a very delicate constitution, any severe or prolonged illness, and especially chronic disturbances of digestion making feeding difficult. A common cause of late sitting, standing, or walking is rickets.

Page 9

Should a child be urged to walk?

Never; he is usually quite willing to do so as soon as his muscles and bones are strong enough. None of the contrivances for teaching children to walk are to be advised.

When do children begin to talk?

Generally at one year a child can say “papa” and “mamma” or other single words. At the end of the second year the average child is able to put words together in short sentences.

If at two years the child makes no attempt to speak, what should be suspected?

Either that the child is a deaf-mute or that it is mentally deficient, although this is occasionally seen in children who are only very backward.

Table showing the Average Weight, Height, and Circumference of Head and Chest of Boys[1]

At birth	Weight	7-1/2 pounds.
	Height	20-1/2 inches.
	Chest	13-1/2 "
	Head	14 "
One year	Weight	21 pounds.
	Height	29 inches.
	Chest	18 "
	Head	18 "
Two years	Weight	26-1/2 pounds.
	Height	32-1/2 inches.
	Chest	19 "
	Head	19 "
Three years	Weight	31 pounds.
	Height	35 inches.
	Chest	20 "
	Head	19-1/2 "
Four years	Weight	35 pounds.
	Height	38 inches.
	Chest	20-3/4 "
	Head	19-3/4 "

Five years	Weight	41 pounds.
Height	41-1/2 inches.	
Chest	21-1/2 "	
Head	20-1/2 "	
Six years	Weight	45 pounds.
Height	44 inches.	
Chest	23 "	
Seven years	Weight	49-1/2 pounds.
Height	46 inches.	
Chest	23-1/2 "	
Eight years	Weight	54-1/2 pounds.
Height	48 inches.	
Chest	24-1/2 "	
Nine years	Weight	60 pounds.
Height	50 inches.	
Chest	25 "	
Ten years	Weight	66-1/2 pounds.
Height	52 inches.	
Chest	26 "	

The above weights are with ordinary house clothes.

[1] Weights for the first four years are without clothes.

The weight of girls is on the average about one pound less than boys. They are about the same in height.

Charts showing weight curve for the first year, and from one year to fourteen years are given at the end of this book.

DENTITION

How many teeth are there in the first set?

Twenty.

What is the time of their appearance?

Page 10

The two central lower teeth are usually the first to appear, and come from the fifth to the ninth month; next are the four upper central teeth, which come from the eighth to the twelfth month. The other two lower central teeth and the four front double teeth come from the twelfth to the eighteenth month. Then follow the four canine teeth, the two upper ones being known as the “eye teeth,” and the two lower as the “stomach teeth”; they generally come between the eighteenth and the twenty-fourth month. The four back double teeth, which complete the first set, come between the twenty-fourth and thirtieth month.

At one year a child usually has six teeth.
At one and a half years, twelve teeth.
At two years, sixteen teeth.
At two and a half years, twenty teeth.

What are the causes of variation?

The time of appearance of the teeth varies in different families; in some they come very early, in others much later. The teeth may come late as a result of prolonged illness and also from rickets.

What symptoms are commonly seen with teething?

In healthy children there is very often fretfulness and poor sleep for two or three nights; there may be loss of appetite, so that only one half the usual amount of food is taken; there is salivation or drooling, and often slight fever; there may be some symptoms of indigestion, such as vomiting or the appearance of undigested food in the stools. In delicate children all these symptoms may be much more severe.

How long do these symptoms last?

Usually only three or four days; but there may be no gain in weight for two or three weeks.

What is the cause of most of the other symptoms attributed to teething?

Nearly all of them come from indigestion due to bad feeding.

PART II

INFANT FEEDING

What is the best infant food?

Mother’s milk.

Of what is mother's milk composed?

Thirteen parts solids and eighty-seven parts water.

What are the solids?

Fat, sugar, proteids, and salts.

What is the fat?

The cream.

What is the sugar?

It is lactose, or milk sugar.

What are the proteids?

The curd of the milk.

Are all these elements necessary?

Yes; we cannot expect to rear a healthy infant unless they are all in his food.

Of what use is the fat?

It is needed for the growth of the bones, the nerves, the fat of the body, and the production of heat.

Of what use is the sugar?

It is needed for the production of heat, and to make fat in the body.

Of what use are the proteids?

They are needed for the growth of the cells of the body, such as those of the blood, the various organs, and the muscles.

Page 11

Of what use are the salts?

Particularly for the growth of bone.

Of what use is the water?

By means of the water the food is kept in a state of minute subdivision or in solution, so that the delicate organs of a young infant can digest it. It is also necessary to enable the body to get rid of its waste.

NURSING

Should all mothers attempt to nurse their children?

As a rule they should do so, but there are many conditions when they should not.

What are the most important ones?

If the mother has or has had tuberculosis or any other serious chronic disease, or is herself in very delicate health, she should not try. She is likely soon to fail in nourishing her child, and the attempt may do herself much harm as well as injure the child.

How often should infants be nursed during the first two days of life?

Usually only four or five times daily, since there is very little milk secreted at this time.

When does the milk come in abundance?

Usually on the third day, sometimes not until the fourth or fifth day.

Should the infant be fed anything additional during the first two days?

Usually not; if much food were necessary, we may be sure Nature would have provided it. Water, however, should be given regularly.

How frequently should an infant be nursed during the first week?

After the third day, every two hours during the day and twice during the night. The frequency during the rest of the first year is given in the following table:

PERIOD. Nursings in 24 hours. Interval by day. Night nursings (10 P.M. to 6 A.M.).

1st and 2d day	4	6 hours.	1
3 days to 6 weeks	10	2 "	2
6 weeks to 3 months	8	2-1/2 "	2
3 to 5 months	7	3 "	1
5 to 12 months	6	3 "	0

How long should the child be kept at the breast for one nursing?

Not over twenty minutes.

Should the child take both breasts at one nursing?

If the milk is very abundant one breast may be sufficient, otherwise both breasts may be taken.

What are the important things to be attended to in nursing?

First, regularity; it is just as important as in the case of bottle-feeding. Secondly, the nipples should be kept clean by being washed after every nursing.

What should be the diet of a nursing mother?

She should have a simple but generous diet with plenty of fluids; three regular meals may be given and gruel, milk, or cocoa at bed-time and sometimes between meals. She may take eggs, cereals, most soups, and nearly all vegetables, avoiding sour fruits, salads, pastry, and most desserts. Meat should not be taken more than twice daily, and in many cases but once. She should take but little tea or coffee, and ordinarily no wine or beer.

Page 12

Are fruits likely to disturb a nursing infant?

Sour fruits in some cases may do so, but sweet fruits and most cooked fruits are useful.

What else is important in the life of the nursing mother?

She should lead a simple natural life; should have regular out-of-door exercise, preferably walking or driving, as soon after her confinement as her condition will permit. She should have regular movements from the bowels daily. She should be as free as possible from unnecessary cares and worry; her rest at night should be disturbed as little as possible; she should lie down for at least one hour in the middle of the day.

Does the nervous condition of the mother affect the milk?

Very much more than her diet; worry, anxiety, fatigue, loss of sleep, household cares, social dissipation *etc*., have more than anything else to do with the failure of the modern mother as a nurse. Uncontrolled emotions, grief, excitement, fright, passion, may cause milk to disagree with the child; at times they may excite acute illness, and at other times they may cause a sudden and complete disappearance of the milk.

Does menstruation affect the milk?

In nearly all cases the quantity of milk is lessened so that the infant is not satisfied and may gain less in weight or not at all. In many cases the quality of the milk is also affected to such a degree as to cause slight disturbances of digestion, such as restlessness, colic, and perhaps some derangement of the bowels. In a few, attacks of acute indigestion are excited.

Is regular menstruation a reason for stopping nursing?

Not invariably; as a rule both functions do not go on together. But if the child is gaining regularly in weight between the periods, nursing may be continued indefinitely, although it may be well to feed the infant wholly or in part during the first day or two that the mother is unwell.

What symptoms indicate that a nursing infant is well nourished?

The child has a good colour, sleeps for two or three hours after nursing, or, if awake, is quiet, good-natured, and apparently comfortable. It has normal movements of the bowels and gains steadily in weight.

What symptoms indicate that a child who is nursing is not properly nourished?

It does not gain and may even lose in weight. It no longer exhibits its usual energy and playfulness, but is either listless and indifferent or cross, fretful and irritable, and is apt

to sleep poorly. It grows pale and anaemic and its tissues become soft and flabby. When the milk is scanty it will often nurse a long time at the breasts, sometimes three quarters of an hour, before stopping. At other times it may take the breast for a moment only, and then turn away in apparent disgust.

What should be done when such symptoms appear?

This depends upon the severity of the symptoms and how long they have lasted. If the child has made no gain for three or four weeks, or is losing weight, immediate weaning will probably be necessary; in any case, other food in addition to the breast milk should be given at once. One may begin by alternating the nursing and the bottle-feeding and increase the number of bottle-feedings as may be indicated by the results.

Page 13

Is there any objection to a baby being partly nursed and partly fed?

None whatever; it is often better from the outset to feed the baby during the night, in order not to disturb the mother's rest.

What symptoms indicate that the mother's milk disagrees with the child?

The child suffers from almost constant discomfort sleeps; little and then restlessly, cries a great deal, belches gas from the stomach, and passes much by the bowels, or if not passed, the gas accumulates and causes abdominal distention and colicky pain. There may be vomiting, but more often the trouble is intestinal. Sometimes the bowels are constipated, but usually the movements are frequent, loose, green, contain mucus and are passed with much gas.

What should be done under these circumstances?

If the symptoms have persisted for two or three weeks and the child is not gaining in weight, there is little chance of improvement, and the child should be taken from the breast at once. If there is some gain in weight, one may try for a little longer, endeavouring to improve the mother's milk by rest, fresh air, careful diet, *etc*. However, one should always realize that the trouble is with the milk, not with the child.

What changes should be made if a nursing infant habitually vomits?

If this occurs soon after nursing, the infant has usually taken too much and the time of nursing should be shortened, or one breast may be given instead of two; the nursing should also be interrupted by occasional rests, so that the milk is not taken too fast.

If the vomiting occurs some time after nursing and is repeated, it is a sign of indigestion; often because the milk is too rich in fat. The intervals between nursings should then be lengthened; the breast milk may be diluted by giving one or two tablespoonfuls of plain boiled water, lime-water, or barley-water, five or ten minutes before nursing; the mother should eat less hearty food, especially less meat.

What should be done if the infant has frequent or habitual colic?

This is usually because the milk is too rich in proteids; the mother should take more out-of-door exercise, eat less meat, and seek to control her emotions; all causes of worry should be removed.

Can constipation in a nursing infant be controlled through the mother's milk?

Only to a limited extent. It is important that the mother's bowels be regular and her digestion good. An increase in the meat and milk of her diet is sometimes beneficial.

WEANING

At what age should the child be weaned from the breast?

Usually weaning should be begun at nine or ten months by substituting one feeding a day for one nursing, later two feedings, and thus gradually the child is to be taken from the breast altogether.

Page 14

What is the principal reason for weaning earlier?

The most important one is that the child is not thriving—not gaining in weight and not progressing normally in its development. Serious illness of the mother, or pregnancy, may make weaning necessary.

At what age should the weaning be completed?

Generally at one year. In summer it may sometimes be advisable to nurse an infant a little longer rather than wean in warm weather; but even then the dangers of weaning are much less than those of continuing to nurse, as is so often done, after the milk has become very scanty and poor in quality.

When should a child who is weaned from the breast be taught to drink from the cup, and when to take the bottle?

If weaning is done as early as the eighth or ninth month it is better to give the bottle; if from the tenth to the twelfth month the infant should be taught to drink or be fed with a spoon.

How may some of the difficulties in weaning be overcome?

By feeding every nursing infant once a day or by giving it water regularly from a feeding-bottle. It then becomes accustomed to the bottle. This is a matter of great convenience during the whole period of nursing when the mother or nurse is from necessity away from the child for a few hours; when more feeding is required at weaning time the child does not object.

When should a child be weaned from the bottle?

With children who are not ill, weaning from the bottle should invariably be begun at the end of the first year, and after a child is thirteen or fourteen months old the bottle should not be given except at the night feeding.

Is there any objection to the child's taking the bottle until it is two or three years old?

There are no advantages and some serious objections. Older children often become so attached to the bottle that only with the greatest difficulty can they be made to give it up. Frequently they will refuse all solid food, and will take nothing except from the bottle so long as it is given, and when finally at three or four years, it is taken away, they will not touch milk during the rest of their childhood. The difficulty is here that children form the "bottle habit." This habit is troublesome, unnecessary, and should by all means be prevented. An exclusive diet of milk for children of two or three years often results in anaemia and malnutrition.

How should one train a child to do without the bottle?

This is usually very easy if it is begun at one year. The milk should be poured into a tiny glass or cup and little by little the child is taught to drink; at first only a small portion of the food is taken in this way, the balance being given from the bottle; but in the course of a few weeks the average infant learns to drink from a cup without difficulty, and all the food can be so given.

Page 15

If the child is two or more years old, the only effective means of weaning from the bottle is through hunger. The bottle should be taken away at once and entirely, and nothing allowed except milk from a cup until the child takes this willingly. Sometimes a child will go an entire day without food, occasionally as long as two days, but one should not be alarmed on this account and yield. This is a matter of the child's will and not of his digestion, and when once he has been conquered it is seldom that any further trouble is experienced. As soon as a child has learned to drink his milk from a cup, cereals and other solid foods may gradually be added to the diet. The educational value of such training is not the least important consideration.

Can a baby just weaned take cow's milk of the same proportions as one of the same age who has had cow's milk from birth?

Very rarely; to give a baby who has had nothing but the breast from birth, plain cow's milk, or even that milk which a bottle-fed baby of the same age might take, is almost certain to cause indigestion. The change in the food is quite a marked one, and should be made gradually by beginning with a very weak milk and increasing its strength as the baby becomes accustomed to take cow's milk.

What would be the proper proportions for an infant weaned at four or five months?

About the same as for a healthy bottle-fed infant of two months; the quantity of course should be larger. The food can in most cases be gradually increased so that in two or three weeks the usual strength for the age can be taken.

What would be the proper proportions for an infant weaned at nine or ten months?

About the same as for a bottle-fed infant at four or five months, to be increased as indicated above.

Will not a child lose in weight when placed upon so low a diet?

Very often it will do so for the first week or two, but after that will gain quite regularly; the acute indigestion, however, which generally accompanies the use of stronger milk will, in most cases, cause a greater loss.

ARTIFICIAL FEEDING

What foods contain all the elements present in mother's milk?

The milk of other animals,—cow's milk being the only one which is available for general use.

Is it not possible for infants to thrive upon other foods than those containing fresh milk?

They may do so for a time, but never permanently. The long-continued use of other foods as the sole diet is attended with great risk.

What are the dangers of such foods?

Frequently scurvy is produced (see page 141), often rickets, and in other cases simply a condition of general malnutrition,—the child does not thrive, is pale, and its muscles are soft and flabby.

THE SELECTION AND CARE OF MILK USED FOR INFANT FEEDING

Page 16

What are the essential points in milk selected for the feeding of infants?

That it comes from healthy cows, and that it is clean and fresh.

Is it not important to select a rich milk?

By no means; in fact the very rich milk of highly bred Jerseys and Alderneys has not been found nearly so satisfactory in infant feeding as that from some other herds, such, for example, as the common “grade cows.”

Which is the better, milk from one cow or the mixed milk of several cows?

The mixed, or “herd milk,” is usually to be preferred since it varies little from day to day; while that from a single cow may vary considerably.

How fresh is it important that cow’s milk should be for the best results in infant feeding?

This depends very much upon the season, and how carefully milk is handled. As ordinarily handled at the dairy and in the home, milk should not be used for infants in winter after it is forty-eight hours old; in summer not after it is twenty-four hours old, and it may be unsafe in a much shorter time. When handled with especial care milk may be safe for a longer time.

What are the two essentials in handling milk?

1. That it be kept clean and free from contamination. This necessitates that cows, stables, and milkers be clean, and that transportation be in sealed bottles; also that those who handle the milk do not come in contact with any contagious disease. All milk-pails, bottles, cans, and other utensils with which the milk comes in contact should be sterilized shortly before they are used, by steam or boiling water.

2. That it be cooled immediately after leaving the cows, and kept at as low a temperature as possible; to be efficient this should not be above 50 deg. F.

Milk produced under hygienic conditions and handled with special care is sold in bottles in a number of cities under the name of “certified,” “guaranteed,” or “inspected” milk. When available such milk should be used for infants. Of course the extra care bestowed in its production and transportation increases the cost of the milk, but the best will usually be found in the end to be the cheapest.

How should milk be handled in the home when obtained fresh from the cows?

That to be used for infants should be strained through a thick layer of absorbent cotton or several thicknesses of cheese-cloth into quart glass jars or milk bottles which should be covered and cooled immediately best by placing the bottles quite up to their necks in

ice water or cold spring water, where they should stand for at least half an hour. That required for children who take plain milk may now be poured into half-pint bottles, stopped with cotton, and put in the ice-chest, or the coolest place possible. This first rapid cooling is very important and adds much to the keeping qualities of the milk. Milk loses its heat very quickly when cooled in water, but very slowly when it is simply placed in a cold room. After standing four or five hours the top-milk may be removed; after twelve to sixteen hours the cream may be removed.

Page 17

How should milk be handled when bottled milk is purchased?

It should be cooled as just described, as its temperature is usually somewhat raised during transportation If it has been bottled at a dairy, the cream or the top-milk may be removed after an hour or so.

How should milk and cream be handled when they are purchased in bulk?

Such milk should never be used for infants when it is possible to obtain bottled milk, as it is much more liable to contamination. Both cream and milk should be poured at once into covered vessels and kept in the coolest place possible. The cream and top-milk will seldom rise upon such milk with any satisfactory regularity.

What are the important things to be secured in nursery refrigerators?

Absolute cleanliness is essential; hence the inner portion should be of metal. Those made entirely of metal are unsatisfactory as in them the ice melts very quickly. If the ordinary metal refrigerator sold is encased in a wooden box, we have the best form. Another easy way of securing the same result Is to make for the refrigerator a covering or “cosey” of felt or heavy quilting, which can be easily removed when wet or soiled.

The compartments of the refrigerator should be so arranged that the bottles of milk are either in contact with the ice or very near it. The supply of ice should be abundant. Often the amount of ice is so small, and the bottles so far away, that the temperature of the milk is never below 60 deg. or 65 deg. F. To be really effective a refrigerator should have a temperature where the milk is placed of not over 50 deg. F. The temperature should be tested with the nursery thermometer from time to time to ascertain what results are being obtained. Spoiled milk owing to a faulty refrigerator is to be blamed for many attacks of acute illness among infants. Next to the feeding-bottles it is the one thing in the nursery which should receive the closest attention.

THE MODIFICATION OF COW’S MILK

Can cow’s milk be fed to infants without any changes?

No; for although it contains similar elements to those in mother’s milk, they are not identical, and they are not present in the same proportions.

Is this a matter of much importance?

It is of the greatest importance. There are few infants who can digest cow’s milk unless it is changed. To change cow’s milk so as to make it more nearly resemble mother’s milk is called *modifying* cow’s milk.

How is this milk whose proportions have been changed distinguished from the original unchanged milk?

The changed milk is usually called “modified milk”? the original unchanged milk is known as “plain milk,” “whole milk,” “straight milk,” or is referred to simply as “milk.”

What are the principal differences between cow’s milk and mother’s milk?

Page 18

Cow's milk has a little more than half as much sugar; it has nearly three times as much proteids and salts; its proteids are different and much more difficult of digestion; its reaction is decidedly acid, that of mother's milk is faintly acid or neutral.

Are there any other important things to be considered?

Yes; mother's milk is always fed fresh and is practically sterile. Cow's milk is generally kept twenty-four hours and sometimes much longer. It is always to a greater or less degree contaminated by dirt and germs, the number of which increases rapidly (1) with the age of the milk; (2) in proportion to amount of the dust or dirt which enters it; (3) with any increase in the temperature at which the milk is kept.

It is just as important for success in infant feeding that these conditions receive attention as that the proportions of the different elements of the milk are right.

How is the acidity of cow's milk overcome?

By the addition of lime-water or bicarbonate of soda. If lime-water is used, one ounce to twenty ounces of food is generally required; if soda is used, twenty grains to twenty ounces of food.

If there is a tendency to constipation the milk of magnesia (Phillips's) may be used; from one half to one teaspoonful being added to each twenty ounces of food.

How is the sugar best increased?

By adding milk sugar to the food; one ounce to each twenty ounces of food will give the proper quantity for the first three or four months. This will make the proportion about the same (between 6 and 7 per cent) as in mother's milk.

How should the sugar be prepared?

Simply dissolved in boiled water; if the solution is not clear, or if there is a deposit after standing, it should be filtered by pouring through a layer of absorbent cotton, half an inch thick, which is placed in an ordinary funnel.

Will not cane (granulated) sugar answer as well?

Not as a rule; however, there are many infants who get on very well when cane sugar is used. It has the advantage of being much cheaper. A good grade of milk sugar is somewhat expensive, costing from twenty-five to sixty cents a pound, and cheap samples are apt to contain impurities.

If cane sugar is used, what amount should be added?

Considerably less than of the milk sugar. Usually about half the quantity (half an ounce to twenty ounces of food) is as much as most infants can digest If the same quantity is used as of the milk sugar, the food is made unduly sweet, and the sugar is likely to ferment in the stomach and cause colic.

Is not the purpose of the sugar to sweeten the food in order to make it palatable?

Not at all; although it does that, its real use is to furnish one of the essential elements needed for the growth of the body, and the one that is required by young infants in the largest quantity.

Page 19

How do we know that this is so?

By the fact that in good breast milk the amount of sugar is greater than that of the fat, proteids, and salts combined.

We have seen that cow's milk has nearly three times as much proteids (curd) and salts as mother's milk. How are these to be diminished?

By diluting the milk.

Will it be sufficient to dilute the milk twice (i.e., add two parts of water to one part of milk)?

Not for a very young infant. Although this will give about the quantity of proteids present in mother's milk, the proteids of cow's milk are so much more difficult for the infant to digest, that in the beginning it should be diluted five or six times for most infants.

If cow's milk is properly diluted and lime-water and sugar added does it then resemble mother's milk?

No; the mixture contains too little fat.

What is the easiest way of overcoming this?

By increasing the fat in the milk before dilution. It may be done by using top-milk or a mixture of milk and cream.

What is top-milk?

It is the upper layer of milk removed after standing a certain number of hours in a milk bottle, glass jar, or any tall vessel with straight sides. It contains most of the cream and some of the milk just below.

The strength of the top-milk is measured by the fat it contains—e.g., a 10-per-cent milk contains 10 per cent fat; 7-per-cent milk contains 7 per cent fat, *etc*. These are the two strengths of top milk most used in infant feeding.

On what does the percentage of fat in top-milk depend?

1. On the length of time the milk has stood.

2. On the manner in which the top-milk is removed.

3. On the number of ounces removed.

4. On the richness of the milk used.

Unless these are known it is impossible to say even approximately how strong in fat the top-milk is.

When and how should top-milk be removed?

If milk fresh from the cow, or before the cream has risen, is put into bottles and rapidly cooled, the top-milk may be removed in as short a time as four hours. In the case of bottled milk it makes little difference if it stands a longer time, even until the next day. The best means of removing it is by a small cream-dipper[2] holding one ounce; although it may be taken off by a spoon or siphon. It should not be poured off.

[2] Obtained from any of the Walker-Gordon milk laboratories, from James Dougherty, No. 411 West 59th Street, New York, and from many druggists. Price, 20 cents.

How can we obtain a 10-per-cent top-milk with the different kinds of cow's milk?

From a rather poor milk (containing 3—3-1/2 per cent fat) by removing the upper eight ounces from a quart, or one fourth.

From a good average milk (containing 4 per cent fat) by removing the upper eleven ounces from a quart, or about one third.

Page 20

From a rich Jersey milk (containing 5—5-1/2 per cent fat) by removing the upper sixteen ounces, or one half.

How can we obtain a 7-per-cent top-milk with the different kinds of cow's milk?

From a rather poor milk, by removing the upper eleven ounces from a quart, about one third.

From a good average milk, by removing the upper sixteen ounces, or one half.

From a rich Jersey milk, by removing the upper twenty-two ounces, or about two thirds.

[Illustration: The percentage of fat in the different layers of milk of good average quality.]

What is cream?

Cream is often spoken of as if it were the fat in milk. It is really the part of the milk which contains most of the fat. It differs from milk chiefly in containing much more fat.

In what ways is cream now obtained?

(1) By skimming, after the milk has stood usually for twenty-four hours? this is known as "gravity cream." (2) By an apparatus known as a separator; this is known as "centrifugal cream"; most of the cream now sold in cities is of this kind. The richness of any cream is indicated by the amount of fat it contains.

The usual gravity cream sold has from 16 to 20 per cent fat. The cream removed from the upper part (one fifth) of a bottle of milk has about 16 per cent fat. The usual centrifugal cream has 18 to 20 per cent fat. The heavy centrifugal cream has 35 to 40 per cent fat.

FOOD FOR HEALTHY INFANTS[3]—THE EARLY MONTHS

[3] The directions and formulas given in the following pages are intended only for guidance in feeding children who are not suffering from any special disturbance of digestion; directions for such conditions are given in a later chapter.

What are the most important points to be remembered in modifying cow's milk for feeding during the early months?

That of the different ingredients of milk the sugar is most easily digested; the fat is next; while the proteids are the most difficult.

What relation should the fat bear to the proteids during this period?

For most infants with good digestion the best results are obtained when the fat is three times the proteids. However, this is not true of all. There are many healthy infants who are unable to digest this proportion of fat, and who do much better when the fat is made only twice the proteids.

How can one obtain formulas in which the fat is three times the proteids?

By using for dilution a 10-per-cent milk (i.e., milk containing 10 per cent fat) which serves as the primary formula from which all the other formulas of this series are derived.

In 10-per-cent milk the fat is just three times the proteids.

How can one get the 10-per-cent milk?

(1) As top-milk, as described on page 64; or, (2) by mixing equal parts of plain milk and ordinary cream (containing about 16 per cent fat); (3) from any of the milk laboratories it may be ordered directly.

Page 21

Is it better to obtain the 10-per-cent milk by using a mixture of milk and cream, or as top-milk?

If one can get milk fresh from the cows, the top-milk is to be preferred on account of freshness. The food can then be made up when the milk is but a few hours old. In cities, if one uses bottled milk, the upper third may also be used. But if one buys milk and cream separately, it is usually more convenient to mix these, as the cream will not rise upon milk a second time with any uniformity.

How can one obtain formulas in which the fat is twice the proteids?

By using for dilution a 7-per-cent milk (i.e., milk containing 7 per cent fat) which serves as the primary formula from which all the other formulas of this series are derived.

In 7-per-cent milk the fat is just twice the proteids.

How can one get the 7-per-cent milk?

(1) As top-milk, as described on page 64; or, (2) by mixing three parts of milk and one part of ordinary (16 per cent) cream; (3) from any of the milk laboratories it may be obtained directly. As in the case of 10-per-cent milk, the top-milk is generally to be preferred to a mixture of milk and cream.

How should the food be prepared during the early months?

It is convenient in calculation to make up twenty ounces of food at a time. The first step is to obtain the 10-per-cent milk or the 7-per-cent milk to be used as the primary formula. Then to take the number of ounces of this that are called for in the formula desired.

Note.—One should not make the mistake of taking from the top of the bottle only the number of ounces needed in the formula as this may give quite a different result.

There will be required in addition one ounce of milk sugar[4] and one ounce of lime-water in each twenty ounces. The rest of the food will be made up of boiled water.

[4] If the milk sugar be measured in the milk-dipper, two scant dipperfuls may be calculated as one ounce. If measured in a tablespoon, three even tablespoonfuls may be calculated as one ounce.

These formulas written out would be as follows:

First Series

Formulas for the Early Months from 10-per-cent Milk

I. II. III. IV. V.

10-per-cent milk 2 oz. 3 oz. 4 oz. 5 oz. 6 oz.
Milk sugar 1 " 1 " 1 " 1 " 1 "
Lime-water 1 " 1 " 1 " 1 " 1 "
Boiled water 17 " 16 " 15 " 14 " 13 "
---
20 oz. 20 oz. 20 oz. 20 oz. 20 oz.

/pre>

As the milk sugar dissolves in the water the total in each column will be exactly twenty ounces. The food is strengthened by gradually increasing the milk and reducing the water.

Page 22

The approximate composition of these formulas expressed in percentages is as follows:

FORMULA.	Fat.	Sugar.	Proteids.
I.	1.00	5.50	0.33
II.	1.50	6.00	0.50
III.	2.00	6.00	0.66
IV.	2.50	6.00	0.80
V.	3.00	6.50	1.00

Second Series
Formulas for the Early Months
from 7-per-cent Milk

	I.	II.	III.	IV.	V.
7-per-cent milk	2 oz.	3 oz.	4 oz.	5 oz.	6 oz.
Milk sugar	1 "	1 "	1 "	1 "	1 "
Lime-water	1 "	1 "	1 "	1 "	1 "
Boiled water	17 "	16 "	15 "	14 "	13 "
	20 oz.	20 oz.	20 oz.	20 oz.	20 oz.

/pre>

The approximate composition of these formulas expressed in percentages is as follows:

FORMULA.	Fat.	Sugar.	Proteids.
I.	0.70	5.50	0.35
II.	1.00	6.00	0.50
III.	1.40	6.00	0.70
IV.	1.75	6.00	0.87
V.	2.00	6.50	1.00

How is one to decide whether to use the First or the Second Series of formulas?
With a large, strong child, having a good digestion one should use the First Series. With a smaller, less vigorous child, whose digestion is not so good, or with one who does not do well upon the First Series, the Second Series should be used.

Why is it necessary to make the food so weak at first?
Because the infant's stomach is intended to digest breast milk, not cow's milk; but if we begin with a very weak cow's milk the stomach can be gradually trained to digest it. If we began with a strong milk the digestion might be seriously upset.

How rapidly can the food be increased in strength from Formula I to II, from II to III, etc.?
No absolute rule can be given. Usually we begin with I on the second day; II on the fourth day; III at one week or ten days; but after that make the increase more slowly. A large infant with a strong digestion will bear a rather rapid increase and may be able to take V by the time it is three or four weeks old. A child with a feeble digestion must go much slower and may not reach V before it is three or four months old.

It is important with all children that the increase in the food be made very gradually. It may be best with many infants to increase the milk by only half an ounce in twenty ounces of food, instead of one ounce at a time as indicated in the tables. Thus from 3 ounces, the increase would be to 31/2 ounces; from 4 ounces to 41/2 ounces, *etc*. At least two or three days should be allowed between each increase in the strength of the food.

Page 23

What general rule can be given for increasing the food?
To increase when the infant is not satisfied but is digesting well.

How does an infant show that he is not satisfied?
He drains the bottle eagerly and cries when it is taken away. He often forms the habit of sucking his fingers immediately after. He begins to fret half an hour or an hour before the next feeding is due.

In the series of formulas given in the table the quantities are mentioned for making only twenty ounces of food. How should it be prepared when more than this quantity is needed?
It is equally convenient to make up 25 ounces, 30 ounces, 35 ounces, or 40 ounces at a time.

To make—
25 ounces of any formula add one quarter more of each ingredient. 30 " " one half " " 35 " " three quarters " " 40 " " twice as much " "
Thus 25 ounces of Formula I would be obtained by using 21/2 ounces of milk, 11/4 ounces of sugar and lime-water, 211/4 ounces of water; 30 ounces of the same would require 3 ounces milk, 11/2 ounces lime-water and sugar, and 251/2 ounces water; 35 ounces would require 31/2 ounces milk, 13/4 ounces lime-water and sugar, and 293/4 ounces water. The amount of water need not be calculated in any case, but after measuring carefully the other ingredients enough water should be added to bring the total up to the amount required.

How great an increase in the quantity should be made at one time?
One may make up five ounces additional food; but the first two days only two or three ounces of the additional amount should be given; the next two days, four ounces; after two days more, the five ounces may be given.

The increase in the quantity given at a single feeding

should not be more than a quarter of an ounce.

FOOD FOR HEALTHY INFANTS—THE LATER MONTHS

How long should the fat be as much as three times the proteids?
This is seldom of advantage longer than three or four months.

What changes should then be made in the milk?
After Formula V of the First Series (6 ounces of 10-per-cent milk in 20 ounces of food) has been reached, the fat should be increased very slowly for this proportion (3 per cent) is near the limit for most healthy children. The milk should now be strengthened chiefly by raising the percentage of proteids.

How is this accomplished?
The 10-per-cent milk and the formulas derived from it should now be discontinued, and those made from 7-per-cent milk used.

Third Series
Formulas for the Later Months
from 7-per-cent Milk

Page 24

I. II. III. IV. V.

7-per-cent milk 7 oz. 8 oz. 9 oz. 10 oz. 11 oz.
Milk sugar 1 " 1 " 1 " 3/4 " 1/2 "
Lime-water 1 " 1 " 1 " 1 " 1 "
Boiled water 12 " 11 " 10 " 4 " 3 "
Barley gruel 0 " 0 " 0 " 5 " 5 "
---
20 oz. 20 oz. 20 oz. 20 oz. 20 oz.

/pre>

Since the sugar dissolves, the total will be twenty ounces in each column.

Of any of the formulas, 25 ounces is made by using one quarter more of each ingredient; 30 ounces, by using one half more; 35 ounces, by using three quarters more; 40 ounces, by using twice as much, exactly as described in the First Series on page 73.

The approximate composition of these formulas expressed in percentages is as follows:

FORMULA. Fat. Sugar. Proteids.

I. 2.50 6.50 1.25
II. 2.80 6.50 1.40
III. 3.15 7.00 1.55
IV. 3.50 6.00 1.75
V. 4.00 6.00 2.00

How should the food be increased during this period? Beginning with I of this Series, which should usually follow V of the First or Second Series (pages 70, 71), the increase may generally be made in a week or ten days to II; in about two weeks more to III; now more slowly to IV and V. When IV or V has been

reached, the same formula may sometimes be continued for three or four months with no other change than an increase in the quantity.

In passing from Formula V of the First Series to Formula I of the Third Series the proportion of fat is at first reduced. Is this necessary or important?
No; it only happens to come so in simplifying the calculation. It may be avoided by taking off at first the upper 13 ounces as top-milk and using 7 ounces of this in a 20-ounce mixture, in place of Formula I; and by using for the next increase the upper 15 ounces as top-milk, taking of this 8 ounces in a 20-ounce mixture in place of Formula II. Then should follow Formula III.

What further addition may be made to the food of the later months?
Usually about the sixth or seventh month, farinaceous food in the form of gruel may be added, this taking the place of part of the water and part of the sugar.

What changes may be made in the food when the infant has reached the age of ten or eleven months?
The proteids may be still further increased, and the sugar and the lime-water reduced until plain milk is given.

How may this best be done?

Page 25

At first one feeding a day of plain milk and barley gruel may be given; later, two feedings; then three feedings, *etc*. Let us suppose an infant to be taking such a modified milk as Formula IV or V (page 76), six feedings a day. The plain milk diluted only with barley gruel would at first replace one of these feedings; then two, three, four, *etc*., these changes being made at intervals of about two weeks. The proportions of the milk and barley gruel should at first be about 5-1/2 ounces milk, 2-1/2 ounces barley; later, 6 ounces milk, 3 ounces barley; still later, 7 ounces milk, 2 ounces barley, until finally plain milk is given to drink and the cereals given separately with a spoon. This is reached with most infants at fourteen or fifteen months; with many at twelve or thirteen months. Other forms of farinaceous food may of course be used in the place of the barley, and in the same proportions.

With some infants the addition of a pinch of bicarbonate of soda may be advantageously made to each milk-feeding when the lime-water is omitted, but with most this is unnecessary.

If the infant strongly objects to the taste of the milk when the milk sugar has been omitted, a small quantity (one fourth to one half teaspoonful) of granulated sugar may for a time be added to each feeding, then gradually reduced.

GENERAL RULES FOR GUIDANCE IN THE USE OF THE FORMULAS GIVEN

It should again be emphasized that these formulas are not intended for sick children nor for those suffering from any marked symptoms of indigestion. For such infants special rules are given later.

What should be the guide in deciding upon a formula with which to begin for a child who is to be artificially fed?
The age and the weight are of some importance, but the best guide is the condition of the child's digestive organs. One should always begin with a weak formula, particularly, (1) with an infant previously breast fed; (2) with one just weaned, as a child who has never had cow's milk must at first have weaker proportions than the age and the weight would seem to indicate; (3) with infants whose power of digestion is unknown. If the first formula tried is weaker than the child can digest, the food can be strengthened every three or four days until it is found what the child is able to take. On the contrary, if the food is made too strong at first, an attack of indigestion will probably follow.

How should the food be increased in strength?
The first essential is that it be done very gradually; abruptly increasing the food usually causes a disturbance of digestion.

It is never wise to advance more rapidly in strengthening the food than from one formula to the next one in any of the series given; with many infants it is better to make the steps of increase only half as great as those indicated (page 72).

Page 26

How rapidly should the food be increased in quantity?
The increase should not be more than a quarter of an ounce in each feeding; or from one and a half to two ounces in a day.

When should the food be increased?
In the early weeks an increase may be necessary every few days; in the later months sometimes the same formula may be continued for two or three months. It is, however, impossible to give a definite rule as to time. One cannot say with any child that an increase is to be made every week or every two weeks. A much better guide are the conditions present.

The signs indicating that the food should be increased are, that the infant is not satisfied, not gaining in weight, but is digesting well, *i.e.*, not vomiting, and having good stools. One should not increase the food, however, so long as the child seems perfectly satisfied and is gaining from four to six ounces a week, even though both the quantity and the strength of the food are considerably below the average; nor should the food be increased if the child is gaining from eight to ten ounces a week, even if he seems somewhat hungry. The appetite is not always a safe guide to follow.

How can one know whether the strength or the quantity of the food should be increased?
In the early weeks it is well first to increase the strength of the food, the next time to increase the quantity, then the strength again, *etc.*
After the fourth or fifth month, the quantity, chiefly, should be increased.

If a slight disturbance or discomfort occurs after the food has been strengthened, is it best to go back to the weaker formula or to persist with the new one?
Symptoms of minor discomfort are seen for a day or two with many infants after an ordinary increase in food; but in most cases an infant soon becomes accustomed

to the stronger food and is able to digest it.
If, however, the symptoms of disturbance are marked,
one should promptly go back to the weaker formula.
The next increase should be a smaller one.

Should one be disturbed if for the first two or three weeks of artificial feeding the gain in weight is very slight or even if there is none?
Not as a rule. If the infant does not lose weight,
is perfectly comfortable, sleeps most of the time,
and does not suffer from any symptoms of indigestion,
such as colic, vomiting, *etc*., one may be sure
that all is going well and that the infant is becoming
used to his new food. As the child's appetite
improves and his digestion is stronger, the food may
be increased every few days and very soon the gain
in weight will come and will then be continuous.
If, however, the scales are watched too closely and,
because there is only a slight gain in weight or none
at all, the food is rapidly increased, an acute disturbance
of digestion is pretty certain to follow.

Is not constipation likely to occur if the child is on a very weak food?

Page 27

It is very often seen and is due simply to the small amount of residue in the intestine. Under these circumstances, if the bowels move once every day, one should not be disturbed even when the movements are small and somewhat dry. As the food is gradually strengthened, this constipation soon passes off; while if injections, suppositories, or cathartics are used to produce freer movements, the functions of the bowels are likely to be disturbed.

Under what circumstances should the food be reduced?
Whenever the child becomes ill from any cause whatever, or whenever any marked symptoms of indigestion arise.

How may this be done?
If the disturbance is only a moderate one and the food has been made up for the day, one third may be poured off from the top of each bottle just before it is given, and this quantity of food replaced by the same amount of boiled water.

If the disturbance is more severe, the food should be immediately diluted by at least one half and at the same time the quantity given should be reduced.

For a severe acute attack of indigestion the regular food should be omitted altogether and only water given until the doctor has been called.

If the food has been reduced for a disturbance of digestion, how should one return to the original formula?
While the reduction of the food should be immediate and considerable, the increase should be very gradual. After a serious attack of acute indigestion, when beginning with milk again, it should not be made more than one fifth the original strength, and from ten days to two weeks should pass before the child is brought back to his original food, which should be done very gradually. It is surprising how long a time is required with young infants before they

completely recover from an attack of acute indigestion, even though it did not seem to be very severe. The second disturbance always comes from a slighter cause than the first one.

THE ADDITION OF OTHER FOODS TO MILK

How long should modified milk be continued without the addition of other food?
This depends upon circumstances; usually, for about six months; but if the infant is thriving satisfactorily the milk may be used alone for ten or eleven months; with some infants who have especial difficulty in digesting cow's milk, it is advisable to begin the use of other food at three or four months or even from the outset.

What is the first thing to be used with milk?
Farinaceous food in some form, usually as a gruel.

How are these gruels made?
They may be made directly from the grains or from some of the prepared flours (page 149). The flours are usually to be preferred as being more simple of preparation.

How should they be used in making the food?
They should be cooked separately, rather than with the milk; when the food is mixed, they take the place of a portion of the water in the formulas given on pages 70 and 71.

Page 28

How much of the gruel should be used?
If it is prepared as recommended on page 149, it may make according to circumstances from one sixth to one half the total quantity of food.

Which of the farinaceous foods are to be preferred?
Those most used are barley, oatmeal, arrowroot, and farina. There is not much difference in their nutritive value; oatmeal gruel is somewhat more laxative.

What value do these substances possess as infant foods?
Some of the starch is digested and absorbed; but the chief value of gruels is believed to be that when added to milk they render the curd more easily digested by preventing it from coagulating in the stomach in large tough masses. This is certainly true with many infants, but there are others who are not at all benefited, and not a few young infants whose digestion is made distinctly worse by the use of farinaceous food, particularly when employed in considerable quantity. The addition of gruels to milk for all infants is not to be recommended.

What further additions may be made to the diet of healthy infants during the first year?
Beef juice, the white of egg, and orange juice.

How and when may beef juice be used?
With infants who are strong and thriving satisfactorily it may be begun at ten or eleven months; two teaspoonfuls may be given daily, diluted with the same quantity of water, fifteen minutes before the midday feeding; in two weeks the quantity may be doubled; and in four weeks six teaspoonfuls may be given. The maximum quantity at one year should not be more than two or three tablespoonfuls.

With delicate infants who are pale and anaemic, beef juice is more important, and it may often be wisely begun at five or six months in half the quantities

mentioned.

When should white of egg be used?
Under the same conditions as beef juice, particularly with infants who have difficulty in digesting the proteins (curd) of milk. At six months half the white of one egg may be given at one time, and soon after this the entire white of one egg. The best in manner of cooking is the “coddled”, egg (see page 151).

When should orange juice be begun?
Usually about the eleventh or twelfth month; it should be given about one hour before the feeding; two teaspoonfuls at first, then one tablespoonful at a time, and later three or four tablespoonfuls. It is particularly useful when there is constipation. It should always be strained, and care should be taken that it is sweet and fresh.

OVERFEEDING

What is meant by overfeeding?
Giving an infant too much food; either too much at one time or too frequently. Overfeeding is sometimes practised during the day, but is chiefly done at night.

Is not an infant’s natural desire for food a proper guide as to the quantity given?

Page 29

The appetite of a perfectly normal infant usually is; but overeating is a habit gradually acquired and may continue until twice as much food as is proper is taken in the twenty-four hours. This habit is most frequently seen in infants whose digestion is not quite normal; because of the temporary relief from discomfort experienced by taking food into the stomach, they often appear to be hungry the greater part of the time, especially at night.

What are the causes of overfeeding?
The most common one is the habit of watching the weight too closely, and the conviction on the part of the mother or nurse that because a child is not so large nor gaining so rapidly as some other infant of the same age, more food or stronger food should be given.

What harm results from overfeeding?
All food taken in excess of what a child can digest becomes a burden to him. The food lies in the stomach or bowels undigested, ferments, and causes wind and colic. When overfeeding is longer continued, serious disturbances of digestion are soon produced. The infant is restless, fretful, constantly uncomfortable, sleeps badly, and stops gaining and may even lose in weight. Such symptoms may lead to the mistaken conclusion that too little food is given, and it is accordingly increased, when it should be diminished. One of the results of long-continued overfeeding is dilatation or stretching of the stomach.

What should guide one as to the quantity of food to be given to any infant??
(1) The size of the infant's stomach at the different months; (2) the amount of milk which the healthy nursing infant gets; (3) the quantities with which most children do best. The table of quantities and intervals of feeding, on page 108, gives the average figures derived from these sources. It is seldom wise to go beyond the limits there stated; nor should one insist upon giving any fixed amount if it is clearly

more than the child wants or can be made to take except by continued coaxing.

LOSS OF APPETITE

What is to be done when without any other signs of illness a child's appetite gradually fails?
This is often the result of a long period of overfeeding or the use of milk too rich in fat. If in all other respects the child seems well and simply does not want his food, it should be offered at regular hours, but not more frequently; on no account should he be coaxed, much less forced, to eat, even though he takes only one half or one third the usual quantity. The intervals between feedings should not be shortened but rather lengthened. Often, with a child a year old, it is necessary to reduce the number of feedings to four or even three in twenty-four hours. Water, however, may be offered at more frequent intervals. The food should be weakened rather than strengthened. No greater mistake can be made than, because so little is taken, coaxing or forcing food at short intervals through fear lest the child may lose weight.

Page 30

THE CHANGES IN THE FOOD REQUIRED BY SPECIAL SYMPTOMS OR CONDITIONS

Infants with weak digestion and those suffering from various forms of indigestion have often especial trouble in digesting the fat of milk. To meet the needs of such there is required a series of formulas in which the fat is lower than in those already given.

These formulas are obtained from plain milk.

Fourth Series
Formulas from Plain Milk (containing 4-per-cent Fat)

--
I. II. III. IV. V. VI. VII. VIII.
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re>

Plain milk 5oz. 6oz. 7oz. 8oz. 9oz. 10oz 12oz. 14oz.
Milk sugar 1 " 1 " 1 " 1 " 3/4 " 3/4 " 1/2 " 1/2 "
Lime-water. 1 " 1 " 1 " 1 " 1 " 1 " 1 " 1 "
Boiled water 14 " 13 " 12 " 7 " 6 " 5 " 2 " 0 "
Barley gruel 0 " 0 " 0 " 4 " 4 " 4 " 5 " 5 "

20
20 20 20 20 20 20 20
oz.
oz. oz. oz. oz. oz. oz. oz.

When larger quantities than 20 ounces are required

they are calculated in the same manner as described on page 73 in speaking of 10-per-cent milk.

The approximate composition of the formulas of the Fourth Series expressed in percentages is as follows:

FORMULA.	Fat.	Sugar.	Proteids.
I.	1.00	6.00	0.90
II.	1.20	6.00	1.00
III.	1.40	6.50	1.20
IV.	1.60	6.50	1.40
V.	1.80	6.00	1.60
VI.	2.00	6.00	1.80
VII.	2.40	5.50	2.10
VIII.	2.80	5.50	2.50

Why is it that an infant so often vomits some of its food within a few moments after finishing its bottle?
Usually because the quantity is too large. Sometimes it is due to the fact that the food is taken too rapidly, from too large a hole in the nipple. It may be due to too tight clothing, or to moving the child about in such a way as to press upon the stomach.

What are the principal causes of, and the changes in the food required by habitual vomiting, regurgitation, or spitting up of small quantities of food between feedings, often repeated many times a day?
This is always a symptom of gastric indigestion, and a most troublesome one. In such conditions the fat and often the sugar also should be reduced and the lime-water increased.

Formulas made from rich top-milk or milk and cream are to be avoided. Those made from 7-per-cent milk are less likely to be the cause of trouble than those from 10-per-cent milk; but if the symptoms are at all severe it is better to use instead of these the formulas of the Fourth Series derived from plain milk.

Page 31

Reduction in the sugar may be made by adding only one half ounce of milk sugar to each twenty ounces of the food; in severe cases the sugar may be omitted altogether.

It is often advisable to double the amount of lime-water—i.e., use two ounces to each twenty ounces of food.

The malted foods and all other foods containing much sugar usually aggravate the symptoms.

The intervals between meals should generally be half an hour longer, and sometimes an hour longer, than when digestion is normal.

The quantity given at a feeding should generally be less than with a normal digestion. Usually a smaller quantity of a strong food succeeds better than a larger quantity of a weak food.

What are the causes of, and food changes required by a constant and excessive formation of gas in the stomach, leading to distention and pain, or eructations (belching) of gas and often of a sour, watery fluid?
This is often associated with habitual vomiting, and is due to similar causes, but particularly to the sugar, which should be greatly reduced or omitted entirely.

What changes should be made when there is habitual colic?
This is generally due to an accumulation of gas in the intestines which forms there because the proteids (curd) of the milk are not digested. They should be reduced by using in the early months a weaker formula—i.e., instead of Formula V of the First or Second Series, IV might be used, or, for a short time, even III.
The proteids may be reduced in the middle period by using weaker formulas If we desire to reduce the proteids without reducing the fat, we may change from the Second to the First Series.

Another means of relieving habitual colic is the use of partially peptonized milk (page 115); still another the dilution with barley-water instead of plain water.

What change should be made if curds appear in the stools regularly or frequently?
This is usually associated with habitual colic, and has to be managed exactly like that condition, by the means just described.

How should the milk be modified for chronic constipation?
The constipation of the first weeks of life has been already referred to (page 82); it usually disappears as the food is gradually strengthened in all its proportions.

Habitual constipation at a later period is difficult to overcome by diet alone. It sometimes depends upon the fact that the proteids are too high, and sometimes that the fat is too low. Hence it is more frequent when infants are fed upon plain milk variously diluted (page 90), then when 7-per-cent or 10-per-cent milk is used, and diluted to a greater degree. But it is not desirable to use a top-milk containing more than ten per cent fat for this purpose, nor is it wise to carry the fat in the food above 4 per cent (i.e., 8 ounces of 10-per-cent milk, or 12 ounces of 7-per-cent milk, in a 20-ounce mixture) or other disturbances of digestion may be produced.

Page 32

In some cases the use, in place of milk sugar, of ordinary brown sugar, in half the quantity, is of assistance; or of some of the malted foods (Mellin's food, malted milk, cereal milk) also in the place of milk sugar.

The substitution of the milk of magnesia for the lime-water as recommended on page 60 will often be found useful.

To infants over nine months old, orange juice may be given.

What special modifications are required during very hot weather?
During the warm season it is well to make the proportion of fat less than during cold weather. During short periods of excessive heat it should be much less. The fat is reduced by using 7-per-cent milk in place of 10-per-cent (i.e., the Second instead of the First Series of formulas, page 71), or plain milk in place of the 7-per-cent milk in the Second and Third Series (page 90). At such times also the usual food should be diluted, and water should be given freely between the feedings.

What changes should be made in the food of a child who, with all the signs of good digestion, gains very little or not at all in weight?
If the child seems hungry the quantity of food may be increased; but if the child will not readily take any more in quantity the strength may be increased by the use of the next higher formula. One should, however, be extremely careful under these circumstances not to coax or force a child; for this plan is almost certain to cause disturbance of digestion and actual loss in weight. A better policy is that of looking after the other factors in the child's life,—the care, sleep, fresh air, *etc*., for with these rather than with the food the trouble often lies.

What should be done with infants who in spite of

all variations in the milk continue to have symptoms of indigestion and do not thrive?
Except inmates of institutions who form a class by themselves, most infants who receive proper care thrive upon milk if the proportions suited to the digestion are given. Still there are some who do not. The nutrition of such is always a matter of difficulty.

If a wet-nurse is available the employment of one is the thing most likely to succeed, particularly if the infant is under four or five months old.

If the infant is older, or if a wet-nurse cannot be obtained, some of the substitutes for fresh cow's milk may be tried. One of the best is condensed milk, Borden's Eagle brand, canned, being preferred. This is more likely to agree if the symptoms are chiefly intestinal (colic, flatulence, curds in the stools, constipation or diarrhoea) than if they are chiefly gastric (vomiting, regurgitation, *etc*.).

How should condensed milk be used?
For an infant three or four months old with symptoms of indigestion, it should at first be diluted with 16 parts of boiled water, or, sometimes preferably, with barley-water. With improvement in the symptoms the dilution may be made 1 to 14, 1 to 12, 1 to 10, and 1 to 8, these changes being gradually made. The intervals between feedings and the quantities for one feeding are given on page 108.

Page 33

How long should condensed milk be continued?
In most cases it should be used as the sole food for a few weeks only. Afterward, one feeding a day of a weak formula of modified milk (e.g., No. III or IV of the Second Series, page 71) may be given; later two feedings, and thus gradually the number of milk feedings is increased until the child is taking only modified milk.

Condensed milk is not to be recommended as a permanent food where good fresh cow's milk can be obtained.

What are the objections to its use?
It is very low in fat and proteids, and high in sugar. This accounts for its easy digestibility, and also explains why children reared upon it often gain very rapidly in weight, yet have as a rule but little resistance. They are very prone to develop rickets and sometimes scurvy.

Are the proprietary infant foods open to the same objections as condensed milk?
They are. What has been said of condensed milk applies equally well to most of those that are sold in the market as substitutes for milk.

What changes in the food are required by slight indisposition?
For slight general disturbances such as dentition, colds, sore throats, *etc.*, it is usually sufficient simply to dilute the food. If this is but for two or three feedings, it is most easily done by replacing with boiled water an ounce or two of the food removed from the bottle just before it is given; if for several days, a weaker formula should be used.

What changes should be made for a serious acute illness?
For such attacks as those of pneumonia, bronchitis measles, *etc.*, attended with fever, the food should be diluted and the fat reduced as described

on page 95. It should be given at regular intervals, rather less frequently than in health. Water should be given freely between the feedings. Food should not be forced in the early days of an acute illness, since the loss of appetite usually means an inability to digest much food.

What immediate changes should be made in the food when the child is taken with an acute attack of gastric indigestion with repeated vomiting, fever, pain, etc.?
All milk should be stopped at once, and only boiled water given for ten or twelve hours; afterward barley-water or whey may be tried, but no milk for at least twenty-four hours after the vomiting has ceased. When beginning with modified milk the quantity should be small and the fat low, which may be secured by the use of the Fourth Series of formulas in the place of the First or Second Series. The proportion of lime-water may be doubled.

What changes should be made for an attack of intestinal indigestion attended by looseness of the bowels?
If this is not severe (only two or three passages daily) the fat should be lowered in the manner stated just above, and the milk should be boiled for five minutes. If curds are present in the stools, it may be still further diluted.

Page 34

If the diarrhoeal attack is more severe, and attended by fever and foul-smelling movements of greater frequency, all milk should be stopped immediately and the diet mentioned just above under the head of acute disturbances of the stomach should be employed.

What changes in the food should be made when the child seems to have very little appetite and yet is not ill?
The number of feedings should be reduced, the interval being lengthened by one hour or even more. No greater mistake can be made than to offer food every hour or two to an infant who is not hungry. Such a course only prolongs and aggravates the disturbance.

What other conditions besides the food greatly Influence the child's digestion?
Proper clothing, warm feet, regular habits, fresh air, clean bottles, and food given at the proper temperature are all quite as important as the preparation of the food; quiet peaceful surroundings and absence of excitement are also essential to good digestion.

COMMON MISTAKES IN MILK MODIFICATION AND INFANT FEEDING

I. In using modifications made from top-milk, much confusion arises from the notion that top-milk is a single definite thing, whereas its composition depends upon a great variety of conditions and, unless all these are known, it is impossible to tell how strong it is. Directions for the removal of top-milk should be explicitly followed (see page 63), or the results will be very different from those expected.

II. In formulas calling for a certain number of ounces of top-milk of any given strength, the mistake

is made of removing only the number of ounces needed for the formula. The proper way is to remove the amount required to secure a top-milk of the desired strength and then to take of this the number of ounces needed in the formula.

III. A rich Jersey milk is used as if it were ordinary milk. The formulas given in this book are chiefly calculated on the basis of a good average milk which contains about 4 per cent fat. Many persons have the idea that the richer the milk, the more rapidly the child will gain in weight, and hence the superiority of such milk for infant feeding. While it is true that some children taking a very rich milk may, for a time, gain rapidly in weight, yet sooner or later, serious disturbances of digestion are nearly always produced.

IV. The food is increased too rapidly, particularly after some disturbance of digestion. If, in an infant three or four months old, an attack of somewhat acute indigestion occurs, the food should seldom be given in full strength before two weeks. The increase in the diet should be made very gradually, the steps being made only one half those indicated in the series of formulas on pages 70 and 71. Otherwise it generally happens that the attack of indigestion is very much prolonged and much loss in weight occurs.

Page 35

V. When symptoms of indigestion occur, the food is not reduced rapidly enough. Indigestion usually means that the organs are, for the time, unequal to the work imposed. If the food is immediately reduced by one half, the organs of digestion soon regain their power and the disturbance is short. In every case the amount of reduction should depend upon the degree of the disturbance.

PREPARATION OF COW'S MILK AT HOME

What articles are required for the preparation of cow's milk at home?
Feeding-bottles, rubber nipples, an eight-ounce graduated measuring glass, a glass or agate funnel, bottle brush, cotton, alcohol lamp or, better, a Bunsen gas burner, a tall quart cup for warming bottles of milk, a pitcher for mixing the food, a wide-mouth bottle for boric acid and one for bicarbonate of soda, and a pasteurizer. Later, a double boiler for cooking cereals will be needed.

What bottles are to be preferred?
A cylindrical graduated bottle with a rather wide neck, so as to admit of easy washing, and one which contains no angles or corners. A single size holding eight ounces is quite sufficient for use during the first year. All complicated bottles are bad, being difficult to clean. One should have as many bottles in use as the child takes meals a day.

How should bottles be cared for?
As soon as they are emptied they should be rinsed with cold water and allowed to stand filled with water to which a little bicarbonate of soda has been added. Before the milk is put into them they should be thoroughly washed with a bottle brush and hot soap-suds and then placed for twenty minutes in boiling water.

What sort of nipples should be used?
Only simple straight nipples which slip over the neck of the bottle. Those with a rubber or glass tube are too complicated and very difficult to keep clean. Nipples made of black rubber are to be preferred. The hole in the nipple should not be so large that the milk will run in a stream, but just large enough for it to drop rapidly when the bottle with the nipple attached is inverted.

How should nipples be cared for?
New nipples should be boiled for five minutes; but it is unnecessary to repeat this every day as they soon become so soft as to be almost useless. After using, nipples should be carefully rinsed in cold water and kept in a covered glass containing a solution of borax or boric acid. At least once a day they should be turned wrong side out and thoroughly washed with soap and water.

What sort of cotton should be used?
The refined non-absorbent cotton is rather better for stoppering bottles, but the ordinary absorbent cotton will answer every purpose.

Which is better, the Bunsen burner or the alcohol lamp?
If there is gas in the house, the Bunsen burner is greatly to be preferred, being cheaper, simpler, and much safer than the alcohol lamp. If the lamp is used, it should stand upon a table covered with a plate of zinc or tin, or upon a large tin tray. The French pattern of alcohol lamp is the best.

Page 36

Give the directions for preparing the food according to any of the above formulas.
The nurse's hands, bottles, tables, and all utensils should be scrupulously clean. First dissolve the milk sugar in boiling water, filtering if necessary. Then add the milk and cream and lime-water, mixing the whole in a pitcher. A sufficient quantity of food for twenty-four hours is always to be prepared at one time. This is then divided into the number of feedings required for the day, each feeding being put in a separate bottle, and the bottle stoppered with cotton. The bottles should then be cooled rapidly by standing, first in tepid then in cold water, and afterward placed in an ice chest. If the milk is to be pasteurized or sterilized, this should precede the cooling.

DIRECTIONS FOR FEEDING INFANTS

How should the bottle be prepared at feeding time?
It should be taken from the ice chest, and warmed by standing in warm water which is deep enough to cover the milk in the bottle; it should then be thoroughly shaken and the nipple adjusted; the nurse should see that the hole in the nipple is not too large nor too small.

How may the temperature of the milk be tested?
Never by putting the nipple in the nurse's mouth. Before adjusting the nipple, a teaspoonful may be poured from the bottle and tasted, or a few drops may be poured through the nipple upon the inner surface of the wrist, where it should feel quite warm but never hot; or a thermometer may be placed in the water in which the bottle stands. A dairy thermometer should be used, and the temperature of the water should be between 98 deg. and 105 deg. F.

What is a simple contrivance for keeping the milk warm during feeding?
A small flannel bag with a draw string may be slipped over the bottle.

In what position should an infant take its bottle?
For the first two or three months it is better, except at night, when it may be undesirable to take the infant from its crib, that it be held on the nurse's arm during the feeding; later it may lie on its side in the crib provided the bottle is held by the nurse until it has been emptied; otherwise a young infant readily falls into the bad habit of alternately sucking and sleeping, and often will be an hour or more over its bottle.

How much time should be allowed for one feeding?
Never more than twenty minutes. The bottle should then be taken away and not given until the next feeding time. Under no circumstances should an infant form the habit of sleeping with the nipple in its mouth. A sleepy infant should be kept awake by gentle shaking until the food is taken, or the bottle should be removed altogether.

Should an infant be played with soon after feeding?
On no account; such a thing frequently causes vomiting and sometimes indigestion. After every feeding the infant should be allowed to lie quietly in its crib, and disturbed as little as possible.

Page 37

INTERVALS OF FEEDING

How often should a baby be fed during the first month?
Every two hours during the day and twice during the night, or ten feedings during the twenty-four hours.

At what age may the interval be made two and a half hours?
Usually at five or six weeks.

When may it be increased to three hours?
Usually at two months.

Why should not a child be fed more frequently?
It takes the stomach nearly two hours to digest a meal at two months, and about two and a half hours at five or six months, and if the meals are too near together the second one is given before the first has been digested and vomiting and indigestion result. The meals should be far enough apart to give the stomach a little time for rest just before each feeding.

Schedule for Feeding Healthy Infants during the First Year

AGE.	Interval between meals, by day.	Night feedings (10 P.M. to 7 A.M.).	No. of feedings in 24 hours.	Quantity for one feeding.	Quantity for 24 hours.
	Hours.			Ounces.	Ounces.
2d to 7th day	2	2	10	1 -1-1/2	10-15
2d and 3d weeks	2	2	10	1-1/2 — 3	15-30
4th and 5th weeks	2	1	10	2-1/2 — 3-1/2	25-35
6th to 8th week	2-1/2	1	8	3 — 5	24-40
3d to 5th month	3	1	7	4 — 6	28-42
5th to 9th month	3	0	6	5 — 7-1/2	30-45

9th to 12th month	4	0	5	7 — 9	35-45

This schedule gives the averages for healthy children
The smaller quantities are those required by small children whose digestion is not very vigorous.
The larger quantities are those required by large children with strong digestion; in very few cases will it be advisable to go above these figures.

The interval is reckoned from the beginning of one feeding to the beginning of the next one.

When should the interval between the feedings be lengthened?
When there is gastric indigestion as shown by habitual vomiting or the regurgitation of food long after the bottle is finished; also when the appetite is very poor so that the infant regularly leaves some of its food.

When should the interval between the feedings be shortened?
This is done much too frequently; it is rarely advisable to feed any infant, except one seriously ill, oftener than the time put down in the schedule.

REGULARITY IN FEEDING

Page 38

How can a baby be taught to be regular in its habits of eating and sleeping?
By always feeding at regular intervals and putting to sleep at exactly the same time every day and evening.

When should regular training be begun?
During the first week of life.

Should a baby be wakened to be nursed or fed if sleeping quietly?
Yes, for a few days. This will not be required long, for with regular feeding an infant soon wakes regularly for its meal, almost upon the minute.

Should regularity in feeding be kept up at night as well as during the day?
Only up to nine or ten o'clock; after that time a baby should be allowed to sleep as long as it will.

At what age may a well baby go without food from 10 P.M. to 6 or 7 A.M.?
Usually at four months, and always at five or six months. Night feeding is one of the most frequent causes of wakefulness and disturbed sleep.

STERILIZED MILK

What is meant by sterilizing milk?
Heating milk for the purpose of destroying germs.

Does all cows milk contain germs?
Yes; even when handled most carefully, milk contains many germs; but when carelessly handled, and in summer, the number is enormous. While most of these are harmless or cause only the souring of milk, others are occasionally present which may produce serious diseases such as typhoid fever, diphtheria scarlet fever, cholera, tuberculosis, and many forms of diarrhoea.

Under what circumstances is it necessary to sterilize milk?

1. In warm weather when it cannot be obtained fresh; hence always in cities and towns during the summer.

2. When one cannot be certain that the cows are healthy, or that the milk has been carefully handled.

3. When the milk is to be kept for any considerable time (i.e., over twenty-four hours), especially if no ice can be had.

4. During epidemics of typhoid fever, scarlet fever, diphtheria, or any form of diarrhoeal disease.

What are the two methods of heating milk?

The first is known as *sterilizing*, in which the milk is heated to 212 deg. F. for one hour or one hour and a half; the second is known as *pasteurizing*, in which the milk is heated to 155 deg. or 170 deg. F. for thirty minutes. A temperature of 155 deg. F. continued for thirty minutes is sufficient to kill the germs of the diseases above referred to.

Will milk which has been thus treated keep indefinitely?

No; for although all the living germs may be killed, there are many undeveloped germs, or spores, which are not destroyed, and which soon grow into living germs. Milk heated to 212 deg. F. for an hour will keep upon ice for two or three weeks; that heated to 155 deg. F. for two or three days.

Page 39

Is milk which has been sterilized always a safe food?
No; for the reason that the milk may be so old, so dirty, and so contaminated before sterilizing that it may be still unfit for food, though it contains no living germs.

Is cow's milk rendered more digestible by being heated in this way?
Sterilizing milk does not improve its digestibility but rather the contrary. Sterilized milk should be modified for infant feeding in the same way as milk which has not been heated.

Is milk in any way injured by heating to 212 deg. F. for an hour?
There is abundant evidence that milk is rendered less digestible by such heating; also that it is more constipating, and that for some children its nutritive properties are interfered with, so that it may cause scurvy; this, however, is not seen unless it is continued as the sole food for a long period. These objections are of so much importance that this plan of heating milk is not to be recommended for general use.

When is it advantageous to heat milk to 212 deg. F.?
For use upon long journeys, such as crossing the ocean. Milk should then be heated for one hour upon two successive days, without removing the cotton stoppers from the bottles.

Is milk in any way injured by heating to 155 deg. F. for thirty minutes?
This point is not yet definitely settled. Such heating does not affect the taste of milk and does not render it more constipating. The unfavourable effects; if there are any, are so slight that they need not deter one from the use of pasteurized milk, even for long periods. The preference, however, should always be given to milk which is so clean and

so fresh as not to require any heating.

How should milk be pasteurized?
A convenient form of apparatus is that known as Freeman's pasteurizer[5]; another is the Walker-Gordon pasteurizer.[6]

[5] This can be obtained at 411 West Fifty-ninth Street, New York, with bottles and full directions; a tin one, at a cost of $3.50, and a copper one, which is much more durable, for $7.00.

[6] Obtained at the same prices from any of the Walker-Gordon milk laboratories.

How should milk be cooled after pasteurizing?
Always by placing the bottles in cold water, so as to cool them rapidly; never by letting them stand at the temperature of the room, or by placing them, when warm, in an ice box.

Why is this precaution necessary?
Cooling in the air or in an ice box requires from two to four hours, and during that time a great many of the undeveloped germs may mature and greatly injure the keeping properties of the milk. In the cold water, milk can be cooled in from ten to twenty minutes if the water is frequently changed, or if ice is added to the water.

MODIFIED MILK OF THE MILK LABORATORIES

Page 40

What is "modified milk" of the milk laboratories?
It is milk containing definite proportions of the fat, sugar, proteids, *etc*., put up usually according to the prescription of a physician, who indicates how much of the different elements he desires. The most reliable are the laboratories of the Walker-Gordon Company, which has branches in many of the large cities of the United States.

This is an excellent method of having milk prepared since it can be done with greater care and cleanliness than are possible in most homes. It is besides a great convenience if circumstances make it impossible to prepare the milk properly at home.

The laboratory should be used for infant feeding only by one who is somewhat familiar with this method of ordering milk.

PEPTONIZED MILK

What is peptonized milk?
Milk in which the proteids (curd) have been partially digested.

How is this accomplished?
By the action of a peptonizing powder which is composed of a digestive agent known as the extractum pancreatis and bicarbonate of soda, which is added to the plain or diluted milk. This is sold in tubes or in tablets, and it is the active ingredient of the peptogenic milk powder.

Describe the process.
The plain or modified milk is placed in a clean glass jar or bottle, and the peptonizing powder, which is first rubbed up with a tablespoonful of the milk,

is added and the bottle shaken. The bottle is then placed in a large pitcher or basin containing water kept at the temperature of about 110 deg. F., or as warm as the hand can bear comfortably, and left for ten to twenty minutes if the milk is to be partially peptonized; for two hours if it is to be completely peptonized.

What taste has partially peptonized milk?
None, if peptonizing is continued for only ten minutes, but at the end of twenty minutes it begins to be bitter, when the process of digestion has gone further.

How is the bitter taste avoided in partially peptonized milk?
At the end of ten or fifteen minutes the milk may be placed in a saucepan and quickly raised to boiling point; this kills the ferment, so that the milk will not become bitter when warmed a second time. Or, the milk may be rapidly cooled by placing the bottles first in cool and then in ice water; in this way the ferment is not destroyed, and the milk may become bitter when warmed for feeding.

Should the whole day's supply be peptonized at once, or each bottle separately just before the feeding?
Either plan may be followed. If the former, it is better to raise the milk to boiling point after peptonizing; if the latter, it should not be peptonized more than ten minutes, for it will continue to peptonize while it is being taken by the child.

Is not the bitter taste of completely peptonized milk a great obstacle to its use?

Page 41

Not in the case of young infants; one under four or five months old will usually take it without any objection after two or three feedings; but it cannot often be used for those who are much older.

How much of the peptonizing powder should be used?
There are required for one pint of plain milk, five grains of the extractum pancreatis and fifteen grains of bicarbonate of soda. This quantity is usually put up in a single tube or tablet. In the formulas previously given, less than this will be required; for the weaker formulas, one half or one third of the powder mentioned will be sufficient for one pint of food. For a single feeding of four ounces, one may use one eighth of a tube with a weak formula, or one sixth of a tube with a stronger formula.

What are the advantages of peptonized milk?
Partially peptonized milk is useful for young infants who have great difficulty in digesting the curd of milk, sometimes even when diluted as already described; completely peptonized milk, during acute attacks of indigestion.

For how long a period may the use of peptonized milk be continued?
Completely peptonized milk may be used for a few days, or at most a few weeks; partially peptonized milk may be used for two or three months, but not indefinitely; it should be left off gradually by shortening the time of peptonizing, and lessening the amount of the powder used.

FEEDING DURING THE SECOND YEAR

How many meals are required during the second year?
It is usually better to continue five meals throughout the second year. Some children will sleep from

6 P.M. to 6 A.M. without waking, but unless there is a feeding at 10 P.M. children are apt to wake very early in the morning.

Should each feeding be prepared at the time it is given, or all feedings at one time, as during the first year?
During the second and third years it is better to prepare the milk for the entire day at one time. If it is to be modified by adding cream, water, *etc.*, it is done as during the first year.

Later, when only plain milk is used, the quantities needed for the different feedings should be put into one or into two bottles, which then may be pasteurized or not as may be necessary. In this way the different feedings are kept separate, and the day's supply of milk is not disturbed every time the child is fed, as otherwise is unavoidable. The food should be prepared as soon as possible after the daily milk supply is delivered in the morning.

Give a proper diet for an average healthy child of twelve months.
6.30 A.M. Milk, six to seven ounces; diluted with barley or oat gruel, two to three ounces; after the thirteenth month, taken from a cup.

9 A.M. Orange juice, one to two ounces.

Page 42

10 A.M. Milk, two parts; oatmeal
or barley gruel, one part;
from ten to twelve ounces in all may
be allowed;
it should be given from a cup.

2 P.M. Beef juice, one to
two ounces;
or, the white of one egg, slightly cooked;
later, the
entire egg;
or, mutton or chicken broth, four to
six ounces.
Milk and gruel in proportions above given,
four to
six ounces.

6 P.M. Same as at 10 A.M.

10 P.M. Same as at 6.30 A.M.,
except that the milk may be
given from the bottle.

How long may this schedule be followed?
Usually until the fourteenth or fifteenth month.
After this time the cereals may be given much thicker
and fed from a spoon.

May any other fruit juices be given at this period?
Orange juice is the best; next to this the juice of
fresh ripe peaches, red raspberries or strawberries.
All these should be strained very carefully through
muslin to make sure that the child gets none of the
pulp or seeds, either of which may cause serious disturbance.
Of the orange or peach juice, from one to four tablespoonfuls
may be allowed at one time; of the others about half
the quantity. The fruit juice is best given one
hour before the second feeding.

When should a child be weaned from its bottle?
Most children can and should be taught to take their

food from the cup or spoon by the time they are thirteen months old; but it is convenient to give the 10 P.M. feeding from the bottle during the greater part of the second year (see page 52).

Give a proper diet for an average child from the fourteenth to the eighteenth month.
The bottle should not be given except at night. Cereals may now form an important part of the diet. They should be very thoroughly cooked, usually for three hours, and strained.

The daily schedule should be about as follows:

6.30 A.M. Milk, warmed, eight to ten ounces, given from a cup.

9 A.M. Fruit juice, one to three ounces.

10 A.M. Cereal: one, later two or three, tablespoonfuls of oatmeal hominy or wheaten grits, cooked for at least three hours; upon this from one to two ounces of thin cream, or milk and cream, with plenty of salt, but without sugar.
Crisp dry toast, one piece;
or, unsweetened zwieback;
or, one Huntley and Palmer breakfast biscuit.
Milk, warmed, six to eight ounces, from a cup.

2 P.M. Beef juice, one to two ounces; and one egg (soft boiled, poached or coddled); and boiled rice, one tablespoonful;
or, broth (mutton or chicken), four ounces; one or two Huntley and Palmer breakfast biscuits, or zwieback; and (if most of the teeth

are present)
rare scraped meat, at first one teaspoonful, gradually
increasing to one tablespoonful.

6 P.M. Cereal: two tablespoonfuls
of farina, cream of wheat,
or arrowroot, cooked for at least one half hour,
with milk, plenty of salt, but without sugar.
Milk, warmed, eight to ten ounces, given from a cup.

Page 43

10 P.M. Milk, warmed, eight
to ten ounces, which may be
given from a bottle.

Give a proper diet for an average child from the eighteenth month to the end of the second year.
The same order of meals as for the months just preceding should be followed. For most children milk at 10 P.M. is desirable. There are many, however who sleep regularly from 6 P.M. until 6 A.M. without food; for such the night feeding should, of course, not be insisted upon.

The daily schedule should be about as follows:

6.30 A.M. Milk, warmed, ten to twelve ounces, given from cup.

9 A.M. Fruit juice, two to three ounces.

10 A.M. Cereals: similar to those given from the fourteenth to the eighteenth month; they need not be strained although they should be cooked and served in the same way.
Crisp dry bread, zwieback, or Huntley and Palmer biscuits, without butter.
Milk, warmed, one cup.

2 P.M. Beef juice and one egg;
or, broth and meat; care being taken that the meat is always rare and scraped or very finely divided; beefsteak, mutton chop, or roast beef

may be given.
Very stale bread, or two pieces of zwieback.
Prune pulp or baked apple, one to two tablespoonfuls.
Water; no milk.

6 P.M. Cereal: farina,
cream of wheat, or arrowroot, cooked
for at least one half hour, with milk,
plenty of
salt, but without sugar.
or, milk toast or stale bread and milk.

10 P.M. If required, ten to
twelve ounces of plain milk.

What fruits may be given at this period?
If the child has a feeble digestion, only the fruit juices previously allowed; strong children may have in addition prune pulp, baked apple, and applesauce. The prune pulp is prepared by stewing the dried prunes without sugar until they are very soft, and removing all the skin by putting the fruit through a strainer; of this from one to two tablespoonfuls may be given at one time. The baked apple should be given without cream, and the applesauce should have very little sugar.

How and when should water be given?
Throughout the second year water should be given freely between the feedings, especially in warm weather; from one to three ounces may be given at one time, either from a spoon, a glass, or a bottle. The water should be boiled daily and then cooled. It should not be allowed to stand in the room, but fresh water should be put into the bottle each time.

FEEDING DURING THE THIRD YEAR

What changes may be made in the diet during the third year?
The night feeding at 10 P.M. should be omitted.
A greater quantity of solid food may be allowed, particularly at the mid-day meal. It is not advisable to begin

potato and other vegetables until this age is reached. Three regular meals should be given and milk once besides, either between the breakfast and dinner or dinner and supper, whichever is the longer interval. Water should be allowed freely between meals.

Page 44

What would be a proper schedule for an average child during the third year?

7.30 A.M. Cereal: cooked (preferably over night) for three hours, although a somewhat larger variety may be given than during the second year; given as before with milk or thin cream, salt, but very little sugar.

Warm milk, one glass.

A soft egg, poached, boiled or coddled.

Bread, very stale or dry, one slice, with butter.

10 A.M. Warm milk, one cup, with a cracker or piece of very stale bread and butter.

2 P.M. Soup, four ounces; or, beef juice, two ounces.

Meat: chop, steak, roast beef or lamb or chicken.

A baked white potato; or, boiled rice.

Green vegetable: asparagus tips, string beans, peas, spinach; all to be cooked until very soft, and mashed, or preferably put through a sieve; at first, one or two teaspoonfuls.

Dessert: cooked fruit—baked or stewed apple, stewed prunes.

Water; no milk.

6 P.M. Cereal: farina,
cream of wheat, or arrowroot, cooked
for at least one half hour, with plenty
of salt,
but without sugar;
or, milk toast;
or, bread and milk;
or, stale or dry bread and butter and
a glass of milk.

PART III

THE DIET OF OLDER CHILDREN (FOURTH TO TENTH YEAR)
Throughout this period the largest meal should always
be in the middle of the day, and a light supper given,
very much like that described for the third year.
During the first half of this period, milk may be
allowed once either between breakfast and dinner or
dinner and supper; no other eating between meals should
be permitted, but water should be allowed freely.

MILK AND CREAM

What part of the diet should milk form during childhood?
It should form a very important part up to the tenth
year; nothing can take its place. There are comparatively
few children who cannot take and digest milk if it
is properly fed.

Why is milk so advantageous?
Because no food that we possess has so high a nutritive
value as milk, for the amount of work required of
the organs of digestion. It is, therefore, peculiarly
adapted to the diet of the child.

What are the essential points in the use of milk?
It should be clean and fresh, but not too rich.
It is a mistake to select for any children the rich
milk of a Jersey herd and use it as though it were

an ordinary milk. For children who have difficulty in digesting milk, it should be somewhat diluted, *i.e.*, one part of water to four parts of milk, or salt or bicarbonate of soda should be added. It is also important not to give milk at meals when fruits, especially sour fruits, are allowed.

Page 45

How much milk may advantageously be given?
The average child with good digestion should take from one and one half pints to one quart of milk daily, this including not only what the child drinks but what is served upon cereals and in other ways. It is seldom wise to allow a child to take as much as two quarts daily, as a more mixed diet for most children is better.

To what extent may cream be used?
Older children do not require so large a proportion of fat in their food as do infants, and the use of cream, especially very rich cream, often results in disturbances of digestion. The use of too much or too rich cream is a common cause of the coated tongue, foul breath and pale gray stools, often called "biliousness."

Is not cream useful in overcoming the constipation of children?
With infants it is valuable to a certain point, but with older children only to a limited degree, and if such symptoms as those above described are present, cream should not be given.

EGGS

To what extent may eggs be used in the diet of this period?
They form a most valuable food. It is essential that they should be fresh and only slightly cooked, soft boiled, poached or coddled; fried eggs should never be given and all omelets are objectionable.

Which is more digestible, the white or yolk of the egg?
For the great majority of children, the white of the egg. This forms one of the most digestible proteids

we possess, and can be used, even in the latter part of the first year, with advantage.

Is it not true that eggs often cause "biliousness"?
Very seldom, if fed as above advised. This is an old prejudice but has little basis in fact.

How often may eggs be given?
Most children from four to ten years old will take one egg for breakfast and another for supper for an indefinite period with relish and benefit. There are, however, some few who have a peculiar idiosyncrasy as regards eggs and cannot take them at all.

MEAT AND FISH

What meats may be given to young children?
The best are beefsteak, mutton-chop, roast beef, roast lamb, broiled chicken and certain delicate fish, such as shad or bass.

What are the important points to be considered in giving meat to children?
Most meats should be rare and either scraped or very finely divided, as no child can be trusted to chew meat properly. Meats are best broiled or roasted, but should not be fried.

How often should meat be given?
At this period, only once a day, at the mid-day meal.

Is not the excessive nervousness of many modern children due to the giving of meat, or at least aggravated by its use?

Page 46

There is little ground for such a belief, unless an excessive amount of meat is given. Certainly cutting off meat from the diet of nervous children seldom produces any striking benefit.

What meats should be forbidden to young children?
Ham, bacon, sausage, pork, liver, kidney, game and all dried and salted meats, also cod, mackerel and halibut; all of these are best withheld until the child has passed the tenth year.

Are not gravies beneficial and nutritious?
The beef juice, or so-called "platter gravy," from a roast is exceedingly nutritious and desirable, but many of the thickened gravies are much less digestible and are too often given in excess; only a small quantity should be allowed. They should not form an important part of the meal.

VEGETABLES

What vegetables may be used at this period?
White potatoes may be given first. These should preferably be baked or boiled and mashed, but never fried. They should be served with beef juice or with cream rather than with butter.

Of the green vegetables, the best are peas, spinach, asparagus tips, string beans, stewed celery, young beets, or carrots, and squash. Baked sweet potato, turnips, boiled onions and cauliflower, all well cooked, may be given after the sixth or seventh year in moderate amount.

The principal trouble in the digestion of vegetables is due to imperfect cooking. It is, in fact, almost impossible to cook them too much; they should also be very finely mashed. They form a valuable

addition to the diet after three years, although the amount at first given should be small, one or two teaspoonfuls. They greatly aid in securing regularity of the bowels. Because small particles are seen in the stools, it is not to be inferred that they are causing disturbance and should, therefore, be stopped, but only that they should be more thoroughly cooked and more finely divided before being given.

Is it safe to use canned vegetables for children?
Many of the best brands of canned vegetables are quite safe and some, such as peas and asparagus, can be used with advantage. They are frequently better than stale green vegetables often sold in the markets.

What vegetables should not be given to young children?
None of those which are eaten raw, such as celery, radishes, onions, cucumbers, tomatoes or lettuce. Certain others, even when well cooked, should not be allowed; as corn, lima beans, cabbage, egg plant. None of these should be given until a child has passed the age of ten years.

Are vegetable salads to be given?
As a rule salads of all kinds should be omitted until a child has passed the tenth year. Salads are difficult to digest and a cause of much disturbance in children of all ages.

CEREALS

Page 47

What are the most important points in selecting and preparing cereals?
The important things are that they are properly cooked and not used in excess. The ready-to-serve cereals should never be chosen for children, nor should a child, because he is fond of cereals, be allowed to make his entire meal of them, taking two or three saucerfuls at a feeding.

Many of the partially cooked preparations of oatmeal and wheat are excellent, but should be cooked for a much longer time than is stated upon the package, usually three or four times as long. Digestibility is chiefly a matter of proper cooking. Most of the grains,—oatmeal, hominy, rice, wheaten grits,—require at least three hours' cooking in a double boiler in order to be easily digested. The prepared flours,—corn starch, arrowroot, barley,—should be cooked at least twenty minutes. I know of no preparation in the modern market which requires no cooking, which is to be recommended for children.

How are cereals to be given?
Usually with milk or a mixture of milk and cream; always with an abundance of salt and with very little or no sugar, one half teaspoonful on a saucerful of cereal should be the limit.

Cereals should not be served with syrups or butter and sugar.

BROTHS AND SOUPS

What broths and soups are to be recommended?
Meat broths are generally to be preferred to vegetable broths,—mutton or chicken being usually most liked by children. Nearly all plain broths

may be given. Those thickened with rice, barley or corn starch form a useful variety, especially with the addition of milk.

Vegetable purees of peas, spinach, celery or asparagus may be used for children over seven years old. Tomato soup should not be given to young children.

BREAD, CRACKERS AND CAKES

What forms of breadstuffs are best suited to young children?
Fresh bread should not be given, but stale bread cut thin and freshly dried in the oven until it is crisp is very useful, also zwieback, the unsweetened being preferred. Oatmeal, graham or gluten crackers and the Huntley and Palmer breakfast biscuits, stale rolls, or corn bread which has been split and toasted or dried till crisp, form a sufficient variety for most children.

What breadstuffs should be forbidden?
All hot breads, all fresh rolls, all buckwheat and other griddle cakes, all fresh sweet cakes, especially those covered with icing and those containing dried fruits. A stale lady-finger or piece of sponge cake is about as far in the matter of cakes as it is wise to go with children up to seven or eight years old.

DESSERTS

What desserts may be given to young children?
Mistakes are more often made here than in any other part of the child's diet. Up to six or seven years, only junket, plain rice pudding without raisins, plain custard and, not more than once a week, a small amount of ice cream.

Page 48

What should be especially forbidden?
All pies, tarts and pastry of every description, jam, syrups and preserved fruits; nuts, candy and dried fruits.

Does "a little" do any harm?
Yes, in that it develops a taste for this sort of food, after which plainer food is taken with less relish. Besides the "little" is very apt soon to become a good deal.

Does not the child's instinctive craving for sweets indicate his need of them?
That a child likes or craves sweets is the usual excuse of an indulgent parent. Every child likes his own way, but that is no reason why he should not be trained to obedience and self-control; a child's fondness for sweets can hardly be considered a normal instinct. As a matter of fact, supported by everyday experience, no causes are productive of more disorders of digestion than the free indulgence in desserts and sweets by young children. It is a constantly increasing tendency, not easily controlled as a child grows older; and in early childhood, the only safe rule is to give none at all.

FRUITS

Are fruits an essential or important part of the diet?
They are a very important part and should be begun in infancy. They are particularly useful for the effect they have upon the bowels. It is important that they should be selected with care and given with much discretion, especially in cities. In the country where fruit is absolutely fresh, a somewhat greater latitude may be allowed than is given below.

What fruits may safely be given to children up to five years old?
As a general rule, only cooked fruits and the juices of fresh fruits.

What fruit juices may be used?
That from sweet oranges is the best, but the fresh juice of grape fruit, peaches, strawberries and raspberries may also be used.

What stewed fruits may be given?
Stewed or baked apples, prunes, pears, peaches and apricots.

What raw fruits are to be particularly avoided with young children?
The pulp of oranges or grape fruit, also cherries, berries, bananas and pineapple.

What precautions should be emphasized regarding the use of fruits?
That they should be used with greater care in hot weather and with children who are prone to attacks of intestinal indigestion.

What symptoms indicate that fruits should be avoided?
A tendency to looseness of the bowels with the discharge of mucus, or frequent attacks of abdominal pain or stomach ache.

Is there any special choice of meals at which fruit should be given?
The fruit juice given early in the morning, upon an empty stomach, works more actively upon the bowels than if it is given later in the day.

It is not, as a rule, wise to give cream or milk with sour fruits. Usually the fruit is best given at the mid-day meal, as a dessert, at a time when no milk is taken. It is in all cases important that the quantity of fruit should be moderate.

Page 49

What besides water and milk should a child be allowed to drink and what should be forbidden?
Tea, coffee, wine, beer and cider in all quantities and in all forms should be forbidden to young children below puberty. Cocoa which is made very weak, *i.e.*, almost all milk, is often useful as a hot drink. Lemonade, soda-water, *etc.*, should if possible be deferred until the tenth year. A free indulgence in things of this kind should never be permitted with children of seven or eight years.

INDIGESTION IN OLDER CHILDREN

What are the different ways in which indigestion shows itself in children?
First, in acute disturbances which last for a few days only; and, secondly, in chronic disturbances which may continue for weeks or months.

Which of the two forms of indigestion is more likely to impair seriously the health of the child?
Chronic indigestion; for since the cause is not recognized it often goes on for months and even years unchecked.

What are the symptoms of acute indigestion?
These are familiar and easily recognized. They are vomiting, pain, undigested movements from the bowels, often fever and considerable prostration.

Such attacks are usually traceable to their proper cause, the removal of which is followed by prompt recovery.

What are the common causes of acute indigestion?
This is frequently due to overeating, to indulgence in some special article of improper food, or to eating heartily when overtired. Acute indigestion often marks the beginning of some acute general illness.

How should acute indigestion be managed?
One should bear in mind that for the time being the digestive organs have stopped work altogether. The important thing, therefore, is to clear out from the intestines all undigested food by some active cathartic, such as castor oil. The stomach has usually emptied itself by vomiting. All food should be stopped for from twelve to thirty-six hours, according to the severity of the attack, only water being given.

At the end of this time is it safe to begin with the former diet?
No; for such a procedure is almost certain to cause another attack of indigestion. At first only broth, thin gruel, very greatly diluted milk, or whey should be given. The diet may be very slowly but gradually increased as the child's appetite and digestion improve, but in most cases a week or ten days should elapse before the full diet is resumed.

What are the symptoms of chronic indigestion?
These, although familiar, are not so easily distinguished and are very often attributed to the wrong cause. There are usually general symptoms such as indisposition, disturbed sleep, grinding of the teeth, fretfulness, languor, loss of weight and anaemia. There are besides local symptoms: flatulence, abdominal pain, abdominal distention, constipation, or looseness of the bowels with mucus in the stools, foul breath, coated tongue, loss of appetite, or an abnormal capricious appetite. Such symptoms are often wrongly ascribed to intestinal worms.

Page 50

What are the common causes of chronic indigestion?
This is generally the result of a bad system of feeding, either the prolonged use of improper food or of improper methods of feeding.

Examples of bad methods of feeding are, coaxing or forcing to eat, rapid eating with insufficient mastication eating between meals, allowing a child to have his own way in selecting his food, as when he lives largely upon a single article of diet. Things to be considered under the head of improper food are, indulgence in sweets, desserts, *etc*., the use of imperfectly cooked foods, especially cereals and vegetables, and of raw or stale fruits.

Is it not true that a diet or a special article of food which does not make a child ill is proof that such a diet or such a food is proper for a child?
By no means; with many people the only guide In feeding children is that the article in question did not make the children sick, therefore it is allowable. This is a very bad principle. A better one is to adopt such a diet as will nourish the child's body with the least possible tax upon his digestive organs; in other words, to exclude articles which experience has shown to be injurious to most children.

How should chronic indigestion be managed?
This is a much more difficult matter than the treatment of acute indigestion, for, as it is usually the result of the prolonged use of improper food or of an improper method of feeding, a cure can be accomplished only by a discovery and removal of the cause.

Is chronic indigestion curable?
In the vast majority of cases it is so, but only by faithfully observing for a long period the rules for simple feeding laid down elsewhere. One of the greatest' difficulties in the way of recovery is that parents and nurses are unwilling to follow a restricted diet long enough to secure a complete

cure, or to change radically their methods of feeding, but expect the child to recover by simply taking medicine.

For how long a period is it necessary to continue very careful feeding?
In any case it must be done for several months; with most children for two or three years; with some, throughout childhood, for with them the slightest deviation from established rules is sure to provoke a relapse.

Is not medicine useful?
It is undoubtedly of assistance for the relief of some symptoms, but the essential thing is proper feeding, without which nothing permanent can be accomplished.

GENERAL RULES TO BE OBSERVED IN FEEDING

Bad habits of eating are readily acquired but difficult to break.

Young children should not be allowed to play with their food, nor should the habit be formed of amusing or diverting them while eating, because by these means more food is taken.

Older children should not be permitted to make an entire meal of one thing, no matter how proper this may be.

Page 51

Children, who are allowed to have their own way in matters of eating are very likely to be badly trained in other respects; while those who have been properly trained in matters of eating can usually be easily trained to do anything else that is important.

Learning to eat proper things in a proper way forms therefore a large part of a child's early education. If careful training in these matters is begun at the outset and continued, the results will well repay the time and effort required.

Whether the child feeds himself or is fed by the nurse, the following rules should be observed:

1. Food at regular hours only; nothing between meals.

2. Plenty of time should be taken. On no account should the child bolt his food.

3. The child must be taught to chew his food. Yet no matter how much pains are taken in this respect, mastication is very imperfectly done by all children; hence up to the seventh year at least, all meats should be very finely cut, all vegetables mashed to a pulp, and all grains cooked very soft.

4. Children should not be continually urged to eat if they are disinclined to do so at their regular hours of feeding, or if the appetite is habitually poor, and under no circumstances should a child be forced to eat.

5. Indigestible food should never be given to tempt the appetite when the ordinary simple food is refused? food should not be allowed between meals because it is refused at meal-time.

6. One serious objection to allowing young children highly seasoned food, entrees, jellies, pastry, sweets,

etc., even in such small amounts as not to upset the digestion, is that children thus indulged soon lose appetite for the simple food which previously was taken with relish.

7. If there is any important article of a simple diet such as milk, meat, cereals, or vegetables, which a child habitually refuses, this should always be given first at the meal and other food withheld until it is disposed of. Children so readily form habits of eating only certain things and refusing others that such an inclination should be checked early.

8. If an infant refuses its food altogether, or takes less than usual, the food should be examined to see if this is right. Then the mouth should be inspected to see if it is sore. If neither of these things is the cause, the food should be taken away and not offered again until the next feeding time comes.

9. In any acute illness the amount of food should be much reduced and the food made more dilute than usual. If there is fever, no solid food should be given. If the child is already upon a milk diet, this should be diluted, and in some cases partially peptonized.

10. In very hot weather the same rules hold, to give less food, particularly less solid food, and more water.

FOOD FORMULAS

Page 52

Beef Juice.—One pound of rare round steak, cut thick, slightly broiled, and the juice pressed out by a lemon-squeezer, or, better, a meat-press. From two to four ounces of juice can generally be obtained. This, seasoned with salt, may be given cold, or warmed by placing the cup which holds it in warm water. It should not be heated sufficiently to coagulate the albumin which is in solution, and which then appears as flakes of meat floating in the fluid.

Beef Juice by the Cold Process.—One pound of finely chopped round steak, six ounces of cold water, a pinch of salt; place in a covered jar and stand on ice or in a cold place, five or six hours or overnight. It is well to shake occasionally. This is now strained and all the juice squeezed out by placing the meat in coarse muslin and twisting it very hard. It is then seasoned and fed like the above.

Beef juice so made is not quite as palatable as that prepared from broiled steak, but it is even more nutritious, and is more economical, as fully twice as much juice, can be obtained from a given quantity of meat. Beef juice prepared in either of these ways is greatly to be preferred to the beef extracts sold.

Mutton Broth.—One pound of finely chopped lean mutton, including some of the bone, one pint cold water, pinch of salt. Cook for three hours over a slow fire down to half a pint, adding water if necessary; strain through muslin, and when cold carefully remove the fat, adding more salt if required. It may be fed warm, or cold in the form of a jelly.

A very nutritious and delicious broth is made by thickening this with cornstarch or arrowroot, cooking for ten minutes and then adding three ounces of milk, or one ounce and a half of thin cream, to a half pint of

broth.

Chicken, Veal, and Beef Broths.—These are made and used in precisely the same manner as mutton broth.

Meat Pulp.—A rare piece of round or sirloin steak, the outer part having been cut away, is scraped or shredded with a knife; one teaspoonful to one tablespoonful may be given, well salted, to a child of eighteen months. Scraping is much better than cutting the meat fine.

For this on a large scale, as in institutions, a Hamburg-steak cutter may be employed.

Junket, or Curds and Whey.—One pint of fresh cow's milk, warmed; pinch of salt; a teaspoonful of granulated sugar; add two teaspoonfuls of Fairchild's essence of pepsin, or liquid rennet, or one junket tablet dissolved in water; stir for a moment, and then allow it to stand at the temperature of the room for twenty minutes, or until firmly coagulated; place in the ice box until thoroughly cold. For older children this may be seasoned with grated nutmeg.

Whey.—The coagulated milk prepared as above is broken up with a fork and the whey strained off through muslin. It is best given cold. If some stimulant is desired, sherry wine in the proportion of one part to twelve, or brandy one part to twenty-four, may be added. Whey is useful in many cases of acute indigestion.

Page 53

Barley Jelly from the Grains.—Three tablespoonfuls of pearl barley; soak overnight, then place this in one quart of fresh water; add pinch of salt, and cook in double boiler steadily for four hours down to one pint, adding water from time to time; strain through muslin. When cold this makes a rather thick jelly. If a thinner gruel (barley water) is desired, one half the quantity of barley should be used.

Oat, Wheat, or Rice Jelly.—These are prepared from oatmeal, wheaten grits, and rice grains in the same manner as the barley jelly.

Barley Jelly from the Flour.—Either Robinson's patent barley or prepared barley flour of the Health Food Company may be used. One rounded tablespoonful of the flour, thoroughly blended with a little cold water, is added, stirring, to one pint of boiling water containing a pinch of salt; cook for twenty minutes in a double boiler, and strain. This makes a jelly of about the consistency of that made from the grains as above. It is essentially the same in composition, and much less trouble to prepare. A thinner gruel (barley water) is made by using half the quantity of flour.

When this is to be mixed with milk, it is well to add the milk to the barley gruel before removing from the fire, and stir two or three minutes, or until the milk has nearly reached the boiling point, when it should be removed and bottled.

Oat or Wheat Jelly from the Flour.—These are made from the prepared oat flour of the Health Food Company or Hubbell's prepared wheat flour. They are used like the barley.

Imperial Granum.—This is prepared and used in precisely the same way as the barley flour above mentioned, the gruel being mixed with milk before

it is removed from the fire.

Albumin Water.—The white of one fresh egg; half a pint of cold water; pinch of salt; teaspoonful of brandy. This should be shaken thoroughly and fed cold either with a spoon or from a bottle. It is useful in cases of vomiting, and can sometimes be retained by a very irritable stomach.

Lime-water.—One heaping teaspoonful of slaked lime; one quart boiled or distilled water; place in a corked bottle and shake thoroughly two or three times during the first hour. The lime should then be allowed to settle, and after twenty-four hours the upper clear fluid carefully poured or siphoned off for use.

Dried Bread.—Either stale or fresh bread may be used; it is cut in thin slices and placed in the oven, with the door open, and quickly dried until it is crisp, but not browned. It is in many respects preferable to crackers for little children.

Coddled Egg.—A fresh egg, shell on, is placed in boiling water which is immediately after removed from the fire. The egg then cooks slowly in the water, which gradually cools, for seven or eight minutes, when the white should be about the consistency of jelly. For a delicate digestion the white only should be given, with salt; it can be easily separated from the yolk.

Page 54

PART IV

MISCELLANEOUS

THE BOWELS

How many movements daily should an infant have during the first few weeks of life?
Usually two or three a day for the first week, and then one or two each day.

How many after a child is a month old?
A healthy child should have at least one movement each day; many have two and some more than two; but it is the character of the stools rather than their number which is to be taken as the evidence of perfect digestion.

What is the appearance of a healthy movement of a child who is taking nothing but milk?
It is soft, yellow, and smooth, containing no lumps.

When are the stools dark brown or black?
While taking bismuth, iron, and sometimes when taking much meat or beef juice; also while taking many of the prepared foods. They may be dark brown or black from blood. This last is a condition which may indicate serious illness.

How may a child be trained to be regular in the action of its bowels?
By endeavouring to have them move at exactly the same time every day.

At what age may an infant be trained in this way?
Usually by the second month if training is begun early.

What is the best method of training?

A small chamber, about the size of a pint bowl, is placed between the nurse's knees, and upon this the infant is held, its back being against the nurse's chest and its body firmly supported. This should be done twice a day, after the morning and afternoon feedings, and always at the same hour. At first there may be necessary some local irritation, like that produced by tickling the anus or introducing just inside the rectum a small cone of oiled paper or a piece of soap, as a suggestion of the purpose for which the baby is placed upon the chamber; but in a surprisingly short time the position is all that is required. With most infants, after a few weeks the bowels will move as soon as the infant is placed on the chamber.

What advantage has such training?
It forms the habit of having the bowels move regularly at the same hour, which is a matter of great importance in infancy and makes regularity in childhood much easier. It also saves the nurse much trouble and labour.

SLEEP

Should a child sleep in the same bed with its mother or nurse?
Under no circumstances, if this can possibly be avoided. Very young infants have often been smothered by their mothers, by overlying during sleep. If the infant sleeps with the mother, there is always the temptation to frequent nursing at night, which is injurious to both mother and child. Older children also should, if possible, have separate beds; many contagious diseases and bad habits are contracted by children sleeping together.

Page 55

How should an infant's bed be prepared?
The mattress should be firm but soft, the pillow very thin, and the covering not excessive. A baby should not be allowed to sleep always in the same position, but should be changed from side to side. Hair pillows are useful in summer and for children who perspire very much.

How much sleep is natural for a newly born baby?
A baby with a good digestion and proper food will usually sleep at this period about nine tenths of the time.

How much should a baby sleep at six months?
About two thirds of the time.

Up to what age should an older child take a nap during the day?
Always until four years old, and if possible longer.

At what age may an infant go all night without feeding?
At five months a child should not be fed or nursed between 10 P.M. and 6 A.M. At two years a child can easily go from 6 P.M. to 6 A.M. without feeding.

How should a baby be put to sleep?
The room should be darkened and quiet, the child's hunger satisfied, and the child made generally comfortable and laid in its crib while awake.

Is rocking necessary?
By no means. It is a habit easily acquired, but hard to break, and a very useless and sometimes injurious one. The same may be said of sucking a rubber nipple, or "pacifier," and all other devices for putting children to sleep.

What are the principal causes of disturbed sleep?
As quiet peaceful sleep is a sign of perfect health, disorders of sleep may be produced by almost anything

which is wrong with the child.

1. Habitual disturbance of sleep in infants is most frequently associated with the food or feeding. It may be from the discomfort of chronic indigestion due to improper food. In bottle-fed infants it is often the result of overfeeding; in those who are nursed it is often due to hunger. A common cause is frequent night feeding; an infant who is fed three or four times during the night is almost invariably a bad sleeper.

2. Disturbed sleep or sleeplessness may be due to causes purely nervous. Such are bad habits acquired by faulty training; as when the nursery is lighted and the child taken from its crib whenever it wakes or cries; or when some of the contrivances for inducing sleep have been used. Any excitement or romping play just before bedtime, and fears aroused by pictures or stories, are frequent causes. Children who inherit from their parents a nervous constitution are especially likely to suffer thus.

3. There may be physical discomfort from cold feet, insufficient or too much clothing, or want of fresh air in the sleeping room.

4. Interference with breathing due to obstruction from large tonsils or adenoids. These cause great restlessness and lead a child to assume many different postures during sleep, often lying upon the face or upon the hands and knees.

Page 56

5. Chronic pains or frequently recurring night pains may be causes of disordered sleep, when a child wakes with a sudden sharp cry. In infants this is most often due to scurvy, sometimes to syphilis. In older children it may be the earliest symptom of disease of the hip or spine.

6. Sleeplessness and disturbed sleep are frequent whenever the general condition falls much below a healthy standard; *e.g.*, in infants who are not thriving and in children suffering from marked anaemia.

How are children who sleep too little, or whose sleep is constantly disturbed, to be treated?
Never by the use of soothing sirups or other medicines. Successful treatment consists in the discovery and removal of the cause.

Do children ever sleep too much?
It is doubtful if healthy children ever do. Excessive sleep is an important symptom of some diseases of the brain. Otherwise it seldom if ever occurs unless soothing sirups or other drugs have been given.

EXERCISE

Is exercise important for infants?
It is as necessary for them as for older children.

How is it obtained?
A young baby gets its exercise by screaming, waving its arms, kicking, *etc*. The clothing should not be so tight as to make these movements impossible. At least twice a day the infant should be allowed for fifteen or twenty minutes the free use of its limbs by permitting it to lie upon a bed in a warm room, with all clothing except the shirt, stockings, and napkin removed. Later, when in short clothes,

the baby may be put upon a thick blanket or quilt laid upon the floor, and be allowed to tumble about at will. A nursery fence two feet high, made to surround a mattress, is an excellent device and makes a convenient box stall for the young animal, where it can learn to use both its arms and legs without the danger of injury. Only by exercise such as this do the muscles have an opportunity to develop properly.

THE CRY

When is crying useful?
In the newly born infant the cry expands the lungs, and it is necessary that it should be repeated for a few minutes every day in order to keep them well expanded.

How much crying is normal for a very young baby?
From fifteen to thirty minutes a day is not too much.

What is the nature of this cry?
It is loud and strong. Infants get red in the face with it; in fact, it is a scream. This is necessary for health. It is the baby's exercise.

When is a cry abnormal?
When it is too long or too frequent. The abnormal cry is rarely strong, often it is a moaning or a worrying cry, sometimes only a feeble whine.

What are the causes of such crying?
Pain, temper, hunger, illness, and habit.

Page 57

What is the cry of pain?
It is usually strong and sharp, but not generally continuous. It is accompanied by contraction of the features, drawing up of the legs, and other symptoms of distress.

What is the cry of hunger?
It is usually a continuous, fretful cry, rarely strong and lusty.

What is the cry of temper?
It is loud and strong and accompanied by kicking or stiffening of the body, and is usually violent.

What is the cry of illness?
There is usually more of fretfulness and moaning than real crying, although crying is excited by very slight causes.

What is the cry of indulgence or from habit?
This is often heard even in very young infants, who cry to be rocked, to be carried about, sometimes for a light in the room, for a bottle to suck, or for the continuance of any other bad habit which has been acquired.

How can we be sure that a child is crying to be indulged?
If it stops immediately when it gets what it wants, and cries when it is withdrawn or withheld.

What should be done if a baby cries at night?
One should get up and see that the child is comfortable—the clothing smooth under the body, the hands and feet warm, and the napkin not wet or soiled. If all these matters are properly adjusted and the child simply crying to be taken up, it should not be further interfered with. If the night cry is habitual some other cause should be sought (see page 121).

How is an infant to be managed that cries from

temper, habit, or to be indulged?
It should simply be allowed to "cry it out." This often requires an hour, and in extreme cases, two or three hours. A second struggle will seldom last more than ten or fifteen minutes, and a third will rarely be necessary. Such discipline is not to be carried out unless one is sure as to the cause of the habitual crying.

Is it likely that rupture will be caused from crying?
Not in young infants if the abdominal band is properly applied, and not after a year under any circumstances.

LIFTING CHILDREN

How should a young baby be lifted from its bed?
The right hand should grasp the clothing below the feet, and the left hand should be slipped beneath the infant's body to its head. It is then raised upon the left arm.

What is the advantage of this?
The entire spine is supported, and no undue pressure is made upon the chest or abdomen, as often happens if the baby is grasped around the body or under the arms.

How should a child old enough to run about be lifted?
Always by placing the hands under the child's arms, and never by the wrists.

What injury may be inflicted by lifting the child by the wrists or hands?

Page 58

Often serious injury is done to the elbow or shoulder joints.

THE TEMPERATURE

What is the normal temperature of an infant?
The normal temperature varies more than in adults. In the rectum it usually fluctuates between 98 deg. and 99.5 deg. F.; a rectal temperature of 97.5 deg. F. or of 100.5 deg. F. is of no importance whatever unless it continues.

Where should the temperature of infants and young children be taken?
The rectum is altogether the best place, and next to this the groin. The rectal temperature is from half a degree to a degree higher than that in the groin.

How long should the thermometer be left in place to take the temperature?
Two minutes in the rectum, and five minutes in the groin.

Is the temperature of a young child a good guide as to the severity of its symptoms in illness?
As a rule it is. A temperature of 100 deg. to 102 deg. F. commonly means a mild illness, and one of 104 deg. F. or over a serious one.
The duration of the fever is, however, even more important than the height of the temperature. It should be remembered that in all young children slight causes often produce a high temperature which lasts for a few hours; one should not therefore be unduly alarmed unless the temperature continues high, or is accompanied by other important signs of illness.

Is not a high temperature a more serious symptom

in a young child than in an adult?
The opposite is rather the case. Young children are extremely sensitive to conditions which produce fever, and the thermometer often gives an exaggerated idea of the severity of the symptoms. A cause which in an adult might produce a temperature of 102 deg. F. or 103 deg. F., in a young child would very likely be accompanied by a temperature of 104 deg. or 105 deg. F.

NERVOUSNESS

What are the principal causes of excessive nervousness in infants and young children, and what can be done to prevent this?
The most important cause is the delicate structure of the brain at this time, and its rapid growth. It grows as much during the first year as during all the rest of life. This requires quiet and peaceful surroundings. Infants who are naturally nervous should be left much alone, should see but few people, should be played with very little, and should never be quieted with soothing sirups or the "pacifier."

At what age may playing with babies be begun?
Babies under six months old should never be played with; and the less of it at any time the better for the infant.

What harm is done by playing with very young babies?
They are made nervous and irritable, sleep badly and suffer from indigestion and in many other respects.

Page 59

When may young children be played with?
If at all, in the morning, or after the midday nap;
but never just before bedtime.

TOYS

What points should guide one in selecting toys and playthings for an infant?
The instinct in a baby to put everything into the mouth is so strong that nothing should be given that cannot be safely treated in this way. Hence one should choose things which are smooth, those which can be easily washed, and those which cannot be swallowed.

One should avoid (1) toys with sharp points or corners; (2) those with loose parts that might be detached or broken off and swallowed; (3) small objects which might be swallowed or pushed into the nose or ear, such as coins, marbles, and safety-pins, also beads and buttons unless strung upon a stout cord; (4) painted toys; (5) those covered with hair or wool. Infants have often been severely injured by swallowing what they have pulled off from their small toy animals.

What points are to be considered in selecting the toys and playthings of a child over two years old?
It should be remembered that toys are not merely a source of amusement, but that they have an educational value as well. Those are therefore to be preferred the use of which develops the child's imagination, and with which he can be taught to amuse himself. For boys nothing can surpass blocks, toy soldiers, balls, engines, and cars; and for girls, dolls and housekeeping sets. The complicated mechanical toys now so much in vogue give only a momentary pleasure, and as soon as the wonder at their operation has worn off, they have lost interest for the child except that which he gets in breaking them to see how the

thing worked.

What important things can be taught children with their toys and how may this be done?
The imagination may be developed, and children may be trained to habits of neatness, order and regularity and to concentration of mind.

To this end toys should be kept in an orderly way upon a shelf in the nursery or in a closet, never piled in a miscellaneous heap in the corner of the room. Children should select their toys and play with one thing at a time, which they should be taught to put away in its place before another is given. They should never be allowed to have a dozen things strewn about the room at one time, with none of which they are occupied.

KISSING

Are there any valid objections to kissing infants?
There are many serious objections. Tuberculosis, diphtheria, and many other grave diseases may be communicated in this way. The kissing of infants upon the mouth by other children, by nurses, or by people generally, should under no circumstances be permitted. Infants should be kissed, if at all, upon the cheek or forehead, but the less even of this the better.

Page 60

CONVULSIONS

What should be done for a child in convulsions before a doctor arrives?
Keep the child perfectly quiet with ice at the head, put the feet in a mustard bath, and roll the entire body in large towels which have been dipped in mustard water (two heaping tablespoonfuls of mustard to one quart of tepid water), and have plenty of hot water and a bath tub at hand, so that the doctor can give a hot bath if he thinks it advisable.

When is a hot bath useful?
If the convulsions have continued until the pulse is weak, the face very pale, the nails and lips blue, and the feet and hands cold, the hot bath will be useful by bringing blood to the surface and relieving the heart, lungs, and brain.

How should the bath be given?
The temperature should not be over 106 deg. F.; this should always be tested by a thermometer if one can be obtained. Without this precaution, in the excitement of the moment, infants have frequently been put into baths so hot that serious and even fatal burns have been produced. If no thermometer is available the nurse may plunge her arm to the elbow into the water. It should feel warm, but not so hot as to be at all uncomfortable. One half a teacupful of powdered mustard added to the bath often adds to its efficacy.

FOREIGN BODIES

What should be done if a foreign body has been swallowed?
First, examine the throat with the finger to see if

it has lodged there, and if so remove it. If it has passed from the throat it has usually gone into the stomach.

What should be done in this case?
Give the child plenty of dry food, like bread, potato, *etc*., but under no circumstances either an emetic or cathartic. An infant may have its usual food.

What harm would a cathartic do?
It is likely to hurry the foreign body too rapidly through the intestine and in this way do harm; otherwise it becomes coated with fecal matter and passes the intestine usually without doing injury.

What should be done if a child gets a foreign body into the ear?
Unless this can easily be removed with the fingers it should not be meddled with, for it is likely to be pushed farther into the ear. The child should be taken to a physician.

What should be done if there is a foreign body in the nose?
The child should blow his nose strongly while the empty nostril is compressed. Unless this removes it a physician should be called. Meddlesome interference is always harmful.

COLIC

What are the symptoms of colic?
There is a strong, hard cry, which comes suddenly and returns every few minutes. With this there is drawing up of the feet, contraction of the muscles of the face, and other signs of pain. The abdomen is usually tense and hard.

Page 61

What should be done for a baby with colic?
First, see that the feet are warm. Place them against a hot-water bag, or hold them before an open fire; apply a hot flannel to the abdomen, or let the child lie upon its stomach across a hot-water bag. If the colic continues, a half teacupful of warm water containing ten drops of turpentine may be injected into the bowels with a syringe; at the same time the abdomen should be gently rubbed so as to start the wind. If the gas is in the stomach, half of a soda mint tablet may be given in a tablespoonful of very warm water.

EARACHE

What are the symptoms of earache?
The pain is generally severe and accompanied by a sharp scream; the child often puts the hand to the affected ear, or cries whenever it is touched. The pain is likely to be prolonged and continuous.

How should a child with earache be treated?
The ear should be irrigated with a solution of boric acid (twenty grains to the ounce) as warm as can be borne. Dry heat may then be applied in several ways. The ear having been first covered with cotton, a small hot-water bag or one filled with hot salt or bran, may be bound over it with a bandage; or a small butter plate heated in hot water may be used in the same way. The hot-water bag may be held against the ear or the child may lie with his head upon it. The use of such substances as oil and laudanum in the ear is not to be recommended.

CROUP

What are the symptoms of croup?
There is a hollow, dry, barking cough, with some difficulty in breathing.

When is this likely to come on?
Usually at night.

Is simple croup dangerous?
The ordinary croup of infants is spasmodic croup, and is very rarely dangerous, although the symptoms seem very alarming.

What are the symptoms?
In a mild attack there is simply noisy breathing, especially on drawing in the breath, with a tight, barking, or croupy cough. In a severe attack the child's breathing is more noisy and becomes difficult.

What is the dangerous form of croup?
Membranous croup, which is the same thing as diphtheria of the larynx.

How does this develop?
Gradually; very rarely does it come on suddenly.

What should be done for a baby who has spasmodic croup?
The room should be very warm, hot cloths or poultices should be applied over the throat, and either a croup kettle or an ordinary tea-kettle kept boiling in the room. This is more efficacious if the child is placed in a tent made by a raised umbrella with a sheet thrown over it, and the steam introduced beneath the tent. If the symptoms are urgent, ten drops of the sirup of ipecac should be given every fifteen minutes until free vomiting occurs. Whenever the symptoms reach a point where breathing becomes difficult, a doctor should be summoned without delay.

Page 62

CONTAGIOUS DISEASES

What are the first symptoms of measles?
Measles comes on rather gradually with cough, sneezing, watery eyes and nose, much like an ordinary cold in the head. The eruption appears after three or four days, first upon the face and neck as small red spots, and spreads slowly over the body.

Is measles a serious disease?
In infants and during the winter season it is likely to be very serious on account of the danger of bronchitis and pneumonia, which frequently accompany it. In children over four years old it is generally not severe. No child should be voluntarily exposed to this disease, and particularly one who is delicate or prone to disease of the lungs should be protected against it.

When and how is measles contagious?
Measles may readily be conveyed from the very beginning of the catarrh, two or three days before any eruption is present. It is not often carried by healthy persons. Its poison does not cling long to a sick room.

What is German measles?
German measles, or rubella, is a distinct disease and has nothing to do with ordinary measles. It is extremely rare for a child to be much sick with it. There is usually a very extensive eruption which may cover the body, but few other symptoms.

What are the first symptoms of scarlet fever?
Generally it comes suddenly, with vomiting, high fever, and sore throat. The eruption usually appears within twenty-four hours as a red blush, first upon the neck and chest, and spreads rapidly.

When and how is scarlet fever contagious?

Scarlet fever is only slightly contagious for the first one or two days of the attack. It is most contagious at the height of the disease and during desquamation. It may be carried by healthy persons and by the clothing or bedding from the sick room.

How does whooping-cough begin?
For a week or ten days it cannot be distinguished from an ordinary cold on the chest. Then the attacks of coughing gradually become more severe and vomiting may follow. After a severe coughing fit the breath is caught with a peculiar noise known as the "whoop."

How does chicken-pox begin?
It usually comes out gradually, as widely scattered pimples over the scalp, face, and body, many of which soon become small vesicles, resembling tiny blisters. There is itching and local discomfort but little fever, and the child rarely seems to be very ill.

How does diphtheria begin?
Sometimes suddenly, but usually gradually, with sore throat and swelling of the glands of the neck, with white patches upon the tonsils, or a free discharge which may be bloody, from the nostrils.

How does mumps begin?
As a swelling upon the jaw, beneath the ear. As it increases it extends forward upon the cheek and backward behind the ear. It affects one or both sides.

Page 63

Mumps is not very common in young children, and in them it is usually mild. After twelve or thirteen years it is likely to be more severe.

How long after exposure do the first symptoms appear in the different diseases?
In scarlet fever in from three to five days, rarely later than a week; in measles in from nine to fourteen days, occasionally as late as twenty days; in whooping-cough in from one to two weeks; in chicken-pox in from fourteen to sixteen days; in German measles in from ten to sixteen days. In diphtheria the time varies much; it may be only one day, and it may be one or two weeks. In mumps it is usually a little less than three weeks, the average being twenty days.

Which of these diseases are most contagious?
Measles and chicken-pox are very contagious, and very few children who have not had them can come near a person suffering from either disease without taking it. Whooping-cough is almost as contagious as measles, and for young babies even more so. A very close exposure is not necessary in the case of either of these diseases, and whooping-cough can undoubtedly be contracted in the open air. Scarlet fever and diphtheria are much less contagious; for both of these a pretty close exposure is necessary.

How long should a child with any of these diseases be kept away from other children?
With measles, for two weeks after the rash has gone; with scarlet fever, for at least four weeks after the rash has gone, and longer if the peeling is not over or if the ears are running; with whooping-cough, for two months, or so long as the paroxysmal cough continues; with chicken-pox, until all crusts have fallen off, or for about three weeks after the eruption appears; with German measles for one week after the eruption has faded; with diphtheria, at least ten days after the throat is well in a very mild case, and four weeks if the case has been severe; with mumps

for one week after the swelling has gone.

What should be done when a child shows the first symptoms of serious illness?
The child should be put to bed. If it is an infant the food should be diluted to one half the usual strength; if an older child, only fluid food should be given. If the child seems feverish, take the temperature If the bowels are constipated, give a teaspoonful of castor oil; but no other medicine without the doctor's orders. Send for the doctor at once, and until he comes carefully exclude all other children from the room.

By what nursery training may the examination and treatment of sick children he made much easier?
By teaching all children to gargle, to show the throat, to take pills, and by constantly teaching them to regard the doctor as the child's best friend, and his visits as a great treat. On no account should a child be frightened into obedience by threats of what the doctor will do.

With care and patience most children may be taught to gargle and take pills at four or five years, and to show the throat willingly at two or three. All these matters should be made a part of the child's education.

Page 64

SCURVY

What is scurvy and how is it produced?
Scurvy is a disease of general nutrition, usually caused by the long-continued use of improper food. Most of the cases come from the use of the prepared infant's foods sold in the stores, especially when they are given without fresh milk; occasionally the use of condensed milk and of sterilized milk is followed by scurvy; sometimes it is seen when, owing to feeble digestion, it has been necessary to make cow's milk very weak for a long time.

What symptoms are seen in an infant with scurvy?
At first there is only indefinite and occasional soreness in the legs so that the child cries out when handled. As this soreness becomes more severe the child is often thought to have rheumatism. The gums swell and are of a deep purple colour. There may be bleeding from the gums, nose, bowels, or black-and-blue spots may be seen upon the legs. The ankles and knees may swell. The child grows very pale, loses appetite and weight, and sleeps badly.

What should be done when an infant shows signs of scurvy?
The diet should at once be changed to fresh milk, properly modified according to the child's digestion, but not sterilized or pasteurized. The juice of a sweet orange should be given, best about an hour before the feeding. At first one or two teaspoonfuls, four or five times a day; later, more may be given if the symptoms are not improved.

Properly treated an infant with scurvy generally recovers promptly and completely. If not recognised, or untreated, it may cause death.

CONSTIPATION

When it is necessary to move the bowels immediately, what are some of the easiest methods?
An injection of one tablespoonful of sweet oil may be given, or half a teaspoonful of glycerine in one tablespoonful of water, or a teacupful of tepid soap and water, or a glycerine suppository. None of these should be continued excepting under the physician's directions.

What sort of a syringe is to be preferred for giving an injection to an infant?
The bulb syringe is the simplest; this consists of an oval bulb of soft rubber and a soft rubber or a hard rubber tip. It holds one or two ounces.

What is the most essential thing in preventing or overcoming constipation?
The formation of the habit of having the bowels move every day regularly at the same hour, and proper early training (see page 156).

What is the best hour?
In most cases immediately after the first meal in the morning.

What are some simple means by which constipation may be relieved?
The best are diet, suppositories, and massage.

The changes to be made in the milk of constipated infants have been mentioned on page 82. The addition to the milk of some of the malted foods, such as Mellin's food or malted milk, is sometimes useful. For little children the fruit juices are particularly beneficial when given half an hour or more before the first morning feeding, with half a glass of water.

Page 65

For older children the amount of white bread, toast, and potato, should be reduced, and green vegetables oatmeal, and Graham bread given, with plenty of fruit twice a day. Raw scraped apples are sometimes of more value than any other fruit.

The best suppositories for continuous use are probably the gluten suppositories of the Health Food Company. One should be given the first thing in the morning. They act rather slowly, usually in about two hours. In obstinate cases one may also be used at bedtime. Glycerine suppositories act more quickly, but are too irritating for regular use.

Massage consists in rubbing the abdomen, which may be done in one of two ways: Beginning at the right groin, the hand is carried up to the ribs, then across to the opposite side, then around to the left groin. The abdomen is stroked gently at first, and afterward deeper pressure used as the child becomes accustomed to it. The second method is by rubbing the deeper parts with a circular movement—the fingers not moving upon the skin—making a series of small circles, beginning at the right groin and following the same course as described above. Either method should be employed for six or eight minutes twice a day, at almost any regular time, except soon after a meal.

DIARRHOEA

In case a child is taken with diarrhoea, what should be done?
With a moderate looseness of the bowels in an older child, solid food should be stopped, and boiled milk given diluted with gruel; the child should be kept perfectly quiet, as walking about always aggravates such a disturbance. If the symptoms are more severe

and attended by fever and vomiting, all milk should be stopped at once, and only broth, barley water, or some thin gruel given. Some cathartic, usually castor oil, is required with a severe attack.

If the patient is an infant, the milk should be diluted and especially should the fat be reduced (see page 76). In severe attacks with vomiting or frequent foul stools, all food should be stopped for at least twelve hours and all milk for a longer time, and the bowels freely moved by a cathartic.

Why is a cathartic necessary if the movements are already frequent?
Such movements are nearly always due to an irritation in the bowel, set up by the fermenting food which has not been digested. The diarrhoea is Nature's effort to get rid of the irritant. Nothing to stop the movements should be given until the bowels have been thoroughly cleared by the treatment mentioned.

BAD HABITS

What are the most common bad habits of young children?
Sucking, nail-biting, dirt-eating, bed-wetting, and masturbation.

What do children suck?
Most frequently the thumbs or fingers, sometimes the clothing or blanket; often the "pacifier" or rubber nipple.

Page 66

When is this habit most frequently seen?
It begins in quite early infancy, and if not broken may last until children are six or seven years old.

Is the sucking habit a harmful one?
When persisted in it may produce a misshapen mouth or fingers. It constantly stimulates the flow of saliva and certainly aggravates disturbances of digestion during which the sucking habit is likely to be practised. It may lead to thrush or other forms of infection of the mouth. It is not necessary as a means of quieting a child, though it may in some degree cover up the consequences of bad feeding or bad training. On no account should the habit of sucking the "pacifier" be allowed as a means of putting children to sleep, or of quieting them while restless from dentition or indigestion.

How is the sucking habit to be controlled?
One should be sure in the first place that the constant sucking of fingers is not due to hunger from insufficient food. Sucking of the hands may often be controlled by wearing mittens or fastening the hands to the sides during sleep. In more obstinate cases it may be necessary to confine the elbow by small pasteboard splints to prevent the child from bending the arm so as to get the hand to the mouth.

When are nail-biting and dirt-eating seen, and how are they to be controlled?
These habits belong especially to children over three years old. They are seen particularly in those who are excessively nervous or whose general health is below par; sometimes in those who develop serious nervous diseases later in life. Children with such tendencies should be closely watched, and every means used to break up these habits early. Dirt-eating is a morbid craving which is rarely seen in a normal child.

At what age may a child generally be expected to

go without wetting the bed during the night?
Usually at two and a half years, if it is taken up late in the evening. Some children acquire control of the bladder at night when two years old, and a few not until three years. After three years habitual bed-wetting is abnormal.

How should a young child addicted to bed-wetting be managed?
At three or four years of age, punishments are sometimes useful, especially when it seems to depend more upon the child's indifference than anything else. They are of no value in older children, rewards being much more efficacious. In all cases one should give a child plenty of milk and water early in the day, but no fluids after 4 P.M., the supper being always of solid or semi-solid food. The child should be taken up regularly at ten o'clock or thereabouts. It often happens that the formation or continuance of the habit is due to the child being in poor general condition, to some irritation in the urine, or in the genital organs. Unless the simple means mentioned are successful the child should be placed under the charge of a physician.

Page 67

What is masturbation?
It is the habit of rubbing the genital organs with the hands, with the clothing, against the bed, or rubbing the thighs together. Sometimes the child sits upon the floor, crosses its thighs tightly and rocks backward and forward. Many of these things are passed over lightly and are regarded for months as simply a "queer trick" of the child.
It may be seen at any age, even in those not more than a year old, and in both sexes.

How should such a child be treated?
Masturbation is the most injurious of all the bad habits, and should be broken up just as early as possible. Children should especially be watched at the time of going to sleep and on first waking. Punishments and mechanical restraint are of little avail except with infants. With older children they usually make matters worse. Rewards are much more efficacious. It is of the utmost importance to watch the child closely, to keep his confidence, and by all possible means to teach self-control.

Some local cause of irritation is often present, which can be removed. Medical advice should at once be sought.

VACCINATION

Nowadays when small-pox occurs so seldom is it necessary to have every child vaccinated?
It should by all means be done. It is only by the practice of general vaccination that small-pox is kept down. In countries or in communities where vaccination is neglected, frightful outbreaks of small-pox occur every now and then just as in olden times.

What is the best time for vaccination?
The time usually selected is from the third to the sixth month. It may be deferred in a very delicate child who is not likely to be exposed to small-pox, or in a child suffering from any form of skin disease.

Which is preferable for vaccination, the arm or the leg?
The part which can be most easily protected and kept at rest is to be chosen. In infants who do not yet walk or creep, the leg is to be preferred? in older children, in most circumstances, the arm. If older children are vaccinated on the leg, they should not be allowed to walk much while the vaccination is active.

When should vaccination be repeated?
An unsuccessful vaccination proves nothing and should be repeated in two or three weeks. If success fully vaccinated in infancy, a child should invariably be revaccinated before puberty. If exposed or likely to be exposed to small-pox at any time vaccination should be repeated.

[Illustration: Weight chart for the first year; the curved line indicates the average rate of gain.]

[Illustration: Weight chart, one to fourteen years. The upper line indicates the average for boys; the lower (dotted) line that for girls.]