U. S. DEPARTMENT OF LABOR
CHILDREN'S BUREAU
JULIA C. LATHROP, Chief

INFANT CARE

BY

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ILLUSTRATIONS.

LETTER OF TRANSMITTAL.

U. S. Department of Labor,
Children's Bureau,
Washington, D. C., July 22, 1914.

Sir: I transmit herewith the second monograph in the Care of Children series.

This issue discusses the care of the baby to the close of the second year. It is written by Mrs. Max West, who wrote the first number of this series, entitled "Prenatal Care," and the same method has been used in its preparation—namely, exhaustive study of the standard literature on the hygiene of infancy as well as consultations with physicians, nurses, and other specialists in this field.

Like the preceding one of the series, it is addressed to the average mother of this country. There is no purpose to invade the field of the medical or nursing professions, but rather to furnish such statements regarding hygiene and normal living as every mother has a right to possess in the interest of herself and her children. It endeavors to present the accepted views of the best authorities at the present time. Footnotes indicate the chief sources.

The bureau is deeply indebted to many persons for aid, not only to those who have given generously of valuable professional time to read and criticize the manuscript, but as well to those who have advised as to materials and appliances and to those who have aided in securing the illustrations.

Respectfully submitted.

Julia C. Lathrop, *Chief.*

Hon. William B. Wilson,
Secretary of Labor.

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INFANT CARE.

BIRTH REGISTRATION.

One of the most important services to render the newborn baby is to have his birth promptly and properly registered.

In most States the attending physician or midwife is required by law to report the birth to the proper authority, who will see that the child's name, the date of his birth, and other particulars are made a matter of public record. Birth registration may be of the greatest importance when the child is older, and parents should make sure that this duty is not neglected.[1]

LIVING CONDITIONS.

The house which is to be the home of children should be sunny, well ventilated, and dry. The choice is usually limited by the size of the family income, but there is, nevertheless, within this limit some range of selection. Among houses of the same rental one may be in better repair than another, or the houses on one side of the street may be sunnier than those on the other, or one house may have more space about it than another, or the plumbing, drainage, or other conveniences in one may be in a more sanitary condition than in another.

Flats and apartments do not usually afford enough freedom for growing children, although a baby may do very well in such a place until he is 2 or 3 years old, when he needs more room, both indoors and out. Tenements with dark rooms are not fit homes for children. Suburban homes, or those in the outskirts of cities or close to public parks, give to city children of the average family the best chance for proper growth and development.

In selecting a city house it is wise to consider what possibilities it has for future improvements—as, for example, whether the roof can be utilized for play space, whether there is room for a porch or bay window on any side, and whether the back yard can be made into a pleasant out-of-door living room for the family.

[1] Write to the Children's Bureau, U. S. Department of Labor, Washington, D. C., for monograph on birth registration.

Those who live in smaller cities, towns, and rural communities will find it easier to provide their children with light, air, and out-of-door space. In every case the house and its surroundings should be carefully inspected. The cellar or basement should be clean and dry; if there is a well, it should be so located as to prevent the water from being poisoned by the foul drainage from stable or outhouses. Pools of stagnant water, manure heaps, piles of garbage, refuse or rubbish of any sort, or open privies are all dangerous to health and furnish breeding places for disease-carrying insects, such as flies and mosquitoes.

The health of the baby is so dependent upon sanitary surroundings that a list of Government publications relating to the hygiene of the home is given in the appendix to this pamphlet. (See Appendix.)

NURSERY.

LIGHT AND VENTILATION.

Sunshine is as necessary for the baby as for the plant, and a baby deprived of it will pine and droop just as a plant does; therefore the room in which the sun shines for the longest period of the day should be chosen for the nursery.

The room should have a constant supply of fresh air, as the baby will be much less liable to illness than when he is deprived of it. To "air" a room at intervals by opening the windows is well, but a far better plan is to have a continual stream of fresh air flowing through. To do this the windows must be opened on opposite sides of the room in order to secure a cross draft, which is always necessary to real ventilation. When the outside temperature is so extremely low that a comfortable temperature can not be maintained with the windows open, outside air should be frequently admitted by opening wide the windows on opposite sides and flushing every part of the room for a few moments. In severe weather it is a good plan to air the nursery whenever the baby is taken into another room. In all the mild months the windows should be kept constantly open night and day.

The overwhelming importance of fresh air to children is strikingly shown in a recent English report on the mortality, by different age groups, among the inhabitants of well-ventilated and ill-ventilated houses in the same towns. The families chosen were of similar income and social status.[1]

The general result of this investigation was to show that in the group comprising children under 5 years of age not only were the

[1] A report on Relative Mortality in Through and Back-to-Back Houses in certain Towns in the West Riding of Yorkshire, by Dr. L. W. Darra Mair, London, 1910.

deaths from diseases of the respiratory tract, such as pneumonia and bronchitis, far more frequent in the badly ventilated houses, as might have been expected, but the deaths from diseases caused by defective development and malnutrition were 40 per cent higher in the poorly ventilated houses than in those which had through ventilation, showing the great importance of fresh air to all young children.

HEATING.

It is desirable to have a heating system which is readily controlled, so that the temperature of the room may be raised or lowered when necessary. Hot-air furnaces are considered more healthful than steam or hot water, because they provide for the circulation of fresh, moistened air. Gas and oil heaters should be avoided if any other method can be had, as such heaters exhaust the air of even a large room in a short time. An open grate in the room is an advantage, both because extra heat may be had when needed and because it helps to keep the air in the room in circulation.

CLEANING.

The floor should be bare, so that it can be kept clean by wiping it with a damp cloth or dust mop. There should be no heavy draperies nor upholstered furniture to catch dust. Painted walls which can be washed are sanitary and easily renewed.

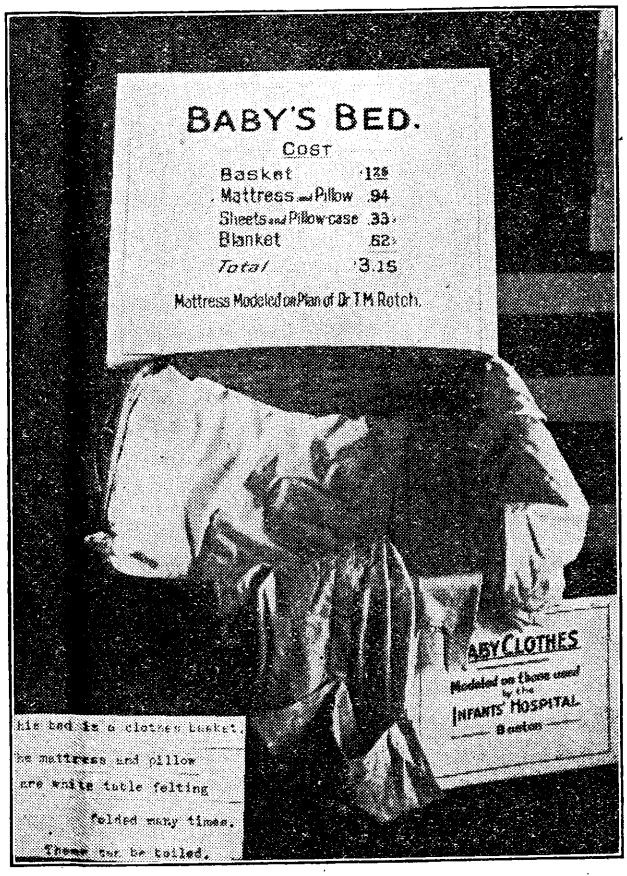
BED.

The first bed may be made from an ordinary clothes basket (see Plate I) or from a light box, such as an orange crate. Later a metal crib with a firm spring is desirable. Table padding or "silence" cloth, folded to four thicknesses, makes a very good mattress, because it is readily washable; when washed it should be hung out of doors to dry. A sanitary crib mattress may be made by stuffing bed ticking with excelsior, which can be renewed as often as necessary. Sphagnum moss or straw can be used in the same way. The mattress cover may be made of bed ticking or heavy unbleached muslin, which can be emptied, washed, and dried in the sun at intervals. In case excelsior or straw is used for the temporary filling, it should be made as level and smooth as possible, and a piece of soft felting or a small comfort should always be placed over the mattress to soften the rough surface. After the baby has learned not to wet the bed at night, an ordinary mattress of hair, felt, or cotton may be used, but it should be protected by oilcloth, rubber sheeting, or absorbent paper as an additional precaution. Since a rubber or oilcloth sheet is both hard and cold, a soft pad should always be used directly underneath the

baby. Table felting makes excellent pads. The illustration on this page shows a simple and inexpensive bed for a young baby.[1]

Pillow.—A baby will breathe more easily and take a larger supply of air into the lungs if no pillow is used. If the mother desires, she may place a clean folded napkin or some other clean soft cloth under the baby's head, but it should not be allowed to elevate the head appreciably. Toward the end of the second year a thin hair pillow

PLATE I.



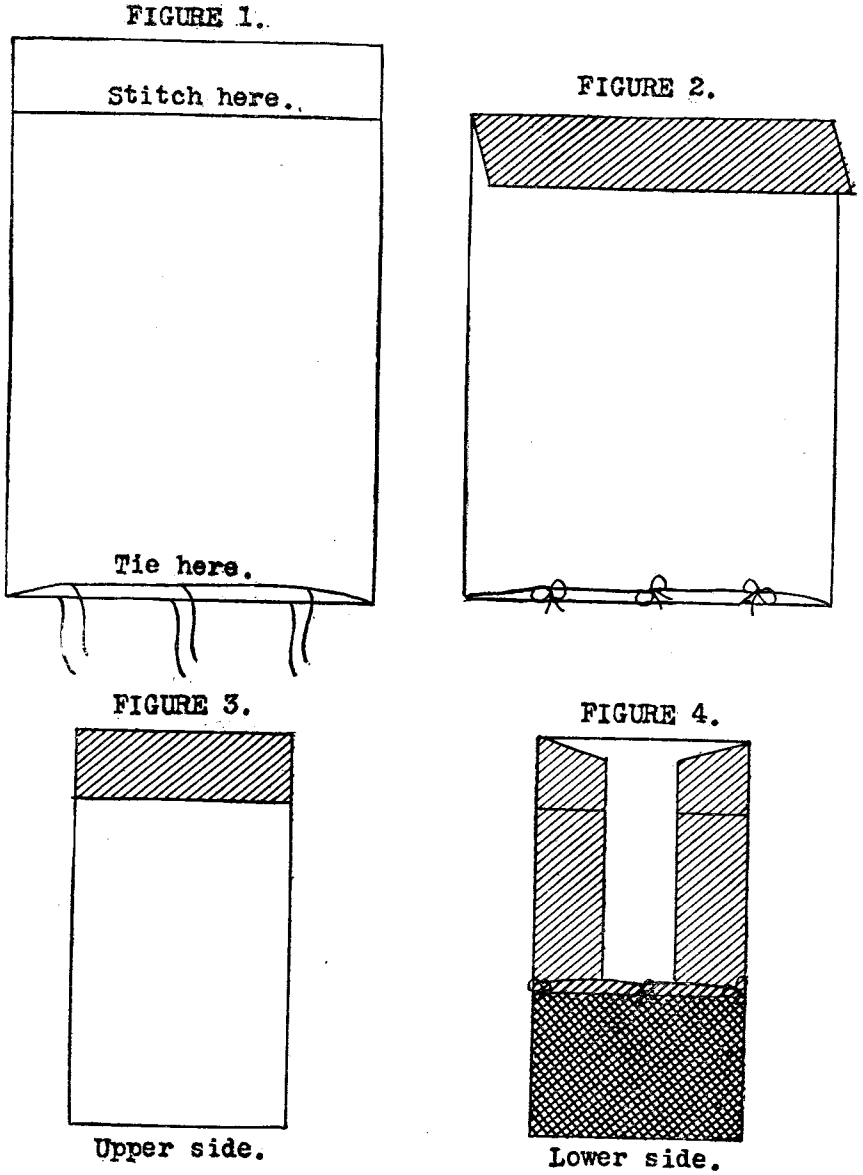
may be used. Feather or down pillows are unduly heating to the child's head.

Making the bed.—To make the baby's bed when a metal crib is in use, cover the mattress with the oilcloth or soft rubber sheeting, to each corner of which a strong tape has been sewed. Tie these tapes together under the mattress to hold the rubber smooth. (If desired, the rubber cover may be made like a pillowcase, covering the mat-

[1] Courtesy of the Committee on Infant Social Service of the Women's Municipal League of Boston.

tress entirely.) Over this place the cotton pad, then cover with a small sheet, which should be tucked under the mattress on all four sides so that the bed is perfectly smooth.

PLATE II.



The above plate illustrates a method of adjusting the bed covers which has been found helpful.[1]

[1] Courtesy of Miss Amy McMahon, Harriet Lane Home for Invalid Children, Johns Hopkins Hospital, Baltimore, Md.

Make a cotton bag the width of a crib blanket and 10 inches longer, closed on three sides like a pillowcase and open at the end, this end to be closed by buttons or tapes. Stitch the case straight across 10 inches below the closed end, thus making a flap. (See fig. 1.) Now put the crib blankets (one or two, according to the temperature) inside this cover. Adjust the blankets smoothly within the cover, tie or button the open end, and turn down the flap at the other end. (See fig. 2.) The object of this flap is to give additional protection to the blanket at the top to save it from being soiled or stained by milk, medicine, or by the material which the baby may vomit.

Then take the blanket thus covered and proceed as follows: Fold the two sides under about 10 inches and turn the bottom up under in the same way about one-third of its length, thus forming what may be described as a sort of loose sleeping bag. (See figs. 3 and 4.) Put the baby on his bed and place the cover thus folded over him. The object is to prevent the rigidity of a bed made in the old-fashioned way, with the covers tucked under the mattress, and to give the baby freedom of motion. It is especially adapted to young babies before they are old enough to kick the covers off. Older children will need to have the cover fastened in some way, and in such cases it may be secured by safety pins to the mattress over the baby's shoulders. It is the cover which comes next to the baby and fits in closely around him that keeps him warm, and not an excess of bedclothing piled on top of him. In addition to the top cover, a soft blanket wrapped closely around the baby, especially about the neck and shoulders, should be used in extremely cold weather.

Some of the additional advantages of the blanket cover here described are that it saves trouble in bed making, and especially that it protects the blankets so completely that they will need washing much less frequently than otherwise. The blankets should be well aired and sunned when not in use, and if sewed within clean covers for the summer will be secure from moths.

OTHER EQUIPMENT.

This may include a screen to protect the baby from drafts, a low chair without arms for the mother, baby scales, bathtub, and a basket for the toilet articles. The other furniture of the room should consist of a chiffonier or bureau to hold the baby's clothing and other possessions, and two tables—one for the scales, basket, etc., and the other a low one on which the bathtub may be placed when the baby is being bathed. Later there may be a nursery chair and a high chair. Small rocking chairs are dangerous because they are so easily tipped over.

CLOTHING.

Clothing should always be adapted to season and climate. A baby is comfortably dressed when his clothing is warm enough without

being too warm. If he is too warm, the baby will perspire; if not warm enough, he will have cold hands and feet or become blue about the mouth. Little babies need to be kept warm, and gradually accustomed to cooler conditions, but older babies are often overdressed. A baby that is continually dressed in clothing which is too warm becomes pale and languid and instead of being protected is more liable to colds and bowel troubles. The mother should feel of the baby's body occasionally, and if she finds it constantly moist the clothing is too warm. In addition, clothing must be loose, so that all the little growing and expanding muscles and organs may have plenty of room to develop; it must be soft and smooth, so that the tender flesh will not be irritated; and, finally, it must be clean and dry. When these conditions have been secured it does not matter in the least how plain and simple the garments are.

BANDS.

Bands are unhemmed strips of flannel, from 6 to 8 inches wide and 18 inches long, and are used to hold the navel dressing in place. The knitted band with shoulder straps should be substituted for the flannel band as soon as the navel has healed. Bands of any sort must never "bind." A band, if drawn tightly about the abdomen, instead of preventing rupture may produce it, especially if the pressure is in the wrong place. The abdominal muscles of a healthy baby need little support, save, perhaps, in the earliest weeks of life; rather they need free play in order to be strengthened in the natural way by the slight exercise the baby can give them.

SHIRTS.

Baby shirts come in four weights and several sizes. It is well to begin with the second size, as the first is soon outgrown. These shirts, as well as the knitted bands, are made of all wool, or of wool and silk, wool and cotton, or all cotton. Either the all cotton, the cotton-and-wool, or silk-and-wool mixtures are best. The shirts should open all the way down in front.

Many physicians prefer cotton or linen undergarments for children of all ages. They believe that woolen underclothing is responsible for many of the "colds" and similar ailments from which children suffer. Cotton garments do not overheat nor irritate the skin, and at the same time they readily absorb moisture. A summer weight and a winter weight should be used, and all other additions to the baby's clothing made according to the temperature. Extra wraps must be used when he is taken out. This rule applies especially to children living in overheated apartments and houses where the indoor temperature resembles that of summer much of the time. A child wearing underclothing that is too warm in such an atmosphere is made unduly sensitive and becomes a ready prey to infection of vari-

ous kinds. In the North, or in winter, or in case the house can not be easily or sufficiently heated, or for very young or weakly babies, shirts and bands which are part wool are advisable.

PETTICOATS.

Light-weight part-wool flannel may be used for the petticoats, which for very young babies should not extend more than 10 inches below the feet. They may be made by the "princess" or "Gertrude" model if warmth is desired, but for summer they should be made with a cotton waist, as in the case of older children. Petticoats should always hang from the shoulders.

SLIPS.

Slips should be made of some very soft material, such as cambric, nainsook, long cloth, or batiste. They should not be more than 28 inches long and should be very simply made. Care must be taken not to have anything about the neck that will scratch or irritate the tender skin, as eczema may be caused in this way. Starch is positively forbidden in a baby's clothes.

WRAPPERS AND NIGHTGOWNS.

Wrappers, either flannel or cotton, according to the weather, may be used in the place of slips, and in summer they do away with the need for petticoats as well. The only value of a long petticoat is to provide extra warmth and to make it easier to handle a little baby, while the white slip serves only to keep the petticoat clean and to complete the conventional idea of a baby's toilet; therefore a simple wrapper which opens all the way down the front saves time and trouble for the mother and gives the baby comfort. Besides flannel, other materials may be used, such as challis, nun's veiling, cashmere, henrietta cloth, or any other light, soft material which can be readily washed. Outing flannel may be used, but the fuzzy surface of the cotton flannels is highly inflammable, and great care must be taken not to allow a spark of fire to reach the baby when wearing such a garment. These wrappers may be worn as nightgowns when the baby is older. Nightgowns and wrappers, both short and long, may be bought ready-made, a very satisfactory sort being made of stockinet. Winter nightgowns have a draw string run through the hem so that they may be drawn up to protect the baby's feet.

DIAPERS.

The diaper is by far the most troublesome part of the baby's outfit. The ordinary cotton or linen diaper made of "bird's-eye," domett flannel, or terry cloth is open to objections. In the first place, a large number must be provided, which involves a considerable outlay of time and money on the mother's part. Then, as no diaper is fit to use a second time without having been washed and dried, the care of

these garments adds to the labor of the household. In addition to these objections the ordinary diaper is hot and clumsy, not to speak of the objectionable odor which clings so persistently to it. There is evidence to show that a wad of thick materials between the legs may deform the thighs to some extent. Besides, unless the diaper is most carefully washed, with soap that contains nothing to irritate the skin (a bland white soap is best), is thoroughly rinsed, and well dried in the open air, there is danger that the baby's flesh may become chafed and sore, especially when hot, nonabsorbent material, such as canton flannel is used.

Pads.—But since diapers are necessary, some practical substitute for those in common use may be found. If an outside diaper is made of cheesecloth, or some other thin, soft, loosely woven material which is easy to wash, an inside pad may be used to catch the discharges. If this pad is made of something which may be destroyed, the most disagreeable part of the washing will be done away with; but even if the pad must be washed, the time and labor involved in washing pads will be much less than in washing an entire diaper. Washable pads may be made of any soft material at hand, such as old turkish towels or knitted underwear, or other material having a loose texture. Smooth materials, however soft, do not hold the discharges as well. Terry cloth, a material resembling turkish toweling, makes excellent pads after it has been washed a few times to render it more readily absorbent. From the Karitane Harris Hospital, in Dunedin, New Zealand, we learn of the use of sphagnum moss for these absorbent pads. The moss is that which florists use for packing plants and grows very extensively in the swamp regions of the United States, but it needs to be thoroughly dried and cleaned of sticks and stems before being used for this purpose.

> Such a pad (i. e., a pad of sphagnum moss inclosed in cheesecloth) weighing only an ounce will completely absorb and retain a quarter of a pint of urine—say as much as would be passed in the night. This is infinitely cleaner and healthier than allowing the urine to spread over a wide area of napkin and nightdress, and thus cause extensive chilling and more or less irritation of the skin. Dry sphagnum forms an extremely light, clean, airy, elastic pad, which will yield in any direction and accommodate its shape to the parts.[1]

Those living in the country where this moss grows may find it a great convenience to pick and dry the moss for this or other domestic purposes. Paper seems to promise the greatest possibilities for general use, and with the rapid increase in the manufacture of absorbent, or "bibulous" papers, as they are called in the trade, it is to be hoped that a satisfactory, effective, and cheap pad may be found even if an entire paper diaper does not prove to be practicable.

How to put on the diaper.—The ordinary diaper is a square of material from one-half to three-fourths of a yard wide, folded

[1] Feeding and Care of the Baby (New Zealand), 1913, p. 76.

diagonally and then folded again, making four thicknesses of material. If the inner pad is used, this outer diaper need be folded but once and the extra thickness will be secured in the pad.

PLATE III.

FIGURE 1.

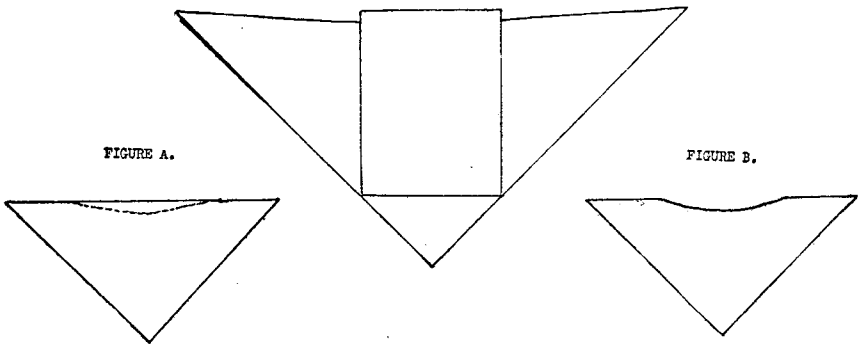


FIGURE A.

FIGURE B.

FIGURE 2.

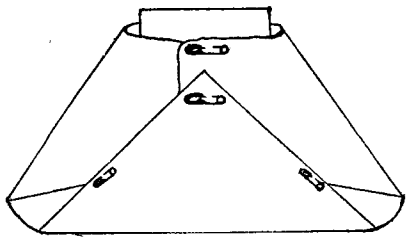
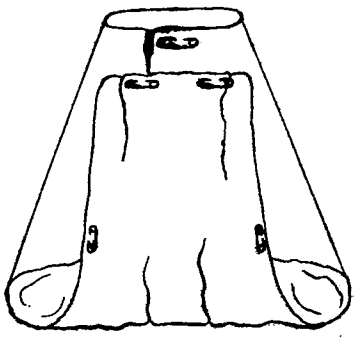


FIGURE 3.



Changing the diaper.—During the mother's waking hours the diaper should be changed as often as it is wet or soiled. In the night it should be changed when the baby is taken up to be fed.

In Plate III, figure A shows a square diaper which has had a small dart taken up in the middle of the top or diagonal side to make it fit slightly over the hips. Figure B shows the diaper folded with the seam turned inside, figure 1 shows the folded diaper with the inner pad in position, and figure 2 the diaper as it appears when pinned.

The square diaper is used in each of the sketches. Many physicians and nurses prefer the oblong or towel-shaped diaper, which does away with some of the superfluous material of the square form. The material is folded down at the top so that it is double under the seat. The lower corners are brought up between the legs and fastened in four places. Figure 3 illustrates the oblong diaper as it appears when folded and pinned. The babies in the picture on page 20, Plate V, are wearing oblong diapers.

SHOES AND STOCKINGS.

It is very important to keep the baby's legs and feet warm. Stockings and diaper should meet, leaving no part of the leg exposed. If the weather is warm the baby usually will not require any covering for his feet, but in cold weather and in all weather when it grows cold toward night it is well for him to wear a pair of merino stockings. These need not be all wool; indeed, if of a mixture of cotton they are much better, as they will not shrink. For an older baby, who is on the floor a good deal, stockings and soft-soled shoes are necessary for comfort, except during the heat of summer. All the shoes from the very first should be chosen to fit the natural shape of the foot, with broad toes and straight soles. Socks may be worn in summer, but in the cooler months the baby's legs should be entirely covered.

Plate IV [1] shows the actual shape of the bottom of a baby's foot, with suitable and unsuitable shoes.

Plate V shows some of the happy patrons of a day nursery in the stockyards district of Chicago dressed for a hot summer day.

CLOAKS AND CAPS.

Since a baby exercises very little when taken out in a carriage, he must be warmly wrapped. Cloaks should either be of warm woolen material or have an interlining of wool, or in cold climates both. For the "runabout" baby additional warmth is secured by the use of leggings, a sweater, overshoes, and mittens. In summer if a wrap is needed it may be of silk or cotton, although a cloak of challis, cashmere, or nun's veiling has more warmth and at the same time is light in weight. Caps should not be thick enough to cause the head to perspire. A silk cap with an interlining of wool wadding or of flannel may be used in winter. In the coldest weather a little hood knitted of woolen yarn, having a cape to come down under the coat collar and protect the neck, is excellent. Silk or muslin caps may be worn in the milder months, or the baby may go bareheaded if protected from the sun. No starch should be used in the caps, as stiff strings or ruffles will scratch the delicate skin of the baby and may produce eczema. Cap strings and ribbons should be

[1] Pediatrics, by Dr. Thomas M. Rotch.

PLATE IV.

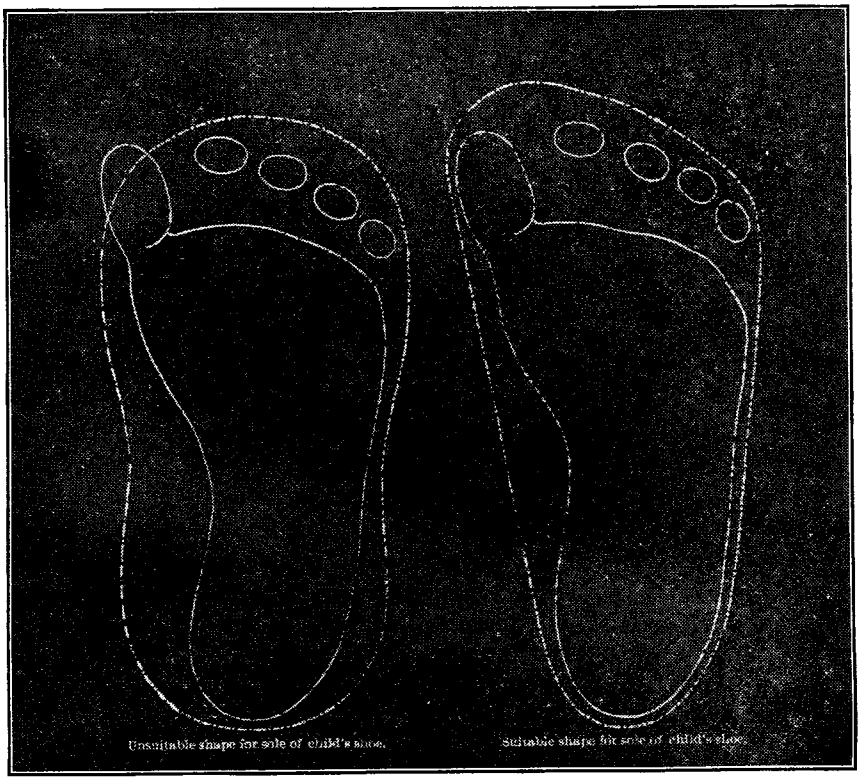
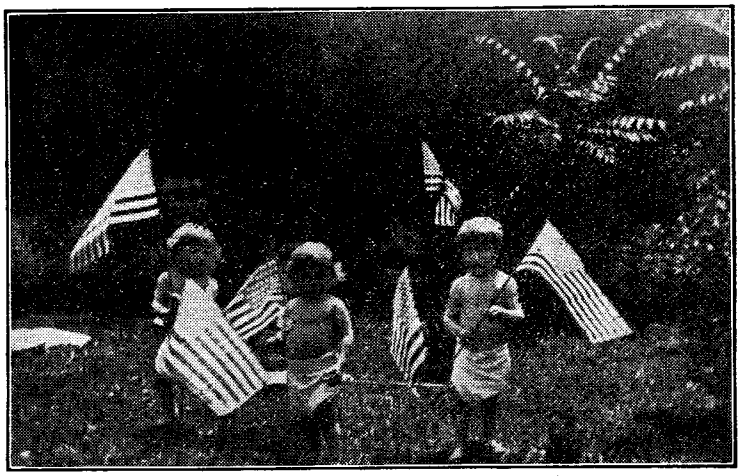


PLATE V.



carefully examined after the child is dressed, to see that they are not too tightly tied. Frostbitten nose or cheeks may result if the circulation is checked by tight ribbons.

PLATE VI.

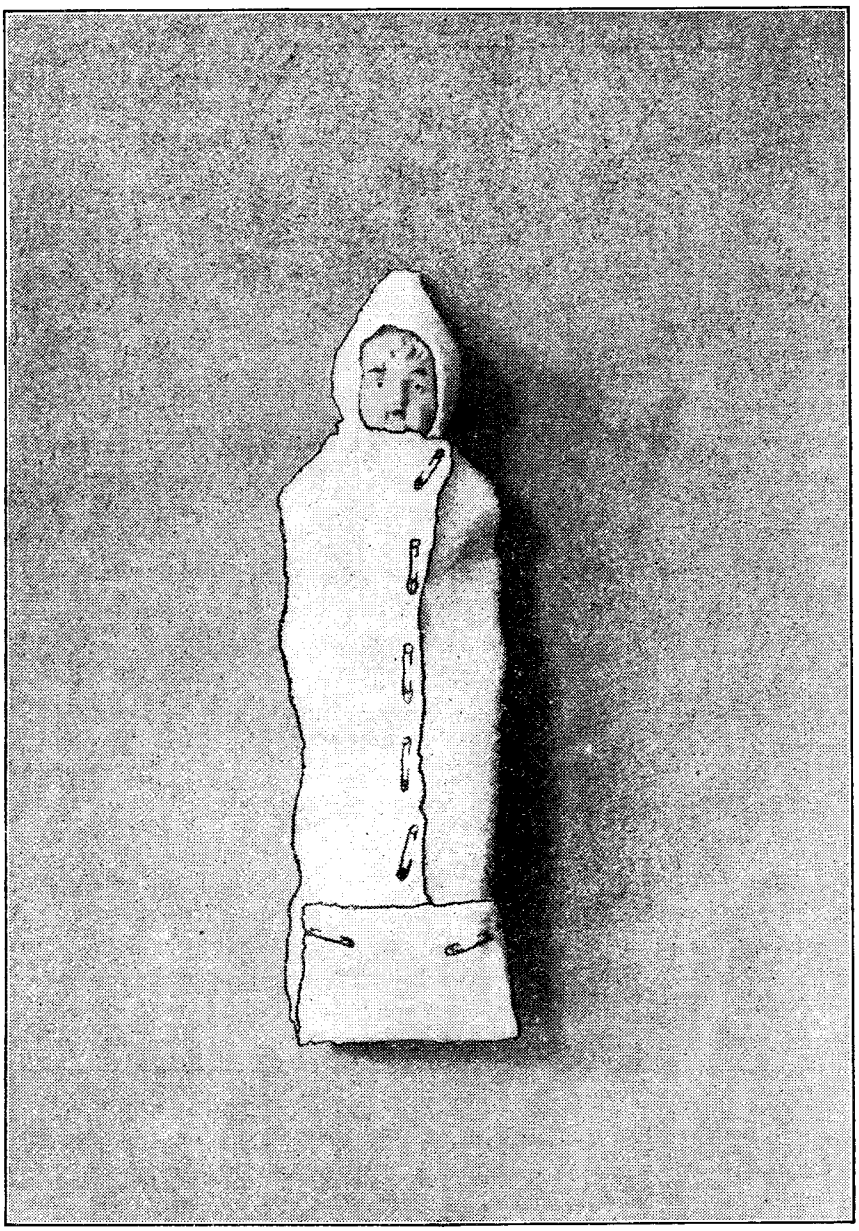
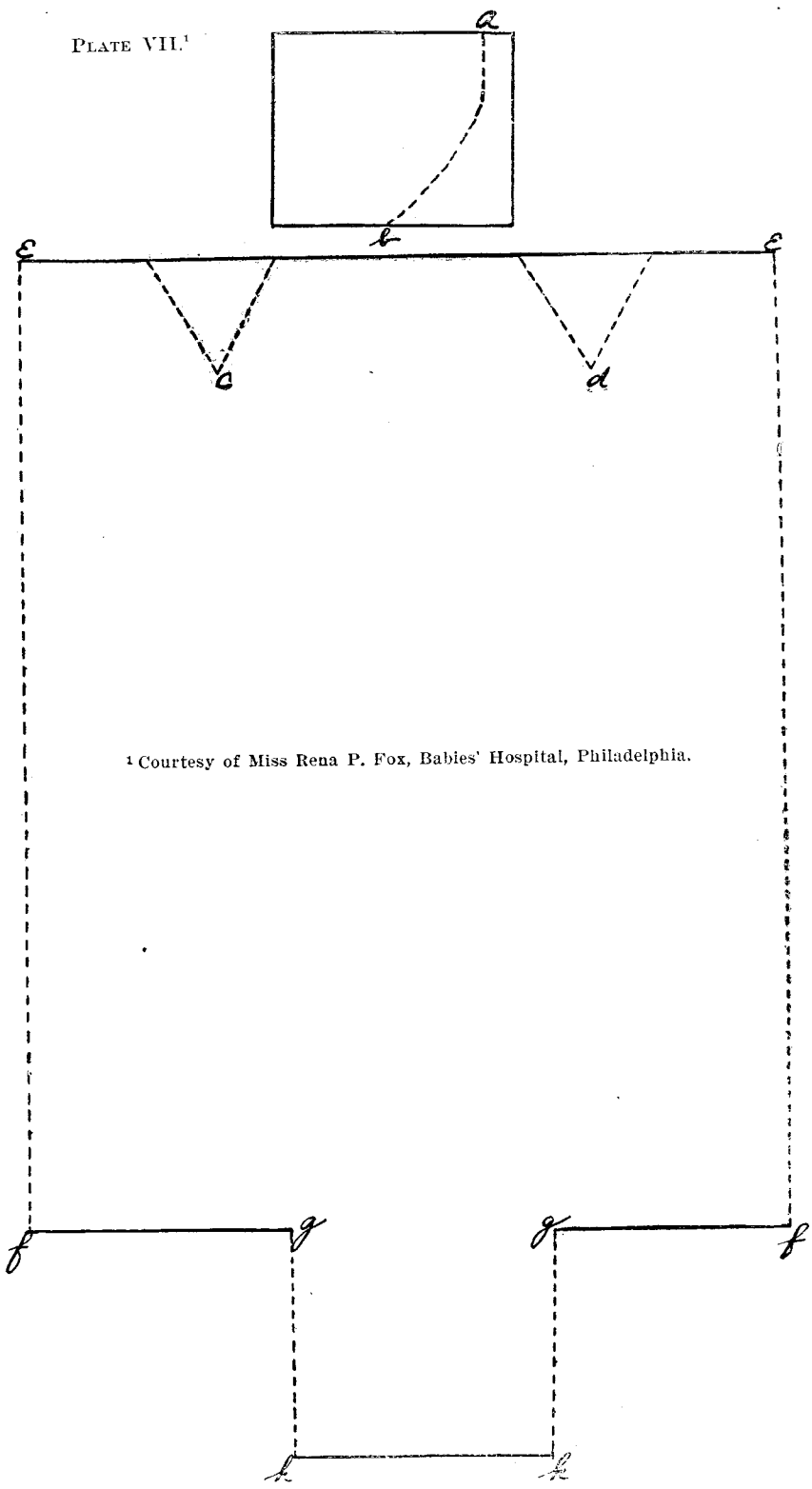


Plate VI [1] illustrates a simple and cheap winter wrap and hood for a young baby. Plate VII [1] shows how it is made.

[1] Courtesy of Miss Rena P. Fox, Babies' Hospital, Philadelphia.

PLATE VII.[1]



[1] Courtesy of Miss Rena P. Fox, Babies' Hospital, Philadelphia.

Cut a piece of eiderdown as indicated by dotted lines, making it long enough (from e to f) to reach from the baby's neck to about 4 to 6 inches below his feet, and wide enough to lap over entire chest on each side, thus giving double thickness over front of body. The darts in the top will make it fit somewhat over the shoulders. The extension at the bottom should be about one-third the length of the baby.

The hood, which should be fastened to the wrap in the back, is made by cutting along the dotted line, the flannel being double at the top. Sew these edges together. The cap may be lined and tied under the chin with ribbons if desired.

Put the wrap on by folding over first one side and then the other and fasten every 3 or 4 inches; then turn up the square over the feet, fastening with pins or buttons at corners as illustrated in the drawing.

OUT-OF-DOOR LIFE.

Keep the baby out of doors. Except in winter, begin when the baby is 2 weeks old to take him out for a few minutes every day in mild, pleasant weather, increasing the time gradually until he is staying out most of the time. Probably no other thing will do so much to insure a healthy babyhood as this, and the result will well repay whatever trouble is necessary to secure it. With the exceptions mentioned below, a baby may spend practically all the time out of doors, both sleeping and waking, if there is some one to look after him to see that he is protected against sun, wind, and dangerous insects. A young baby may stay in his carriage or crib on the porch, on the roof, under the trees, or in the back yard, where the busy mother can look after him; older babies who need exercise may be kept in a creeping pen either on the porch or in the yard. (See p. 25.) If it is not feasible to provide out-of-door sleeping places for these older babies, at least the windows of the nursery should be kept wide open most of the year.

WHEN NOT TO TAKE THE BABY OUT.

When the weather is very cold, as in winter in the North, when the snow is melting, or when there is a heavy storm in progress or a high wind blowing quantities of dust about, it will be best to give the baby his airing indoors or on a protected porch. Dress him as for going out, open all the windows wide, and let him remain in the fresh air for some time. Very young or delicate babies require much heat and must be very warmly covered to protect them against being chilled, and a baby under 3 months of age should not be taken out in severe weather; but plenty of fresh air is essential to all babies.

When the weather is excessively hot the baby should be taken out early in the day and then kept indoors until the late afternoon. From that time on until the rooms have cooled in the evening he should be kept out, being well protected from mosquitoes. If a screened porch is available, the health and comfort of the baby will be greatly increased.

CAUTION.

A word of caution should be given as to the danger of young children climbing up to open windows and falling out. If the windows have screens, they should be so carefully fastened in that there is no possibility of pushing them out. When screens are not in use, the windows should either be lowered from the top or thin wooden slats should be used to protect the lower sash. Similar precautions must be used if the baby is put to sleep on the fire escape. Sleeping porches are usually well protected.

The baby's eyes and head should always be carefully shielded from the direct sunlight. This is just as important while he is asleep as while awake. Do not allow the baby to lie staring up into the sky, even when the sun is not shining.

Great care should be taken to protect the baby from flies and mosquitoes. If the house is not provided with screens, the baby's bed, crib, or carriage should be covered with netting suspended over a pole or two clotheslines in the form of a tent, so as not to shut off the air. Never lay a netting directly over the baby's face.

CREEPING PEN.

A creeping pen affords the necessary protection to the baby and gives room for exercise. It consists of a fence made in four sections, each, say, 18 inches high and 4 feet long, hinged at three corners and latched at the fourth. Ready-made pens have spindles like a stair rail, so that the baby may have something to take hold of when he tries to climb to his feet. As it folds together, the pen can be readily moved about. The floor of the pen should be made of something soft to save the baby from bumps. A cork mat is the cleanest and best material, but a blanket or rug will answer. When the pen is used in the yard a floor of clean white sand will not only protect the clothing but afford the baby who is old enough to play by himself much wholesome entertainment. A combination bed and play pen, the sides of which are covered with wire netting, is on the market. The bottom is made of flexible slats and covered below with netting. The bed has a cover so that the baby is completely protected from flies and mosquitoes, and is perfectly safe. It is furnished with casters, or wheels, so that it may be moved about readily, and it may be folded up when not in use.

When it is not possible to purchase one of the ready-made articles an ingenious person may devise a satisfactory play pen from any materials at hand. A board 6 or 8 feet long and a foot wide may be used to fence off a sunny corner of the nursery for a pen.

Plate VIII shows a creeping pen the sides of which are made from a tennis net.

VEHICLES.

The choice of a vehicle for the baby is a matter of great importance. The folding cart, which may be taken on the street cars, permits mother and baby to go out many times when it would not otherwise be possible. The great convenience of this cart can not be denied, but such carts should be used only for the purpose for which they are intended, namely, to convey the baby short distances, and not as pleasure vehicles, nor should the baby be left to sit fastened in one of these small carts for any great length of time.

Some of the go-carts of the present day are so small, so stiff, and so ill adapted to the baby's anatomy that they can hardly be recommended even for temporary use. Also, they are so close to the ground that the child is propelled through only the lower and colder air currents, which fling an unending stream of germ-laden dust off the street into his face. They frequently have no cover with which to shield the baby from heat or cold, or sun or wind, and in cold weather it is impossible to keep a baby sufficiently warm in one of them. The best vehicle for ordinary use about the home is one which is at least 2 feet high. It should have room for the baby, with the necessary wrappings, in any position, and a cover that can be readily adjusted to secure the needed protection; it should have strong, well-balanced springs and stand squarely on four wheels. A safety strap which fastens about the baby's waist gives greater protection than the ordinary carriage strap.

PLATE VIII.[1]

Carriage outings are, at best, not an unmixed advantage to the baby, although often they afford the only available means of his getting the out-of-door air. The lack of exercise and the more or less rigid position maintained for considerable periods of time serve to tire the baby. Also it is no doubt true that a baby sent out in

[1] (Courtesy of Dr. W. P. Northrup.)

charge of another child or of some person not altogether competent to judge of his comfort is often neglected. A more wholesome and natural place for the baby to take his airing is in the yard or on the porch, where he can be under the mother's supervision.

THE CARE OF THE BABY.[1]

NURSEMAIDS.

It may be well to speak a word of warning as to nursemaids. One has only to visit the parks of any city on a pleasant day to note the instances of neglect and carelessness on the part of nursemaids toward the babies in their charge. Infants are allowed to lie with the sun shining in their eyes; are permitted to become chilled, tired, or hungry, or to lie in wet diapers; they are scolded or jerked about by one arm or fed with candy, cakes, or other unsuitable foods to keep them contented. When at home they may be left strapped in a high chair for long periods, or without the mother's knowledge may be given soothing sirups or other quieting medicines.

But it is not only in physical matters that grave harm may be done to the baby. A nurse sometimes threatens that the policeman, the doctor, or it may be a wholly imaginary creature or person, will come, if necessary, to enforce her will. Fear instilled thus early in the impressionable mind of a child is often almost impossible to eradicate and may persist to the child's harm for many years. The mother must be on her guard to prevent this possibility. A too rigid obedience to the nurse should always be viewed with suspicion, and although there are, of course, many thoroughly honest and conscientious nursemaids, who are entirely devoted to the children in their care, no mother can afford to run the risk involved in neglecting to investigate the character of the nursemaid whom she engages. A nursemaid who shows evidence of ill health should be examined for tuberculosis or other chronic disease, as the baby may readily become infected from an attendant suffering from such illness.

BATHS AND BATHING.

Directions for the baby's first bath are given in the pamphlet on Prenatal Care.[2] A healthy baby should be bathed every day. During the first two weeks these and all matters pertaining to the care of the baby are usually under the doctor's or nurse's supervision. When the mother takes charge of the baby she will find it convenient, usually, to give the bath before the midmorning feeding and after the bowels have moved.

[1] See also "Care of the baby," Supplement to Public Health Reports No. 10, 1913.
[2] Prenatal Care, p. 30.

The room should be comfortably warmed to about 72 degrees. It is not wise to have the room so hot that the baby perspires, as there is grave danger of his being chilled when, the bath over, he is taken into another room where the temperature is lower or when the room itself is rapidly cooled. It is better for the baby to have his bath in a room at ordinary temperature than in a bathroom which is heated by oil or gas. The baby should be protected from drafts by screens or by a shield made by hanging a blanket over the backs of two chairs. The full tub bath may be given as soon as the scar where the navel cord was attached has fully healed. An infant's bathtub serves every purpose for the first year of a baby's life or until he has outgrown it. A tiny baby may be bathed in a basin or bowl for some weeks. This basin should always be warmed before it is filled. The water should be at body heat or slightly above—that is, from 98 to 100 degrees. A bath thermometer is an inexpensive convenience and should be provided, but if none can be had the mother may test the temperature with her elbow. When the water feels neither hot nor cold it will be comfortable for the baby. It should be tested after the baby is undressed and ready to get into the water. Hot water should never be added to the bath while the baby is in the tub. Never leave a young baby alone in the tub. Never put the baby in the bath while the tub is standing on a stove or heater; he might be seriously burned in this way.

No unnecessary exposure or delay should take place, for in cold or cool weather the baby is quickly chilled. To prevent this, all the necessities, such as soap and towels, clothing, bath apron for the mother, tub, water, thermometer, powder, and the like should be placed at hand before undressing the baby. In some cases it may be much more convenient for the mother to give the bath at night, just before the baby's bedtime. Never bathe a baby within an hour after feeding. A baby should always have his own towels and wash rags. Soft cheesecloth makes excellent rags; the towels should be old and soft.

Before the baby is completely undressed his scalp should be washed, the head lowered a little to avoid getting soap in the eyes. Use a pure, bland, white, nontransparent soap. Very little soap is needed for cleaning a baby's skin, and it is most important that the skin be thoroughly rinsed. After the head and face have been washed and dried, remove the clothing and soap the entire body; then place the baby in the bath, holding him with the left forearm under the neck and shoulders, the hand under his arm, lifting the feet and legs with the right hand. Use the right hand to sponge the entire body, then lift the baby out and wrap him at once in a warmed towel. Dry carefully with soft warm towels, patting the skin gently. Never rub the baby's tender skin with anything less

smooth than the palm of the hand. Dress as rapidly as possible if the weather is cold, taking great pains not to expose him unnecessarily. When the weather is very hot in summer, only a slip and diaper are needed.

If the skin is carefully dried after the bath there will be little need for powder, and it should never be used as a cover for careless drying. It is well to use a little pure talcum powder in the creases and folds of the skin, under the arms, and around the buttocks, but it should not be used so generally as to fill the pores of the skin and clog them and should be applied only after the skin is dry.

For one reason or another a baby sometimes objects to his bath. In such cases judicious coaxing may be employed. Toys which float will often divert the baby's attention and make him forget his objections to the water. Sometimes lowering him into the water wrapped in a towel or covering the top of the tub with a cloth, so that he can not see the water, will accomplish the result. If his dislike has been caused by having been put at some previous time into a bath which was too hot or too cool, let him dabble in the water first with his hands and feet until he is reassured. Sometimes the baby will cease his objections to the bath if his face is not washed until after the tub bath is over. Force or harshness is worse than useless in this as well as in other matters in the training of the baby. The same result is accomplished if the baby is induced to the desired action by pleasant means and his sensitive nervous system is not upset.

Cool baths.—The temperature of this bath may be gradually lowered until it is down to 96 degrees for a baby of 6 months and 90 for one of 1 year of age. Toward the end of the second year a robust baby may be given a cool sponge, but he should never be frightened or chilled in administering this wholesome treatment. He should be gradually accustomed to it by being allowed to stand in his tub at the end of his daily bath with his feet in the warm water, while a sponge of cooler water is squeezed over the throat and chest. The water may be made colder by degrees until he is taking it quite cool and enjoying it. He must be rubbed quickly and thoroughly at once until the skin is red and glowing. If this reaction does not come or if the child shows any appearance of chill or has cold hands and feet two or three hours after the bath the treatment must not be repeated. Provided the glow always comes, a quick cool sponge douche or shower at the end of the bath is one of the best tonics than can be found and induces an excellent habit for after life. After a cool bath the child should always have vigorous exercise for a few minutes in order to promote the necessary reaction.

Salt.—Use half a teacupful of common or sea salt to each gallon of water. The salt should be dissolved in a cup of warm water to prevent the sharp particles from pricking the skin. The doctor sometimes orders a salt bath.

Starch.—Add a cupful of ordinary cooked laundry starch to a gallon of water.

Soda.—A soda bath requires two tablespoonfuls of ordinary baking soda to a gallon of water, dissolving it in a little water before adding it to the bath.

Bran.—Make a cotton bag of cheesecloth or other thin material, 6 inches square. Fill loosely with bran. Soak the bag in the bath water, squeezing it frequently until the water becomes milky. Starch, soda, and bran baths are often used in place of the ordinary soap-and-water bath when the skin is inflamed, as in chafing or prickly heat.

Sea bathing.—Although a baby under 2 years should not be given a sea bath, a word of caution about sea bathing for young children may not be amiss. The cruelty with which well-meaning parents treat young, tender children by forcibly dragging them into the surf, a practice which may be seen at any seaside resort in the summer, can have no justification. The fright and shock that a sensitive child is thus subjected to is more than sufficient to undo any conceivable good resulting from the plunge. On the other hand, a child who is allowed to play on the warm sand and becomes accustomed to the water slowly and naturally will soon learn to take delight in the buffeting of the smaller waves, but he should not be permitted to remain more than a minute or two in the water, and should be thoroughly dried, dressed immediately, and not left to run about the beach in wet clothing.

HOW TO LIFT THE BABY.

To lift a young baby, slip the left hand under the back beneath the shoulders, spreading the fingers in such a way as to support the neck and head, and lift the feet and legs with the right hand. Never lift the child without thus supporting the spine. When a baby has learned to hold up his head and has gained considerable strength in the muscles of the back and neck, he may be lifted by grasping him with outspread fingers under the armpits, the body held firmly, so that the entire strain does not come on the shoulders. A baby should never be lifted by the arms. It is possible to dislocate the shoulder joint by careless lifting.

HIGH CHAIR.

A baby should not be put in a high chair until he is quite well able to hold the spine and head erect, and should never be left in such a chair for any length of time. There is grave danger of producing a deformity of the spine if a baby is forced to maintain a rigid sitting position for long periods before bones and muscles

are sufficiently developed. Mothers should be on their guard to prevent the possibility of the baby being fastened in a high chair and left there to take care of himself during her absence, as maids and nurses may resort to this neglectful method of caring for the baby at such times.

TOYS.

Since a baby wants to put everything in his mouth, his toys must be those that can safely be used in this way. They should be washable and should have no sharp points nor corners to hurt the eyes. Painted articles and hairy and woolly toys are unsafe, as are also objects small enough to be swallowed, and those having loose parts, such as bells and the like.

A child should never have so many toys at one time as to distract his interest. He will be quite satisfied with a few things for the time being, and a handful of clothespins, for example, will often please just as much as an expensive doll or other toy. It is an excellent plan to have a box or basket in which to keep empty spools and other household objects which the baby may play with.

CARE OF THE SPECIAL ORGANS.

Eyes.—Whether the young baby is awake or asleep, his eyes should always be shielded from strong light, either sunlight or artificial, and from dust and wind. Care should be taken not to allow any soapy water to enter the baby's eyes in bathing. Swelling or redness or any discharge should have medical attention at once.[1]

Mouth.—A healthy baby's mouth needs no cleaning before the teeth come. The saliva is a sterilizing fluid, intended to keep the mouth healthy, and it is possible to injure the delicate tissues by attempting to clean them with a cloth. If the mouth must be washed, a swab made by twisting a piece of sterile absorbent cotton on the end of a clean stick should be used. Dip this in warm boiled water and wipe the gums very carefully. Never put a finger inside the baby's mouth unless in an emergency. (See "Care of the teeth," p. 54.)

Ears.—Wash the external ear with a soft rag, but never attempt to introduce any hard instrument inside the ear to clean it. Always dry the ears and creases back of them very carefully.

Nose.—The baby's nose should be cleaned as a part of the daily toilet in the same way as the ears. When the baby has an infectious cold he should have special attention. (See "Cold in the head," p. 68.)

Genital organs.—These organs in both sexes should be kept scrupulously clean, with as little handling as possible. Boys should be

[1] See "Care of the eyes," Prenatal Care, p. 20.

examined by a physician to see whether or not circumcision is needed. The foreskin should frequently be drawn back at bathing time and the organ cleansed. If the mother finds it difficult to retract it, she should not attempt to do this alone, but should ask the doctor to show her how. Perfect cleanliness is the principal treatment required in girl babies. If nervous symptoms appear the baby should be examined by a physician. Any swelling or redness of the parts or a discharge, however slight, should be brought at once to the doctor's attention.

FEEDING.

PROCESS OF DIGESTION.

In order to comprehend the principles which underlie the proper feeding of infants, it is well to understand what is involved in the process of digestion and what food elements are needed for the growth, maintenance, and repair of the body.

Digestion is the process or series of processes by which the food eaten is changed into the forms in which it can be absorbed by the tissues of the body. This is a most intricate operation, involving the use of many organs and functions, but one which takes place without difficulty in the healthy human body. But since all the complicated machinery necessary for digestion must be started at once, and since, necessarily, the organs of a newborn baby can be but feeble, it stands to reason that the food presented to them must be especially adapted to them. This food must be liquid; also it must contain the five essential elements which the human body requires for growth, namely, the fats and sugars and starches, which furnish the necessary heat and energy: the proteins, or muscle-forming foods; the mineral salts needed for the growth of all tissues; and, lastly, a great amount of water. All these are found in milk, and in no other food which the infant is capable of digesting. Therefore milk is the one proper infant food.

BREAST FEEDING.

The milk necessary for the normal healthy growth of every infant mammal, including the human species, is created for it in the breast of its mother. The milk of the cow, mare, ass, goat, and other animals has been analyzed by many investigators, to see whether any one of them bears so close a resemblance to human milk that it may be used as a substitute. All these investigations show that the milk of each animal is different from that of every other and each is especially adapted to the requirements of the young of that species. No other argument than this simple physiological one should be needed to induce a thoughtful mother to nurse her baby at the beginning of his life, but if further demonstration is needed the evidence

on every hand of the comparative failure of artificial feeding, at least as far as young babies are concerned, should be convincing.[1]

Statistics gathered from this country and many others show that breast-fed babies have a much greater chance for life than those who are bottle fed, and also that the infant illnesses, not only those of the digestive tract but many other varieties, afflict bottle-fed infants much oftener and much more seriously than those who have breast milk. Not only does breast milk protect the nursing baby from illness and increase materially his chance for life, but it practically insures that his development shall proceed in a normal, orderly fashion.

The body makes a greater proportional growth during the first year of life than during any other, and the brain increases more in the same time than in all the rest of the years of life put together. It is therefore of the utmost importance to the whole existence of each individual that during this most critical period the baby be surrounded with all possible conditions for perfect health. The most important of these conditions is breast milk. Food is the one question of overwhelming importance to the baby. If the food is one to which the digestive apparatus must learn to accommodate itself, or one which is lacking in some of the elements necessary for growth and development, the natural processes are hindered and if illness comes they are seriously interfered with, sometimes to an extent which makes it difficult, if not impossible, for the baby to regain entirely the lost ground. To accustom the infant organs to do their work properly at this critical, formative time is essential to the health of the adult in no small degree. Undoubtedly in many cases grown people would have escaped many of the defects and deficiencies with which they have to contend if they had passed the period of infancy in perfect health.

These are the impelling reasons why mothers should nurse their babies. Other less important reasons are that if the mother takes care of the baby herself it is much easier to nurse than to feed by a bottle; that breast milk is practically free from disease germs, and that it is fed to the baby at a uniform temperature from beginning to end of the nursing.

NURSING MOTHER.[2]

The majority of mothers can nurse their babies, at least in part, if they have suitable care and advice. What is chiefly required is that this conviction should enter the mind of the mother and abide there; for the fear that she will not be able to perform this function, or that the milk will not or does not agree with her child,

[1] See Prenatal Care, pp. 32–35, for consideration of breast feeding as affected by prenatal conditions.

[2] See Prenatal Care, pp. 32–35.

has more to do with the supposed inability to nurse than any other one factor. The gland which secretes maternal milk is a wonderful and delicate mechanism. So intimate is the connection of the mammary nerves with the mind that the mental states of the mother are readily reflected in their function. Fear, anger, or worry may serve to check the secretion of the milk, or to change its quality so much that, for the time being, it is unfit for use, while, on the other hand, a calm mind, joy, laughter, and delight in life, coupled with the desire and intention to nurse the baby, will make it possible to do so. Failing this spirit, all other measures may prove futile.

The secretion of milk is induced by the efforts of the baby to nurse, and therefore he should be put to the breast regularly for at least two weeks after birth, even if only a very little milk is secreted. This patient effort, with proper food and care, coupled with the determination to succeed, will usually result in a good supply of milk, and no physician or nurse who appreciates the value of breast milk for the baby will counsel another course. It is rarely true that the mother's milk does not agree with the baby. It is much more often deficient in quantity than in quality. The return of menstruation may lead to a slight temporary disturbance, but is not a sufficient cause for weaning.

Diet.—A nursing mother should have a light, abundant, and appetizing diet, and such a one as causes her no indigestion. Disturbances in the digestive tract of the mother are quickly reflected in the baby's condition, and therefore the mother should refrain from eating or drinking those things which she knows from experience she can not digest. As a rule, indigestion in the mother, which shows itself in constipation, eructations of gas, headache, diarrhea, and the like, is caused by such foods as heavy puddings or underdone pastry; doughnuts; fried food soaked in fat; made dishes, such as croquettes and fritters; pickles, mincemeat, baked beans, pork and cabbage, and other heavy or poorly cooked foods; but people differ greatly in their power of digestion, and what will suit one person may upset the next. Overeating may be a cause of indigestion.

A mixed diet of such digestible and nutritious foods as are readily available is desirable for the nursing mother. All foods are milk-making foods. The foods selected will differ widely according to circumstances, but will usually include vegetables, ripe fruits, meat, poultry and fish, with oysters and the like, eggs, milk, cheese, farinaceous foods of all kinds (cereals, flour, meals, etc.), breads, especially graham, whole wheat, corn meal, and bran, and simple desserts. Occasionally acid fruits, vegetables, and spices eaten by the mother may cause some disturbance in the baby, and in such cases they should be avoided.

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Constipation is to be most carefully avoided, by eating bran bread[1] and other laxative foods. Drugs should be taken as little as possible, and only on the doctor's advice. Tea and coffee may be taken in moderation, not more than one cup of each a day. Alcoholic drinks of all sorts are better avoided. One quart of milk should be taken each day. Six to eight glasses of good drinking water a day are required, one or two of which should be taken on rising to encourage the action of the bowels.

Exercise.—In order that a healthy nursing mother may be able to eat and digest a generous supply of food materials, exercise in the fresh air is indispensable. This must be undertaken gradually, so that the woman who is not accustomed to exercise may not be overtired. A vigorous walk is one of the best of tonics, because of its effect both on the body and on the mind. Worries take flight when treated to sunshine and fresh air and leave the nervous system free to perform its normal functions. The woman who has a garden to look after or other interests which take her out of doors a good deal in the course of a day gets her exercise in the most natural way, but she will need to be on guard against overtaxing herself. No exercise should be carried on to the point of weariness, because then the nutriment which should go to make milk for the baby will be used to renew the mother's worn-out tissues.

Sleep.—An abundance of sleep is essential. The nursing mother should have at least eight hours of sleep every night and an hour in the daytime. A mother soon learns to rest herself whenever the baby nurses, and these brief periods of relaxation help greatly to keep her in good condition.

Bathing.[2]—A daily bath is desirable and should be taken whenever possible. It is especially important to remove the odors of perspiration or old milk from the mother's body and clothing, as the baby may refuse to nurse when an unpleasant odor is forced upon him.

Amusements and recreation.—A conscientious young mother is very apt to defeat her own ends by staying at home too constantly and watching over her baby so incessantly that she grows pale and nervous and begins to worry, a condition which often results in depletion of the milk and corresponding disturbance in the baby. Healthy babies are better off with a judicious amount of "letting alone," and there is no reason why a mother should not be absent some part of every day, if there is a responsible person to be left in charge. Out-of-door life, pleasant recreation which is not exhausting, visiting, and other diversions are essential to every nursing mother if she is to keep up an abundant supply of milk. The family, especially the husband, should realize how important it is to shield the nursing mother from *unnecessary* work and worry, and to provide her at intervals with the oppor-

[1] See "Diet for a nursing mother," Prenatal Care, p. 34. [2] See "Bathing," Prenatal Care, p. 13.

tunity for rest and recreation. However, a healthy mother should not regard herself nor permit her family to regard her as in any sense an invalid at this time. She is much more likely to succeed in nursing if she goes about her ordinary duties as usual and fills her life with normal interests.

TECHNIQUE OF NURSING.

The first secretion of the breasts is called colostrum, and while not a true milk is adapted to the baby's needs in the first hours of his life. He should therefore be put to the breast as soon after birth as the mother is able to bear it. This early nursing is important to the mother because it helps to contract the uterus, and to the baby for various reasons, one of which is that he needs to learn how to draw his food before the breast fills with milk and becomes less pliant and more painful.

The mother holds the baby on her arm, drawing him to the breast in such a way that his head is comfortably supported, turning slightly toward the side she wishes to present and drawing the baby's feet and legs against her body. A pillow under the opposite shoulder is a welcome support. The baby should be able to grasp the nipple squarely. If his head is too low, the milk may flow back in his throat, making him cough and choke; but the head must be low enough so that the nostrils are not covered by the breast. It is impossible for the baby to suck properly unless he can breathe freely, and the mother should hold the breast away from his nostrils with the fingers of her free hand. When the breasts have filled, if the milk flows too fast, as sometimes happens, she may control the flow by taking the breast in her hand so that one finger is above and one below the nipple and by pressing it gently at the base. If the baby's efforts to nurse make the mother's nipples sore, they should be washed with plain boiled water or boric-acid solution before and after each nursing and may be anointed with lanolin at night, covering them with gauze or clean linen. If a crack should appear, the greatest care should be taken to prevent infecting the breast, as if this happens a painful breast abscess may result. A doctor should always be consulted. The cracked nipple should be kept constantly clean by washing it with boiled water. A glass nipple shield should be used, care being taken that it is always perfectly clean and made sterile by boiling. The shield will not materially increase the difficulty of nursing for the baby and will safeguard the mother. If the breasts become engorged, they may be relieved by using a breast pump, if necessary, or by gentle massage; but all manipulation only serves to stimulate the breast to greater activity and the less handling it can have the better. Hot or cold applications, according to the patient's preference, are useful, and a breast binder is often a great relief, but

should be applied by a physician or nurse.[1] Usually the matter rights itself without difficulty as soon as the relation between the supply and demand is established. If the mother has received the proper care during pregnancy and the breasts and nipples have received due attention, which is part of a doctor's duty, the nursing period will be shorn of much of its pain and trouble. In general, the nipples should be kept as clean and as dry as possible and should be washed before each nursing.

REGULARITY IN NURSING.

The baby should be nursed regularly, by the clock, from the very first and should have nothing between meals save water to drink. It takes from one and one-half hours to three hours for a baby's stomach to empty itself after a full meal of breast milk and considerably longer for the process of digestion to be completed in the intestines.

The baby should not ordinarily be allowed to remain at the breast over 20 minutes in any case, and the nipple should be withdrawn several times during the nursing, so that he will not take the food too rapidly with consequent regurgitation and indigestion. If the milk is plentiful, the breasts should be nursed alternately, but it may be necessary to give both breasts at one feeding in order to satisfy the baby. Do not let the baby go to sleep while nursing.

HOW OFTEN TO FEED.

Most babies thrive better if the interval between feedings is fairly long. This interval may be six hours until the milk is established. From that time the baby may be fed at three-hour intervals until he is 6 months old, when four hours should be allowed to elapse between feedings. Many babies do well if fed only once in four hours from birth. However, if the breast supply is scanty, more frequent stimulation is sometimes necessary to the success of breast feeding.

Night feeding (after the 10 o'clock nursing) may be omitted when the child is 4 months old.

The following table shows the nursing interval and the number of feedings in 24 hours when the three-hour interval is used:[2]

Period.	Nursings in 24 hours.	Interval by day.	Night nursings (10 p.m. to 6 a.m.).
		Hours.	
First and second day	4	6	1
Third day to 4 months	7	3	1
4 to 7 months	6	3	0
7 to 12 months	5	4	0

[1] See Prenatal Care for the treatment of engorged breasts.

[2] The Care and Feeding of Children, 1914, L. Emmett Holt, M. D.

SUPPLEMENTARY FEEDING.

There is apt to be a time, after the departure of the nurse, when the mother is just getting about her accustomed duties and is somewhat enfeebled and worried with the care of the baby, that the supply of milk decreases. It is at this or some other later period of stress that many babies are needlessly weaned. Instead, the baby should be put to breast with unfailing persistence at regular intervals, no matter how little he gets, since every mouthful of breast milk is important to him. It is the tendency of the breasts to cease to secrete milk when suction is discontinued, and it is essential to a continuance of the supply that it be constantly drawn upon. The mother should be encouraged to eat more nourishing food, such as milk, cream, eggs, meat, and good bread, and to take a larger amount of fluid food. Raw eggs beaten up and added to milk agree well with many persons. Even if the amount of milk diminishes until the baby gets little or none, it may often be reestablished by patient and constant effort, provided the mother does not worry, but rather strives in every way to build herself up by good food, out-of-door life, and pleasant surroundings, in all of which she should have the help of her family. Meanwhile the baby must be given additional food.

WHAT TO FEED.

This supplementary food should be cows' milk, adapted to the age of the infant, given by bottle, using a nipple with a very small hole lest the baby, finding it easier to nurse the bottle, will not suckle the breast with sufficient vigor to give it the required stimulation.

HOW MUCH TO FEED.

In order to determine how much breast milk he is getting, and therefore how much supplementary food is needed, the baby should be weighed, without making any change in the clothing, before and after each nursing in 24 hours and the results carefully set down. At the end of this period it will be possible, by adding the various amounts together, to see exactly how much milk the baby has had and from this to determine to what extent the mother's milk needs to be supplemented. In this situation the help and care of a good doctor are especially needed.

The scales should be similar to grocer's scales, having a pan or basket in which to lay the baby, and should weigh to one-half ounce. Spring scales are not sufficiently accurate for this purpose.

WEIGHT.

In order to determine how the baby is thriving, it is necessary to weigh him at stated intervals and compare the results. The average

baby weighs about 7 pounds at birth, boys being slightly heavier than girls. A healthy baby may weigh as little as 5 or 6 pounds and as much as 10 or 12 pounds, but these weights are unusual. A slight falling off in weight occurs during the first few days or the first week of life, amounting to a few ounces or as much as a pound, but this loss is promptly regained in from 4 to 10 days, and from that time the baby should show a constant gain in weight. During the first month the daily gain should average about three-fourths of an ounce; at 7 months, about one-half ounce a day; and at 1 year, one-fourth of an ounce a day. The average baby gains about $1\frac{1}{4}$ pounds a month for the first six months and one pound a month from that time to the end of the first year, doubles its weight at about 5 or 6 months, and trebles it at the end of the first year. A diminishing weight demands careful attention. If there is a loss in weight, and especially if it is accompanied with other symptoms of illness, a good doctor should be consulted at once. If these conditions occur in the heat of summer, the physician will make any change in the diet with very great caution, taking pains not to increase the food to the extent of producing diarrhea.

A very rapid increase in weight is not to be desired. The ideal in baby feeding is not to produce a fat baby, but rather a proportionately nourished one. It is comparatively easy to grow fat, but it is a harder and slower process to grow muscle, bone, blood, and nerve tissue. The majority of mothers feel that if they have a fat, red-cheeked baby it is evidence they are giving the best sort of care, but this is not always true. Some of the well-advertised infant foods produce just this kind of babies, but the later development shows that the food was deficient in some of the important elements needed for the symmetrical development of all parts of the body, and weakness of some part or some later deficiency of health may be the first indication that such babies were not properly fed. A perfect baby does not have the outlines of his muscles obliterated by wads and cushions of fat. He is alert, springy. The flesh is hard to pressure, not soft and flabby. His color is pinkish, save when the cheeks have been reddened by the cold or heat. A leading English authority on infant care declares that in his opinion "it is practically impossible for any infant to put on more than 6 or 8 ounces of good nitrogenous tissue in one week, and very few can put on as much."[1] Bottle-fed babies should be watched with particular care as to their weight in summer. It is better to have little or no gain during the excessive heat than to upset the digestion by overfeeding designed to keep the baby gaining.

[1] Eric Pritchard, M. D., Infant Education, London, 1907, p. 18.

HOW TO WEIGH THE BABY.

Undress the baby completely. Put a soft cloth in the pan of the scales and lay the baby on it, or wrap the baby in a blanket if the room is not warm. Weigh carefully and write down the result. Remove the baby, weigh the blanket or cloth, and subtract this amount from the first weight.

When weighing the baby before and after nursings to determine the amount of breast milk he is receiving, do not undress him, but weigh both times in exactly the same clothing. If the diaper becomes wet or soiled meantime, do not change it until after the weight has been taken.

ARTIFICIAL FEEDING.[1]

The term "artificial feeding" refers, in common acceptance, to the method of feeding which must be employed when a baby is, for any reason, denied breast milk, because any other method of feeding a young baby than at its mother's breast is truly artificial.

MILK.

Wide experience has shown that fresh cows' milk is the best substitute for breast milk. This milk should be the purest and cleanest possible; it should be the product of a tuberculin-tested herd, one that is healthy, well fed, properly housed and cared for, and milked by clean milkers into sterilized utensils. The milk should be bottled and cooled at the dairy and delivered to the consumer in sealed bottles. The milk commonly sold from open cans, known as "loose" or "dipped" milk, should never be given to a baby.

Certified milk.—In certain places it is possible to obtain what is known as "certified" milk, which is fresh, clean, pure, normal milk of uniform composition and highest quality obtained from healthy cows and produced and handled under the supervision of a medical milk commission, with special sanitary precautions. Although the amount of certified milk is as yet far too small, the demand for it is steadily increasing. As soon as mothers become convinced of the infinite advantage of having a supply of raw milk whose quality is guaranteed they are quite ready to pay the additional cost. This milk averages to cost about 16 cents a quart; but compared with the cost of the illness due to the use of unclean milk, this is not to be considered. There can be no doubt that the use of certified milk has been a great factor in the reduction of deaths from infantile diarrhea in recent years. The American Association of Milk Commissions publishes literature on the subject. The secretary may be addressed at the Ortz Building, Cincinnati, Ohio.

Heating or cooking milk.—When certified milk can not be had, or some other milk known to be clean, it is safer to heat that which is

[1] See also "Care of the baby." Supplement to Public Health Reports No. 10, 1913.

used. Bad milk may look clean and may taste and smell sweet, since disease germs do not reveal their presence by the ordinary tests. It is very difficult to insure the cleanliness of the general milk supply, and since it seems impossible to be certain that the milk is always perfectly clean, it is necessary to kill these germs by some process of heating before using the milk for young babies, or for any babies, in the heat of summer. These processes, however, do not make good milk out of bad, nor clean milk out of that which is dirty; they merely make a poor thing a little less dangerous, and emphasize the necessity for raising the standard of local milk production.

PLATE IX.

Breed of cows.—Authorities recommend the herd milk of Holstein or ordinary grade cows for infant feeding, as such milk has a more nearly proper percentage of fat than others. If one is obliged to use milk having a high percentage of fat, such as that from Jersey or Guernsey cows, some part of the fat should be removed before making up the feedings.[1]

Care of the milk.[2]—One of the reasons why cows' milk is not always a safe food is that it is very readily infected with germs, some of which may make the baby sick. These germs multiply with astonishing rapidity when the milk is allowed to stand for any length of time at a moderate temperature, but do not flourish if the milk is kept very cold. The milk should never be left standing on the door-

[1] Milk and its Relation to the Public Health, Hygienic Laboratory Bull. No. 56.
[2] See Appendix for list of references.

step in the sun, nor in a warm kitchen, but should be put in the ice box as soon as it is delivered. It must be kept covered, protected from dust and flies, not left standing in shallow, open pans nor put into the refrigerator in pitchers or open dishes, as it is very readily contaminated by other foods. Milk should be kept in glass jars or bottles which are made sterile by boiling before being filled. If the milk is sour, or shows a sediment in the bottom of the bottle, it is not fit to give to the baby.

A homemade ice box.[1]—An ice box as illustrated,[2] which will serve to keep the baby's feedings cold for 24 hours, can be made at home for very small cost, as follows: Procure a wooden box about 18 inches square the same depth; put a layer of sawdust 3 inches thick in the bottom of the box; fill in with sawdust around a 10-quart tin pail or a section of 10-inch galvanized pipe which occupies the middle of the box. Inside this pail or pipe place another slightly smaller pail, which is to hold the ice and the bottles. This inner pail should be covered, and the outer box tightly closed by a wooden cover lined with several thicknesses of newspaper. The inner pail should be taken out each morning to be emptied and cleaned. This little device will keep cool with 5 cents' worth of ice for 24 hours or even longer. When feeding time comes, the box is opened, one bottle is taken out, and the box is quickly closed again.

HOW TO FEED THE BABY.

WHAT TO FEED.

Leading authorities differ so widely on various points connected with this subject that no directions can be given which will meet with general agreement. A few of the fundamental points are given here, but whenever possible the mother should confer with a good doctor regarding an artificially fed infant.

The only proper artificial food is cows' milk, suitably modified to suit the child's age and development. Some babies have peculiarities, and with them rules can not be closely followed; but with most, if proper rules are followed from the outset, there will be comparatively little trouble. The advice of a good doctor should be sought and followed. It is most unwise for the mother to experiment with different foods or different mixtures, or to try to feed her baby by the advice of her neighbors.

Whenever there are signs of indigestion, such as vomiting or frequent loose stools, the mother should dilute the food, or omit it altogether, giving nothing but a little plain boiled water until the doctor sees the baby.

[1] See Appendix for Farmers' Bulletin on homemade ice box.

[2] Courtesy of the Committee on Infant Social Service of the Women's Municipal League of Boston.

The following directions for feeding the baby have been prepared by a committee of the American Medical Association:[1]

Beginning on the third day, the average baby should be given 3 ounces of milk daily, diluted with 7 ounces of water. To this should be added 1 tablespoonful of limewater and 2 level teaspoonfuls of sugar. This should be given in seven feedings.

At 1 week the average child requires 5 ounces of milk daily, which should be diluted with 10 ounces of water. To this should be added 1½ even tablespoonfuls of sugar and 1 ounce of limewater. This should be given in seven feedings. The milk should be increased by one-half ounce about every four days. The water should be increased by one-half ounce every eight days.

At 3 months the average child requires 16 ounces of milk daily, which should be diluted with 16 ounces of water. To this should be added 3 tablespoonfuls of sugar and 2 ounces of limewater. This should be given in six feedings. The milk should be increased by one-half ounce every six days. The water should be reduced by one-half ounce about every two weeks.

At 6 months the average child requires 24 ounces of milk daily, which should be diluted with 12 ounces of water. To this should be added 2 ounces of limewater and 3 even tablespoonfuls of sugar. This should be given in five feedings. The amount of milk should be increased by one-half ounce every week. The milk should be increased only if the child is hungry and digesting his food well. It should not be increased unless he is hungry, nor if he is suffering from indigestion even though he seems hungry.

At 9 months the average child requires 30 ounces of milk daily, which should be diluted with 10 ounces of water. To this should be added 2 even tablespoonfuls of sugar and 2 ounces of limewater. This should be given in five feedings. The sugar added may be milk sugar or if this can not be obtained cane (granulated) sugar or maltose (malt sugar). At first plain water should be used to dilute the milk.

At 3 months, sometimes earlier, a weak barley water may be used in the place of plain water; it is made of one-half level tablespoonful of barley flour to 16 ounces of water and cooked for 20 minutes.

At 6 months the barley flour may be increased to 1½ even tablespoonfuls cooked in the 12 ounces of water.

At 9 months the barley flour may be increased to 3 level tablespoonfuls cooked in the 8 ounces of water.

Sugar is added to the food to furnish a necessary foodstuff, not to sweeten. Physicians differ as to the best sugar for use in infant feeding. Malt sugar gives very good results, and several preparations which contain dextrin as well as maltose are on the market, but are expensive. Milk sugar is also expensive, and some physicians believe that it has a greater tendency to upset the baby. Cane sugar is the cheapest form of sugar, and many babies seem to digest it very well. One objection to the use of cane sugar is that the baby quickly becomes accustomed to the sweet taste, making it difficult later to induce him to eat unsweetened foods.

AMOUNT OF FOOD.

The table from Dr. Holt's book, given on the following page, shows the amount of food required by the average healthy baby at the given ages and the proper interval between feedings.

[1] Save the Babies, prepared for use in Baby Health Conferences for the Committee on Public-Health Education Among Women, by Drs. L. Emmett Holt and Henry L. K. Shaw. Council on Health and Public Instruction, American Medical Association

Schedule for feeding healthy infants during the first year.[1]

Age.	Interval between meals by day.	Night feedings (10 p. m. to 7 a.m.).	Number of feedings in 24 hours.	Quantity for 1 feeding.	Quantity for 24 hours.
	Hours.			*Ounces.*	*Ounces.*
Second to seventh day	3	1	7	1½–2½	10–17
Second and third weeks	3	1	7	2 –4	14–28
Fourth to ninth week	3	1	7	3 –4½	21–31
Tenth week to fifth month	3	1	7	3½–5	24–35
Fifth to seventh month	3	0	6	4½–6½	27–39
Seventh to twelfth month	4	0	5	6½–9	33–45

The interval is reckoned from the beginning of one feeding to the beginning of the next. Large children with strong digestion may take the larger quantities, while small or weak infants should take the smaller amounts. If the baby either habitually regurgitates his food or leaves some milk in the bottle each time, the interval between feedings should be increased.

A simple rule[2] for feeding the average healthy baby is to give 1½ ounces of milk in 24 hours for every pound of body weight. To this is added the sugar and diluting fluid as directed for the given age. Thus a baby weighing 10 pounds will take 15 ounces of milk in 24 hours, increased by the necessary sugar and fluid.

PREPARATION OF THE FOOD.

Everything that is to be used in the preparation of the baby's food, including the hands and clothing of the mother or nurse, must be absolutely clean. To clean the utensils they should be boiled in the large kettle for 15 minutes just before using.

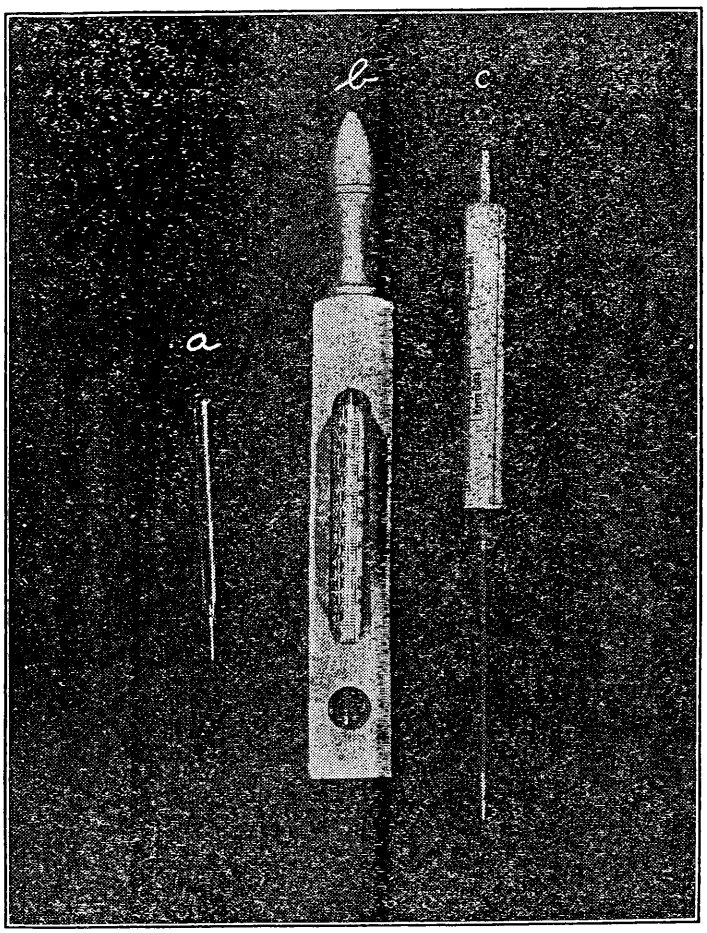
Utensils.—Enameled ware or aluminum utensils are the safest kind to use, since they are most readily kept clean. They should be used exclusively for this purpose. The following articles will be found convenient:

As many nursing bottles as there are feedings in one day.
A nipple for each bottle.
A new clean cork stopper for each bottle.
A bottle brush.
A graduated measuring glass.
A 2-quart pitcher.
A funnel.
A long-handled spoon for stirring the food.

[1] Care and Feeding of Children, L. Emmett Holt, M. D., 1914.
[2] Infant Feeding, Clifford G. Grulee, M. D., 2d ed., p. 148.

A pail or kettle for pasteurizing the milk and sterilizing the utensils.
A fork.
A tablespoon.
A double boiler for cooking cereals.

PLATE X.



a Clinical thermometer.
b Bath thermometer. The frame being wood, permits the thermometer to float.
c Milk thermometer.

The foregoing illustration shows three thermometers for household use.[1]

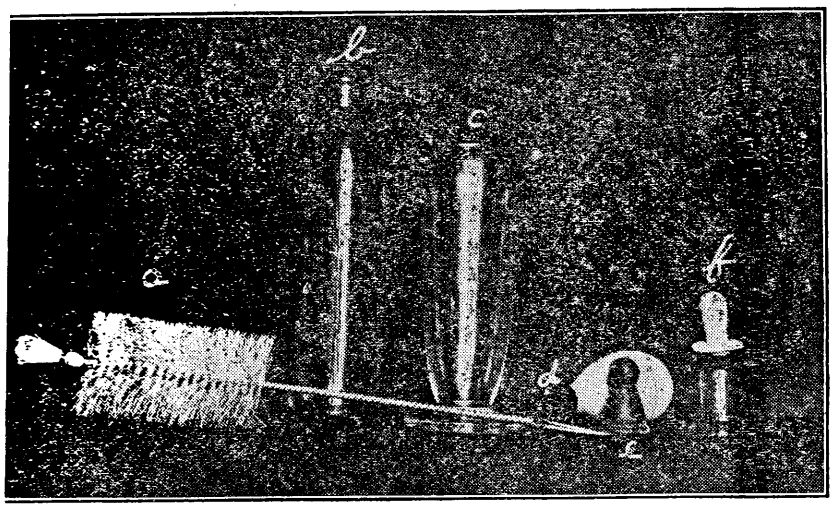
Bottles.—The best nursing bottle is the one which affords the least harbor for germs. An 8-ounce cylindrical bottle having the scale in ounces blown in the side is most convenient, as it fits readily into the ice box and the pasteurizer. Such a bottle should have a short neck which slopes gradually into the shoulder. It is difficult, if not impos-

[1] Photographs by Dr. Kent Beattie.

, to clean a long-necked bottle having a sharp angle below. It ıld be possible to reach every part of the inside with the bottle sh. New bottles should be annealed by placing them on the e in a dishpan of cold water and leaving them to boil for 20 min- . Allow them to stay in the water until it is cold. Bottles s treated will not readily break when filled with boiling water or n the food is being cooked in them.

ach bottle should be emptied as soon as the baby has finished nurs- then rinsed with cold water and left standing, filled with water, ıl the bottles for one day's feedings have all been used. At a venient time, scrub all the bottles with hot soapsuds, using the le brush over every part of the inside. Then rinse them thor-

PLATE XI.



a Bottle brush.
b Nursing bottle.
c Glass graduate.
d Infant syringe.
e Nipple.
f Nipple shield.

ghly through several waters and put them in a kettle of water over fire. When the water has boiled for 15 minutes the bottles will sterilized.

Plate XI shows a nursing bottle which may be readily cleaned, form of nipple capable of being turned inside out, and cer- n other useful articles.

Nipples.—A conical nipple is best, since it can be readily turned ide out to be cleaned. Nipples attached to long rubber tubes ıuld never be used, as it is impossible to clean them. They are so ngerous to infant health and life that the sale of them ought to be ohibited by law. The hole in the nipple should be just large ıugh so that when the filled bottle is held upside down the milk

drops rapidly. If the hole is large enough so that the milk runs in a stream, the baby will take his food too fast.

Care of nipples.—Nipples need special care. If allowed to soak in water when not in use the rubber quickly becomes spongy and disintegrates, the hole grows larger and larger, and the nipple is soon unfit for use.

Immediately after the feeding remove the nipple and rinse with cold or warm (not hot) water. Rub the outside with a little common salt to remove the milk, turn the nipple inside out, rinse, and rub with salt; rinse again and boil for five minutes. The nipple will dry at once when removed from the boiling water. Place in a dry glass jar which has been boiled and screw the cover on tight. Keep from the light. The nipples should be rinsed in boiled water just before using.[1]

It is wise always to have extra nipples prepared, as they are subject to many accidents.

How to prepare the feedings.—Take the milk bottle out of the ice box, rinse with boiled water, and wipe the top with a clean towel. Next remove the paper cap with the fork which has just been boiled. Then pour out enough milk for the day's feedings, measuring the amount in the glass graduate, and empty it into the pitcher. Measure the required amount of water (using cold boiled water) in the same way and add to the milk. Measure the sugar and limewater; add these to the milk and water and stir well. Then take as many bottles as there are to be feedings in 24 hours, and fill them exactly to the proper depth according to the scale blown in the bottle. If the materials have been carefully measured, the bottles will be filled to equal depth. Close with new, clean bottle corks in preference to wads of cotton, and pasteurize or sterilize the feedings thus prepared in accordance with directions that follow.

Pasteurizing.—This process consists in heating the milk to 145 degrees, holding it there for some time, and then cooling it rapidly to 50 degrees. The use of one of the excellent pasteurizers and sterilizers in the market greatly simplifies this part of the work, but satisfactory results can be attained by the use of an ordinary pail or kettle. A convenient method for home pasteurizing is as follows:[2]

Put a gallon (4 quarts) of water on the stove in a kettle. When the water is boiling hard, remove the kettle from the stove to a table and allow it to stand uncovered for 10 minutes; then put the filled and loosely corked bottles into the water, cover the kettle, and allow it to stand covered for half an hour. At the end of this time remove the bottles, cool rapidly under running water, and put in the ice box until needed. Do not uncork the bottle from the time it is first closed until the baby is to be fed.

[1] Adapted from Feeding and Care of Baby, New Zealand pamphlet, 1913.

[2] Method supplied by Miss Rena P. Fox, superintendent Babies' Hospital, Philadelphia.

Boiling.—Fill the bottles and stand them in a kettle of water over the fire. When the water has boiled three-quarters of an hour the milk will have been sufficiently heated; or, when more convenient, the milk may be simply boiled in a clean saucepan for three minutes, poured into sterilized bottles, and then cooled rapidly in running water.

HOW TO GIVE THE BABY THE BOTTLE.

When it is time to feed the baby take the cold bottle from the ice; do not pour out the milk, but place the bottle, still corked, in a vessel of warm water, having the water cover the bottle above the milk line, and allow the water to heat. Do not allow the water to boil, as that will make the milk too hot. To test the temperature of the milk, open the bottle and drop a little milk on the inner surface of the arm. If it feels comfortably warm to the mother's skin it will be right for the baby. If it has been made too hot, cool the bottle under running water. The mother should never put the nipple in her own mouth to test the temperature of the milk, as an infection, such as a "cold," might easily be conveyed in this way from mother to baby. Put on one of the sterile nipples from the jar. Handle the nipple only by the neck, and do not touch the part which is to go into the baby's mouth.

PLATE XII.

Hold the baby on the left arm in the same position as for breast feeding. The bottle should be held by the mother or nurse throughout the feeding. It must be presented to the baby at such an angle that the neck of the bottle is kept continually filled and the baby is able to grasp the nipple squarely. The feeding should be finished in 20 minutes. If the baby eats greedily, withdraw the nipple for a moment several times during the feeding. If he is sleepy, keep him awake until the bottle is finished. If, in spite of this, he falls asleep, remove the bottle and do not give another until the next feeding time. Babies like to nurse a little, then sleep a little, then take the bottle again; but this should not be allowed, as it unduly prolongs the feeding.

Plate XII[1] shows how to hold the baby while giving the bottle.

[1] Courtesy of Miss Rena P. Fox, Babies' Hospital, Philadelphia.

NORMAL FEEDING.

If the baby has been breast fed for a while and is then put on cows' milk, it is wise, until he has become somewhat accustomed to the new food, to use a weaker mixture at first than the one indicated for that age. The food can be strengthened every few days if necessary until it suits his age. If the baby shows any signs of disturbed digestion, it is wise to return at once to the weaker food until he is quite well again; if he seems satisfied, is gaining from 4 to 6 ounces a week, does not vomit, and has normal stools, it is reasonably certain that the food is of the right strength and quantity.

UNDERFEEDING.

As a rule, babies are overfed rather than underfed. But if the baby cries as soon as the bottle is taken away, and again before the next feeding time, a careful increase may be made day by day toward a stronger mixture, stopping at a point where he is satisfied.

OVERFEEDING.

If the baby sleeps restlessly, vomits his food, or has loose bowel movements, it usually indicates that he is being fed too much, too often, or that his food is stronger than he can digest. If the baby is breast fed, the interval between nursings should be lengthened to 4 hours, as a first measure. It is wise to see the doctor, when possible. For bottle-fed babies the amount of the day's feeding may be decreased by using one-half of the usual contents of each bottle until the disturbance has subsided. (See "Diarrhea," p. 64.)

PROPRIETARY FOODS.

These foods may be classified into those made upon a milk basis and those made upon a cereal basis. Or they may be grouped so as to show which are intended to be added to fresh cows' milk after they have been mixed with water, and which are intended to be mixed only with water. They might also be divided according to their composition, showing which are high in sugar or in insoluble starch or deficient in fats. An analysis of the entire subject is now being carried on by the Bureau of Chemistry of the Department of Agriculture, and this report, when available for distribution, will be of great value to all those interested in the matter of infant feeding. The general consensus of opinion among authorities seems to be that one or another of these foods may be temporarily used when fresh cows' milk is not available for any reason, as in traveling, or in the Tropics, but that their continued and exclusive use is to be condemned. All are expensive, and many of them do not give the baby the required food elements nor the proper proportions of these elements, while the use of some of them is known to be followed by various forms of illness.

DRINKING WATER.

The baby needs plenty of cool, unsweetened water to drink. It is safe to boil all the drinking water for a baby, which should be given to a young baby lukewarm, never ice cold. Never put sugar or anything else in it. Offer it to the baby between feedings; in summer especially he needs to drink frequently. A "runabout" baby is constantly exercising while awake and requires a great deal of water. Fretful babies, especially those who are cutting teeth, are often quieted by a cool drink.

THE FEEDING OF OLDER INFANTS.

The following rules are quoted from the report of the committee of the American Medical Association before referred to:

Unless a child has loose bowels he should be given from 1 to 3 tablespoonfuls of strained fruit juice once a day after he is 7 or 8 months old.

After he is 9 months old he may be given squeezed beef juice, beef tea, or plain mutton or chicken broth once a day.

When he is 10 months old he may have part of a soft egg, a small piece of crisp toast or zwieback, or a crust of bread to chew immediately after his feeding.

Other solid foods should not be given during the first year.

At 12 months he may take his milk undiluted and strained cereal may be given twice a day.

During the second year the child should have four meals a day. Hours: 6 a. m., 10 a. m., 2 p. m., 6 p. m. Nothing but water should be allowed between his meals.

At 12 months the baby should be weaned from the bottle and taught to drink milk from a cup. He may then have cereals twice a day, which should be thoroughly cooked, and for the first two or three months they should be strained. He should have four cups of milk daily.

When 15 months old he may have at first a teaspoonful, later one tablespoonful of rare scraped beef, mutton, or chicken.

When 18 months old he may have one-half of a mealy baked potato daily.

When 2 years old he may have most of the fresh green vegetables when thoroughly cooked and finely mashed.

The juice of fresh fruits may be given after 12 months.

Cooked fruit, such as baked apple or apple sauce, should be given once a day after a child is 18 months old; it should at first be strained.

Stale raw fruits are especially dangerous in the city and in the summer.

Begin with a very small quantity of each new food, noting carefully the effect on the baby, and strengthening it slowly as required. For instance, begin by giving one teaspoonful of fruit juice, diluted with an equal quantity of water, and increase gradually until the proper amount for the given age is reached.

Beef juice is chiefly valuable as a stimulant. It has but little food value and is not to be given in the place of nourishing foods but as an addition to it. Two teaspoonfuls diluted with an equal quantity of water may be given 15 minutes before the midday

feeding, beginning about the ninth month. If the baby is delicate, it may be begun as early as the fifth month in half the above quantity.

Only one new article should be added to the baby's diet at a time and the effect on the baby should be carefully noted. (See p. 80 for preparation of vegetables.) Meat should be boiled, roasted, or broiled for the baby and must be cut in fine pieces, as the baby will not chew it sufficiently at this age.

Never give the baby cakes, candy, doughnuts, pastry, fresh breads, griddlecakes, sirups or molasses, pork or tough meat of any kind, bananas or any overripe fruit, pickles, tea, coffee, soda water, wine, cider, beer, nor tastes of the family meals. If this is begun he will soon demand a taste of everything he sees, and his appetite for the simple diet which is essential at this age will be quickly destroyed.

INFANT FEEDING IN THE TROPICS.

Because of the scarcity of cows' milk it has heretofore been customary to depend largely upon the use of condensed milk, both sweetened and unsweetened, for infant feeding in tropical climates.

Dr. Victor G. Heiser, Director of Health for the Philippines, is authority for the statement that experience in the Philippines has demonstrated the value of natural sterilized milk. This natural milk is now very extensively prepared in Switzerland, Italy, and Denmark, and is exported in cans of various sizes adapted to special uses. This canned milk keeps perfectly sweet for months and has proven a very satisfactory substitute for the ordinary milk supply. It is used in the same way as natural cows' milk would be used in the Temperate Zone.

A series of experiments in infant feeding which have been carried on at the Ancon Hospital in the Canal Zone since 1906 have resulted in the evolution of a method of infant feeding involving the use of both sweetened and unsweetened condensed milks. A set of formulas is published and distributed by the Department of Sanitation of the Zone.

INFANT STOOLS.

The first passages from a newborn baby's bowels are known as meconium. The excretion is black or nearly so, and is thick, of a tarlike consistency, with little or no odor. This soon changes to the normal yellow stool of the healthy infant as the baby begins to feed at his mother's breast. The stools are then of a dull yellow or orange color without disagreeable odor and soft and mushy in appearance. They are passed from one to three times a day, averaging twice a day in most breast-fed babies until 6 months of age, when one stool a day is usual. When there is a long interval

between feedings the number of stools is usually lessened, being only one a day, and sometimes only one in 36 hours. Artificially fed infants usually pass but one stool a day, and the color and odor vary with the character of the food. With breast-fed babies the stool is a mass, while with those fed on the bottle there is more tendency to a "formed" stool.

When there is a greatly marked difference in the character of the stools, especially when the number increases, the mother should have a doctor see the baby, meanwhile decreasing the food or, better, withdrawing it altogether for some hours, giving water instead.

In order to do away with the need for diapers as early in life as possible, the baby should be taught to use the chamber. This training may be begun by the third month, or even earlier in some cases. It should be carried out with the utmost gentleness, since scolding and punishment will serve only to frighten the child and to destroy the natural impulses, while laughter will tend to relax the muscles and to promote an easy movement. In order to be effective the chamber must be presented to the baby at the same hour every day, usually just before the morning bath, and it must be presented persistently each day until the habit is formed. Much time and patience will be required on the part of the mother, but in the end the habit thus formed will be a great saving of trouble to her and of untold value to the child, not only in babyhood but throughout the whole of life.

Experience has shown that an ordinary porcelain cuspidor is an excellent vessel to use for a young baby. It should be kept scrupulously clean, and in cold weather must be warmed before being used. The mother takes the vessel in her lap, seating the baby upon it with his back toward her breast, so that she may support him in a comfortable position. If the movement does not come within a few minutes the better course is to wait until the next day. A little observation on the mother's part will lead her to know at what hour the baby's bowels are ready to move, and she should choose that moment for the trial. If the baby has a tendency to be constipated, it may be well to introduce a well-oiled soap stick for a moment before beginning, in order to start the movement and to indicate to the baby what is wanted.

THE NORMAL BABY.

DEVELOPMENT.

An inexperienced mother is often greatly at a loss to know whether a baby is properly thriving or not, and may be unduly alarmed at small matters, or may not understand the serious nature of certain conditions. It may be helpful to mention the leading characteristics

of a normal, healthy baby, and the mother may assume the lack of these conditions to show that temporarily or otherwise the baby is not in perfect health:

A steady gain in weight.
Bowel movements of the normal number, color, and consistency.
Absence of vomiting or regurgitation of the food.
A good appetite.
A clear skin.
Bright, wide-open eyes.
Alert, springy muscles, which respond readily to any stimulus.
A contented expression.
Very little crying.
Quiet, unbroken sleep, with eyes and mouth tightly closed.
No evidence of pain or discomfort.
A constant growth in stature and intelligence.

Other points in a normal development are:

The soft spot in the top of the head begins to close at 14 months and should be entirely closed at 2 years.

The baby learns to hold up his head, unsupported, during the fourth month.

He laughs aloud from the third to the fifth month.

He reaches for toys and holds them from the fifth to the seventh month.

At 7 or 8 months he is usually able to sit erect and hold the spine upright.

During the ninth and tenth months he makes the first attempts to bear the weight on the feet, and can usually stand with assistance at 11 or 12 months.

He begins to walk alone in the twelfth and thirteenth months and walks alone at the fifteenth or sixteenth month.

At 1 year usually a few words can be spoken, and at the end of the second year the baby makes short sentences.

Children differ in the rapidity of their development, some being slower and some faster; therefore the mother should not be unduly alarmed at variations from this statement, although marked differences should put her on guard.

TEETH.

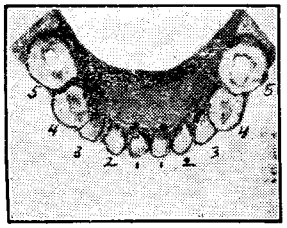
The embryonic teeth begin to develop at least six months before birth. It is probable that a nutritious diet for the prospective mother lays the foundation for healthy teeth in the baby and that lack of proper food for the mother may deprive both her own and the baby's teeth of some part of their normal vigor.[1] Every child has two sets of teeth. The first set, known as the deciduous or "milk" teeth, are replaced, beginning at about the sixth year, with the permanent or "second" teeth. Nearly all so-called "teething" troubles belong

[1] See Prenatal Care, pp. 8, 9, "Diet in pregnancy."

to the first period, as a disturbance is rarely connected with the coming of the permanent set.

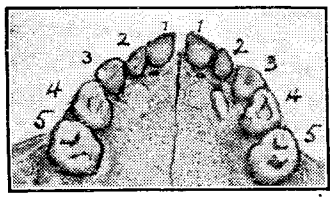
At birth each tiny tooth of both sets lies partly embedded in a cavity of the jawbone, surrounded with and covered by the softer tissues of the gum. As the baby grows, the teeth grow also, and if the baby is healthy they are ready to cut through the gums, beginning at about the seventh month of life. There are 20 of the milk teeth, 5 in each half jaw. The teeth appear in groups. There are five of these groups, with intervals between their appearance. After the first group there is a pause of five to eight weeks; after the second a pause of one to three months; after the third, one of from two to three months; after the fourth, one of from two to four

PLATE XIII.[1]



Lower jaw.

1, First incisor, 6 to 9 months.
2, Second incisor, 12 to 15 months.
3, Canine or "stomach," 18 to 24 months.
4, First molar, 12 to 15 months.
5, Second molar, 24 to 30 months.



Upper jaw.

1, First incisor, 8 to 12 months.
2, Second incisor, 8 to 12 months.
3, Canine or "eye," 18 to 24 months.
4, First molar, 15 months.
5, Second molar, 24 to 30 months.

months. Thus, by the time a baby is 1 year old it may have 6 teeth; at 1½ years there should be 12; at 2 years, 16 teeth; and at 2½ years the entire set should be cut. There is considerable variation, both as to the order in which they appear and in the time, so that the mother need not be alarmed if her baby does not follow the average as above stated, but if the baby has no teeth at the end of the first year it can hardly be said to be developing properly. Probably the diet is at fault, or some disease is retarding the growth of the baby in general. In such a case the doctor should be consulted.

Deciduous or "milk" teeth.—The above illustrations, with the appended notes, show the position of the teeth in the mouth, their names, and the approximate times of their appearances.

This set of teeth is replaced by the permanent set, beginning about the sixth year. A child should be taken to the dentist at this time, if, as sometimes happens, the milk teeth are so firm that they do not

[1] Courtesy of Dr. Kent Beattie.

fall out, but, remaining in the jaws, crowd back the second set and cause them to come in misshapen and irregular.

Growth.—During the second year the baby should have more or less dry, hard foods on which to chew. There is sometimes a tendency to keep a baby too long on an exclusively soft diet for fear that solid food will upset him, but it is important to the development of strong, healthy teeth that they shall have exercise in biting and chewing. Begin by giving the baby of about a year of age some dry, hard crust or toast, or hard crackers, at the end of a regular meal. During the second year, other kinds of food requiring chewing may be gradually added to the diet list and taken as part of the regular meals.

Care.—It is generally believed that much of the health of the second teeth depends upon the care that is given to the first set. As soon as the molars make their appearance they should be gently cleaned each day with a soft brush. As the baby grows into childhood he should be taught the daily care of his own teeth.

Ailments of teething.—Altogether teething is a natural process and is not alone responsible for all the illness attributed to it, nevertheless there is no doubt that many babies suffer severely while cutting their teeth. When the gums are red and swollen it sometimes affords relief if they are lanced, and it may be well to have a doctor examine the baby's mouth to see if the operation is needed. The process of teething is occasionally associated with digestive disturbances. The number of stools may increase and vomiting may occur. The baby may be restless and fretful and try continually to bite on something. In all these cases the quantity and strength of the food should be reduced and drinking water should be offered at frequent intervals. No teething lotions nor medicines of any kind should be given for the relief of the pain of teething. If they do relieve it, it is probably because they contain opium in some form or other narcotic drugs.

There is a dangerous tendency to attribute to teething many ailments which are due to other causes. The teeth begin to appear at about the same time that the baby is being weaned and new foods are being tried. Disturbances of the digestive tract are very likely to occur for these reasons. If the baby cuts his teeth in the summer, his illness may be due to excessive heat, to improper feeding or overfeeding, and to the pain of cutting the teeth, and it would be difficult to say which factor is chiefly responsible. In any case, careful feeding is of the utmost importance.

The baby should not be expected to gain in weight during these periods of painful eruption of the teeth, but the weight may remain stationary for two or three weeks without harm. The baby should not be urged to eat when he has no appetite, merely for the sake of the desired increase in weight. After the disturbance has passed he will be hungry and will soon regain the lost ground. On the other

hand, if the baby is coaxed to take more food than he wants, his digestion is sure to be upset, and this, added to the pain of teething, may result in serious illness. The "second summer" has gained a reputation for being the most critical period of the baby's life, but, as a matter of fact, statistics show that the first summer is a much more hazardous time, and if properly fed and cared for a healty baby should be brought through the second summer in perfect condition.

WEANING.

Weaning is the process whereby the baby is gradually deprived of breast milk. It should proceed slowly, one bottle feeding being substituted for one breast feeding during the day for some time, then two bottles, and so on until all breast feeding has been done away with and the baby is entirely weaned. In order that this change may be accomplished with as little disturbance as possible, one bottle feeding may be given to the baby in 24 hours as early as the fifth or sixth month. This will hardly be sufficient to upset the baby's digestion and yet will serve to accustom him to the taste of strange food and to the use of the bottle and to begin the education of the stomach in dealing with new materials.

When to wean.—In most cases the baby should be weaned by the end of the first year, and in some cases from one to three months earlier, depending largely upon the health of the baby, the amount and quality of the breast milk, and upon the time of the year. It is unwise to wean the baby in the heat of summer or when infant illness of any sort is epidemic. It has been proved over and over again that breast milk will save a sick baby's life and restore him to health after the strain of a long hot summer, and that often there is no other food that can be relied upon to accomplish the same result. Therefore, even though the breast milk must be supplemented with one or several bottles, it is wise to nurse the baby through the summer so that the breasts will not cease entirely to secrete and may be called on in an emergency. If the baby is weaned at 10 months or earlier he may be fed by bottle; if not until the end of the year, he may be taught to drink from a glass or cup directly.

If drinking water has been given by means of a nursing bottle during much of the first year, the baby will take his food in the same way the more readily. A healthy infant weaned at 9 months should begin with the food for an infant of 4 or 5 months. If he digests this mixture well, the strength can be increased until within two or three weeks he is taking the food full strength. Increase in the diet should be made with special caution at the beginning of summer or during the heat, when there is great danger of inducing diarrhea. It is far better to keep the baby on rather a low diet,

even without increasing his weight, than to upset the intestinal tract by overfeeding. If, after trying a new food, vomiting occurs or the stools show that there is indigestion, it is always best to return to the weaker food until the disturbance has subsided.

Weaning from the bottle.—An artificially fed infant is weaned from the bottle by beginning at 10 months to substitute one feeding a day from the spoon or cup for one bottle feeding, gradually increasing the number of such feedings until the baby is weaned, usually by the thirteenth month. The mother will find it a convenience to continue the bottle for the night feedings as long as necessary.

SLEEP.

The infant brain increases its size two and one-half times in the first year, a greater growth than takes place during all the remaining years of life. At the same time this enormous brain development is taking place the other organs of the little body are growing rapidly. During sleep the body tissues are re-created and the energy and materials needed for the activity of the waking hours are stored up. It is manifest, therefore, that the baby must have a correspondingly large allowance of sleep. He should be provided with the best possible sleeping accommodations, so that the hours of sleep may be of the greatest value to him. He should always sleep in a bed by himself, and whenever possible in a room by himself, where he need not be disturbed by the presence of other persons, and where light, warmth, and ventilation may be adjusted to his particular needs. Not a few young babies are smothered while lying in the bed with an older person, some part of whose body is thrown over the baby's face during heavy sleep.

AMOUNT.

A young baby sleeps 18 or 20 hours out of 24. At 6 months of age a baby sleeps about 16 hours, at 1 year about 14 hours, and at 2 years at least 12 hours. Daytime naps should be continued as long as possible.

REGULARITY.

A baby should be trained from the beginning to have the longest period of unbroken sleep at night. Some babies get a wrong start in this respect and make great trouble by turning night into day. A strong argument in favor of the three-hour nursing interval is that it does away largely with the need for waking the baby to nurse. Nature intends that the baby shall waken when hungry, and this normally occurs about once in three hours in a healthy baby, so that with a little care the regular feeding interval can be made to coincide with

the normal periods of waking. If the baby is still sound asleep when the three-hour period has come around, he should be gently roused and put to breast. This will involve little shock to his nerves, because he will be about ready to waken in any event.

For the first three months the baby will probably sleep both morning and afternoon. As he grows older these two naps will be merged into one, and an effort should be made to have the longest waking interval in the afternoon, gradually training the baby to stay awake long enough at that time to be quite ready to drop off to sleep for the night as soon as he has had his supper. A mother who must prepare and serve the evening meal of the family will find it a great comfort to give the baby his supper at half past 5 and have him in his crib at 6. For the first few months he will be fed again about 10 o'clock, but after that he should not be taken up. He must be made comfortable in every way, the light should be put out, the window opened, his covers adapted to the temperature, but after the mother has assured herself that everything essential to his comfort has been attended to, she should not go to him when he cries, if he is a perfectly healthy baby. A few nights of this training will result in entire comfort for the baby and the family, while the opposite conditions will make the baby a tyrant who ruthlessly spoils the comfort of the entire household.

TEMPERATURE OF SLEEPING ROOM.

For very young or delicate babies the temperature of the sleeping room should be kept at about 65 degrees. After the baby is 3 months old the temperature may be permitted to fall to 55 degrees, and during the second year to 45. Strong and healthy babies are quickly accustomed to cool and even cold sleeping rooms and usually sleep more soundly and keep themselves covered better than when sleeping in warm rooms. In the severe northern winter, where the temperature drops many degrees below freezing before morning, the baby must wear a flannel nightgown over the cotton one. The sleeves should be pinned together over the ends of the fingers so that the hands will be covered. A very soft flannel nightcap may be needed, and heated articles, such as hot-water bottles or bags of sand or salt may be placed in the bed, great care being taken that they are covered in such a way that the baby can not be burned. The baby should also take his daytime naps in a cold room.

Comfortable sleep during the heated portion of the year is more difficult to secure. The most airy room should be chosen, and all the baby's clothing removed, save the diaper and a very thin cotton gown with loose sleeves. It is better, if possible, to keep the baby out of doors during late afternoon and evening until the rooms have cooled.

If there is a screened porch, he may sleep out all night, with sufficient protection from sudden changes in the weather. Out-of-door sleeping in summer, both by night and day, is excellent for the baby after he is a month or two old, provided always that he is protected from flies and mosquitoes, shielded from the sun and wind, and is covered warmly if there is a sudden drop in the temperature. A baby should never be put down to sleep in all his clothes. His shoes, especially, should be removed, and, unless the weather is very cold, it is better to remove the stockings, also. But the baby's feet must always be kept warm.

DISTURBED SLEEP.

If the baby sleeps lightly, wakens often, and seems uncomfortable it may be that something is disturbing him which can be remedied.

He may be nervous from having been tickled, played with, or tossed about in the latter part of the day. Overstimulation is to be avoided at all times, no matter what its source nor what the age of the baby.

He may be too warm, too cold, or wet; there may be something scratching him, or there may be wrinkles in the bedclothing; he may be lying in a cramped position, or the band or diaper may be too tight.

Or, more likely, he has been overfed, or has had something unsuitable to eat, or is hungry or thirsty.

The room may be too hot, too cold, too light, too noisy, or not sufficiently aired. The conditions which make sleep a delight to older persons affect the baby in the same way, namely, plenty of fresh air passing in a constant current through the room, quiet, a clean body, and clean, comfortable clothing, a good bed, and suitable coverings.

A cool bath or a warm one, according to the temperature, will help to induce quiet sleep. In the summer, when the baby is fretful and sleeps restlessly, a tub bath at bedtime will help to relieve him. A little baby should be turned over once or twice in the course of a long nap.

MEDICINES.

Never give a baby any sort of medicine to induce sleep. All soothing sirups or other similar preparations contain drugs that are bad for the baby, and many of them are exceedingly dangerous. Many babies die every year from being given such medicines. The baby should never be allowed to go to sleep with anything in the nature of a pacifier in his mouth. Thumb and finger sucking babies will rebel fiercely at being deprived of this comfort when they are going to sleep, but this must be done if the habit is to be broken up. The baby ought to have a quiet place in which to sleep, but he should be taught to sleep through the ordinary household noises, unless they

are unduly disturbing. It should not be necessary to walk on tiptoe and talk in whispers while the baby sleeps, provided he has a room to himself during his daytime naps.

HABITS, TRAINING, AND DISCIPLINE.

Habits are the result of repeated actions. A properly trained baby is not allowed to learn bad habits which must be unlearned later at great cost of time and patience to both mother and babe. The wise mother strives to start the baby right.

SYSTEMATIC CARE.

In order to establish good habits in the baby, the mother must first be aware what they are, and then how to induce them. Perhaps the first and most essential good habit is that of regularity. This begins at birth and applies to all the physical functions of the baby—eating, sleeping, and bowel movements. The care of a baby is readily reduced to a system unless he is sick. Such a system is not only one of the greatest factors in keeping the baby well and in training him in a way which will be of value to him all through life, but reduces the work of the mother to the minimum and provides for her certain assured periods of rest and recreation.

As a sample of what is meant by a system in baby care the following plan is suggested, which may be variously modified to suit particular cases:

6 a. m., baby's first nursing.
Family breakfast; children off to school.
9 a. m., baby's bath, followed by second nursing.
Baby sleeps until noon.
12 to 12.30, baby's noon meal.
Out-of-door airing and nap.
3 to 3.30 p. m., afternoon nursing.
Period of waking.
6 to 7 p. m., baby's supper and bed.

It is quite feasible to have the baby's night meal at 11.30 or 12 o'clock, in order to give the mother a chance to spend an occasional evening in pleasant recreation.

PLAYING WITH THE BABY.

The rule that parents should not play with the baby may seem hard, but it is without doubt a safe one. A young, delicate, or nervous baby especially needs rest and quiet, and however robust the child much of the play that is indulged in is more or less harmful. It is a great pleasure to hear the baby laugh and crow in apparent delight, but often the means used to produce the laughter, such as tickling, punching, or tossing makes him irritable and restless. It is

a regrettable fact that the few minutes of play that the father has when he gets home at night, which is often almost the only time he has with the child, may result in nervous disturbance of the baby and upset his regular habits.

The mother should not kiss the baby directly on the mouth, nor permit others to do so, as infections of various kinds are spread in this way. She needs also to be cautioned about rocking the baby, jumping him up and down on her knee, tossing him, shaking his bed or carriage, and, in general, keeping him in constant motion. All these things disturb the baby's nerves and make him more and more dependent upon these attentions. But this is not to say that the baby should be left alone too completely. All babies need "mothering," and should have plenty of it. When the young baby is awake he should frequently be taken up and held quietly in the mother's arms, in a variety of positions, so that no one set of muscles may become overtired. An older child should be taught to sit on the floor or in his pen or crib during part of his waking hours, or he will be very likely to make too great demands upon the mother's strength. No one who has not tried it realizes how much nervous energy can be consumed in "minding" a baby who can creep or walk about, and who must be continually watched and diverted, and the mother who is taking the baby through this period of his life will need to conserve all her strength, and not waste it in useless forms of activity.

BAD HABITS.

Some of the bad habits which a baby learns are these:

Crying.—Crying ought not to be classed as a bad habit without some modification, for although a well-trained baby does not cry very much he has no other means of expressing his needs in the early months of life, and his cry ought to be heeded. But when baby cries simply because he has learned from experience that this brings him what he wants, it is one of the worst habits he can learn, and one which takes all the strength of the mother to break. Crying should cease when the cause has been removed. If the baby cries persistently for no apparent cause, the mother may suspect illness, pain, hunger, or thirst. The first two of these causes will manifest other symptoms, and the actual need for food may be discovered by frequent weighing. But if finally, after careful scrutiny of all these conditions, no cause for the crying can be found, the baby probably wants to be taken up, walked with, played with, rocked, or to have a light, or to have some one sit by him—all the result of his having learned that crying will get him what he wants, and sufficient to make a spoiled, fussy baby, and a household tyrant whose continual demands make a slave of the mother. It is difficult to break up this habit after it has once been formed, but it can be

done. After the baby's needs have been fully satisfied he should be put down alone and allowed to cry until he goes to sleep. This may sound cruel, and it is very hard for a young mother to do, but it will usually take only a few nights of this discipline to accomplish the result. In some cases persistent crying may be due to causes not readily discernible by the mother; in this event, the opinion of a good doctor as to the cause of the crying should be sought.

"*Pacifiers*" *or* "*comforts.*"—The extremely bad habit of sucking on a rubber teat, or a sugar ball, or a bread ball, or any other similar article, is one for which some one else is entirely responsible. The baby does not teach himself this disgusting habit, and he should not have to suffer for it. Some of the evil effects ascribed to this habit are that it spoils the natural arch of the mouth by causing the protrusion of the upper jaw; it induces a constant flow of saliva and keeps the baby drooling; the pacifier is never clean and may readily carry the germs of disease into the baby's mouth; and last and least, it is a habit which is particularly disfiguring to the baby's appearance. The pacifier, of whatever variety, must be destroyed, and no such object should be permitted in the baby's mouth under any circumstances.

Thumb or finger sucking.—This is another habit leading to the same results as the use of pacifiers, but one which the baby may acquire for himself, although it is frequently taught to him. To break up either habit requires resolution and patience on the part of the mother. The thumb or finger must be persistently and constantly removed from the mouth and the baby's attention diverted to something else. The sleeve may be pinned or sewed down over the fingers of the offending hand for several days and nights, or the hand may be put in a cotton mitten. Ill-tasting applications have very little effect. There are patent articles for holding the hand from the mouth sold in the stores, but the persistent covering of the hand often works very well. The baby's hands should be set free now and then, especially if he is old enough to use his hands for his toys, and at meal times, to save as much unnecessary strain on his nerves as possible, but with the approach of sleeping time the hand must be covered.

Bed wetting.—It requires great patience and persistence on the mother's part to teach the baby to control the bladder. Some babies may be taught to do this during the day by the end of the first year, but it is ordinarily not until some time during the second year that this is accomplished. It is necessary to put the baby on the chamber at frequent intervals during the day. Bed wetting may be due to some physical weakness if it persists in children 3 years old and over. A doctor should be consulted. In ordinary cases it may suffice if no

liquid food is given in the late afternoon and if the baby is taken up the last thing before the mother retires.

Masturbation.—This is an injurious practice which must be eradicated as soon as discovered, if at all, as it easily grows beyond control. It is more common in girls than in boys. If the mother discovers the baby rubbing its thighs together or rocking backward and forward with its legs crossed, she should divert him at once to some other interest. Nurses sometimes ignorantly rub the genital organs of babies thinking that it quiets them, but nothing could be more deplorable than this. Mothers can not be too watchful of nursemaids and the methods they employ to quiet or amuse a baby. Children are sometimes wrecked for life by habits learned from vicious nurses, and mothers can not guard too strictly against this evil. Another way in which this habit is learned is by means of playthings which rub upon the sensitive parts, such as rocking horses, swings, teeter boards, and the like. The habit may also be due to some local irritation, and it is wise to consult the doctor at the first evidence of the trouble. In the case of babies the treatment consists in mechanical restraints. A thick towel or pad may be used to keep the thighs apart, or at night the hands may have to be restrained by pinning the nightgown sleeves to the bed, or the feet may be tied one to either side of the crib. Wet or soiled diapers should be removed at once. Cleanliness of the parts is of great importance.

PUNISHMENT.

Harsh punishment has no place in the proper upbringing of the baby. A baby knows nothing of right or wrong, but follows his natural inclinations. If these lead him in the wrong direction the mother must be at hand to guide him in another and better one and to divert his eager interest and his energy into wholesome and normal directions. This is the golden rule in the training of babies, and one which applies to the training of children of all ages. Many parents conceive that their whole duty is to thwart and forbid, enforcing their prohibitions with penalties of varying degrees of severity, forgetting that they are dealing with a sensitive being endowed with all the desires, inclinations, and tendencies that they themselves have, and that if these natural feelings are continually suppressed and thwarted they are sure to seek and find some outlet for themselves. A child who is often punished may be so dominated by fear of his parents that, the natural expression of his vital interests being denied him, he becomes sullen and morose as he grows older.

EARLY TRAINING.

The training in the use of individual judgment can be begun even in infancy; a child should early be taught to choose certain paths of

action for himself; and if he is continually and absolutely forbidden to do this or that he is sometimes seriously handicapped later, because he does not know how to use his own reasoning faculties in making these choices. On the other hand, obedience is one of the most necessary lessons for children to learn. A wise mother will not abuse her privilege in this respect by a too exacting practice. For the most part she can exert her control otherwise than by commands, and if she does so her authority when exercised will have greater force and instant obedience will be more readily given.

Most of the naughtiness of infancy can be traced to physical causes. Babies who are fussy, restless, and fretful are usually either uncomfortable in some way because they have not been properly fed and taken care of, are sick or ailing, or have been indulged too much. On the other hand, babies who are properly fed, who are kept clean and have plenty of sleep and fresh air, and who have been trained in regular habits of life, have no cause for being "bad" and are therefore "good."

It must not be forgotten that the period of infancy is a period of education often of greater consequence than any other two years of life. Not only are all the organs and functions given their primary education, but the faculties of the mind as well receive those initial impulses that determine very largely their direction and efficiency through life. The first nervous impulse which passes through the baby's eyes, ears, fingers, or mouth to the tender brain makes a pathway for itself; the next time another impulse travels over the same path it deepens the impression of the first. It is because the brain is so sensitive to these impressions in childhood that we remember throughout life things that have happened in our early years while nearer events are entirely forgotten. If, therefore, these early stimuli are sent in orderly fashion, the habits thus established and also the tendency to form such habits will persist throughout life.

HOW TO KEEP THE BABY WELL.

The suggestions contained in the following pages are not intended to be a substitute for the care and advice of a physician. But since many mothers are so situated as to be unable to command the services of a physician at once, and since in any case there may be a delay in his arrival, it is well for the mother to understand something of the symptoms of illness and be prepared to deal intelligently with the emergencies that may arise in connection with the care of her children. In all cases of illness the discretion and self-control of the mother are of infinite assistance to the doctor, and when the physician's services are not immediately available the life of the child may depend on the coolness and wisdom of the mother.

The old and most pernicious idea that a certain amount of illness is the necessary accompaniment of infant life is happily fast dying. With the constant increase in the knowledge of the conditions that lead to sickness among children, it is seen that a very large proportion of such illnesses and deaths are preventable by the application of the well-established rules for the proper care of babies. It should therefore be the aim of all intelligent mothers to learn how to save her children from needless illness.

It is said that nine-tenths of all infant illness is due to improper feeding. Whether this is the exact proportion or not, it is quite certain that many babies suffer unnecessarily from mistakes in diet, and it is in this field that the intelligence of the mother is of the greatest value. Babies are usually born healthy, and if they are fed at the breast, or, when this is not possible, with strict regard to the rules for proper artificial feeding, and if they are given hygienic care in other respects and allowed to develop in a natural, normal way, there is little reason why they should be sick, and the responsibility for this rests finally upon the parents. In the following paragraphs is given some account of the minor ailments that may attack babies, together with a brief description of the symptoms of more serious illness, at the appearance of which medical advice should be sought whenever possible.

Most of these suggestions apply as well to older children, as there is no hard and fast boundary line to separate the ailments of infancy from those of childhood.

COMMON AILMENTS.

Diarrhea.—The normal, healthy baby usually has one or two stools a day. If the number increases to four or more the mother should be on her guard against diarrhea. Diarrhea is a symptom of nearly all the disturbances of digestion in infancy, both of the mild and of the severe types. The doctor should be consulted at once if possible, for even a slight attack of diarrhea, unless correctly treated, may lead to a severe disturbance such as cholera infantum. Diarrhea is far more frequent in summer than in winter. This is chiefly because the baby is directly affected by the hot weather so that he is more easily upset by his food. Therefore in hot summer weather all babies, and especially bottle-fed babies, should receive especial care. They should be kept as cool as possible. They should be outdoors except when it is cooler indoors; all unnecessary clothes should be removed, a band and diaper being sufficient clothing; frequent cool sponge baths should be given, and the amount of food on especially hot days should be reduced to two-thirds of the ordinary amount, large quantities of water being given in addition.

The disease is more frequent in bottle-fed babies. If it occurs in a nursing baby it is usually because the baby has been nursed too often or at irregular intervals, or has been given food other than milk. Extend the nursing interval and allow the baby to nurse only 5 or 10 minutes. If the trouble continues, withhold the breast altogether for some hours until there is an improvement. Give a little water to drink now and then.

For bottle-fed babies, if the disturbance is slight, the amount of milk used in the feedings should be reduced by half, skimmed, and all sugar omitted. If the trouble is more severe, all food should be stopped, only plain boiled water should be given, and a physician should be consulted at once.

A baby takes some time to get back to full vigor after even a slight digestive disturbance, and the return to food must be gradual. It will take from 10 days to 2 weeks to restore the normal condition of the digestive tract. A second attack of illness occurs much more readily than the original one.

Constipation.—A nursing baby often responds to this condition in the mother. The mother should have a free evacuation of the bowels each day. If she is regular and the baby is still constipated, he must be held over the chamber at exactly the same hour every day in the effort to induce regular movements. Persistence in the establishment of a regular bowel habit in the baby prevents much of this trouble. Orange juice may be given once a day an hour before his midmorning feeding after the baby is 6 months old. Other remedies are suggested in connection with the treatment of the bottle-fed baby.

Constipation in a bottle-fed baby is more difficult to relieve. After the baby is 5 or 6 months old, oatmeal gruel may be found useful in this condition, and fruit juices as well. Orange juice may be given at 5 or 6 months and the strained pulp of prunes or baked apple in the second year. Massage of the abdomen may be tried. Just before holding the baby over the chamber, undress him as much as necessary and let him lie on his back. Moisten the hand in warm olive oil, albolene, or vaseline, and gently massage the abdomen, using a light circular movement and very little pressure. Begin just above the right groin, carry the hand to the ribs, then across the body and down on the left side. Keep this up for 5 or 10 minutes, but do not let the baby become chilled.

Enemas are not to be commonly employed. If resorted to frequently they cause the bowel muscle to lose its tone and soften and dilate the bowel wall. The ideal treatment consists in the education of the intestine in the regular, unaided performance of its natural function, which is best achieved by persistence in a suitable diet. Do not give drugs for the relief of this condition, save under the doctor's direction.

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If the baby is constipated, a soap stick or a gluten suppository may be tried. Take a piece of firm white soap half an inch thick and about 2 inches long and shave it down toward one end until the point is about one-quarter of an inch thick and perfectly smooth. Wet the soap stick or dip it in vaseline before using it. Hold the stick by the thick end, insert the other end in the anus, and allow it to remain in one or two minutes. Gluten suppositories may be purchased at a drug store and are accompanied by directions for their use.

If the baby is badly constipated and needs relief at once, an enema may have to be used. For a baby 6 months old or over use a pint of warm water (95 degrees) in which a teaspoonful of common salt has been dissolved, and half as much or less for young babies. Or if the constipation is specially severe, 1 to 2 tablespoonfuls of warm olive oil may be used instead of the salt solution.

To give an enema, use an infant syringe, which is merely a rubber bulb with a nozzle on one end. To fill it, squeeze the bulb while holding the nozzle under water; when the bulb is released it will fill with water by suction. Let the baby lie on his back across the mother's lap, having the buttocks somewhat elevated by means of a folded towel placed under the hips. This position will cause the water to run up into the bowel more readily and serve to catch any drip. Lift the baby's feet with the left hand and with the right introduce the nozzle, which has been greased with vaseline, inside the anus (the opening to the bowel), directing it toward the back. The operation will cause the baby little or no suffering if gently and slowly performed, although if he is badly constipated the starting of the movement may be somewhat painful. When the liquid has been injected, remove the nozzle and press the towel against the opening to the bowel to retain the water until the baby can be placed over the chamber. As the enema sometimes comes away as the nozzle is withdrawn, the mother's clothing should be well protected. If a fountain syringe must be used, the bag should be held hardly higher than the baby, or the water will have too great force.

Hiccough.—This is a spasm of the diaphragm. In infants it is usually due to an irritation of the stomach caused by overfilling the stomach or by swallowing air with the food. In some cases it may be brought on as the result of a sudden exposure to cold. Care should be taken to avoid these causes. When the trouble is in progress, gentle massage of the abdomen or placing the baby face downward across the mother's lap will sometimes afford relief. A few drops of water to drink may help.

Colic.—This is caused by indigestion due to overfeeding, improper feeding, or too frequent feeding. The bowel is distended by gas, giving rise to severe pain. The baby cries sharply, alternately drawing its legs up to the body, then kicking them away. One of the best

means of relief is a small enema of warm water, which will serve to relieve the pain by driving out the gas from the intestine. The feet and legs should be kept very warm, and the abdomen may be massaged with warm oil. Do not feed the baby while the attack lasts. Though the introduction of warm milk into the stomach may quiet the baby temporarily, the pain will return with greater intensity. Warm water may be given if the baby will swallow it. Colic is peculiarly an ailment of young babies and usually disappears by the third or fourth month. It is also very common in breast-fed babies. Constipated babies are more liable to it than others, and attention should be given to remedying this condition as a method of preventing colic. Colic is also caused by cold, and if the baby has been chilled in any way it is well to place him in a warm bath for 5 or 10 minutes, wrapping him warmly after taking him out of the water. The temperature of the bath should be about 100 degrees.

Convulsions.—This is, to the mother, one of the most alarming illnesses of infancy. It is always a symptom of some disturbance and the cause may be slight or very serious. Accordingly, in case any sort of twitching or convulsive motions are noticed, it is wise to send at once for a doctor. If a convulsion occurs before the doctor comes, keep the baby as quiet as possible, with cold cloths to the head. An enema of warm soapy water may be given. Have plenty of hot water ready so that the doctor may give a hot bath if he desires. Constipation is one of the causes of convulsions, and it is most important to keep the bowels freely open if a child shows a tendency to this trouble. Do not feel alarm if the physician administers chloroform, but never attempt its use yourself, as the slightest error in its administration may prove fatal.

Croup.—Catarrhal croup is one of the most alarming diseases of childhood, but it is practically never fatal. It is believed that children with enlarged tonsils and adenoids are more subject to it than others. The onset is very sudden. The child goes to bed apparently in good health and wakens a few hours later with a hoarse metallic cough most alarming to mothers and loud, difficult breathing.

The baby should be taken up and warmly wrapped. The room should be made very warm and a kettle of water set to boil. If the house is piped with water, the hot water may be turned on in the bathroom or kitchen, all the doors and windows closed, and the hot moist atmosphere will soon cause the paroxysm to relax. If kettles of water must be used, the steam will be more effective if confined under a tent made from a large umbrella or a sheet thrown over the crib. A gas or alcohol stove may be used to keep the kettle boiling. There is a "croup kettle" on the market which is very convenient. It has a long spout which carries the steam where it is needed. Mild attacks of croup will often yield to the application of warm moist

cloths about the throat, using great care not to burn the baby's flesh. When possible, the doctor should be summoned in order to make sure that the baby is not suffering from laryngeal diphtheria.

When the attack is over, all damp clothing should be removed and the room very gradually cooled, the child being kept warmly covered. Children who show a croupy tendency should be invigorated by much out-of-door life, nutritious food, daily cold sponging over the neck and throat, and should be examined for adenoids.

Cold in the head (coryza).—This ailment is particularly annoying to babies, because the obstruction of the nasal passages, making breathing difficult, greatly interferes with the ease of nursing. Serious complications may also follow a bad cold. These include bronchitis, pneumonia, tonsillitis, and abscess of the middle ear. A cold is a germ disease and very contagious. As far as possible, babies should be kept away from those suffering with this trouble, as it may be conveyed by a cough or a sneeze from the person affected. When a mother has a "cold," she should avoid kissing the baby or breathing directly in his face or using her handkerchief in his care. A nursing mother who has a cold should cover her nose and mouth with a thin gauze or veil while the baby is at her breast. Paper napkins, which may be purchased for a few cents a hundred, are a great resource at such a time, as they may be freely used and then burned. If the baby becomes infected, a few drops of albolene placed in each nostril by means of a medicine dropper will relieve the baby very much. The bowels should be kept open, and if there is fever the food should be reduced. Keep the baby in a room the temperature of which does not vary greatly during the 24 hours, but provide plenty of fresh air. Babies who live out of doors, who are fed properly and not too heavily dressed, are much less liable to colds than others. It is wise to keep careful watch over a baby thus affected, as certain contagious diseases appear first as a cold in the head.

Prickly heat.—This disease is due to the heat of summer, or to unduly heavy underclothing. It manifests itself in a fine red rash which comes when the baby is overheated and fades away under cooler conditions. The rash often shows itself first on the back of the neck and spreads over the head and shoulders. It is a very annoying trouble and makes the baby fretful and restless.

If the rash appears in cold weather, the baby is too warmly dressed. Heavy flannels are to be avoided, and a thin cotton or silk garment should be worn next to the skin. When it is caused by summer heat, the baby should be made as cool as possible, dressed in the thinnest clothing, and frequently bathed in cool water. Soap should never be used on an inflamed skin, but a starch, bran, or soda bath will help to relieve the intense itching. Ointments are not so soothing in this condition as powders. A satisfactory powder is made by mix-

ing 1 ounce each of powdered starch and powdered oxide of zinc with 60 grains of boric acid. Any druggist will make this up, and it should be used freely over the inflamed spots.

Chafing.—A fat baby is very apt to become chafed in the folds and creases of the skin, especially about the buttocks, where it is due to wet diapers or to those which have been washed with some irritating soap powder or not thoroughly rinsed. Chafed flesh should not have soap used upon it. Starch or bran water may be tried. Keep the skin clean and use the powder above recommended. In obstinate cases, clean with fresh olive oil only, using no water.

Eczema.—This is one of the most persistent and annoying afflictions of babyhood. It is characterized by a swollen, reddened skin, often covered with tiny pimples or crusts, sometimes having a watery discharge; at other times dry and scaly. Some babies have a predisposition to the disease, and in them a slight cause is sufficient to produce it. A baby's skin is very delicate, and any irritation, such as chapping from exposure to cold wind or the use of hard water or strong soap, may lead to eczema, or it may be caused by woolen underclothing, starched bonnets and strings, or unclean diapers. The disease is also caused by digestive troubles due to overfeeding, and often appears in constipated babies. These causes suggest the measures needed for its prevention.

The disease should be treated by a physician, as it is very persistent and must have careful and constant attention. Neither soap nor plain water should be used on the affected parts, which are usually the head and face. Bran or starch water may be used if necessary.

All liquors should be excluded from the diet of a nursing mother, the amount of meat reduced, and her out-of-door exercise increased. For babies fed on cows' milk the diet should be much reduced, both in quantity and strength, and in older children the starchy foods restricted, potatoes and oatmeal being forbidden. It is of the greatest importance that the child have a free bowel movement every day.

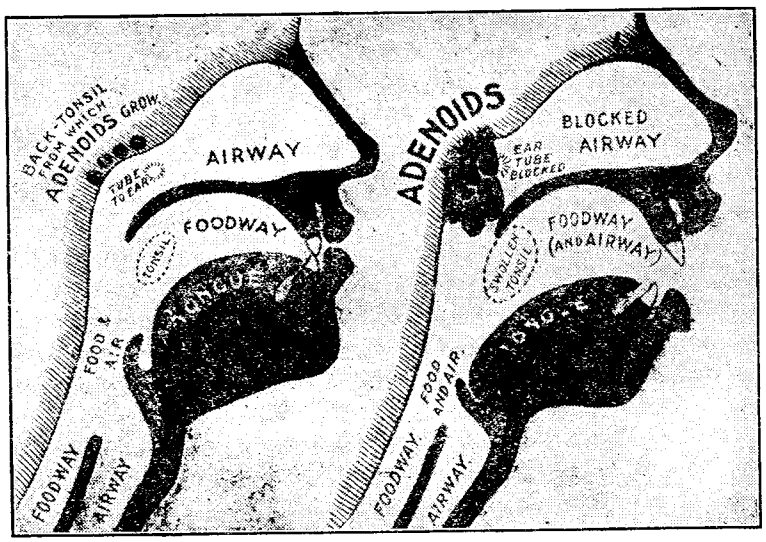
To allay the itching, smear the surfaces with an application made of equal parts of limewater and sweet almond oil, or cover them with a starch and boric-acid powder. It is most important that the baby shall not scratch the inflamed skin, and to prevent it pasteboard splints may be bound lightly about the baby's elbows with strips of cotton. It will thus be impossible for him to get his hands to his face, while having their free use for other purposes. A doctor's help and advice are greatly needed in this disease.

Milk crust.—Yellowish, scaly patches sometimes form on a baby's scalp. To remove, anoint with oil or vaseline at night and wash with warm water and pure soap in the morning, but do not attempt to force the crust away. If it does not all come off, repeat the opera-

tion as many times as needed, but on no account use a comb or any hard instrument to remove it, as it is very easy to start eczema in such a way if the skin is broken.

Rickets.—This disease, characterized by imperfect development of the bones, is probably due to faulty food and improper living conditions. Breast-fed babies are rarely affected, although the baby of a nursing mother whose diet is poor, insufficient, or improper may have the disease. Feeding on condensed milk and proprietary foods is thought to be one of its causes. Prevention consists in giving the baby suitable food, fresh air, and plenty of sunshine, and the same measures will bring about the cure. The symptoms of this disease are bowlegs, prominent abdomen, restless sleep, a perspiring head, weakness, and tenderness of the flesh. The disease may usually be

PLATE XIV.[1]



arrested by prompt treatment at the start. Medical advice should be sought.

Scurvy.—This disease is characterized by bleeding gums, great tenderness of the extremities, pallor, and fretfulness, and is probably due to improper diet. Suitable food and good care usually bring about immediate improvement. Fruit juices are needed, but they must be of an amount and kind suited to the child's age, and the case should be brought to the attention of a doctor, who will direct the treatment.

Adenoids and enlarged tonsils.—The symptoms which indicate that a baby is suffering from adenoids are restless sleep, snoring, snuffling, sleeping with the mouth open, and inability to nurse properly. All these conditions are due to the fact that these enlarged tissues par-

[1] Feeding and Care of the Baby, New Zealand, 1913.

tially close the nasal and throat air passages so that the baby can not breathe freely. Later the same causes may lead to deafness and other defects, which very seriously hinder the child's growth, both of body and mind. All babies who show any signs of trouble of this kind should be examined by a competent physician, who will decide how early the operation for the removal of these growths may be performed. Children suffer so seriously from this disease that no parent should be willing to have a child start out under such a handicap. In the hands of a careful surgeon the operation is a slight one, and in many cases the relief is immediate. The illustration on page 70, taken from the New Zealand pamphlet on the Feeding and Care of the Baby, shows how the air passages are blocked by adenoid growths and how the hearing may be affected by the partial closing of the tube leading to the ear.[1]

CONTAGIOUS DISEASES.[2]

Happily, nursing infants are less liable to these diseases than older children; still, babies have them to a considerable extent. The general symptoms of this class of diseases are fever, vomiting, persistent discharges from the nose, reddened eyes, sore throat, and skin rashes. If such symptoms appear, the child should be kept away from other children and the doctor summoned at once.

Measles.—This disease is never to be regarded as of small consequence, and it is particularly fatal in the first year of life.[3] It is especially to be avoided on account of the complications which may accompany or follow it. Some of these possible complications are bronchitis, pneumonia, tuberculosis, or troubles with the kidneys, eyes, or ears. The disease first appears as a cold in the head. The eyes are red, swollen, and watery; there is running at the nose, and the throat is dry. This stage is followed by a cough and at last, usually after three or four days, the skin breaks out in a profuse rash, which, if it is a mild case, fades away in a few days. The child will be drowsy and fretful and should be kept in bed until the eruption is over.

The eyes are apt to be sensitive in this disease and the crib should be turned so that the baby will not face the windows. It is so essential to have a constant and generous supply of fresh air for the little patient that the windows should not be darkened, as by doing this the ventilation will be cut off to a large extent. Additional protection for eyes may be secured by placing a dark screen about the crib.

The baby should be covered warmly in cold weather. A liquid diet will be the rule. This, however, and all the medical treatment should

[1] From Feeding and Care of the Baby, New Zealand, 1913.
[2] Contagious diseases. Supplement to Public Health Reports No. 6.
[3] Measles. Supplement to Public Health Reports No. 1 (1913).

be under the direction of a physician, whose care is especially needed to save the child from the complications of the disease.

Whooping cough.[1]—Few illnesses to which infants and young children are liable are more dangerous than this, and the greatest pains should be taken to protect them from this infection. It is frequently fatal, and at best it is an exhausting disease, often very obstinate, and it may be followed by other distressing sicknesses, such as bronchitis, pneumonia, and tuberculosis. The disease shows the symptoms of a cold in the head, accompanied by a cough which gradually grows worse until the characteristic whooping sound appears. The attack lasts from three to eight weeks, but often leaves behind it a bronchitis which may persist all winter, if the attack has occurred in the fall. The child should be kept out of doors as much as possible, being protected against cold and exposure by suitable clothing and shelter. Indoors the windows should be open day and night. The bowels should move every day, and the diet should be light but nutritious. Medical advice should always be secured, as under the best treatment the course of the disease may be shortened and the danger of complications greatly lessened. Parents of children suffering from this and other contagious diseases are usually legally and always morally bound to recognize the menace which their sick child is to the well children about, and to respect all necessary precautions and to maintain such quarantine measures as will protect others from exposure. It is believed that this disease, as well as many other contagious diseases, is chiefly communicated by the discharges of the mouth, nose, and throat. Therefore, children suffering from it should, when old enough, use paper napkins for handkerchiefs, and should be urged to use them freely and taught to burn them or put them where they may be burned at once. The mother should use them in the care of the baby. It would undoubtedly save much of the spread of contagious disease if the use of single-service paper handkerchiefs were obligatory in schools.

Pillowcases, towels, and napkins used about the patient may carry the germs from his nose and throat, and should never be used for anyone else until they have been thoroughly disinfected by boiling.

Syphilis.—This disease is one of the most serious with which children can be affected, and, if it is to be cured, involves long and persistent treatment. The prevention of this disease is of first importance. In the vast majority of cases babies are infected from their own parents, and any control of this scourge can be brought about only through the education of parents in their responsibility in this matter. If syphilis makes its appearance in one baby, thoughtful parents will undergo the necessary treatment and see to it that they are both entirely free from disease, as indicated by the most

[1] Whooping Cough: Its nature and prevention. Reprint from Public Health Reports No. 100.

delicate tests, before permitting themselves to produce another child. The baby should also undergo treatment for his own sake and to prevent infection of others.

Tuberculosis.—This is one of the common and fatal diseases of childhood. Prevention is of the greatest importance. Babies and children should be protected from infection by every possible means. The germs are distributed from the sputum of those suffering from the disease, and infants usually contract it from an infected parent or caretaker. The germ may be directly conveyed by kissing or by coughing or sneezing in the baby's face, by using an infected handkerchief for the child, and in other ways. These and other similar ways of infecting the baby suggest the care that is necessary to prevent it. Fresh air, sunshine, and good food are indispensable, both in the prevention of the disease and in its treatment. A tuberculous mother should never attempt to nurse her baby. In case the mother has the disease, both mother and child should live constantly out of doors, and whenever possible city families among whom the disease exists should remove to the country, where the conditions are most favorable to out-of-door life. Public agencies for the relief and prevention of the disease exist in nearly all States, and should be appealed to for instruction and advice.

Hookworm disease.—This disease belongs especially to the southern part of the United States, but travel and the movement of population are distributing it more or less widely. It prevails particularly in sandy soils and in country districts and is caused by a tiny worm which grows in polluted soil and is taken into the body through the skin. Among children the worm finds it way into the body usually through the soles of bare feet. Possibly, also, it is taken into the body in drinking water or on uncooked vegetables, such as salads. The worm is particularly active just after a rain or a heavy dew, and in warm moist places. This disease is manifested by dry hair, tallowlike skin, paleness, headache, swollen abdomen, sores on the legs, and the like. There will be little red swollen places where the worm enters the flesh. The disease usually responds promptly to medical treatment, and if a child is discovered scratching his toes or feet he should be taken at once to a physician.

Prevention is of first importance. A circular giving a full description of the disease, its causes, and how to prevent it, may be had, free of charge, by applying to the Public Health Service, Washington, D. C.[1]

The spread of the hookworm is due to the pollution of the soil by the use of open privies or by the scattering of the bowel movements of persons infected with the worm. The use of sanitary closets is abso-

[1] Hookworm Disease: Its nature, treatment, and prevention. Public Health Bull. 32.

lutely necessary if the disease is to be controlled. Models of such closets are given in the bulletin already referred to. (See Appendix for additional publications on the subject of sanitary privies.)

Vulvovaginitis.—The principal signs of the disease are a yellowish white vaginal discharge. There is apt to be some redness of the parts, and if the discharge is profuse, the adjacent skin of the thighs may be reddened by irritation. The baby should be taken to the doctor at the first appearance of the symptoms.

It is a very contagious disease which is spreading with alarming rapidity throughout the country. When one little girl contracts it there is grave danger of its being transmitted to every other little girl in the house. Only absolute separation, not only of the infected child but of all of her clothing, her towels, wash cloths, soap, etc., can prevent its spread. The hands of the mother should have a thorough scrubbing with soap and brush and should then be washed in a disinfecting solution.[1]

Under no circumstances should the infected child sleep with any member of the household. Great care must be taken not to carry the disease to the eyes, either of mother or baby, by the fingers. The mother must not touch her own or the baby's face until her hands have been cleansed as above, and she must continually guard the baby against doing so. The baby should wear a vulval pad as long as the discharge lasts.

All the infected child's clothing should be placed in a disinfecting solution and then boiled.

Trachoma.—This is a dangerous infectious disease of the eyes which is spreading alarmingly in certain parts of the country and which is responsible for much blindness. It is first shown by swollen, reddened lids with a discharge of pus from the eyes, which are highly sensitive to the light.

The disease spreads from one person to another by the use of a common washbasin, towels, handkerchiefs, and the like, so that children and even infants are as likely to be infected as grown persons. There can never be any effective control over this and many other diseases until parents generally learn what is required, not only for their cure, but, most of all, for their prevention.

When trachoma appears or is suspected in a community, parents should appeal to the local health authorities and other physicians to see that the proper measures are undertaken for the treatment of these and the prevention of other cases, and State authorities may be called upon, as well. The Public Health Service of the United States publishes free literature on the subject. (See Appendix.)

[1] See Appendix for disinfectants.

GENERAL HEALTH CONDITIONS.

GERMS.

Infectious diseases are due to harmful germs or microscopic plants of very simple structure, which are present in the excretions of persons suffering with such diseases, and may be transferred by flies or other means to milk, water, and other foods. Disease germs are removed by disinfection, which means simply cleanliness. Sunshine, fresh air, hot water and soap are the best ordinary disinfectants. If there is contagious illness in the house, or if some member of the family has inflamed eyes, or a sore or wound of any sort to be dressed, the mother should scrub her hands thoroughly in hot water, using plenty of soap and a stiff brush. In addition she should dip them in alcohol or some other disinfecting solution. She should thus cleanse her hands both before and after attending to the sore part, to prevent carrying any harmful germ to the wound or to her own or another's eyes or body.[1]

FLIES.

Some forms of infantile diarrhea and other diseases are caused by germs which may be carried about by flies. It is therefore of great importance to the health and the life of every baby not only to protect him from flies but to keep them away from his food, dishes, and utensils. To accomplish this all the doors and windows should be screened, and when the baby is taken out of doors he should be protected, especially while asleep. For this purpose a screened bed of some sort is necessary.

The conditions which favor the growth of flies should be done away with to the greatest possible extent. The favorite breeding ground of the common housefly is in horse manure, and with the partial elimination of the horse by the extensive use of automobiles and the consequent decrease of stables the number of flies has noticeably diminished. One stable, however, will furnish flies enough to infest a considerable district, and in most of our cities at the present time there are stringent regulations regarding the care and disposal of manure which it is to the interest of every health-loving citizen to assist the authorities in enforcing. Since the period required to produce a full-grown fly from the egg is about 8 days, the manure should be disposed of at least as often as once a week. When this can not be done, it should be disinfected with Paris green, borax, copperas, or cresol solutions to kill the maggots. Recent experiments indicate that borax is the best and cheapest disinfectant for this purpose.

After the flies have hatched they seek feeding places, which they find in uncovered garbage pails, foul drains, privies, and in decaying matter of every sort, as well as in the household food which may

[1] See Appendix for disinfectants.

have been left exposed. Walking over the food, they leave a trail of dirt, including often the germs of diseases, such as typhoid fever or dysentery, which may thus be conveyed into the human system. Garbage and refuse of all sorts, rubbish heaps, decaying matter, and anything which gives rise to foul odors should be covered, disinfected, or removed. Most important of all, however, is the substitution of sanitary privies for the kind in ordinary use in the country. If the flies can be kept away from human excretions they lose much of their power to harm, as they will not then be brought into contact with germs of typhoid fever and other diseases so communicated. Privies should be screened, with closed closets, the contents of which must be completely buried when removed.[1]

PATENT MEDICINES.[2]

Attention has already been called to the danger of giving medicines to babies and children save under competent medical advice, but it is well to emphasize this prohibition particularly in regard to proprietary preparations. Numerous widely advertised nostrums, frequently sold as "soothing" sirups, and preparations claiming to cure the ills of teething, diarrhea, coughs, colds, and the like, often contain dangerous drugs, and many children have lost their lives by being given such medicines. There is evidence to show that children who are repeatedly dosed, but who survive the dosing, sometimes learn to crave these quieting drugs. They are restless and irritable after the effect of the drug wears off and remain so until it is repeated, the drug habit being thus formed in the same way as with grown people.[3] If urged to use a patent medicine, the mother should always examine the label very carefully, for the Federal food and drugs act requires the manufacturers of patent medicines to print on the label of the bottle the amount or proportion of certain dangerous drugs that may be present in the so-called "remedy." Drugs enumerated in the law are:[4]

> Alcohol, morphine, opium, cocaine, heroin, alpha or beta eucaine, chloroform, cannabis indica, chloral hydrate, or acetanilide, or any derivative or preparation of any such substance contained therein.

If the names of any of these drugs or derivatives of them, some of which are laudanum, paregoric, Dover's powder, codein, dionin, chlorodyne, hypnal, acetphenetidin, lactophenin, phenacetin, antipyrin, analgesin, antikamnia, orangeine, and phenalgin,[5] appear on the label, or if extravagant claims are made in the advertisements as to the power of the medicine to cure a large number of diseases, the mother should be on her guard against the "remedy."

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[1] See Appendix for references on Flies, Mosquitoes, Sanitary privies, etc.
[2] Courtesy of Dr. T. C. Merrill, Bureau of Chemistry, Department of Agriculture.
[3] Habit-forming Agents, Farmers' Bull. 393, U. S. Dept. Agr., 1910.
[4] Federal food and drugs act, 1906.
[5] Regulation 28, Federal food and drugs act, 1906, includes these among other derivatives.

In addition to these medicines, a great many proprietary articles are on the market, which, although not falling within the provisions of this act, since they do not contain the specified drugs, nevertheless may do much harm, as they contain sugars, sirups, flavoring materials, and other substances which are very likely to upset the digestion of the baby.

VACCINATION.

Babies should be vaccinated before teething begins. There is less disturbance from it earlier than later, provided the baby is healthy. A suitable time is at from 3 to 6 months of age. The sore made by vaccination should not be covered by any shield which is impervious to air, but must be lightly protected. Various methods are used by physicians, but one of the simplest is to cover it with a loose, wide bandage of sterile gauze, or old linen (recently boiled, to make it perfectly clean). An old handkerchief makes a good bandage, and any of these may be sewed or pinned inside the sleeve. If the bandage becomes wet with the discharge from the sore and sticks to the scab, it should not be pulled off, but the cloth may be cut away around it and a small piece left adhering. The bandage should be changed once or twice a day, or as often as necessary to keep the wound perfectly clean.

TO TAKE THE TEMPERATURE.

Place the baby face downward on the mother's lap with his head to her left. With the right hand slowly insert the bulb end of a clinical thermometer, which has been first dipped in vaseline, in the anus (the opening of the bowel). Direct it toward the back and hold it in four minutes. At least two-thirds of the length of an ordinary clinical thermometer should be visible. Great care must be taken to hold the baby's legs so firmly that the thermometer is not broken.

CLEANLY HABITS.

Children should be taught very early that it is not safe to use a handkerchief that has been used by some one else, and for similar reasons the use of individual towels and wash cloths should be insisted upon.

A baby should be taught to blow its nose, to submit the tongue and throat to inspection, to gargle, and to regard the doctor as a friend whose visits are to be looked forward to with pleasure. Attention to these suggestions will make the task of the physician at some critical time far less difficult than it otherwise might be. If a baby has sometimes been threatened with a visit from the doctor as a means of securing obedience, his fear may be a serious drawback to successful treatment.

RECIPES.

GRUELS AND CEREAL JELLIES.

Barley.—Barley water, gruel, and jelly differ only in thickness. For barley water use 2 level teaspoonfuls of barley flour. Make it into a paste with cold water and add to it a pint of boiling water, stirring continually to prevent lumps. Add a pinch of salt and cook for at least an hour, adding sufficient water at the end to make a pint of liquid. Strain through a cheesecloth or gauze strainer. If gruel or jelly is desired, use two to eight times as much flour to the same amount of water. Pearl barley may be used if necessary. The grains must soak overnight and be cooked for three to four hours. Use a heaping teaspoonful of the grains for a pint of water.

Oatmeal.—Have a pint of water boiling in the top of the double boiler; add half a teaspoonful of salt and drop in gradually half a cup of oatmeal flakes, stirring all the while. Then cook for three hours and strain through a wire sieve. Thin with boiling water to the desired consistency.

Rice and wheat.—Rice jelly is made in the same way as barley jelly. The directions for cooking the various wheat preparations appear on the boxes, but all such preparations should be cooked at least three times as long as is there indicated and should be strained and thinned to the proper strength with boiling water.

A fireless cooker is a great help in the preparation of cereals. If porridges are cooked for the family breakfast, a large spoonful of the cooked porridge may be added to a pint of boiling water, heated, stirred, and strained to make a thin gruel.

Corn meal.—Corn-meal gruel is especially good for the nursing mother, as it seems to promote the flow of milk. Have a quart of boiling salted water and add a cup of fine, yellow corn meal which has been stirred into a thick paste with a little cold water. Cook for two hours, adding boiling water as may be needed. Eat with milk and sugar, or as desired. Grits is also an excellent food, but needs long cooking.

FRUITS AND FRUIT JUICES.

Orange and all other fruit juices should be strained through a wire strainer or a cloth, so as to remove every particle of solid matter, and in addition should be diluted by using an equal quantity of water for a baby of 5 months, gradually diminishing this amount until the juice is given pure.

Apples may be stewed or baked.

Prunes are prepared as follows: Wash them well through several waters, then put them to soak overnight. Cook them the next day in the same water. It will take only a little cooking to make them

perfectly tender. A very little sugar may be added, but for a baby it is best to omit the sugar, as the fruit has its own sugar. The clear juice is laxative. In the second year the cooked fruit may be squeezed through a colander and the strained pulp given to the baby.

MEATS.

Scraped beef or mutton.—Take meat, preferably from the round, free from fat. Place on a board and scrape with a silver spoon. When you have the desired amount of meat pulp, shape into a pat and broil on a hot, dry spider. Do not cook too long. When done, season with a little salt and butter and serve. A few drops of lemon juice may be added.

Beef juice.—Broil lightly a piece of the round of beef, cut in strips, and squeeze the juice out with a meat press or a large lemon squeezer. The juice may be extracted without cooking the meat at all. This is accomplished by soaking beef in cold water. Use a pound of chopped round of beef. Put it in a glass jar with one-fourth as much water. Turn the jar upside down now and then and allow the meat to soak for several hours or over night, keeping it on ice. In the morning, empty the whole into a coarse muslin bag and squeeze out the juice. Season with a little salt. This juice should not be cooked, but warmed slightly before feeding it, and may be added to milk if desired. If needed more quickly, put the beef in a bowl with crushed ice. Cover the meat and ice with a small plate weighted down with a flatiron.

Broths.—Chicken, beef, or mutton may be used as the basis of broth. Use a pint of water to each pound of the meat. Put the meat on in cold water and allow it to come to a boil, then lower the fire so that it will barely simmer for three or four hours. Or prepare it in the fireless cooker as directed for soup.

When the meat is tender, remove it and add enough water to make up the original amount of liquid; strain through a wire sieve and set it away to cool. When cold, the fat may be removed in a solid piece, leaving a clear liquid or jelly. Heat a small portion, seasoning with salt only. Broth has little or no nutritive value in itself, but if added to milk, or thickened with arrowroot, cornstarch, or gelatin, or eaten with dry bread crumbs, it becomes a real food.

If it is desired to use the broth at once, pour out a little into a bowl or soup plate and set the dish on the ice or in a pan of very cold water. The fat will rise and may be skimmed or strained off.

BREADS.

Toast.—The ordinary breakfast toast is not suitable for a baby. For him the bread should be at least one day old and be cut in very thin slices. The slices should be placed on edge in a toast rack in

the oven to dry, or kept separated by some other means. Leave the oven door partly open. The slices should not brown, but after they are dry they may be lightly toasted and should be tender and of a uniform dryness throughout.

Dried bread.—This is similar to the toast. Pull a loaf of fresh bread in pieces and dry in the oven in the same way, then toast very lightly, as needed. No fresh-baked or hot breads of any sort should be given to the baby.

Bran bread.—One cup of cooking molasses, 1 teaspoonful of soda, 1 small teaspoonful of salt, 1 pint of sour milk or buttermilk, 1 quart of bran, 1 pint of flour. Stir well and bake for one hour in a slow oven. It may be baked in a loaf or in gem pans as preferred.

EGGS.

Coddled eggs.—Have a saucepan of water boiling hard, put the egg into the water and remove the dish from the fire at once. Cover, and allow the egg to cook about seven or eight minutes. The white should be soft and of a jellylike consistency, which makes it quite readily digestible. A few experiments will determine what quantity of water to use. Too much water will cook the egg too hard. Some children can not digest the yolks of eggs, and it is wise on this account to begin by feeding the white only. Season with a little salt.

VEGETABLES.[1]

Cauliflower.—One small head of cauliflower, 1 quart of water, 1 teaspoonful of flour, 1 teaspoonful of salt, one-half cup of sweet milk, 1 teaspoonful of butter. Clean and break up cauliflower and cook it 20 minutes in boiling water with a little salt. Drain. Make a sauce with one-fourth cup of water in which the cauliflower was cooked, the butter, flour, and milk. Pour sauce over cauliflower. If very small pieces are desired, mash with a fork or rub through a coarse sieve.

Spinach.—Cook spinach in salted water until tender. Pour cold water over it and drain. Chop fine or rub through a coarse sieve. To 2 tablespoonfuls of spinach add 1 teaspoonful of fine bread crumbs, one-half teaspoonful melted butter, and a little salt. Reheat and serve.

Asparagus.—Cook one-half of a bunch of asparagus in about a pint of slightly salted water. When tender remove stalks, one by one. Place on a warm plate and remove pulp by taking hold of the firm end of stalk, scraping lightly with a fork toward the tip. Use pulp only.

Make a sauce with one-fourth cup of water in which the asparagus was cooked, one-fourth cup of milk, 1 teaspoonful of flour, a little butter and salt. Dip a small piece of toast in the sauce. Take what

[1] Courtesy of Dr. J. P. Sedgwick, Medical School of the University of Minnesota.

is left of the sauce and mix with 2 tablespoonfuls of asparagus pulp. Reheat. Place on toast and serve.

Carrots.—Cook one-half pound of young carrots in a pint of fat-free soup stock or slightly salted water, adding more if it cooks away before they are done. Rub through a sieve, add 1 teaspoonful of bread crumbs, a little butter and salt. Reheat and serve.

Beans.—Soak 2 ounces or 4 tablespoonfuls of beans and cook them slowly in a good deal of water until they are soft, but not broken. Rub through a sieve, add 1 cupful of soup stock and let them cook for one-half hour, adding more stock if it boils away. Mix a little butter and flour, about a saltspoonful of each, and a little salt. Add to soup. Return to fire and cook for a few minutes.

Green peas.—Cook a cupful of green peas in boiling salted water until they are done. Drain, saving the water in which they are cooked. Rub through a coarse sieve. Make a sauce of 2 tablespoonfuls of water in which the peas were boiled, 2 tablespoonfuls of sweet milk, one-half teaspoonful of flour, one-half teaspoonful of fine bread crumbs. Mix all together. Reheat and serve.

Cream soups.—Cream soups may be made from vegetable pulp, using 1 tablespoonful of cooked potatoes, peas, or asparagus to one-half cup of water in which the vegetables were cooked, one-half cup of sweet milk, and one-half teaspoonful of flour with a little butter and salt. Cook another minute or two. Strain if necessary. Serve.

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APPENDIX.

GOVERNMENT PUBLICATIONS ON DOMESTIC SCIENCE.

Much helpful and instructive literature concerning the health and welfare of the family and the sanitation of the home is published by different branches of the Federal Government, notably by the various bureaus of the Department of Agriculture, by the Public Health Service of the Treasury Department, and by the Children's Bureau of the Department of Labor. The titles of these publications, as well as of a few private publications of special interest, are given below.

The following publications are a few of those pertaining directly to domestic problems, several of which are referred to in the present volume. Most of the Government publications are distributed free of charge to residents of the United States. Some, however, have a small price attached. The titles of these are marked with an asterisk (*). These are to be purchased from the Superintendent of Documents, Washington, D. C. Farmers' Bulletins, Entomology Circulars, Animal Industry Circulars, and Weekly News Letters are to be had by addressing a request to the Secretary of Agriculture; and Public Health Reports, reprints from Public Health Reports, Hygienic Laboratory Bulletins, and Public Health Bulletins, from the Public Health Service, Washington, D. C. Publications of the Children's Bureau are sent free upon application to the chief of the bureau.

MILK.

The care of milk and its use in the home, Farmers' Bulletin No. 413.
Use of milk as food, Farmers' Bulletin No. 363.
*The covered milk pail, Farmers' Bulletin No. 210.
*The influence of breed and individuality on the composition of milk, Bureau of Animal Industry Bulletin No. 156.
Extra cost of producing clean milk, Bureau of Animal Industry Circular No. 170.
*Milk and its relation to public health, Hygienic Laboratory Bulletin No. 56. ($1.)
Clean milk: Production and handling, Farmers' Bulletin No. 602.
Removing garlic flavor from milk and cream, Farmers' Bulletin No. 608.

OTHER FOODS.

Principles of nutrition and nutritive value of food, Farmers' Bulletin No. 142.
Preparation of vegetables for the table, Farmers' Bulletin No. 256.
Care of food in the home, Farmers' Bulletin No. 375.
Cereal breakfast foods, Farmers' Bulletin No. 249.
Meats, composition and cooking, Farmers' Bulletin No. 34.
Economical use of meat in the home, Farmers' Bulletin No. 391.
*Bread and toast, Farmers' Bulletin No. 193.
The home vegetable garden, Farmers' Bulletin No. 255.
Food value of corn and corn products, Farmers' Bulletin No. 298.
Nuts and their uses as food, Farmers' Bulletin No. 332.

Cheese and its economical uses in the diet, Farmers' Bulletin No. 487.
Canning vegetables in the home, Farmers' Bulletin No. 359.
Bread and bread making, Farmers' Bulletin No. 389.
Mutton and its value in the diet, Farmers' Bulletin No. 526.
Sugar and its value as food, Farmers' Bulletin No. 535.
Eggs and their uses as food, Farmers' Bulletin No. 128.
Poultry as food, Farmers' Bulletin No. 182.
Fish as food, Farmers' Bulletin No. 85.
Beans, peas, and other legumes as food, Farmers' Bulletin No. 121.
Use of fruit as food, Farmers' Bulletin No. 293.
Potatoes and other root crops as food, Farmers' Bulletin No. 295.
Use of corn, kafir, and cowpeas in the home, Farmers' Bulletin No. 559.
Cornmeal as a food and ways of using it, Farmers' Bulletin No. 565.
Okra: Its culture and uses, Farmers' Bulletin No. 232.
Home manufacture and use of unfermented grape juice, Farmers' Bulletin No. 175.

INSECTS.

House flies, Farmers' Bulletin No. 459.
Remedies and preventives against mosquitoes, Farmers' Bulletin No. 444.
How insects affect health in rural districts, Farmers' Bulletin No. 155.
Practical methods of disinfecting stables, Farmers' Bulletin No. 480.
Experiments in the destruction of fly larvæ in horse manure, Department of Agriculture Bulletin No. 118.
House ants, Entomology Circular No. 34, second series, revised.
The true clothes moths, Entomology Circular No. 36, second series, revised.
The bedbug, Entomology Circular No. 47, revised edition.
The silverfish, Entomology Circular No. 49, second series.
Cockroaches, Entomology Circular No. 51, revised.
House fleas, Entomology Circular No. 108.
Hydrocyanic-acid gas against household insects, Entomology Circular No. 163.
A homemade flytrap for 20 cents, Weekly News Letter, August 12, 1914.

THE HOUSE.

Practical suggestions for farm buildings, Farmers' Bulletin No. 126.
Modern conveniences for the farm home, Farmers' Bulletin No. 270.
How a city family managed a farm, Farmers' Bulletin No. 432.
*A cheap and efficient sterilizer, Farmers' Bulletin No. 353.
*A cheap and efficient ice box, Farmers' Bulletin No. 353.
*The fireless cooker, Farmers' Bulletin No. 296.
*A model kitchen, Farmers' Bulletin No. 342.
The farm kitchen as a workshop, Farmers' Bulletin No. 607.

PRIVIES.

The sanitary privy, Farmers' Bulletin No 463.
Sanitary privy, its purpose and construction, Public Health Bulletin No. 37.
*Disposal of night soil, Public Health Reports, Reprint, No. 54. (5 cents.)
Standard sanitary privy, North Carolina Board of Health, Raleigh, N. C.

SEWAGE DISPOSAL.

Sewage disposal on the farm and the protection of drinking water, Farmers' Bulletin No. 43.
*Milk and pure water, Farmers' Bulletin No. 296.

DISEASE.

Contagious diseases: Their prevention and control in children's institutions, Public Health Reports, Supplement, No. 6.
Measles, Public Health Reports, Supplement, No. 1.
Whooping cough: Its nature and prevention, Public Health Reports, Reprint, No. 100.

Hookworm disease: Its nature, treatment, and prevention, Public Health Bulletin No. 32.
Tuberculosis: Its nature and prevention, Public Health Bulletin No. 36.
Tuberculosis: Its predisposing causes, Public Health Reports, Supplement, No. 3.
Open-air schools for the cure and prevention of tuberculosis among children, Public Health Bulletin No. 58.
The relation of climate to the treatment of pulmonary tuberculosis, Public Health Bulletin No. 35.
Trachoma in Kentucky, Public Health Reports, Reprint, No. 196.
Trachoma in Minnesota, Public Health Reports, Reprint, No. 134.
Trachoma in Kentucky, Public Health Reports, Reprint, No. 101.
Some facts about malaria, Farmers' Bulletin No. 450.
How to prevent typhoid fever, Farmers' Bulletin No. 478.
The duty of a good neighbor, Weekly News Letter, October 7, 1914.

DRUGS.

Habit-forming agents: Their indiscriminate sale and use a menace to the public welfare, Farmers' Bulletin No. 393.
Harmfulness of headache mixtures, Farmers' Bulletin No. 377.

DISINFECTANTS.

Some common disinfectants, Farmers' Bulletin No. 345.
Disinfectants: Their use and application in the prevention of communicable diseases, Public Health Bulletin No. 42.

HYGIENE OF CHILDREN.

Care of the baby, Public Health Reports, Supplement, No. 10.
Summer care of infants, Public Health Reports, Supplement, No. 16.
Prenatal care, Children's Bureau, Care of children series No. 1.
Infant care, Children's Bureau, Care of children series No. 2.
Heat and infant mortality, Public Health Reports, Reprint, No. 155.
Sewage-polluted water supplies in relation to infant mortality, Public Health Reports, Reprint, No. 77.
Baby-saving campaigns, Children's Bureau, Infant mortality series No. 1.
Report of New Zealand Society for the Health of Women and Children, Children's Bureau, Infant mortality series No. 2.
Infant feeding in the Tropics, W. E. Deeks, Chief of Medical Clinic, Ancon Hospital. Reprint Proceedings Canal Zone Medical Association, 1911.

BIRTH REGISTRATION.

Birth registration, Monograph No. 1, 2d edition, Children's Bureau.

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