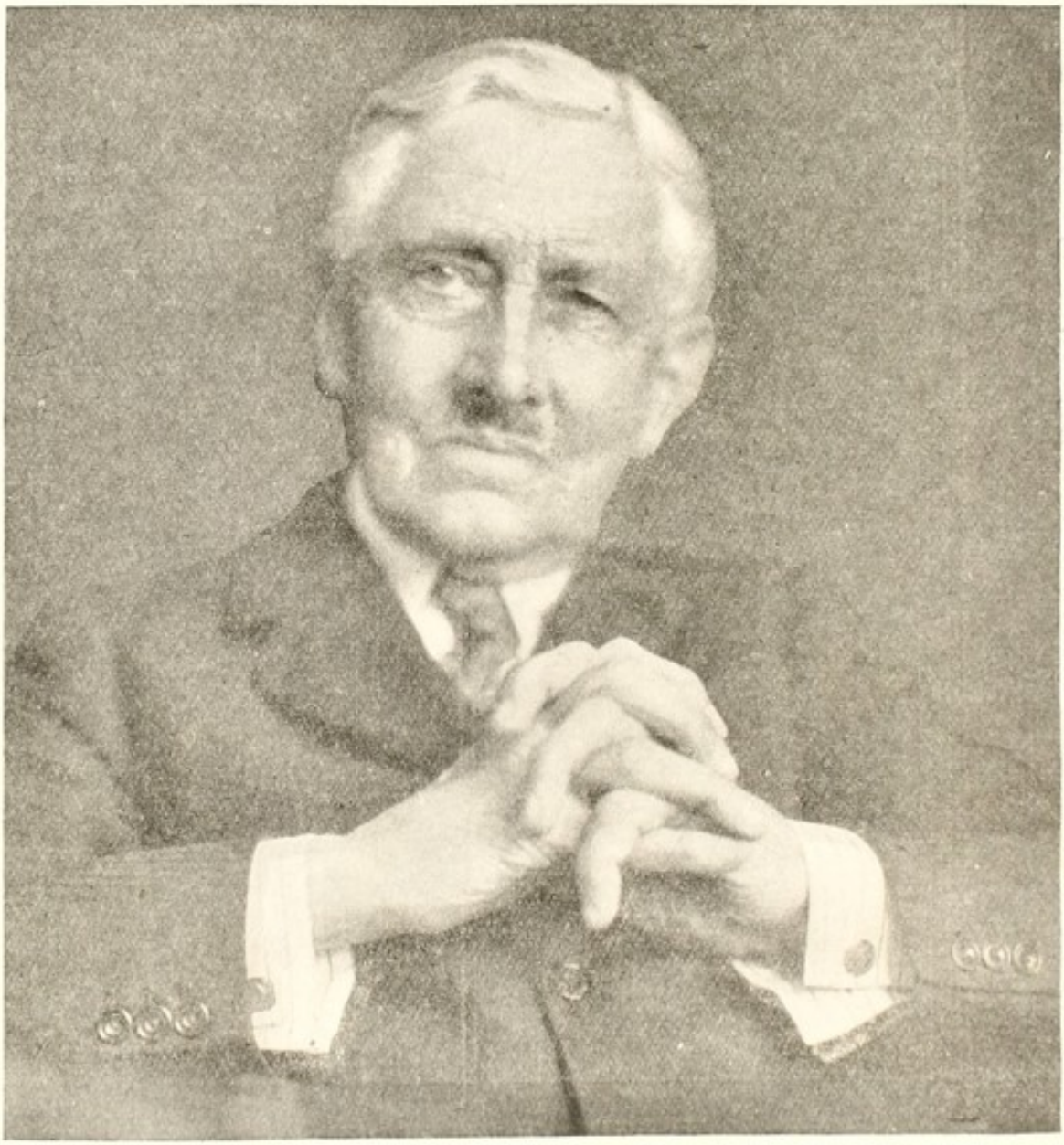
Feeding and care of baby / by Sir F. Truby King.



SIR F. TRUBY KING, Kt.

FEEDING and CARE *of* BABY

By

Sir F. TRUBY KING, Kt., C.M.G.

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It is wiser to put up a fence at the top of a precipice than to maintain an ambulance at the bottom.

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DEDICATION

To the memory of a gracious little lady — my wife — without whose constant help and encouragement this book would never have been written, I dedicate this and all future editions.

Wellington,
New Zealand,
March, 1937.

PREFACE

It has long been the intention of the author to bring out a new edition of "Feeding and Care of Baby," but owing to the fact that his time was so fully occupied with his Life's work both in New Zealand and overseas, he found it impossible to devote the necessary time to completing the task. As the result of over thirty years' intensive observation and work, the Mothercraft teaching has been greatly extended, but the instructions and advice to Mothers have been considerably simplified, though the fundamental principles laid down in the original editions of "Feeding and Care" remain unchanged and unchallenged. "Feeding and Care of Baby" has always been the recognised standard textbook of The Royal New Zealand Society for the Health of Women and Children, for the training of Nurses and students, and has been extensively used by parents and all persons interested in the study of Mothercraft. The Dominion Council, realising the urgent need for a new edition, approached Sir Truby King and obtained his permission for the revision to be completed by the Nursing and Medical Advisers to the Society under the personal direction of the author. For over a quarter of a century the Royal New Zealand Society and its Nurses have followed Sir Truby King's work as closely as possible, and the present edition of "Feeding and Care of Baby" embodies the teaching which has proved most advantageous to Mother and Child. The information contained in the many thousands of Charts and Records of babies under the supervision of the Society, has been available in compiling the revision. We have studied carefully all Sir Truby's numerous other publications extending over many years, including books, pamphlets, lectures, Hygeia notes and addresses, and we have endeavoured to give effect to the following points:—

(1) Complete revision of the text and all feeding tables in accordance with the latest teaching of Sir Truby King and the Royal N.Z. Society for the Health of Women and Children.

(2) A systematic re-grouping of the contents.

(3) Many new illustrations.

(4) The incorporation of new subject matter not contained in the original book.

(5) Larger type to make the text easy and pleasant to read.

(6) Careful preservation of the original spirit of the book and its value to parents and nurses.

ACKNOWLEDGEMENTS

The editors wish to thank Professor R. Bevan Dodds, Dean of the Dental Faculty of Otago University, who has kindly written the section on "Care of Baby's Teeth," which embodies the latest teaching on the subject while preserving the spirit of the original; and Dr. E. H. Williams, Senior Physician to the Truby-King-Harris Hospital, Dunedin, who has kindly rewritten his article "The good results of percentage feeding," which appeared in the original edition.

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Royal New Zealand Society for the
Health of Women and Children,
Dunedin, New Zealand,
April, 1937.

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LIST OF ILLUSTRATIONS

What Every Baby Needs

(Whether WELL or ILL)

I—AIR

Abundance of pure, cool, outside air flowing fresh and free day and night. **Ventilation** means a current across a room, which cannot be got by a mere open window. Keep baby out of direct draught. See pages 44-56.

II—WATER

Must be boiled. Bathing water should be boiled also if of doubtful purity.

III—FOOD

Suitable food, proper intervals, nothing between the regular feedings.

Best Food—Mother's milk. **Best substitute**—Modified cow's milk. No other food for first 9 months. Shun patent foods, and "pieces."

In sickness, may need to stop, dilute, modify, or change food.

IV—CLOTHING

Must be non-irritating, non-constrictive, light, but sufficiently warm. See pages 59 to 66.

V—BATHING

Cosy corner. Bath and dress very quickly—no dawdling. See pages 70-73.

If baby ill or very delicate, forgo bath for day or so, and substitute wiping rapidly with a cloth wrung out of warm water.

VI—MUSCULAR EXERCISE and SENSORY STIMULATION

When a baby is ill for some time the tone and activity of the muscles and other tissues and organs can usually be fairly sustained by good nursing, judicious handling, changing position in cot, massage, etc. As the baby improves, airing of skin, bathing, and plenty of outing in sunlight are essential. See pages 68-70.

VII—WARMTH

Warmed air and surroundings are essential for prematures, and may be needed for a week or more when getting coddled babies into healthier habits.

Diarrhœa and colds are often due to cold feet and legs, and may be cured by attention to this and other essentials. Babies, like adults, benefit enormously by being kept in pure, cool air if properly clad. See pages 66, 67 and 194-198.

VIII—REGULARITY OF ALL HABITS

Regularity of feeding, with proper intervals and no food between meals. Regularity of exercise, sleep, etc. Regularity of action of the bowels.

(See "Bowels," "Constipation," and "Enema," pages 40-44 and 193)

IX—CLEANLINESS

Cleanliness is everything, especially with regard to food and feeding utensils.

Remove soiled napkins from room at once, and place in water. Hands which have come in contact with soiled napkins must be well washed before again handling baby or his food.

X—MOTHERING

Proper "mothering" and "handling" of a baby are essential for the best growth and development. No woman is a perfect "born-mother"—she has to learn how (see page 76).

XI—MANAGEMENT

Fond and foolish over-indulgence, mismanagement, and "spoiling" may be as harmful to an infant as callous neglect or intentional cruelty.

The "can't-be-so-cruel" mother or nurse, who won't bring herself to wake the baby a few times, if needed, in order to establish once for all regular feeding habits; or who weakly gratifies every whim of herself and the child, rather than allow either to suffer temporary discomfort for the sake of permanent health and happiness—such a woman is really cruel, not kind. To save a lusty, honest cry she will pacify an infant with a "comforter," or with food given at wrong times, and may thus ruin the child in the first month of life, making him a delicate, fretful, irritable, nervous, dyspeptic, little tyrant who will yell and scream, day or night, if not soothed and cuddled without delay (see page 221).

XII—REST AND SLEEP

These depend mainly on the above. Remember to turn baby in his cot, and remove wet napkins, cold bottles, etc.

N.B.—If baby is ill a doctor should always be called in, if possible. Never resort to soothing powders or patent medicines!

The rational treatment of every form of ill-health, from broken bones to fevers, is to take extra care to provide as perfectly as possible all the simple essentials for health—pure air, pure water, suitable food, suitable clothing, cleanliness, exercise, rest, and regularity of all habits.

Though drugs are rarely essential for the cure of disease in babies, there are times when the saving of life may depend on their timely and proper use—a question which can be decided only by a doctor.

Fig. 1. Child Aged Four Years.

Reared according to the principles advocated in this book.

Pregnancy and Nursing

Foresight and Hygiene

Directly a woman knows she is pregnant she should consult her doctor.

The special need of the expectant mother is **plenty of open air exercise and exposure to the elements, and a sufficiency of rest and sleep.** This, with freedom from undue worry and excitements—a pleasant, active country life, with no suggestion or trace of invalidism—is the ideal condition; but the town mother can maintain good health if she will pay attention to the laws and needs of life. Regularity of habits is all-important, and avoidance of the bodily and social trammels to which women subject themselves, from constriction of the body and feet to the ties and inconveniences of excessive "calling" and being called on.

"**Neuralgia is the Prayer of the Nerves for Healthy Blood.**"—If the expectant mother is sedentary and constipated, and suffers from headache or neuralgia due to an impure blood stream poisoning her brain cells, how can she expect her unborn babe to be healthy? The tiny, delicate cells of the baby's brain and body, soaked in and fed from the same poisoned stream, are more vulnerable than the mature cells of the mother. Impurity of the mother's blood means poisoning of the baby's cells, and impairment of growth and development—in other words, there will be a stunting of future potentialities as regards both body and mind.

There is no warm-blooded mother in the world, from the humblest mouse to the most exalted human being, who can be healthy herself or give birth to and rear healthy progeny, unless she has plenty of daily exercise and outing. Ask any capable farmer what steps he takes to ensure the health and safety of the mothers of his flocks and herds, and he will tell you free range in the open air and daily exercise are the first essentials, and without these both mother and offspring suffer.

THE BREASTS

During the last few months of pregnancy the nipples should be gently rolled or rubbed morning and evening between thumb and fingers, so as to form, develop, and toughen them, thus aiding suckling and preventing tenderness or cracking. If the nipples are flat or sunken, there may be some trouble in getting hold of them and they may have to be gradually expanded, stretched, and coaxed out by the aid of careful daily suction with a breast pump. Bathing the breasts morning and evening with warm water, and then with cold, is highly beneficial if followed by brisk and thorough drying. Spirit-and-water or Boric Lotion is often used, but the real essentials are cleansing and drying. It is better not to use soap on the nipples. **The breasts should be entirely free from pressure by clothing.**

EXERCISE, OUTING AND REST

There are a few cases of special debility where artificial feeding has to be resorted to in the interests of both mother and child, but in nine cases out of ten insufficiency or disagreement of breast-milk is due to the fact that the mother has led and is probably continuing to lead too sedentary a life, and is not careful as to her other habits. **No mother who fails to take daily sufficient open-air exercise (say a walk of two miles a day) gives herself or her baby a fair chance: further, the more they are out in the sunshine the better, and the windows should be wide open day and night.** Pure air and sunshine have almost as much effect on the health and strength of both mother and child as good food, and no woman can be in her best form as a mother who neglects to take regular open-air exercise throughout pregnancy and afterwards.

Special Exercises

A most important adjunct to outdoor exercise for women is to do regularly for five or ten minutes every morning and evening, half a dozen simple exercises specially designed for promoting the growth and strength of the abdominal muscles and toning up the internal organs. This

tends to ensure an easy, natural labour, and good digestion and regularity of the bowels, both before and after child-birth.

The best forms of exercise are such as ensure slow, systematic bending movements of the trunk, backwards and forwards and from side to side, and systematic deep breathing. The mother should gradually get herself into proper form and training and should not attempt too much at first. Suitable exercises are best learned from the Plunket Nurses or other competent teachers. The little trouble involved will be repaid a hundred-fold to the mother in her own health, safety, and comfort, while the baby will reap equal benefit.

Exercises designed for toning up and developing the muscles of the abdomen are of supreme importance for the expectant mother as they tend to ensure good digestion and regularity of the bowels—especially if accompanied by deep breathing and followed by vigorous self-massage. Further, when the abdominal muscles are in good form child-birth is generally safe and easy, and the use of chloroform and instruments is obviated. During nursing such exercises tend to ensure a steady flow of healthy milk.

The exercises should be done morning and evening very slowly and deliberately for only a few minutes at first—gradually working up to say ten minutes morning and evening.

Positions B and C are preceded by lying at full length. Rising into sitting posture (B) is helped by putting the tips of the toes under a chest of drawers. Elevation of the legs (C) is best done only one at a time, as shown.

Rest

Nothing is worse for the expectant mother than a state of lazy inactivity. Busy, working housewives have far better confinements than less active women. However, overstrain and fatigue are injurious. As much time as can be spared should be spent out of doors—good active walking (not mere sauntering or dawdling) being followed by a rest, sitting or reclining in the open air, pleasantly

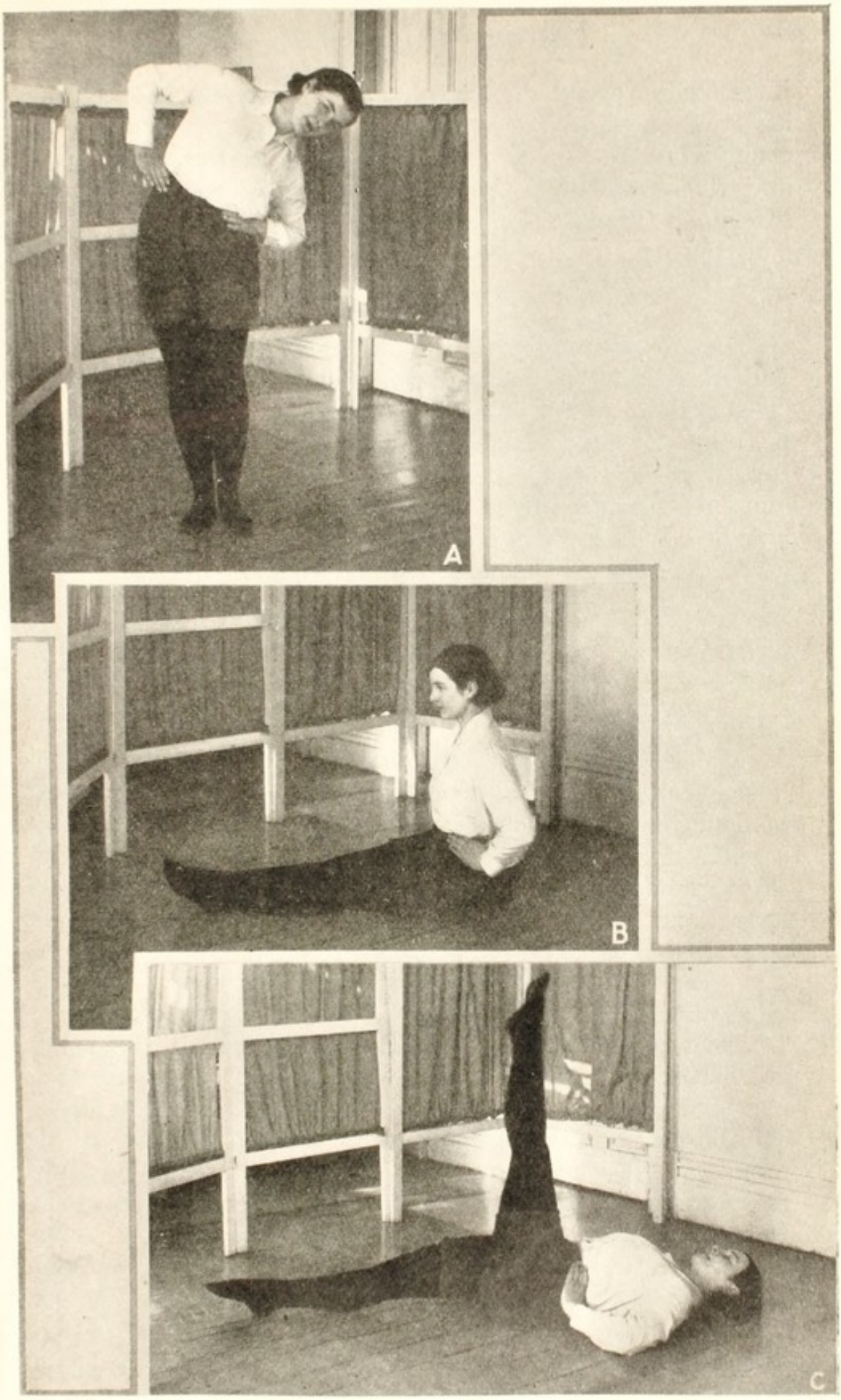


Fig. 3. Physical Exercises.

interested or occupied, not fretting or worrying. Especially as pregnancy advances the mother should recline on a couch with the feet up after each meal; also after walking and whenever tired. An hour of such rest morning and afternoon tends to prevent varicose veins, piles and constipation.

Diet

Diet in pregnancy should be good, simple, digestible, and nutritious, there being no need for any special food preparations, or for taking appreciably more than would be taken at other times. The common counsel to "eat for two" is absurd, because the weight of the mother and her unborn babe scarcely exceeds her ordinary weight. Women bring on indigestion by taking excess of food, especially of soft, sloppy foods.

REGULARITY OF THE BOWELS WITH ROUTINE FOR CONSTIPATION

(1) Regular Action of Bowels

Try to get the bowels evacuated regularly at the same hour every day, regardless of whether there is any natural tendency or inclination for a motion at the appointed time or not. Patience and perseverance in making the daily effort should bring a regular normal motion at the same hour every day, if due care is also exercised to promote activity by the measures mentioned below.

(2) Suitable Food

Take good, simple food, and let some of the following be included every day, viz:—whole-meal bread, oatcake, porridge, spinach, lettuce, celery, leeks, young turnips, cauliflower, young peas, and young French beans, baked apples, well-cooked prunes or figs, dried fruits, such as raisins and dates. They must be thoroughly masticated. Malt extract, cream, olive or cod liver oil and fat meat, all tend to lessen constipation, but excessive fat interferes with and retards digestion. If thoroughly masticated uncooked ripe fruit, especially raw apple, is even better than cooked fruit.

(3) Bathing, Exercise and Water-drinking

Take a cold bath on rising in the morning. Dry thoroughly with a rough towel and dress very quickly. Sip a tumbler of warm water while dressing. For chilly subjects hot water is preferable—otherwise cold water is a better tonic.

If you are delicate, or if there are no conveniences for bathing, sponging all over may be substituted.

For delicate people and those not used to cold bathing, the way to the cold bath may be paved by standing with the feet in warm water at first, using for sponging or douching water with the chill just off, say 70 deg. F. This can be reduced a degree or more every day until cold is reached.

Take twenty minutes' really active exercise as soon as dressed—a brisk walk in the open air is best. Don't let rain or wind stop you! Every woman should have sound boots and a light waterproof.

Besides the morning walk take some further open-air exercise daily if possible. The more time a pregnant or nursing woman spends out of doors, resting and taking exercise, the better for both mother and child.

The special physical exercises mentioned on pages 5-6 as conducive to the growth and toning up of the abdominal muscles (thus facilitating labour) exert also a very beneficial influence over indigestion and constipation.

Cold bathing, or at least sponging with cold water every morning, followed at once by vigorous friction and active exercise, is the best means of firming and toning up the whole system and ensuring good digestion, regularity of the bowels and robust health.

(4) Medicinal Laxatives

If the above measures do not induce regular action of the bowels take a level teaspoon of sulphate of sodium (Glauber's Salt) dissolved in the morning tumbler of warm water; or a tablespoonful of liquid paraffin at bed-time. It must be remembered that liquid paraffin is purely a lubricant and useful in softening the faeces. It is best taken in conjunction with the fruit mixture as recommended in "The Expectant Mother and Baby's First

Months.'' For recipe see page 229. If this is not effective replace the fruit mixture for a time with 10 to 20 minims of best liquid extract of cascara, which, taken in conjunction wth liquid paraffin, is a most effective laxative. Immediately the desired result is brought about and the need for laxatives becomes less, stop the cascara and replace it with the fruit mixture.

(5) Other General and Special Hygienics

Sleep with wide-open windows. The best means for ensuring a current of air across the room is to keep the window of a room with a fireplace wide open. If there is no chimney, open windows and doors will do.

N.B.—Bathing, Exercise, and Water-drinking should be continued indefinitely—should, indeed, be made life habits.

Constipation almost always yields to the foregoing simple regimen, and a great improvement in the general health is brought about as well; but in obstinate cases the expectant mother must consult her doctor without any further delay, and other means may be adopted under his direction such as systematic massage of the abdomen, an occasional enema, etc.

The Nursing Mother

Regimen for Health

Diet

A healthy mother with a good digestion, and taking regularly suitable exercise and the right quantity and quality of food, should have available for her baby just what he needs.

The commonest mistake of the first few days after child-birth is ''stuffing'' the mother, especially overloading her stomach with milk to promote the flow of breast-milk—whereas it tends to retard the natural flow, by causing indigestion, constipation, headache, and loss of appetite.

While the mother is confined to bed, what is called ''light milk diet'' is best, but this should not exclude some dry food such as crisp toast, besides bread and butter, fruit and vegetables. Gradually increase these day by day.

By the third day a little light fish may be given; next day a small grilled chop, and so on. Though no milk is secreted for a day or so, there is often marked thirst; this may be relieved by drinking water fairly freely.

The nursing mother needs a simple, nutritious diet, including fruit, vegetables, plenty of fluid, and no alcohol. In many cases too much rich, fatty, overcooked, highly spiced or otherwise indigestible food is eaten. Some women take too much meat and are not careful enough about plain, wholesome, good cooking. Milk, eggs, porridge, oatcake, and bread and toast, with fish and meat in moderation, form a sound basis. Pastry, new bread, hot buttered toast, rich cakes, the fatty dried outside of fried or baked meat, twice cooked meats, etc. should be avoided.

The taking of some cows' milk tends to increase the supply of mother's milk, but don't overdo this. Women often bring on indigestion and constipation by taking too much milk, either as such or in the form of milk-puddings or gruels. Many nursing mothers would have better digestion, and would secrete better food for their babies if they did not drink more than a pint of milk in the twenty-four hours. They should take a fair quantity of dry food, such as crisp toast, oatcake, etc., a sufficiency of wholesome vegetables and some ripe, fresh fruit daily. The more thorough the mastication, and the more hearty the enjoyment of food, the better for mother and child.

The nursing mother must have plenty of fluid—an average between 2 and 3 pints more fluid than she would take when not nursing. Plain water may be taken—say, a glass on rising, another at bedtime and a glass between meals. This is the ideal, but many mothers claim the indulgence of converting one or more of these drinks into cocoa, weak tea, etc. Up to a certain point, increase in the fluid taken tends to improve the flow of milk; so the effect of drinking a little more may be tried if the flow is deficient.

Food taken only three times a day—the main quantity of fluid being drunk just after each meal and as part of it—and no food between meals, is best. Things found to upset mother or child must be avoided; but the nursing mother should have food varied and to her liking, and

no wide departure should be made from the diet to which she has been accustomed. Condiments, such as pepper and mustard, may be used in moderation, but pickles and curries should be avoided.

Alcohol

The expectant or nursing mother should be given no alcohol. Alcohol taken by the mother flows as a poison in her blood. The tender, growing cells of the baby, directly nourished by this poisoned stream, or fed with milk derived from it, don't grow or develop properly; they tend to become stunted and degenerate. Therefore, a nursing mother should take no beer or stout, however strongly such drinks may be recommended by well-meaning friends or nurses.

Worries and Excitements

Not only should food be heartily enjoyed, but every means should be taken to avoid undue excitements, worries, and sources of annoyance, because the emotions have so much to do with determining the composition and quantity of the milk, and affecting in other ways the health of both mother and offspring. The following passage from Charles Reade's *The Cloister and the Hearth* is most suggestive and entirely true:—

> "The child is poisoned."
> "Poisoned! By whom?"
> "By you. You have been fretting!"
> "Nay, indeed, mother. How can I help fretting?"
> "Don't tell me, Margaret. A nursing mother has no business to fret. She must turn her mind away from her grief to the comfort that lies in her lap. Know you not that the child pines if the mother vexes herself?"

Regular Daily Action of the Bowels

This is supremely important for the nursing mother, both for her own health and that of her baby.

If the mother's bowels have not moved, a dose of castor oil may be given towards the end of the second day after child-birth. After this the bowels should move freely every day, and a regular habit may be established by attention to diet, exercise and water-drinking as indicated.

Defective supply and poor quality of mother's milk are generally due more to indigestion and constipation, resulting from insufficient exercise and lack of fresh air, than to careless feeding, though diet is generally at fault also. A constipated mother may mean a constipated baby. (See regimen for constipation pages 8 and 9.)

Natural Feeding

Accuse not Nature, she hath done her part:
Do thou but thine.—*Milton.*

Fig. 3 Solario's Madonna called "The Nursing of Jesus," or "The Madonna of the Green Cushion." The comfort and benefit to both mother and child of having a cushion or pillow on the lap was apparently better known to the Old Masters than to modern women. It saves the mother's back, and makes stooping unnecessary. Another point, and one of extreme importance, seen in this picture is the muscular activity of the suckled child—the kind of alertness which we notice in all healthy young animals at the breast, and which can scarcely escape attention in the happy rapid tail-wagging of puppies, lambs, foals, calves, etc. Even when the nursling has settled down to calm steady sucking the whole system is still in a state of great activity, as shown by the sustained quickening of the pulse, the rise in the blood pressure, and the universal increase of nervous and muscular tone—in fact, the stimulus of natural suckling is radiated to the whole system, and causes a quickened life in every organ and tissue to the uttermost part of the body.

A woman's milk is not her own. It is created for the baby, and the first duty of the mother is to ensure, by foresight, a proper supply of the only perfect food—the baby's birthright.

There is a special and intimate relationship between the milk of the mother and the digestive and nutritive needs of her own offspring. If two women interchange thriving babies, of the same age, both infants are liable to suffer from indigestion. Hence every mother should, if possible, fulfil her maternal duties.

The suckling of the baby is almost as important for the future health and well-being of the mother as it is for the infant. Not only does nursing foster the highest development of maternal love and devotion, but it also tends to ensure a rapid shrinkage of the enormously congested womb to its natural size and weight. After the baby is born, the main blood current, which has been circulating through the mother's pelvic organs, should be diverted to the breasts. By thwarting this natural transfer, failure to suckle the baby causes more or less persistent pelvic congestion, and thus gives rise to the distortions, displacements, and other disabilities of married women, which so often undermine the health and call for operation later on.

ESTABLISHMENT OF LACTATION

As soon as the mother has settled down comfortably after child-birth, always within twelve hours of birth, baby should be put to both breasts to stimulate the secretion of milk. Failure of the milk supply is often due to the nurse not putting the baby to the breast soon enough, and not persevering.

For a day or so baby usually gets scarcely anything—only a few teaspoonfuls of creamy fluid called colostrum, but every drop of this is precious.

In a few days when the breasts begin to get under way in the making of real milk, they tend to swell, throb, and become more or less hot, tender, hard, and knotty. At this stage great relief is afforded by supporting the breasts with ready-made "breast-supports," or with a breast binder or muslin bandages. Further, if needed, hot fomentations (omitting the nipples) may be used, followed by suitable gentle manipulations, etc. The bowels should be freely opened.

If during the first two days baby is restless and seems thirsty, a few teaspoonfuls of boiled water, at "blood-heat" (about 100 deg. F.), should be given at intervals of four hours—that is, after each attempted suckling. The allowance of water should be increased

gradually up to an ounce four-hourly if baby is getting nothing from the breasts by the end of the second day. Don't give up trying to establish at least partial breast-feeding for several weeks, but if the mother's milk is delayed beyond about two and a half days, something more than water must be given. Begin with a mixture of one part of humanised milk (see page 109, Table F) to three parts of boiled water, and proceed as shown in the "Feeding Table" on page 100, giving after each nursing only what may be needed to make up the mother's supply, and ceasing to supplement as soon as her milk seems adequate.

Care of the Nipples

The nursing mother should keep the nipples scrupulously clean. Before and after each suckling cleanse with boiled water. If this is done and the nipples are dried carefully, there will be no risk of germ infection, sore nipples, or abscess. Two small detachable patches of soft, clean linen or cotton, or sterile "surgical gauze," should be pinned inside the garment covering the nipples, so as to prevent soiling with milk. Fouled clothing may cause poisoning of the baby and severe diarrhoea besides infecting the nipples, with subsequent risk of inflammation of the breast.

Suckling

Baby should have both breasts at each nursing, sucking each breast at first for under two minutes, the second day for three minutes, and so on. Prolonged suckling, at first, is apt to cause tenderness and cracking of nipples. Mothers are generally told that after the first week baby must have only one breast at each nursing, the breasts being used alternately; but it is best to use both breasts at every nursing, letting the baby remain at the second breast for a short time only if the mother's milk is in excess of what is needed.

The regularly repeated act of sucking gives the nerve mechanism regulating the secretion and flow of milk the stimulus needed for ensuring the proper quantity and quality of milk for each stage in the first nine months of

life. The supply should accord with the normal demands of the baby, and this may be expected if the mother's health and habits are as near as possible what they should be. Further, the exercise involved in regular, active sucking should ensure baby sound sleep, from which he tends to wake up refreshed and hungry.

Regular Hours and Intervals

The importance of establishing and practising perfect regularity in the feeding-times for babies is so great, and the prejudice against waking an infant if he happens to be asleep when feeding-time comes round is so widespread, that it is necessary to insist specially on the point. There is no doubt whatever as to the duty of mother and nurse in this matter.

The leading authorities of the day—English, foreign, and American—all agree that the first thing to establish in life is **regularity of habits.** The mother who "can't be so cruel" as to wake her sleeping baby if he happens to be asleep at the appointed feeding-time, fails to realize that a few such wakings would be all she would ever have to resort to.

At the dawn of life, a day or two of regular feeding with proper intervals (practically speaking no baby needs to be fed more often than every three hours) suffices to establish clock-like regularity of the rhythm of alternate sleeping and feeding. The new-born babe should sleep nine-tenths of his time. At perfectly regular intervals the infant should wake, feed, and drop off to sleep again—indeed, he is often half asleep for the last few minutes of his feeding. Babies regularly and properly fed tend to sleep like dormice, digest their food well, and are infinitely more contented and happy than those whose mothers are irregular and unsystematic.

In making out a time-table, the mother should be guided by the "Table for Feeding" page 100, and the "Clock Face," page 19. Having put down on paper the hours at which her baby should be fed, the mother should adhere to this until the time comes for making a change, when she should write out another time-table.

Time at the Breast

The average suckling time of a baby at the breast will depend on the milk supply, the vigour of the infant and the ease with which he obtains the milk from the breasts.

If the baby takes the milk too greedily and quickly, the mother can check this tendency to some extent by squeezing the base of the nipple, or by withdrawing the nipple from time to time. However, there has been needless anxiety on this account. If an infant suck vigorously it may be quite right and natural for him to complete his meal in ten or twelve minutes, or even less. The best average time is between ten and twenty minutes; very rarely should the total time taken exceed twenty minutes. The baby should be encouraged to suck energetically, not to dawdle and get sleepy.

Position While Nursing

The mother should be in as comfortable a position as possible when nursing. During the first week, when the mother is in bed, the baby should be comfortably supported along one arm, while with the opposite hand the mother takes the nipple between the first and second fingers and puts the teat into the mouth. At the same time she pushes back the surrounding parts of the breast with the other fingers and palm, so as to prevent the baby's nose being pressed on. **A child cannot suck properly unless there is a perfectly free entry for air to the nose.**

When nursing in the sitting posture many mothers find a cushion placed across the knees a great advantage, as it does away with stooping. Others prefer simply a low chair, using a footstool in order to raise the leg and thigh of the side on which the baby is nursing.

Handling Baby After Feeding

After he is fed, and perhaps during the course of feeding, baby should be held upright against the shoulder and gently patted on the back to enable him to expel wind swallowed during suckling.

After making sure that baby is warm and dry you should place him in his cot to sleep, and on no account should he be played with or handled unduly, as this may cause vomiting.

Fig. 4. How to Expel Wind after Feeding.

FOUR-HOURLY FEEDING

The normal baby should be fed only five times in the 24 hours (say at 6 a.m., 10 a.m., 2 p.m., 6 p.m., and 10 p.m.).

With clear intervals of three hours and a half between the end of one nursing and the beginning of the next, and with eight unbroken hours at night, the mother has opportunities for sleep, rest, housework, outing, exercise, and recreation; and the fewer the nursings the less the risk of chapped nipples, abscess, etc.

Babies fed from birth only five times a day sleep more soundly, and tend to suck more vigorously and with better appetite. They readily get enough food, but run less risk of overfeeding: they are disturbed by fewer motions—

usually only two a day in the first month instead of three or four. The mere saving in napkin-changing is an important item.

If fed four-hourly from birth, no change whatever in the feeding times need be made during the whole of the first year. This is a great advantage, because babies tend to be more or less upset when they are forced to alter their daily habits and rhythms. **Start right and stick to it.** However, a baby will often give up the ten o'clock evening feed of his own accord at four or five months of age, and thereafter will do best on only four feeds a day.

CLOCK-FACE
For Four-hourly Feeding

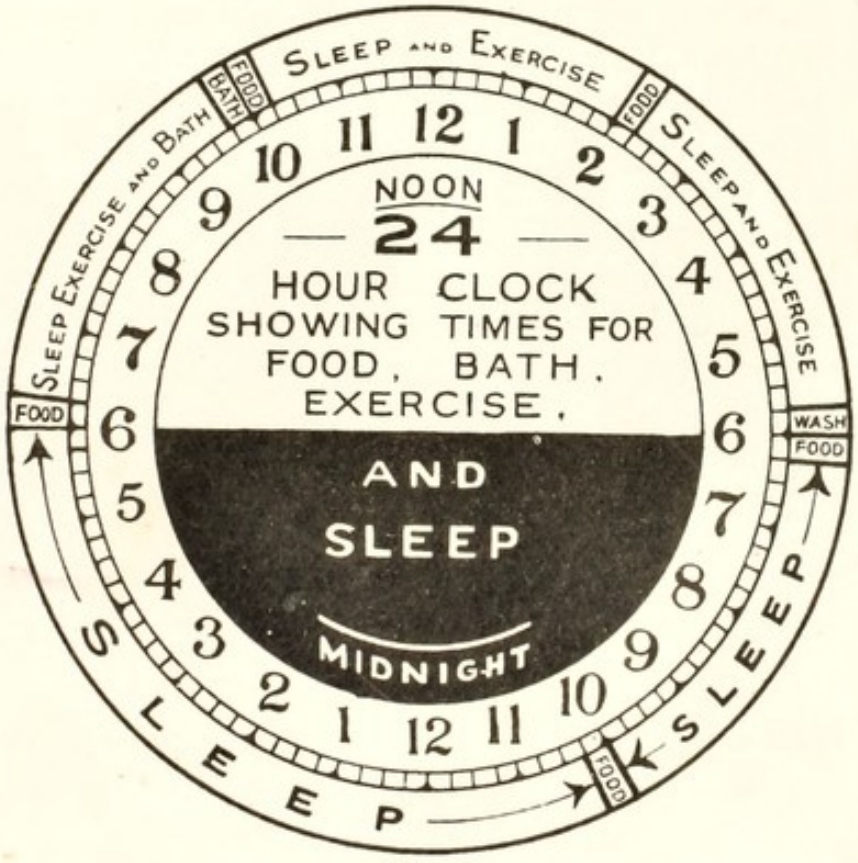


Fig. 5

In some households the mother finds it more convenient to "bath" her baby in the evening, and merely to "wash" him in the morning—reversing the order shown on the "Clock-face." There is no objection to this.

N.B.—Where the word "EXERCISE" appears round the margin of the clock-face it means, in the first instance, mainly the spontaneous movements, baby-play and artless prattle of the contented child, enjoying and responding to the stimulating fresh air and sunlight—these activities alternating with rest and sleep.

Routine for Four-hourly Feeding

The mother should change the order of using the breasts at each nursing; thus, if she nurses at 6 a.m. and 10 a.m., and the right breast is used first at the 6 a.m. feeding, the left breast should be used first at the 10 a.m. feeding, and so on. By this procedure each breast is both stimulated and relieved every four hours in the daytime (five times daily); and at every second nursing one breast is more or less completely emptied, because the sucking tends to be twice as vigorous and effective in the first five minutes as in the second, and to lose force steadily the longer the baby nurses.

Even where the breast supply exceeds the needs of the baby there is no ground for departing from these instructions. All the mother needs to do to prevent the baby from taking too much is to shorten the time allowed for nursing—reducing the suckling if necessary to seven minutes at the first breast, and three minutes at the second; and, if too much is taken even then, withdrawing the nipple several times, or squeezing it so as to lessen the supply still further.

The idea that the above course might sometimes cause the baby to get slightly less fat than would be desirable (on the ground that the final "strippings" are richer in cream) is fallacious, for two reasons:—

(1) If the supply of milk is excessive it tends to fall off quickly to the baby's daily need, provided he is put to the breast regularly and only for the right time;

(2) In the first week or two of life a slight lowness of the proportion of fat is beneficial, rather than otherwise, because fat tends to tax the digestive power of the new-born babe more seriously than the other food elements.

THREE-HOURLY FEEDING

While four-hourly feeding suits nearly all babies, it is found occasionally that a baby thrives better if fed three-hourly for the first month or two. This may apply to one baby in ten.

If a baby weighs under 6 lb. at birth, or is very delicate, it is wiser to feed three-hourly for a time, instead of beginning with four-hourly feeding.

The frequency of feeding should receive very careful consideration in every case. No absolute rule can be laid down.

NO "NIGHT-FEEDING"

The giving of food to a baby between 9 or 10 in the evening and 6 o'clock the next morning is a great mistake—it encourages an unnatural and bad habit. Night-feeding is a serious tax on the mother, but may be a much more serious handicap for the child. **Don't form in the baby at the dawn of life any avoidable habit which would be injurious afterwards.**

The darkest night is the appointed period for the most profound rest and the deepest sleep, and it is scarcely possible to over-estimate the far-reaching benefits which follow on a recognition of the principle that there should be no night-feeding.

"Recreation is Partial Sleep, and Sleep is Universal Re-creation." Why, then, should the young of man whose nervous system is the most complex, delicate, sensitively-balanced, and vulnerable of all created tissues, be denied the perfect fulfilment at the appointed time, of this most beneficent provision of Nature—especially throughout the early months, when sleep is the predominant feature of normal life? Bad habits if started in early life tend to recur and give trouble later on.

HAND EXPRESSION OF BREAST-MILK

In certain instances where the suction of the baby is not available, or where, as in the case of the premature, for some reason the baby is temporarily separated from its mother, emptying of the breasts by artificial means becomes necessary; otherwise the milk supply will decrease. This can be accomplished either by means of hand-milking, or by the use of the breast pump. The former method is much more effective but it needs more skill.

By skilled manipulation a competent nurse can generally express and coax out the milk almost completely.

She should begin by gently pressing and squeezing the dark disc around the nipple (the Areola) with finger and thumb, starting pressure just outside the dark margin and working towards the base of the nipple. After continuing the milking process for a short time the nurse may lift and draw the whole breast forward and downwards, squeezing the organ gently between her hands, stroking it with her fingers from base to apex and letting it slip back again. Then she should resume "milking"—alternating this with a certain amount of manipulating and massage.

Details of Practical Technique

Cleanse the hands and nails with soap, water, and nail-brush, and then cleanse the nipple and the Areola with boiled water, using a small piece of perfectly clean, soft, old cotton, or a piece of absorbent cotton-wool. Dry the hands with a clean towel and keep them dry; the Areola and nipple may be dried with clean cotton. A clean wine-glass, tumbler, or cup may be used for receiving the milk.

Manipulation:—

(1) Grasp the breast between the thumb above and the rest of the fingers below, the thumb and first finger being placed just outside the margin of the Areola.

(2) Press and squeeze the Areola with a firm but gentle follow-up action, converging on the base of the nipple. This pressure, ending with a slight pull behind the base of the nipple, coaxes out the milk. The expressing can be repeated from thirty to sixty times a minute.

The effectiveness of expressing by hand depends mainly on the following factors:—

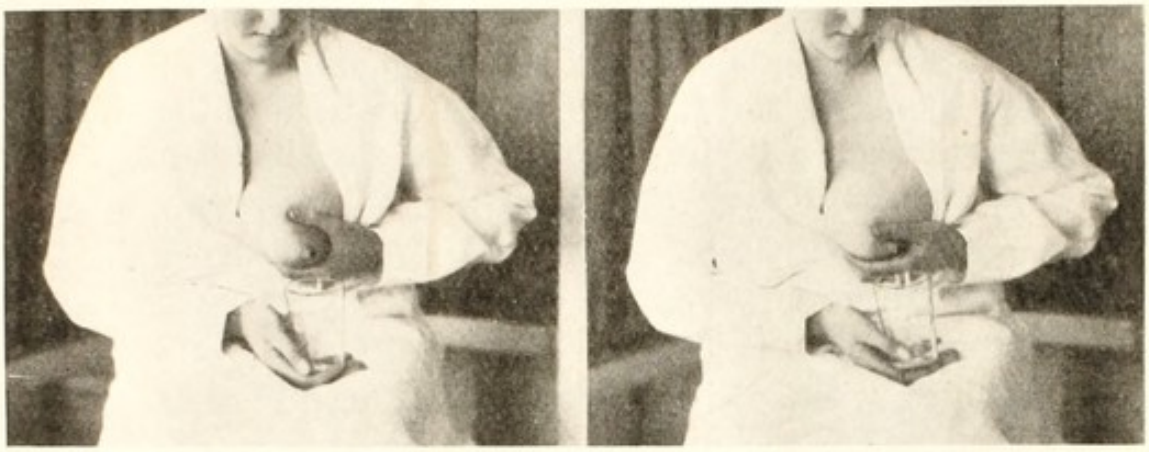
(1) The skill and experience of the operator;

(2) The condition of the breast (full, or more or less empty);

(3) The readiness with which the contraction of the short tubes leading from the milk-sacs to the tip of the nipple becomes relaxed to let the milk escape.

Some breasts give up their milk much more readily than others. Further, a breast which may yield but little

milk, and that only in drops, on the first attempt at expression (or suckling), may give an ample supply quite readily after a few trials. Any mother can easily be taught to draw off her own milk with a little practice.



Figs. 6 and 7. Method of Expressing Milk by Hand.

Human milk will become infested with microbes and "go bad" just as readily as cow's milk, if due attention is not paid to cleanliness, cooling rapidly (in running water, or with ice), and keeping cool and loosely covered. Naturally, the milk should be used as soon as convenient after being expressed; but, where necessary, if proper care is taken, clean human milk may safely be kept for 24 hours before use.

CONDITIONS OF THE BREAST OR NIPPLES LIABLE TO CAUSE DIFFICULTY DURING LACTATION

Cracked Nipples

Painful cracking of nipples is due to want of care and cleanliness. Nipples that are not at once washed and dried after nursing—especially during the first week—tend to become softened and cracked. Another frequent cause is allowing baby to dawdle too long at each suckling—particularly during the first few days; and, worst of all, letting the baby go to sleep with the nipple in his mouth. Where the milk leaks and is allowed to soil the clothing, it "goes bad" and tends to cause cracking and poisoning. In all such cases as the above, it is a wise precaution to cleanse the breasts with boracic lotion after nursing,

instead of using plain boiled water, and the greatest care must be given to drying thoroughly.

Directly a crack is noticed, apply a slight smear of Friar's Balsam with a tiny piece of cotton-wool. This should be done after each nursing, subsequent to thorough cleansing and drying, and at least one application should be made during the night. Very tender, painful, or cracked nipples should be further safeguarded by getting the baby to suck through a "Nipple Shield" for the time being.

If the baby won't suck the nipple shield, tempt him by squeezing a little milk into it, and wet the surface of the artificial nipple with milk. Scrub the shield before and after use, and boil it once a day.

Dabbing with spirit and water after each cleansing is beneficial where the nipples tend to be unduly soft and spongy; this applies also to leaking nipples.

Leaking Nipples

Leaking nipples do not necessarily mean excess of milk and they may leak even when the supply of milk is deficient; the condition is due to poor tone. The mother must improve her general health by cold baths, fresh air day and night, outdoor exercise, etc. Brace up the breasts by sponging and massaging them morning and evening—using hot, followed by cold, water. Avoid too much hot, heavy clothing especially over the breasts.

Flat or Inverted Nipples

If, owing to flat nipples, or baby's lack of sucking power, milk cannot be secured for a time in the natural way, a nurse with slightly oiled fingers may stroke, press and manipulate nipple and breast in such a way as to gently coax and squeeze the milk into the baby's mouth. In addition a nipple shield or breast pump may be carefully used. Such daily drawing off of milk and expanding and developing of the nipples by suction and "forming" with the fingers may soon enable the mother to suckle her child in the normal way; indeed there are few cases that cannot be set right by patience and perseverance.

Engorgement of Breasts

This is specially liable to occur in the first week owing to the milk-tubes being more or less blocked at the start, and the baby taking very little until after the third or fourth day, though active secretion has set in. All goes well if we can tide over the first week.

The hard portions of breasts tending to "cake" can be softened by gently working at the lumps or "knots" directly they begin to form, stroking them from the base towards the nipple, using warmed oil; but if this is not done gently, abscess may result.

Temporary reduction of fluid taken by the mother, free action of the bowels, and comfortable support all tend to relieve distended breasts.

Abscess of the Breast

Abscess of the breast is nearly always due to uncleanliness, dampness of nipples, and cracking; even where abscess does not result, cracks cause much pain, upset the mother, and may stop her milk supply. This easily avoidable trouble is a main reason why women give up nursing. If cracks do not quickly heal with simple attention, consult a doctor.

TEST FEEDING

Weighing Breast-fed Babies Before and After Feeding

If baby is obviously not thriving, or if there is any doubt as to the amount of milk he is taking from the breast, the best thing is to weigh him immediately before and immediately after suckling, over a period of 24 hours. By this simple means it may be found that a baby is receiving on the one hand double as much food as he needs, or on the other hand not half enough. Needless to say the weighing must be done with good grocer's scales, accurate to quarter or half ounce, and not with an ordinary clock-face or spring-balance scales. Scales for this purpose may be borrowed from any Plunket Nurse, and from some scale manufacturers. Baby need not be undressed—weigh him

just before and just after successive nursings, noting the difference each time. At the end of the day the mother knows exactly what quantity of milk has been drawn off the breasts. This affords the basis for feeding. Napkins or other clothing if soiled during feeding should not be changed until the second weighing is completed. Weighing at one suckling is not a reliable guide, as the quantities drawn from the breasts vary at different nursings, the largest amounts being taken at the 6 a.m. and 10 a.m. feeds.

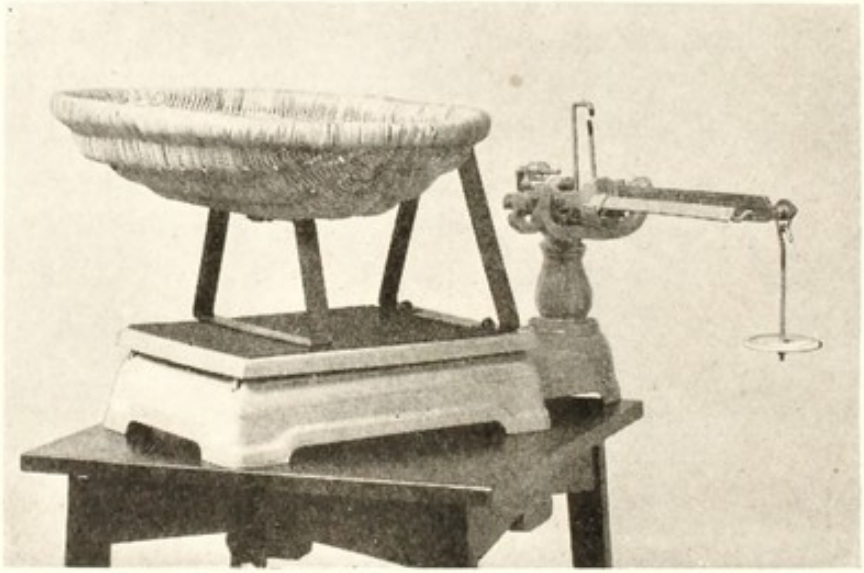


Fig. 8. Type of Scales Suitable for Test Weighing.

Weighing affords the only means of ascertaining whether a breast-fed baby is getting the right quantity of food. Of course if health and growth are normal the milk supply cannot be far wrong; but if there is indigestion, putting up of food, restlessness, disturbed sleep, or any other signs of ill-health or discomfort—or if a baby is not growing properly—the first thing to do is to weigh before and after feeding. **This rule is absolute.** Without such weighing any attempt at treatment is mere guess work and experimenting. The most enlightened specialists of the day admit their inability to form any idea as to the sufficiency or otherwise of the maternal supply, without resorting to what is obviously the only means of finding out. They insist on weighing.

QUANTITY OF BREAST-MILK

The following table shows the average amounts of breast-milk required by the normal baby at various ages:—

Age of Baby	Number of Feedings	Ounces at each Feeding	Total in 24 Hours
1 week	5	2	10
2 ,,	5	3	15
3 ,,	5	3½	17½
1 month	5	4	20
2 ,,	5	5	25
3 ,,	5	5½	27½
4 ,,	5	6	30
5 ,,	5	6¼	31¼
6 ,,	5	6½	32½

It should be remembered that babies do not take the same amount at each feeding, and as long as the total quantity taken from the breast in 24 hours is correct, no particular attention need be paid to individual feedings.

Complementary Feeding

When it is found by means of test weighing that the supply of breast-milk is inadequate for the baby's needs, complementary feeding must be resorted to. In the case of a young baby particularly, complementary feeding should be regarded as a temporary measure, and every effort should be made to increase the milk supply so that the baby can again be fully breast-fed. (See directions for increasing milk supply, page 30.)

In many instances where the supply of mother's milk is found to be insufficient, a flow of breast-milk can be established in a few weeks; in others, though the breast supply markedly improves some artificial feeding has to be continued. A trial of the simple expedient of weighing baby before and after suckling, and adjusting the feeding accordingly, proves conclusively that many mothers give

up breast-feeding quite unnecessarily. By weighing for a period of 24 hours any mother can find out for herself just what is needed. In the vast majority of cases when the shortage has been ascertained and rectified everything goes well, the sole need being to make up the deficiency of breast-milk at each feeding, by giving baby just the proper quantity of artificial food.

Weighing at one suckling is not a reliable guide, as proved by the following quantities drawn from the breasts at successive nursings, by a baby when 4 months of age, viz. 7 ozs., 6 ozs., 4 ozs., 4 ozs., 4 ozs., the first nursing being at 6 a.m. and the last at 10 p.m. Here the baby was getting 25 ozs. a day from the mother (an average of 5 ozs. per nursing) instead of the required 30 ozs. in the day or 6 ozs. per nursing. Had the mother been guided by the evening nursings alone she would have supposed that the breast supply was 2 ozs. short per feeding. On the other hand, had she weighed in the morning only, she would have concluded that a full supply was being drawn from the breasts and that no complement was needed. In such a case as the above a simple adjustment of the feeding would be arrived at by allowing an additional 2½ ozs. at each of the last two feedings.

The common practice of giving three or four "breast feedings" and the rest "bottle-feedings" is a great mistake, because the stimulation of the breasts by suckling, repeated regularly every three or four hours during the day, is the best means of keeping up the flow. When the supply of mother's milk is short she should continue to give both breasts at each nursing, following **immediately** with the required quantity of humanised milk. Allow say five or six minutes for emptying each breast, and five minutes or more for the bottle. The artificial food should be diluted at first, the diluent being gradually reduced during the course of a week or so. When giving a complement a fairly tight teat should be used, and care should be taken not to give too much artificial food; otherwise the baby will not go eagerly to the breast and the necessary stimulus for increasing the natural supply will be lacking.

Babies are sometimes overfed when the natural supply is being augmented by artificial food. The mother should

never forget to allow fully for what she herself supplies. At the first sign of overfeeding—i.e., putting up of food, indigestion, etc. the amount of the complement should be reduced, or if the baby is being fed more frequently than every four hours, longer intervals should be allowed between feedings.

OVERFEEDING ON THE BREAST

Maternal instinct does not tell the human mother how long or how often she should suckle her baby. Yet prevention of overfeeding on the one hand and underfeeding on the other, is supremely important.

Overfeeding in a breast-fed baby may be recognized by excessive gain in weight at first, followed later by a stationary period, then loss of weight, "putting up" of food, frequent relaxed motions, restlessness and colic. Crying, due to discomfort, gives rise to the impression that baby is hungry, and frequently further harm is done by giving extra food. The mother's milk is said to "disagree" and the baby is often weaned unnecessarily.

When these signs of overfeeding are present the baby should be weighed before and after feeding for a period of 24 hours, and the amount of milk taken from the breast can be regulated according to the child's requirements for age and weight. The time at the breast should be shortened and one breast only may be given, temporarily, especially at the first two feeds. If baby is being fed at shorter intervals than four hours, lengthen the interval between feedings to four hours.

UNDERFEEDING ON THE BREAST

The underfed baby will cry before and after feeds, his weight will be stationary, or there may be loss of weight, the motions will be small, infrequent and usually constipated, though occasionally the stools are small and frequent. If the baby is a weakling it may become progressively drowsy and weak, suck feebly, and may go to sleep at the breast, giving the mother the impression that the baby is satisfied.

If signs of underfeeding are present test weighing over a period of 24 hours should be done, to find out exactly

how much baby is taking from the breast, and the deficiency should be made up by giving a complement of properly graded humanised milk.

TREATMENT FOR INCREASING OR BRINGING BACK THE SUPPLY OF BREAST-MILK

In order to promote secretion and the steady flow of milk from every part of the breast, certain other steps should be taken if more milk is needed — whether the baby is being suckled or the milk is being expressed by hand for the time being. Attention to the following points will usually prove beneficial and helpful whether it is desirable to establish lactation, or to increase the daily supply.

1. **Put Baby to Both Breasts Every Time with Absolute Regularity.**

Give artificial food, if necessary, directly after nursing; *never* before or instead of the breast. Breast and bottle milk mixed like this agree perfectly.

After each feed, express the milk between fingers and thumb, and empty breasts as completely as possible. Cleanse and dry nipples.

2. Take **extra** fluid, chiefly water, warm or cold as preferred, about 1½ pints daily. A glass early in the morning, and one before or at each of baby's feeding times, is a practical way to fulfil the need for *extra* fluid.

3. **Diet Should be Plain, Wholesome, and Nutritious**—three meals a day. There is no need for extra food or changes of any sort, provided the ordinary diet of the mother is ample and nutritious. Extra fluid is the main essential. Many mothers take too much cocoa. If milk is taken it should be at meal time — not between the meals. No alcohol of any kind should be taken.

4. **Regulation of the Bowels** is very important. Extra water (6 to 8 glasses daily) and sensible, well-balanced meals, which should always include some fresh fruit and vegetables, also brown bread, will help to prevent constipation. It is advisable to make it an absolute rule to take an apple, orange, or other fruit in season, and a glass of water, preferably hot, first thing in the morning, some time before any other food is taken. If an aperient is necessary, 5 to 10 drops of fluid extract of cascara may be taken, *as a temporary measure*, once or twice a day after meals.

5. **Outdoor Exercise** is extremely important. A good walk is necessary every day, rain or shine, if in any way possible. If the mother is in a position to choose her own time, she should take a short walk before breakfast and after the cool bath.

6. **Daily Cold Baths**, or **Spongings all Over**, benefit the whole system. If unaccustomed to it, stand in warm water at first and sponge quickly with tepid, and later with cold water. Dry briskly with a rough towel. There should be a pink reaction of the skin and a warm glow afterwards.

7. **Rest**—Sufficient rest and sleep, with the windows open, is essential, including a short rest with the feet up in the afternoon. Ensure freedom from all avoidable worries and excitement.

8. **Routine Local Treatment for the Breasts.**

BATHE THE BREASTS first with hot water and then with cold water. To do this—

Have two basins of water—one as hot as can be borne, the other quite cold; a wash-cloth in each.

Bathe the breasts briskly, first with hot and then with the cold water. Repeat the process three or four times, but always end up with the cold water.

Dry quickly with a roughish towel, stroking from the base of the breast towards the nipple; a slight reddening of the skin and a warm glow should result.

Rub gently from the base of the breast all round towards the nipple. Then use long strokes from over the shoulders and under the arms. Finally, a gentle kneading and rubbing all round the breast, always tending from the base towards the nipple, and always keeping the breast well supported with the other hand.

Take about 10 or 15 minutes over the treatment, including bathing, and do not linger unduly over the process.

N.B.—Every drop of baby's own mother's milk is valuable for baby's welfare, and assists in the digestion of artificial food.

Massage of the breasts should always be done gently: five minutes devoted morning and evening to each breast is ample. **Over-prolonged or over-energetic massage may do harm, and might even predispose to congestion and abscess.**

Weaning

By weaning we mean the complete change from natural feeding to artificial feeding.

REASON FOR WEANING

Apart from consumption, there is hardly any illness of the mother which really necessitates weaning, though it may be necessary to take the baby off the breast for a time, and to draw off the milk by hand expression, feeding the baby with properly graded humanised milk until the

mother is sufficiently restored to health. In ordinary cases of cold, influenza, etc. there is no need to give up suckling even temporarily.

Where there is inflammation or abscess of one breast, suckling should generally be continued with the other, though the contrary advice is usually given.

If the supply of breast-milk is insufficient in the early months, make up the shortage at each feed, with humanised milk, and do not substitute a bottle-feed for a breast-feed as when weaning.

In nine cases out of ten where the ordinary custom is to wean the baby, complete or partial nursing could be continued if the mother were well advised, and if she would take more open-air exercise, besides paying strict attention to the other measures needed for ensuring her health.

Pregnancy is usually considered an indication for weaning the baby, but if the mother is in good health and the baby is doing well, sudden weaning is not called for, though the mother should immediately consult her doctor, if she suspects she is pregnant again.

TIME FOR WEANING

In general, the best time for weaning a baby under conditions of modern civilization is between the 9th and 12th months. The younger the baby the more risks attend the process; the mother should therefore do all in her power to ensure a good supply of healthy breast-milk, and should continue nursing for the full period unless there are definite reasons to the contrary.

Weaning should be completed by the end of the twelfth month, unless this comes in very hot weather, in which case it is a safeguard to continue giving at least one breast feed daily until the weather is cooler.

DIRECTIONS FOR WEANING

It is a great mistake to wean a baby suddenly. The process should be a gradual one, and except for special reasons the change from complete natural feeding to complete artificial feeding should never be made in less than two weeks. If properly conducted and spread over a period

of five or six weeks there are practically no dangers to be feared, as it is unlikely that the baby's digestion will be upset, or that the mother will suffer much discomfort from overfilled breasts.

If the mother's breasts do become uncomfortable or painful during the process of weaning baby, temporary reduction of the fluid intake, free action of the bowels and the application of a tight binder to the breasts, will all tend to give relief.

If baby has been accustomed to taking boiled water from a feeding bottle or from a spoon and cup, no great difficulty should be experienced in inducing him to give up the breast.

In order to effect weaning gradually, omit first one breast-feeding, giving instead a complete feeding of properly prepared milk suited to the age of the child. Next omit two breast-feeds, then three, and so on until all are discontinued. Allow from three days to a week, or more, for each change.

If weaning is begun before the ninth month, give the milk mixture from a bottle; if later, it is better to teach baby to take all food from spoon and cup, provided he has cut some teeth. In any case, after nine months, some spoon and cup feeding should be begun, and the bottle gradually discontinued as teeth appear.

If baby is fully up to the normal standard, and thriving well, he may discontinue the 10 p.m. feeding when finally weaned, and should sleep from 6 p.m. to 6 a.m.: that is, he will have only four meals a day, but must be given proportionately more milk at each feed. The guide to this, however, must always be the baby's condition and general progress.

Baby should have been given a bone to chew from six months onwards; and at nine months, whether weaned or not, some hard food, such as twice-baked bread, hard crusts, or crisp toast, should be gradually introduced into his diet. This should be given to him about ten minutes before his feeding time, when he is hungry—not between meals.

WEANING TABLE

Time	First Week	Second Week	Third Week
6 a.m.	Breast feed	Breast feed	Breast feed
10 a.m.	Barley Jelly: 1 tablespoon Whole Milk: 3 teaspoons	Crust Barley Jelly: 2 tablespoons Whole Milk: 3 teaspoons Humanised Milk No. 3: 5 ounces *Boiled Water: 3 ounces Kariol, as below	Crust Barley Jelly: 3 tablespoons Whole Milk: 3 teaspoons Humanised Milk No. 3: 8 ounces Kariol, as below
2 p.m.	Breast feed	Breast feed	Breast feed
6 p.m.	Breast feed	Breast feed	Crust Oat Jelly: 1 tablespoon Whole Milk: 3 teaspoons Humanised Milk No. 3: 8 ounces Kariol, as below
10 p.m.	Breast feed	Breast feed	Breast feed
Amount of Kariol in 24 Hours			½-2 teaspoons

*Reduce the boiled water in the course of 3 or 4 days and increase the Humanised Milk to 8 oz.

WEANING TABLE—continued

Time	Fourth Week	Fifth Week	Sixth Week
6 a.m	Breast feed	Breast feed	Humanised Milk No. 3: 8 ounces
10 a.m.	Crust Oat Jelly: 3 tablespoons Whole Milk: 4 teaspoons Humanised Milk No. 3: 8 ounces Kariol, as below	Crust Barley Jelly: 4-5 tablespoons Whole Milk: 5 teaspoons Humanised Milk No. 3: 8 ounces Kariol, as below	Crust Oat Jelly: 5-6 tablespoons Whole Milk: 5 teaspoons Humanised Milk No. 3: 8 ounces Kariol, as below
2 p.m.	Crust Humanised Milk No. 3: 8 ounces Kariol, as below	Crust Humanised Milk No. 3: 8 ounces Kariol, as below	Crust Humanised Milk No. 3: 8 ounces Kariol, as below
6 p.m.	Crust Barley Jelly: 3 tablespoons Whole Milk: 4 teaspoons Humanised Milk No. 3: 8 ounces Kariol, as below	Crust Oat Jelly: 4-5 tablespoons Whole Milk: 5 teaspoons Humanised Milk No. 3: 8 ounces Kariol, as below	Crust Barley Jelly: 5-6 tablespoons Whole Milk: 5 teaspoons Humanised Milk No. 3: 8 ounces Kariol, as below
10 p.m.	Breast feed	Humanised Milk No. 3: 8 ounces Kariol, as below	Humanised Milk No. 3: 8 ounces Kariol, as below
Amount of Kariol in 24 Hours	2½-4 teaspoons	4½-6 teaspoons	6-7 teaspoons

N.B.: All cows' milk used in the preparation of Humanised Milk and that poured over the cereal jelly should be boiled for five minutes at first. Gradually reduce the time of boiling till the milk is scalded or just brought to the boil.

Kariol may be introduced towards the end of the second week of weaning, commencing with ½ level teaspoon (see directions for measuring and giving Kariol, page 96; and also for the preparation and keeping of Humanised Milk, page 106).

Recipe for Humanised Milk No. 3, page 109.

Fruit juice should be introduced during the weaning period. Commence during the third week giving orange juice 1 teaspoon, increasing to 2 tablespoons at one year of age (see page 95).

Weighing the Baby

The Feeding Table on page 100 shows how much food the average baby needs at various times in the first nine months, but no absolutely fixed allowance will suit all infants under all circumstances; the mother must make such slight alterations as may appear necessary from her child's appetite, condition, and rate of growth. Here comes in the importance of weighing. Baby should be weighed regularly every week for the first few months, and every month afterwards, so as to prevent the risk of his failing to gain at the proper rate. Infantile diarrhœa and other maladies are generally preceded by a period of stationary or declining weight, and if this were attended to in time the germs of disease would rarely gain a footing.

A common spring balance suffices for ordinary weekly weighings and the keeping of a sufficiently accurate "Baby's Weight Chart," though the weight should be checked occasionally on good baby weighing scales.

During the first few days after birth a baby naturally decreases in weight about half a pound. After this, "bottle-feds" tend to remain stationary for one or two weeks; then there should be a steady gain.

From time to time, even with breast-feeding, and at any age, a baby will fail to increase in weight, and may even lose for a week or more, owing to some slight passing disturbance of digestion. Take extra care at such times.

Steady gain in weight, week by week, is the ideal; but don't worry about slight irregularities in the rate of growth, especially during teething, weaning, or after 12 months of age. When infants begin to take more active exercise they tend to put on weight by fits and starts.

Mothers and nurses should be warned against taking pride in getting a baby to advance over-rapidly in weight; a regular gain at the proper rate is safer and better. Excess of food causes a baby to put on extra weight for a time, but this tends to be followed by indigestion and loss in the long run. Besides, we don't want mere weight. We don't want to fatten babies like prize pigs, but to

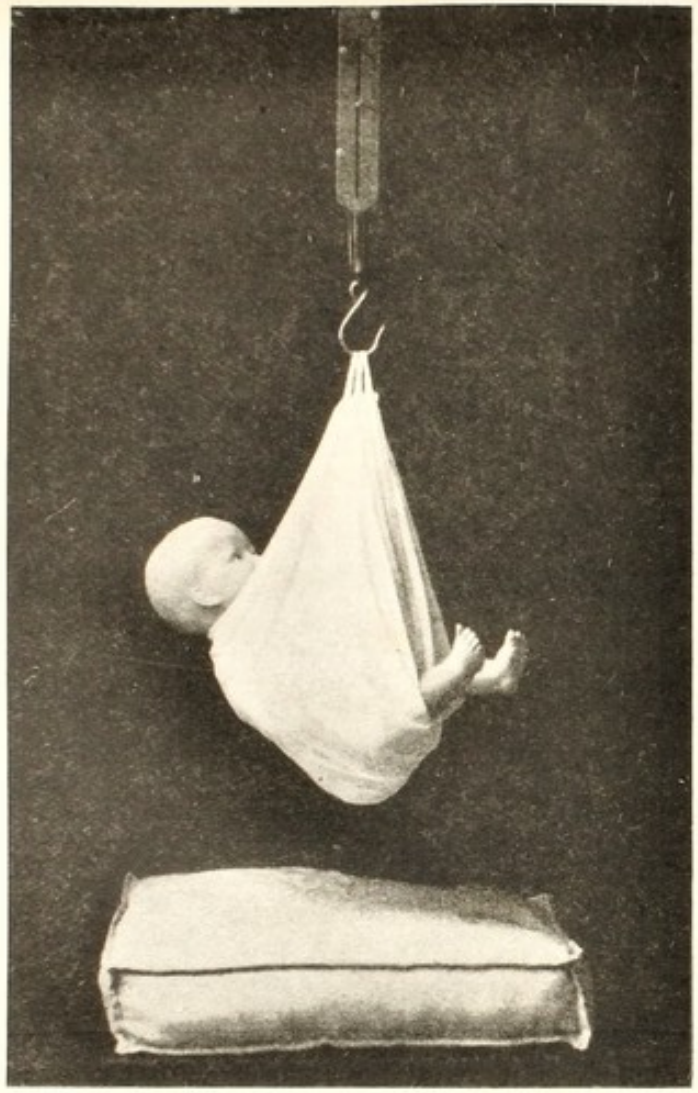


Fig. 9. How to suspend baby comfortably in towel and weigh approximately with spring balance.

Fig. 10. How to weigh baby accurately on a finely balanced scale.

BABY'S WEIGHT CHART

Baby's weight should be entered on chart week by week. Make dot at each weighing and draw line from dot to dot. The curve will show at a glance how baby is doing.

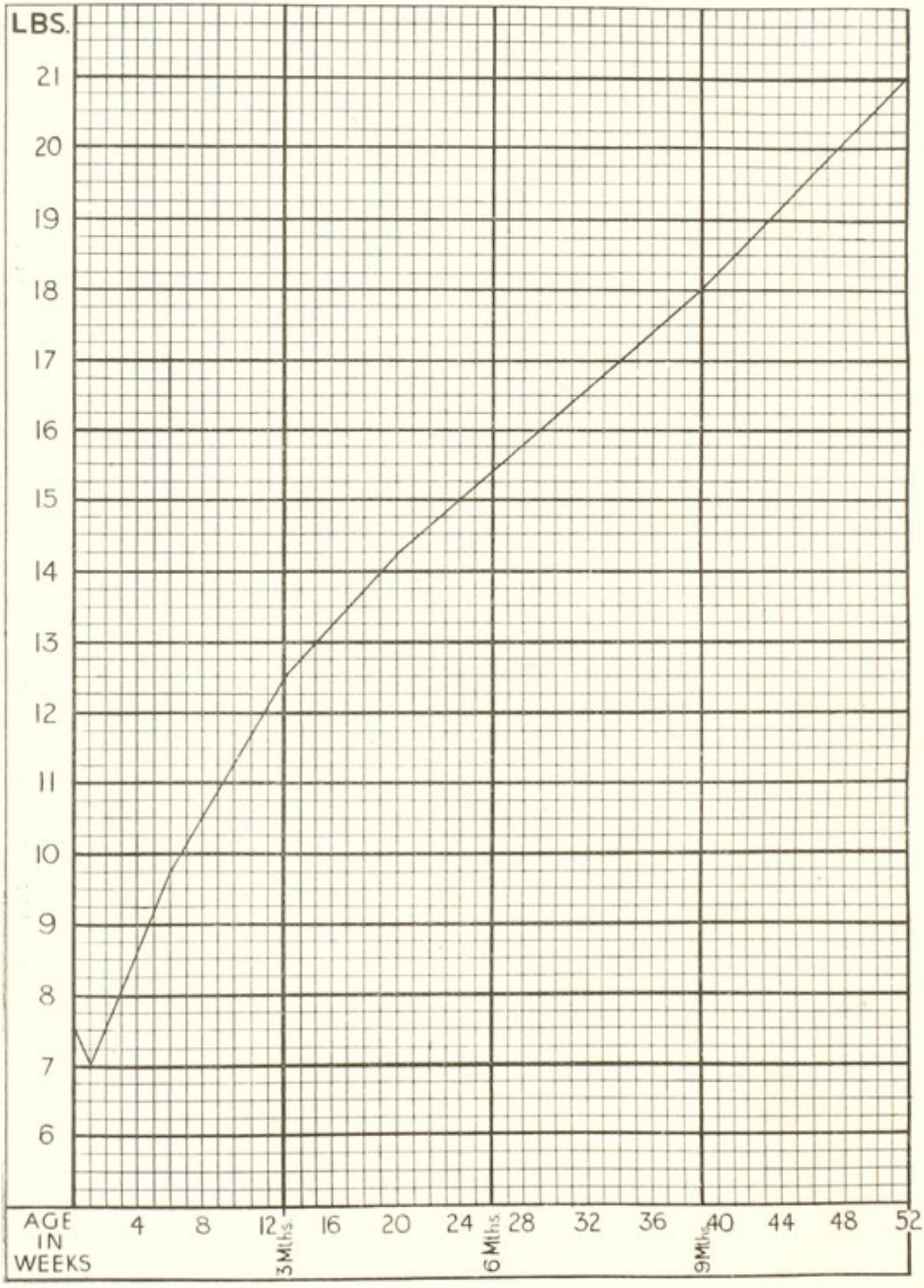


Fig. 11 Baby's Weight Chart

ensure a steady, normal development of good firm bone and muscle.

From the second week to the fourth month an infant should gain from a quarter to half a pound a week; from the fourth to the sixth month he should gain about 1¼ lb a month, and from the sixth to the twelfth month about a pound a month.

An infant at the sixth month should weigh twice its weight at birth, and at the end of the twelfth month a normal infant should weigh about 20 to 21 pounds. These are averages for babies of ordinary weight at birth. A considerable margin on either side is compatible with health, especially in the direction of growing more quickly than the average. As a rule, a child who gains regularly in weight is thriving.

FITNESS VERSUS FATNESS

Infants fed on a wrongly balanced diet, especially one containing an unusually high proportion of carbohydrate, tend to become fat and heavy, but they are usually flabby and wanting in stamina.

However attractive these may appear as babies, they don't develop into the best men and women, and even as children the fact of their having been built out of the wrong stuff shows itself directly they become ill. Such babies "catch whatever's going," and readily succumb to any illness. Even where they don't die, they pick up slowly, and tend to make imperfect recoveries. This is in striking contrast to the baby who is properly fed throughout on the best air and the best food. If such a child does chance to get ill, he "throws off the germs as the bow of an ocean liner throws off the spray—he is pretty well germ-proof." The reason for this is obvious to any one who will take the trouble to contrast the two sections of young pigs shown (Fig. 12)—the one having been fed on what would correspond to its mother's milk, or the closest imitation of it, and the other on sugary or starchy compounds, analogous to the patent foods, etc., which some human mothers are so fond of giving to their babies.

Fig. 12

(*A*) Section of young animal fed experimentally with starchy food not containing sufficient "flesh-forming material." Note excess of fat and lack of bone and muscle.

(*B*) Section of young animal properly fed. Note that size and weight are about the same as in (*A*), but (*B*) shows a preponderance of bone and muscle.

(From "The Theory and Practice of Infant Feeding" by H. D. CHAPIN, A.M., M.D.

Extensive experiments, made on the above lines with little pigs and other young stock, show that the wrongly-fed animal may grow as fast and look as well from the outside as one which has been properly treated, but when the two are cut across, the body of the one is found to be built principally of fat, while that of the other is mainly good bone and muscle.

The Bowels

After the first few days there are usually two or three motions daily. There should be at least one each day after a month old; many infants have two and some more than two, but it is the character of the stools rather than their number which denotes perfect or imperfect digestion.

It is of the utmost importance to insure regularity of the bowels. Try to get them to move at the same time every day just after the morning and afternoon feedings. In a very young baby the disturbance may cause some food to be put up, but usually this tendency soon ceases: the bowels tend to move best just after a meal. If training be begun early, regularity can usually be brought about by the second month.

The best method of training is as follows:—Place a tiny chamber between the nurse's knees. Hold the baby

on this, its back against nurse's chest and its body firmly supported. This should be done twice a day and always at the same hour.

At first it may be necessary to use some local stimulation such as that produced by tickling the anus. This also acts as a suggestion of the purpose for which baby is placed on the chamber; "but in a surprisingly short time the position is all that is required. With most infants, after a few weeks the bowels will move as soon as the infant is placed on the chamber."

Fig. 13. Training in Regular Bowel Habits.

ENEMA

If the above mild external stimulation fails, the mother may try passing the tip of a "soft rubber catheter," size XII, into the bowel; or the soft rubber nozzle of a small

"bulb-enema," specially made for babies, may be used in the same way. Such an enema should hold an ounce. If a motion is not brought about by the mere presence of the nozzle a little water may be injected, say from a teaspoonful to an ounce, according to what proves necessary. The water should be made slightly saline, by adding common salt in the proportion of a bare level teaspoonful to a pint of boiled water, and it should be injected at a temperature of 98 deg. F. (blood heat). Such a fluid tones up the bowel, but (unlike soapy water) is not irritating and does not cause any tendency towards catarrh of the bowel. Soap, whether given by enema or used in the form of "soap stick," always causes more or less irritation of the mucous membrane, often leading to slime in the motions and redness of the orifice, and may cause much pain, straining, and even prolapse of the bowel. These results will not be surprising to anyone who reflects on the smarting caused by a little soapy water getting into the eyes.

Large enemas are liable to distend the bowel, and cause further lack of tone and sluggishness. They should therefore be avoided. Indeed, the mother should not allow herself to drift into the habit of introducing anything into the bowels, if they can be got to move otherwise; she should spare no pains to bring about normal tone and vigour of the whole system and proper activity of the bowels by natural means as soon as possible.

There are occasions when a baby will be benefited by a fairly copious enema, say from three to six ounces of normal saline, given at a temperature of 100 deg. F. This affords the best means of relieving a severe attack of colic. A similar injection may be given to clear out the bowels at the onset of diarrhœa or for convulsions.

Never give a new-born baby castor oil. This is often done under the mistaken idea that the dark tarry material ("meconium") is dirty and ought to be cleaned out as soon as possible. In reality, meconium is pure and mildly laxative, and is intended by Nature to keep the bowels sweet and normal for the first few days. If no motion appears by the end of the second day a small saline enema may be given, but this is rarely necessary.

NORMAL MOTIONS

"If we could keep the motions normal, we should have few or no delicate children."—*(Dr. Harry Campbell)*

Carefully observe the consistency, colour, and smell of motions. For the first few days the natural motions consist of "meconium," a dark, tarry, viscid, odourless substance, which may be passed from three to six times a day.

Stools should gradually change to yellow, varying from pale buff to orange—the intenser shade being seen in the breast-fed baby. In the early stages of artificial feeding, when the food is much diluted, motions are usually pale; when normal strength of food is approached the shade tends to deepen, this being specially affected by the increase in the proportion of fat. When cereals, such as oat jelly, are introduced into the food a brown shade in the motions is noticeable, and this increases as food becomes more varied.

The consistency of motions should be soft, smooth, homogeneous, resembling thin mustard or raw yolk of egg.

The odour should be faint and inoffensive.

ABNORMAL MOTIONS

Motions should be carefully watched for curds or other signs of indigestion, and for greenness or slime, which may point to indigestion.

1. **Green Motions.** Greenness is commonly a sign that the bowel-contents are being hurried on too quickly, due to some disturbance, such as a mild, passing chill, a nervous disturbance, or a slight disagreement of food. An occasional green motion is consistent with health; indeed a baby will sometimes have a green motion every day for a week or more, without appearing to be upset. However, the passage of green motions may mean a threatened attack of diarrhœa, and should put the mother on her guard to avoid any possible source of digestive upset, such as overfeeding, irregular or too frequent feeding, tainted milk, too strong or wrongly proportioned milk mixture.

Motions which become green only after they have been passed for some time are usually of less significance. Taking too much whey may cause bluey-green relaxed motions. If a baby is given grey powder or calomel, the mercury tends to cause the motions to be greenish.

2. **Curd in the motions.** Mothers are apt to worry themselves unduly about the presence of a little curd in the stools. Usually it is of little consequence, especially in the stool of the breast-fed baby,

although much curd may be an indication of overfeeding in either a breast-fed or artificially-fed infant.

An imperfectly blended stool is common after debility or an attack of indigestion, and such a stool is frequently wrongly thought to contain undigested food.

3. **White, tough, pasty, bulk motions** are apt to occur where babies are fed on unmodified or merely diluted cow's milk, owing to excess of indigestible curd.

4. **Pale, clay-like motions** may be due to deficiency of bile, arising from obstructed bile duct or disordered liver.

5. **Hard, dry, or crumbly motions** indicate constipation.

6. **Brown, black or red motions.** Bleeding into stomach or bowels causes brownness, blackness or redness, according to the site of the hæmorrhage.

Black motions are normal in the first week of life, and may also be caused by drugs. Brownish motions are a normal result of starch or starchy patent foods.

7. **Thin, watery motions** are common in diarrhœa, but are most marked in rare choleric summer diarrhœa, tending to rapid collapse.

8. **Frothiness and foulness of motions** are evidence of abnormal fermentation which may call for washing-out or irrigating the bowel.

9. **Slime or mucus in the motions.** A certain amount of mucus is present in all normal stools. Much slime and mucus is specially seen in disorders of the lower part of the bowel, and may be the herald of acute dysenteric diarrhœa, leading to blood and pus in the motions followed by rapid poisoning of the system, torpor and collapse. Much jelly-like mucus, associated with the presence of worms, may be present as a chronic condition in weakly dyspeptic children.

General Hygiene

Pure Air and Sunshine

The question as to whether the injury done by living in closed rooms is mainly a physical or a chemical effect, does not concern us here. Throughout this section I assume for the sake of simplicity that the damage is toxic.

Keep the baby in the open air as much as possible. A sun-bath does not stop at the surface—radiant energy penetrates the body and stimulates the vital processes. When the baby is in the house, let the room (whether bedroom or sitting-room) have an ample current of pure, cool, outside air flowing through it all the time. Keep

baby out of the direct line of draught, but don't be afraid of the air being cold. Pure, cold air is invigorating, and prevents "catching cold." Warm, stuffy air is poisonous and devitalising, and makes babies liable to "catch cold" when taken out into the open. There is no danger, but actual safety, in free-flowing night air.

The new-born babe needs special care and attention. For the first few days it is well to have a fire in the bedroom in cold weather; but, unless for special reasons, this is not advisable after a week or ten days. Even when there is a fire, the room must not be allowed to warm much, but must have a very free flow of pure, cool, outside air, through it day and night. See that baby is sufficiently covered with light, open, fluffy or porous woollen materials, and, if necessary, have a hot bottle as well.

N.B.—At the Truby King Harris Hospital the babies live out of doors all day, and a broad stream of pure, cold, outside air flows through the sleeping rooms all night long; tiny, delicate babies, after a week or more of gradual habituation, sleep well, grow and flourish in rooms where the temperature may sometimes fall almost to freezing-point. Of course the babies are properly clothed and covered (see pages 59-66).

WHERE SHOULD BABY SLEEP?

The baby will thrive best if given a ventilated room to itself.

Opening a bedroom window does not suffice for ventilation. There must be a continuous stream of pure, cool air entering direct from the outside, passing across the room and then up a chimney or ventilator, or out of a door or window on the opposite side of the room.

Where there is no chimney to the bedroom, an excellent cross-current can be maintained by opening the bedroom window, closing the kitchen windows, and leaving open the doors which lead from the bedroom to the kitchen. The warm kitchen chimney then ensures an ample flow of air from the outside, through the bedroom to the kitchen.

It will be better still if the baby can be removed to a separate room. The cot may be taken into the sitting-room

or kitchen when the parents go to bed, if there is not a separate room available. In this case, of course, the room so used must first have been well-aired, and must have the windows open so as to establish a pure, cool stream from it to the fireplace.

As regards the window inlet, a two- or three-inch opening is quite inadequate: and when the opening is covered (as it usually is) with a blind, very little air can enter. The window should be wide open, and the opening should be quite free from obstruction. If a wind is liable to blow in direct on to the baby the cot should be sheltered by a low screen.

The baby should never sleep with its mother, but in a separate cot. If the cot is kept in the same room, it should be on the side of the room opposite to where the parents' bed stands, and there should be a current of pure, outside air flowing across the room between the cot and the bed, so that the baby may not re-breathe what its parents have used up and poisoned.

EFFECT OF PURE AIR

Nothing is more striking than the marked improvement in colour, tone, condition, and liveliness shown by babies when the bedroom is freely ventilated, and they are moved away from the vicinity of their parents, especially when they are moved to an adjacent room. Mothers are inclined to be strongly prejudiced against allowing their babies this inestimable boon—the one thing capable of healing delicate consumptives, making them whole again. Let any mother try a separate bedroom and pure air for her babe for a month and she will not go back to her old ways. Properly-fed babies who have plenty of open air and kicking exercise during the day, and pure, cool air at night, sleep like dormice and give their parents from six to eight hours of uninterrupted rest.

SUN BATHING

The baby should have set periods for gradually increasing exposure of the skin to the sun's rays reflected from the open sky and clouds—and shorter periods during which the sun is allowed to play directly on the bare limbs.

etc. All such surface stimulations should be increased very carefully and cautiously both in extent and duration; and this is specially the case in blue-eyed, fair children whose skins readily become seriously irritated and inflamed if hastily or injudiciously exposed.

Exposure of the skin-surface to the sky, and to the direct rays of the sun, does much more than mere surface stimulation. The sun's rays not only tan and enrich the colour of the skin: they enrich the blood itself, and promote the health and vitality of the whole organism. Infants reared in this way tend to become vigorous, hardy, capable, and resistive to disease: they enjoy life far more than coddled babies—and they smile instead of crying. Later on, open-air schools tell the same story; hence the expression "the open-air smile." With apologies to Robert Louis Stevenson, one may say quite seriously:

> Coddled children, crying babies,
> All grow up as geese and gabies—

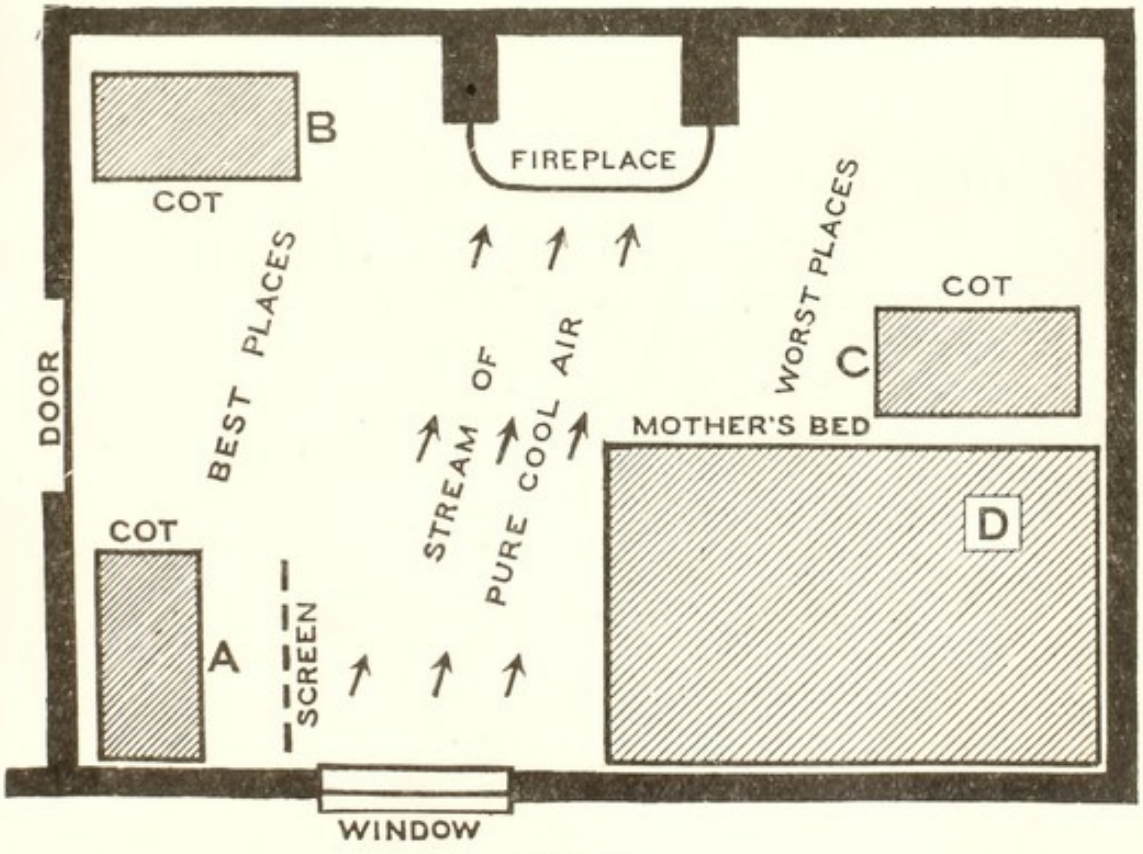


Fig. 14

PLAN OF BEDROOM FOR MOTHER AND CHILD

(When both have to occupy one bedroom.)

The arrows show a broad stream of fresh air flowing across the room from the wide open window to the fireplace.

BEST PLACES FOR BABY

(*A*) **With a low screen, as shown, to prevent direct draught blowing on to the cot, the best position for the baby is at A,** especially if the adjacent room is occupied in the evening or at night, because then the fouled air would be drawn through the chinks around the door, and a baby in the cot at B would inevitably suffer.

(*B*) **This position may be quite as good as A, except when the air of the adjacent room is fouled.** In a very cold, bleak situation, B might be even the safest place for a delicate baby, especially during the winter; but later on it would be better to transfer the cot to A, where the air would be purer and cooler. The screen would prevent direct draught from the window.

WRONG PLACE FOR BABY

(*C*) **This is objectionable because the baby is placed in the current of poisoned air from the mother on its way to the fireplace.** Mother and child should always sleep on opposite sides of a pure, cool stream of outside air, if they cannot have the still greater advantage of sleeping in adjacent but separate rooms.

WORST PLACE FOR BABY

(*D*) **This is by far the worst place in the room—the baby being in bed alongside the mother. The objections are fourfold, viz.:—**

(1) Risk of suffocation by "overlying."

(2) The baby is more or less poisoned by inhaling the breath of the mother.

(3) The baby inhales its own breath over and over again, because when the air round about the mouth and nose is warm the breath stagnates, instead of rapidly ascending to the ceiling.

(4) The warm "muggy" air alongside the mother is enervating, and tends to render the baby's skin tender and more susceptible to cold when exposed in daytime.

"God lent His creatures light and air,
And waters open to the skies,
Man locks him in a stifling lair,
And wonders why his brother dies."

Why not accept the gift for our children, if not for ourselves?

CRADLES

Baby should always sleep in a cradle by himself—never in his mother's bed.

The cradle should be of the open-wire or wicker kind, with a stand to match. It should be long enough to allow the baby to lie comfortably at full length.

Such a bed is strong and light, easy to clean and can be conveniently carried about from room to room. There should be neither linings nor canopy, nor curtains, to a baby's cot or cradle, as these are liable to gather dust, and obstruct the free circulation of air about the baby. Adults have long ago given up all bed-hangings for themselves. Why do they continue them for the baby, whose rapidly growing body burns three or four times as fiercely as their own and has therefore the more pressing need for pure air?

BED-CLOTHING

When lying in its cot the baby (and indeed older children also) should be comfortably tucked in. The ideal bed-clothing is that which will afford the greatest warmth with the least weight, oppression, and hampering of the baby's breathing and other movements. Many of the lower animals, such as birds, opossums, sheep, etc., are ideally clad, their clothing being air imprisoned in the meshes of feathers or fur, the total weight of which may be quite insignificant. We should imitate this condition as nearly as possible by using only wool, instead of cotton or linen, and selecting very open cellular or fluffy fabrics instead of close-woven or felted ones. There may be more warmth in two or three thicknesses of a light, fleecy shawl than in the close, thick material of a rug weighing three times as much—just as there is infinitely more warmth in a light, fleecy new blanket than there is in the same blanket when shrunk and felted by washing, although the shrunk material may be heavier per square yard, and therefore more oppressive to the child. Several layers of clothing are always warmer than the same weight of material would be if it were woven into one thickness, because air is imprisoned not only within the meshes of each layer, but also between the layers.

For baby's bed the following articles are needed in the order in which they are given:—Enveloping blanket, horse-hair mattress, chaff mattress, bed blanket, strip of

mackintosh sheeting, and a larger strip of flannel, cuddling blanket, pillow, sheet and quilt.

MAKING THE BED

While air imprisoned between layers or within meshes of wool keeps in the warmth, any distinct air-current circulating round the child's body, and passing freely in and out of the bed by means of untucked coverings, etc., will cause great chilling in cold weather. It is desirable to avoid this unnecessary waste of heat at all times, and it is imperatively necessary to guard against it when babies sleep in cold air. In making up the bed for baby the aim should be to exclude draughts and keep him really cosy, at the same time allowing for freedom of movement.

(1) Tie a small piece of blanket or flannel round the head of the cot. In warm weather use mosquito netting or cellular cotton instead.

(2) Place a fluffy, new blanket over the empty cradle. This is the enveloping blanket, which should come high up in the bed, so that no gap is left between it and the head lining. A small single-bed blanket will do for the purpose.

(3) On top of the blanket place a firm horse-hair mattress and over this a loose chaff "shakedown" into which the baby comfortably nestles. If a hot-water bottle is required put it between the mattress and the shakedown, thus ensuring mild, lasting, uniform warmth without risk of burning baby.

(4) Cover mattress and shakedown with a small blanket tucked in all round, and over this place a narrow strip of mackintosh, which should be tucked in on both sides.

(5) Cover the mackintosh with a slightly wider piece of blanket or flannel, which can be replaced whenever damp.

(6) Put a small pillow in position. Large, soft pillows are dangerous as baby is liable to become suffocated by burying his head in the pillow.

(7) Make a cosy hollow in the chaff shakedown with your hand and place baby on his side in this cosy nest, tucking his shawl or cuddling blanket round him, well up at the back of the neck and round the feet.

Fig. 15. **Type of Cot Recommended for Baby**

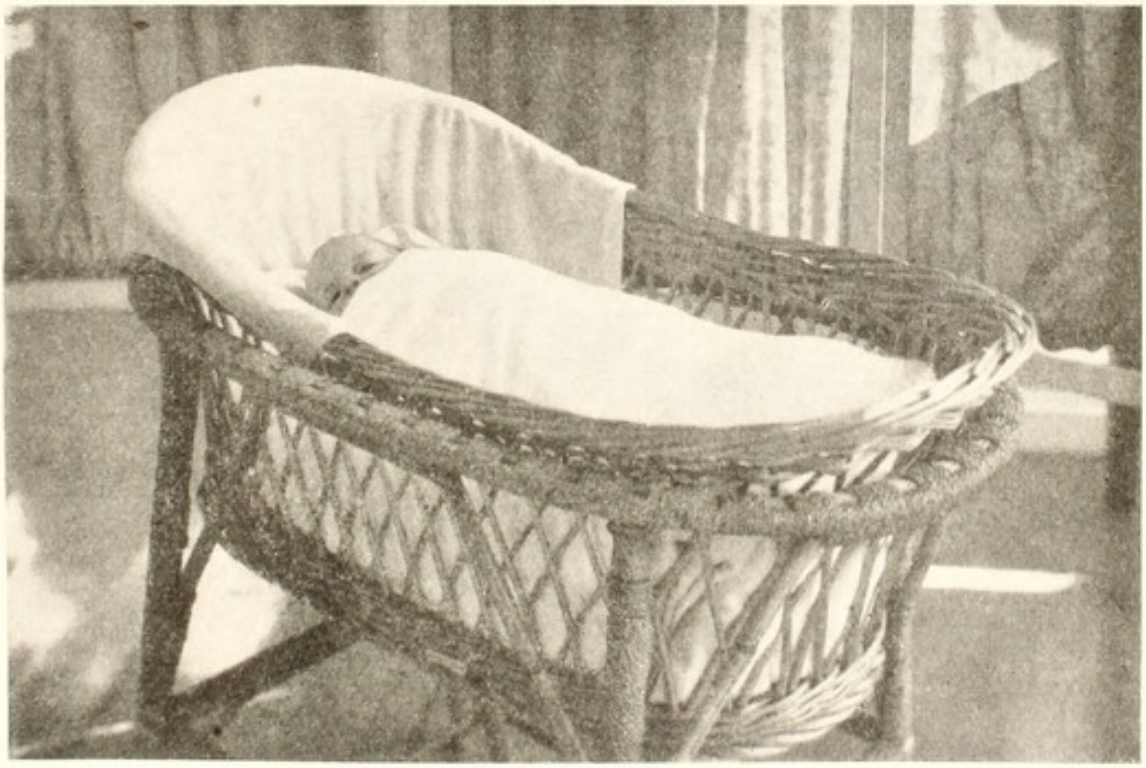


Fig. 16. **The Cot Made Up as Described on Page 50**

Merely glancing at the final stage one might imagine that the baby was not free enough to move and kick, but he is really unhampered: the enveloping blanket is not tight, though it looks so in the picture; further, it becomes quite slack as baby settles down.

(8) Take one side of the enveloping blanket and tuck it over baby and under both mattresses. Do the same with the other side, turning up the foot neatly.

(9) The sheet comes next, and this should be tucked in about six inches at the top to prevent baby's face from becoming irritated by the blankets.

(10) Now place your hand in the cot and feel to see that baby can move quite freely, and having ensured this put on the quilt. The baby will then be in a kind of long envelope or sack, and should be quite cosy and comfortable, provided he is protected from direct draught.

If the bed is properly made there need be no fear of subjecting a young infant to pure, cool, outside air. It will make him keen for his food, and a sound sleeper. He will grow and flourish, and his flesh will become firm and hard, if the other essentials for health are also attended to.

Babies should not be got to sleep by patting, dandling or rocking. Don't use rocking-chairs or cradles with rockers. A baby who is habituated to being in a bassinette from the start and never spoiled by being allowed to go to sleep alongside the mother, will be contented and healthy, and will need no dandling, nursing, or rocking to put him off to sleep.

Chaff Shakedown and Pillow

The best material for these is the light, soft chaff which is winnowed out by the threshing machines—not ordinary harsh chaff; this is quite unsuitable. If the chaff becomes damp it can be renewed cheaply, and the cover, which should be made of strong, unbleached calico, boiled.

The cot already described can easily be adapted to the requirements of a **tropical climate** by using a sheet of cellular cotton material in place of the enveloping blanket. The mattress and chaff shakedown and pillow may be used in the usual way, with sheets of soft cotton or very light, woollen material instead of blankets.

COTS FOR OLDER BABIES

When the baby has outgrown the bassinette, usually at about eight or nine months of age, he should have a plain, strongly-made cot or bed. Usually the drop-side,

wooden cot is found most satisfactory, and this can be made on the same principle as the cradle.

A sleeping bag provides a good means of preventing baby from extricating himself from the best-made bed. The bag should be large enough to allow baby free movement of arms and legs, and can be made by sewing together a double square of strong sheeting or flannel. In the middle of one edge cut a small round neck, and from this a deep placket. Then sew up the bag all round, except for the neck. Bind this and the placket and put on fastenings. Thus you will have something like a large nightgown without sleeves and closed at the bottom. Fix strong tapes to each of the four corners of the bag, so that these may be fastened to the four posts of the bed after baby is placed in the bag.

SCREEN

A screen placed round the head of baby's cradle affords protection from undue draughts. Gently diffused currents of pure air pass round and over the screen. Such a diffused flow is good for the child. Only excessive, direct, rapid draughts of cold air are harmful. Indeed it is wonderful how soon babies, used to nothing but fresh air day and night, become proof even against direct draughts. However, their mothers should be careful to protect them from undue trials of any kind.

There is no greater fallacy than the idea that babies need shading from soft diffused light when sleeping in daytime. All that is necessary is to shade them from direct sunlight, and if the day is very bright, the cradle can be placed under the lee of a wall or hedge, or beneath a verandah or tree; the latter being the kind of protection that animals in the open instinctively seek in similar circumstances.

Soft, open, diffused light from the sky, shaded if need be in the direction to which the eyes are directly turned, does not interfere with sleep in the daytime, and promotes sound reactionary sleep at night. But the mother says, "Is it not trying for the eyes?" Why should soft, diffused daylight be trying for eyes curtained with eyelids—the same eyes that take pleasure in gazing directly at open light

when the child wakes? The keeping of infants in darkened rooms or closely canopied prams during the day, under the mistaken notion that light prevents sleep as it tends to in adults, is responsible for a great deal of debility in babyhood.

For the first week of life it is true that babies are acutely sensitive to light, and should be carefully screened; but after the first week they grow more and more fond of light, and need it for proper growth and development.

MOSQUITO NETS

It is necessary to place netting over baby's cot whenever mosquitoes or flies are troublesome. The practical rule regarding the use of protective nets should be to increase the ventilation; otherwise the air about baby will become stale and enervating. Harm is minimised by not carrying the net below the upper margin of the cradle. This usually suffices for flies. To keep out mosquitoes, the net must, of course, completely envelop the cradle. This is highly injurious as the breath can scarcely escape and fresh air makes its way to the baby with difficulty. To counteract this, place the covered cradle in a perceptible "draught" if the weather is moderately warm. The netting used must be of the largest mesh which will keep out mosquitoes. Run a tape all round the hem and draw it up tightly under the cradle.

PRAMS AND HOODS

One of the most pitiable and exasperating sights of modern babyhood is the spectacle of an unfortunate infant sweltering and sweating under an American leather pram hood. Here surely is human ignorance at its worst—a glorious sunny day, intended to give life and strength to all young creatures, perverted by the mother into an agency of debility and sickness for her offspring!

The ordinary unventilated, leather pram hood is most injurious, as there is no current of pure air passing over the baby's head. It is especially harmful in warm weather, when the baby's breath stagnates around the mouth and nose, so that it breathes its own breath over and over again, thus poisoning the system. The enfeebling effect is

Fig. 17. The Ideal Perambulator

Perambulator with properly ventilated hood, preventing any stagnation of exhaled breath round baby's head and permitting a current of pure air to circulate inside the hood at all times.

This properly ventilated perambulator has developed from the original ventilating canopy devised many years ago by Lady Plunket and adopted by Sir Truby King. Note dark lining which does away with harmful glare so bad for baby's eyes; also absence of ball-fringe which may harm baby's sight by its constant movement.

Parents are strongly recommended to obtain a properly ventilated perambulator such as the above which can be made by all manufacturers.

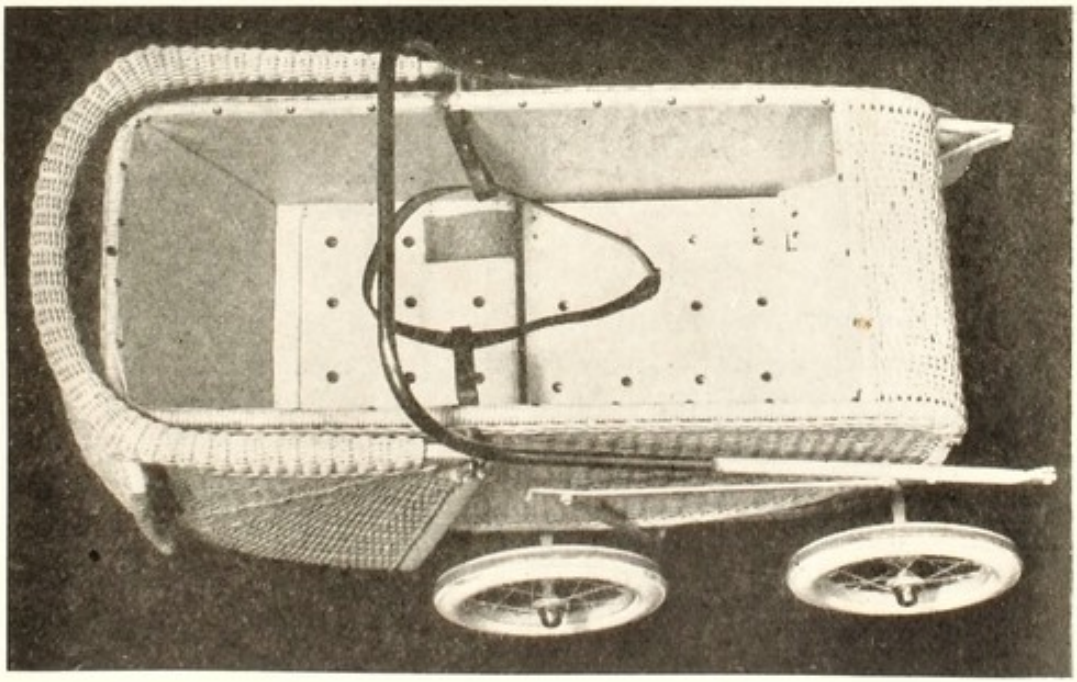


Fig. 18. The Same Perambulator Folded

Same perambulator showing ventilating holes bored in the floor underneath the mattress to prevent stuffiness and condensation of perspiration. The lining of American cloth is washable.

increased by the fact that the hot air causes sweating and general limpness of the whole body.

A baby out in the middle of a green field under a close, leather pram hood on a warm sunny day is actually far worse off for air and healthy stimulation than if indoors

Fig. 19. A Good Type of Go-cart

in a well-ventilated room. Every one knows how bad it is for a baby to be kept indoors, but few realize that it may be even worse off under a leather pram hood in the open air and sunlight!

The ideal sunshade is a tree, shrub, or hedge, such as animals instinctively seek on bright days. Next best is a verandah or wall; failing these, and for use when being wheeled about, there should be a small canopy or blind or

an umbrella-like shade sufficing to keep off the wind and the direct rays of the sun from particular directions, but not causing heating up of air and stagnation around the baby's head. If there is a close-fitting hood it should be made of wicker-work, which stops draught but allows free passage of air. The best colour for a pram-shade is green inside and white outside. Simple white linen is too glaring.

Never make a pram serve the purpose of a baby's cot, because there is bound to be constraint and limitation of movement. Further, a proper cot is more cleanly and free from stuffiness.

GO-CARTS

Go-carts should never be used until a child can sit up and rest his feet on the foot-rest. Care should be taken

Fig. 20.
A Frequent Spectacle in Our Streets
One of the many uncomfortable positions in which children fall asleep in go-carts.

to see that the child is properly clothed and covered. The best plan is to put a warm wrap in the cart, and seat the child in it. Then bring the wrap round the legs and fold it up over the feet, securing it in position with safety-pins. This is absolutely necessary in cold weather, or the child will lose a great amount of heat and will become devitalised and a ready prey to disease.

A child should never be allowed to sleep, as is so often the case, in the awkward, constrained positions almost inseparable from sitting or reclining in an ordinary go-cart. Great care should be used in the selection of a conveyance suitable for babies.

BABY CLOTHING

In planning baby's wardrobe the first need is for practical comfortable garments which give the maximum of wear and use as the baby grows. The following essential points in regard to baby's clothing must be kept in mind.

1. To ensure light, warm, porous, non-irritating materials.
2. To get warmth and air without undue weight or multiplicity of garments.
3. To see that the garments are made in such a way as to ensure easy washing, drying and ironing.
4. To have no constricting bands (to hinder development).
5. To have no undue double thicknesses of material (difficult to air well).

GARMENTS NEEDED FOR BABY'S FIRST YEAR

Woollens

3 knitted singlets.
3 nightgowns.
3 petticoats.
3 jackets.
4 pairs pilchers.
6 pairs of bootees.
2 shawls.
4 flannel triangles.
2 pairs fingerless gloves.
Woollen caps, or bonnets.

Cottons

3 cellular cotton shirts, long-sleeved (to be worn next the skin).
4 petticoats.
4 frocks.
6 bibs.
3 doz. napkins (27 ins. square).
3 cotton binders.

Mothers are advised not to provide the full number of bootees, pilchers, shawls, bibs, caps, or bonnets, as such articles are frequently received as gifts to the baby.

PATTERNS OF BABY'S CLOTHES

Paper patterns of good, simple, baby garments can be procured from the Central Office, Plunket Society, Queen's Bldgs., Princes St., Dunedin, N.Z. (or from any Plunket

nurse). Full directions for cutting out and making up are included in each set.

The primary object of clothing is to protect the body; therefore the first consideration is to adjust and regulate the number and weight of clothes according to changes of weather and season. The less the weight of clothing the better, provided it is warm enough; therefore choose light, porous, fluffy flannel or other woollen materials; avoid thick, firm, closely woven or felted fabrics of any kind, and don't use closely woven cotton or flannelette. The best materials to use next the skin are porous, cellular cotton or linen, silk-and-wool or silk-and-cotton. Pure wool used next the baby's skin is irritating to all babies more or less, though some do not show it obviously. Irritability and peevishness are often due to this cause, and many cases of skin irritation would be obviated if the material used were suitable for the tender skin of the infant.

The best all-round material for baby's petticoats, coats and nightgowns is the cheapest flannel. This is more porous and open in texture than expensive flannel, and not only shrinks less but is decidedly warmer, weight for weight, on account of the air imprisoned both in the meshes and between successive layers. It has the further advantage of being decidedly elastic, and in common with all woollens, does not harbour a chilly dampness like cotton.

HOW TO CLOTHE BABY

The following is suitable for fairly cool weather. Clothe next the skin with a cellular cotton or silk-and-wool singlet, to prevent irritation; over this put a soft knitted woollen vest, then put on the napkin; then a flannel petticoat, with a flannel bodice; and lastly, a light, porous gown, long enough to cover the feet. If the weather is very cold a knitted jacket may be added.

On very close, sultry days almost no clothing may be needed; but this is the very time when the mother or nurse must be most on guard for a sudden change of wind or weather.

Generally speaking there is a tendency to overclothe babies with the result that they become peevish, restless

and sleep badly. Too much clothing retards the baby's activity and vitality and renders him susceptible to colds. Under-clothing on the other hand is a great mistake and tends to retard growth.

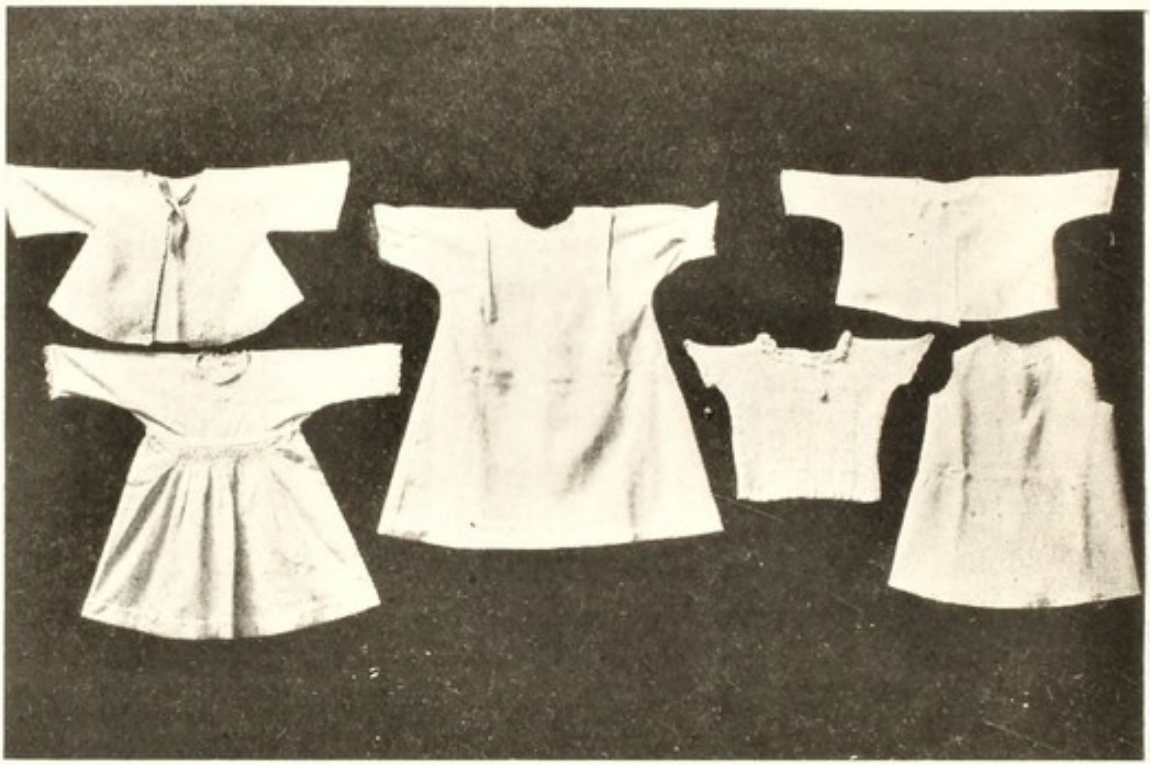


Fig. 21 Baby Clothing

(1) Jacket. (2) Frock. (3) Nightgown. (4) Knitted singlet. (5) Cellular shirt. (6) Petticoat.

Cotton Undershirt

The best material for this is thin, porous, elastic cotton or linen fabric, such as Aertex or Deimel. Cellular cotton can be washed and boiled without shrinking. It is inexpensive, very durable, non-irritating and airy. It keeps the body warm if properly covered with woollen wraps. Two yards of material make three shirts cut out of the width of the material. Sew a piece of tape along the front, near the edge of the garment, or better still a double piece of cellular material; this permits it to be caught in without tearing by the safety pin which passes through the napkin. Thus a chilly space between singlet and napkin will be avoided. Silk and wool vests may be used if desired.

Woollen Singlets

Over the cotton shirt put a soft woollen singlet. This can be made quickly and easily, using two-ply wool. Three ounces of wool will make two singlets.

Petticoat

This is best made straight and simply with no constricting band at the waist. It should be made of flannel or of viyella and may be fastened either down the back or on one shoulder.

Frock

Simple cotton crepe is a good material for baby's dress, but any light wool, cotton, or silk material can be used. The frock can be made either in magyar style or with a yoke, and should be long enough to cover the feet, i.e. about 20 ins. from shoulder to hem. Frocks may be simple or elaborate, according to the taste and means of the mother, but they should never be stiffly starched, or uncomfortably heavy, or too light and airy.

Coats and Jackets

These can be made of flannel for winter wear, to be worn over the frock on cold days. Silk or crêpe-de-chine is suitable for warmer weather.

Napkins

The napkin, though used as a protection to the clothing, is itself one of the most important of the baby's garments. If applied too "snugly" or tightly, or if allowed to extend down nearly to the knees, or if made too bulky and bunchy, the napkin hampers free exercise, and is liable to give rise to grave deformities of the pelvis and legs. To avoid these objectionable features, when the square napkin is folded into a triangle, only one thickness should be pinned up between the legs, the other being folded back under the buttocks.

Napkins are generally made of white cotton Turkish towelling. A dozen or so of soft muslin napkins for use in the early weeks will also be an advantage. These can be made of three or four thicknesses of butter muslin, and are useful in case baby's buttocks become sore or irritated.

The use of waterproof pilchers should be condemned. Baby's napkin should be changed directly it becomes wet or soiled, but if these pilchers are worn the napkin may be wet for some time before it is discovered. The waterproof pilchers thus act as a poultice, and are apt to cause irritation of the buttocks.

Nightgown

The nightgown is best made in magyar style with tucks on the shoulders to allow for added room as the child grows. Like the petticoat and jacket it should be made of flannel, wincey or viyella—**never of flannelette.** The length when finished should be 23½ inches.

Bootees

Bootees can be made from odd pieces of flannel—or these may be knitted. In fact it is a good plan for the mother who knits, to make a complete set of knitted garments—frock, pilchers, coat, bonnet and bootees to match.

Binder

The sole purpose of this temporary bandage is to keep the cord dressing in place until the scar is healed, that is for about a week or ten days. When the navel has healed the binder has served its purpose and should be given up. A soft, porous bandage five inches wide made of butter muslin is the best type of binder to use, as it is entirely non-irritating and is easily washed and boiled.

The common idea that the binder prevents rupture is entirely erroneous. The prolonged use of the binder may cause rupture, and will not prevent it. On the other hand it prevents the walls of the abdomen from becoming strong, and restricts deep breathing, even if lightly applied.

Head Covering

Thick woollen bonnets are very heating, and therefore bad for babies. The head covering, if any is used, should be cool, light, and porous. The heads and eyes of little babies ought to be shaded from strong direct sunlight.

Some mothers are in the habit of covering the baby's face with a thin, cambric handkerchief, and as a result a warm, moist, poisoned cloud of breath is kept hanging

immediately round the baby's nose and mouth. Summer or winter, day or night, such treatment of infants is unpardonable, even though the handkerchief be of the thinnest gossamer. The breath should be free to escape, and pure air should have unrestricted access to the baby at all times.

SHRINKING FLANNEL AND WOOL

All flannel and knitting wool should be shrunk before cutting or knitting up. Choose a good drying day. Fill a tub with cold water and immerse the uncut flannel in it for three or four minutes. Lift it out and hang it on the line dripping. Don't wring it or even squeeze out the water; peg it carefully to prevent it from getting out of shape.

Knitting wool should be treated in the same way. Immerse the skeins of wool in cold water, and hang them up dripping.

CUTTING OUT AND MAKING THE WOOLLEN GARMENTS

If carefully planned and cut out by the Plunket patterns eleven yards good so-called unshrinkable flannel (treated as described above) about 30 in. wide will be sufficient for:—

3 nightgowns (23½ ins. long).
3 petticoats (19 ins. long).
3 jackets (11½ ins. long).

Four flannel triangles—1½ yards, cheaper flannel may be used for these; it should be shrunk as already described. Cut two squares 27 ins. each, fold crosswise and cut into triangles. A half-inch hem is needed along the base of each triangle; crochet the other two edges with double crochet.

Gloves made of flannel, with or without the thumb, are useful, and permit the child to use his arms freely in cold weather without becoming unduly chilled.

WASHING WOOLLENS

All woollens garments must be carefully washed to keep them soft and a good colour; otherwise they become felted and yellow.

Make a very strong lather with soap (recommended for washing flannels) in about a pint of boiling water. Add this to a tub or basin containing one gallon of cold water. Add a teaspoonful of household ammonia if the garments are very dirty. Put them in and squeeze them through and through. If any parts are very soiled they must be lightly rubbed. If necessary wash again in fresh suds until clean. Rinse in plain tepid water, changing the water until the last rinsing is clear without sign of soap. Squeeze the flannels—don't wring them, but shake well and hang out to dry.

This process is the best for all woollens—shawls, knitted singlets, pilchers, blankets, etc.

It is a good practice to boil 8 ozs. of soap and 2 ozs. of borax with one quart of water. This forms a soap jelly, and is kept at hand to make the lather for washing flannels. The process of washing is carried out as described above. When borax is used no ammonia is required.

TO WASH NAPKINS

As soon as wet or soiled, put the napkins in a tub of cold water, and wash straight away, without soap unless soiled, when a little soap may be needed. Boil the napkins in plain water every day, rinse, and dry thoroughly in the open air if possible.

Never use soda, strong soap, or blue, because when baby wets a napkin so treated he will tend to become irritated, and soreness will result.

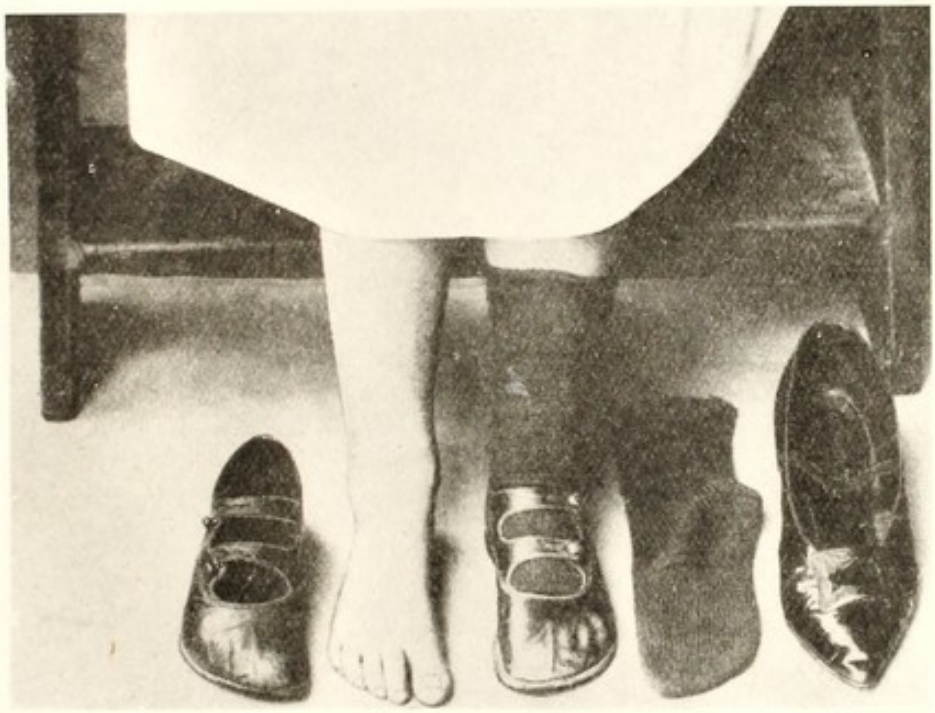
Never leave wet or soiled napkins lying about, and be very careful to wash the hands after handling them.

SHOES AND SOCKS

The question as to whether ordinarily strong children should have the legs and feet habitually clad, after they can walk and have become fairly active, is one on which there is room for difference of opinion; but there is no doubt that all very young or delicate infants should ordinarily have their feet, legs, and thighs clothed suitably, when they are being carried about, or when they are laid on a rug in the open air to kick for exercise. The skin surface of babies is so great in proportion to their size

that undue exposure of large areas is very devitalising, and is often a main factor in hindering growth, or retarding recovery. The stockings ought to be removed before tucking baby into bed (see "Warmth," pages 66-67, and "Exercise," pages 68 to 70.)

If children wear shoes they should be "rights" and "lefts" and should be made the shape of the natural foot, so that no deformities may be brought about. Shoes should be of a size that will allow for growth and activity. Baby's first shoes should have a pliable leather sole, but



B *A* *B* *C* *D*

Fig. 22 Feet and Shoes

(*A*) Normal foot of child, never deformed or cramped by ordinary shoes or socks.
(*BB*) Shoes properly shaped as lefts and rights.
(*C*) Sock properly shaped, being straight along the inner side, not pointed to the middle. The mother can as easily knit the right shape as the wrong.
(*D*) Ordinary girl's shoe, designed for foot deformed by wearing the usual wrongly-shaped shoes.

when the child is walking well a welted sole is best. Shoes should be light, strong, and flexible, adaptable to the natural outline of the foot, allowing of active in-toeing of the foot during walking. The toe of the shoe should be wide enough to allow the toes to move comfortably, and the inner border of the shoe should be straight to the point of the great toe. The heel should be broad and low,

not more than a third to half an inch thick. When fitting on shoes, allow the child to stand in them, and see that there is a little room to spare beyond the great toe. Choose a shoe with a firm back and one that fits securely round the ankle. If the strap is too loose the shoe slips up and down on the foot and is worse than useless to the child.

Socks also should be made with a straight inner border and not pointed to the middle line. Socks that have sunk with frequent washing should be discarded.

Shoes and socks should always be changed if damp.

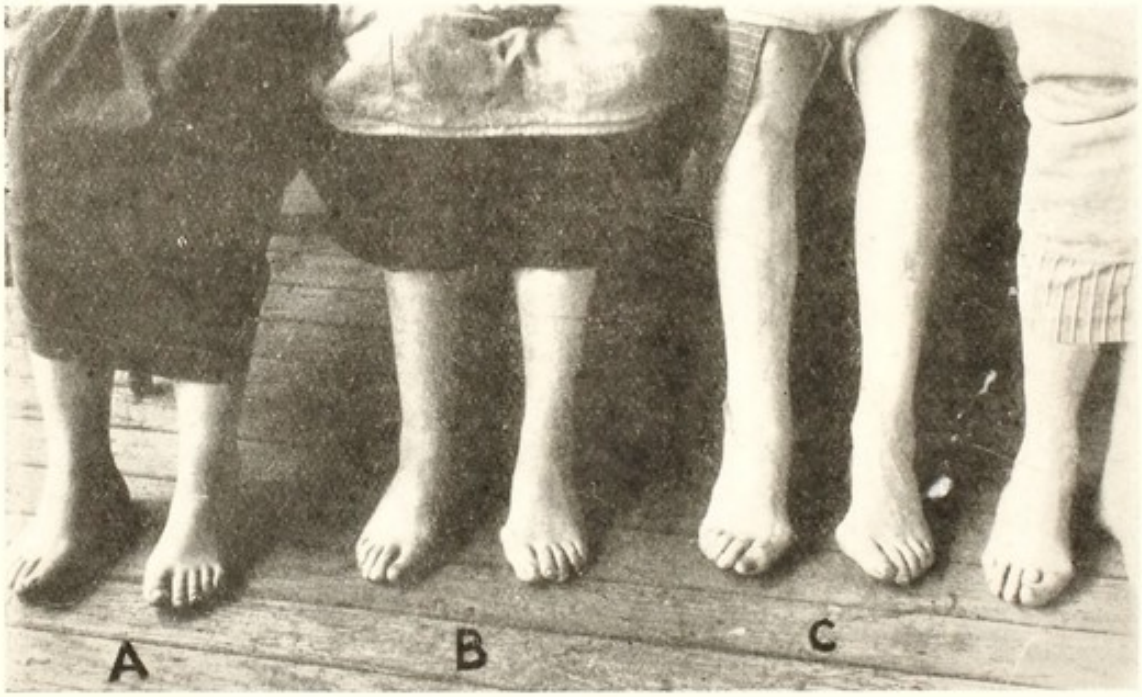


Fig. 23. Typical Feet of Civilization

(*A*) Feet markedly misshapen, but deformity much below average. (These comparatively undamaged feet belong to an imbecile, who has not had the opportunity of indulging her vanity!)
(*B*) Average civilized woman's feet.
(*C*) Excessive, but not rare, distortion.

We cannot too strongly appeal to parents to do all in their power to **protect the rising generation from the physical VICE of deformed feet. Let us start with the babies.**

WARMTH

It must always be kept in mind that a baby's skin-surface is three or four times as extensive in proportion

to his size as that of an adult; therefore when an infant is exposed to cool air he must always be warmly enough clad to prevent excessive escape of heat. Small dumplings cool quicker than big puddings. On the other hand, mothers tend to overclothe their babies in warm weather, thus making them delicate and over-sensitive to cold. The general tendency is to muffle up and overclothe babies rather than to underclothe them.

The gravest and the commonest mistake in the clothing of babies is careless sudden changing from one style of garment to another (*e.g.* arms and legs clad one day and exposed the next); changing from homely flannel to embroidered cotton finery for exhibition purposes, taking a baby out of a warm, stuffy cot indoors and wheeling him about in a push-cart, with bare arms and uncovered dangling legs. These are extreme cases, but there are few mothers who do not give their babies colds by serious, though less obvious, mistakes of this kind.

Hot Bottles

There are many occasions when a well-muffled hot bottle is the best means of making a baby comfortable; for instance, in cases of sickness where the feet tend to be cold (*e.g.* colic, indigestion, diarrhœa, etc), a warmed bed is a better sedative than any drug or soothing powder. However, the use of hot bottles may be overdone, and a baby may be rendered soft and delicate by habitual and unnecessary warming of the bed. None but delicate or sick babies need hot bottles—the healthy are better without them, unless occasionally and under exceptional circumstances. Further, much harm may be done in cases of sickness by leaving a bottle in the bed long after it has cooled down.

N.B.—Many babies are seriously burned by kicking the covers off hot bottles which have been carelessly muffled, or through the mufflings being too thin. Extreme care is needed. Indeed, the best plan is to place the bottle, well muffled, between a mattress and shake-down, where it will retain its heat and tend to keep up an equable temperature for a long time. It is a safe rule never to put a hot bottle in a position where the mufflings

can be reached by the baby's feet, because if the bottle is very hot it may burn the tender skin of infancy through several thicknesses of blanket.

CLEANLINESS

Cleanliness in everything with regard to baby is extremely important. This applies particularly to food, feeding utensils and clothing.

The mother's nipples must be kept clean by using warm, boiled water before and after nursing. If baby has any artificial food, the food and the feeding utensils must be kept scrupulously clean.

Soiled napkins must be removed from the room at once and washed. Even those slightly wetted should never be merely dried and used again—they must be washed. No soda should be used in washing napkins.

Hands which have come in contact with soiled napkins must be washed before again handling baby or his food.

Baby's clothing and bedding should always be clean and dry.

REGULARITY OF ALL HABITS

Regular habits for the baby are of first importance. A baby cannot be expected to thrive if his mother is not regular and punctual in the matter of all details in his daily routine.

Clock-like regularity of feeding, with intervals of four hours (or at least three hours) from the beginning of one feeding to the beginning of the next. There must be no night feeding.

Regularity of exercise, bathing, sleeping, etc.

Regularity of action of the bowels.

EXERCISE

Sensory and Muscular

Sensory exercise is most important, because it is what "runs us." It is the main source of the stimulation of all our bodily machinery, including even the voluntary muscles. The essential vital organs (nerve centres, heart, lungs, digestive and excretory organs, etc.) depend for

their activities almost entirely on stimuli coming to them through the sensory nerves: hence one cannot overstate the advantage of pure, fresh, flowing air day and night, and of open-air outings, especially in sunshine. Keep the skin active.

A large amount of exercise should be taken, from a very early age, in the form of vigorous sucking, kicking, waving the arms, etc., and later on by crawling. Every such activity should be encouraged. At least twice a day the infant should have for fifteen or twenty minutes the free, unhampered use of his limbs. In warm summer weather, if protected from wind by a screen, a fairly strong baby may be laid on a bed or rug in the open air on a sunny verandah, clad merely in a woollen shirt, long stockings, and napkin. Here he may be left to kick freely and enjoy himself for five or ten minutes. Then, if he

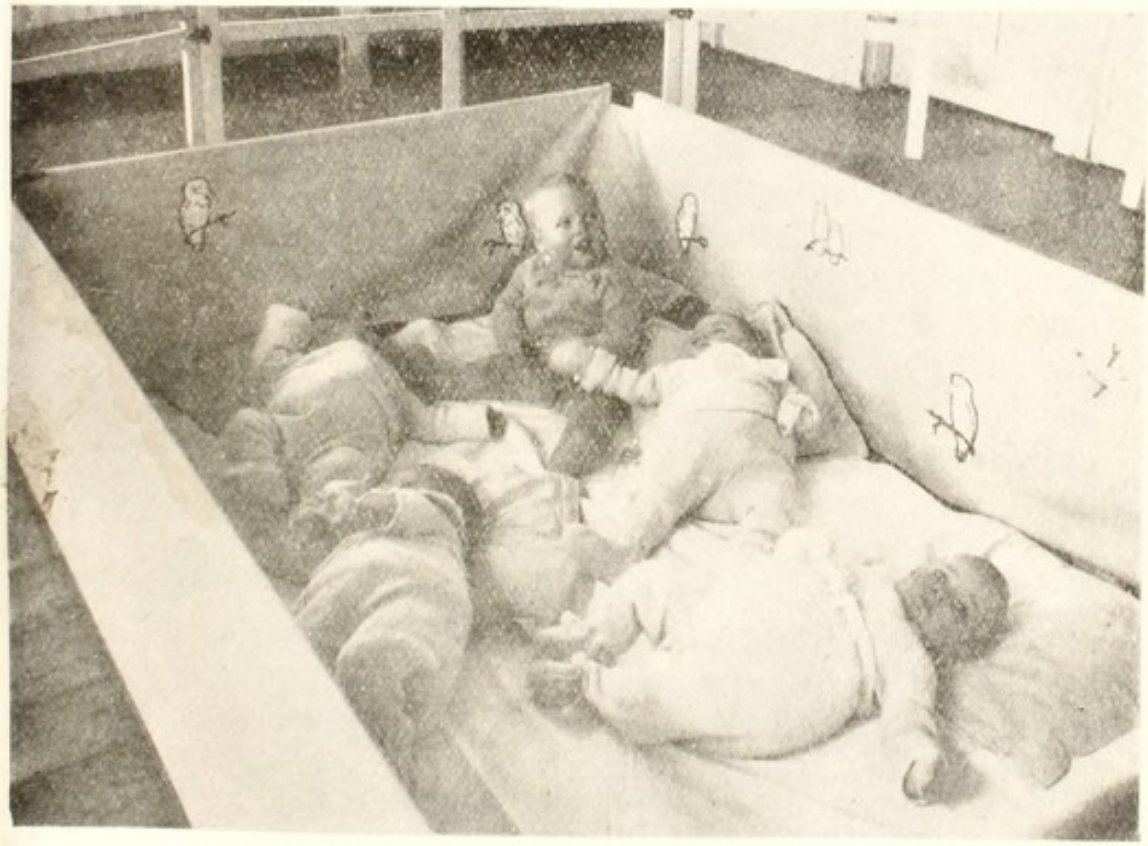


Fig. 24 Kicking Pen

This should be provided for every baby. Anyone can make a kicking pen. Four sides of an old packing-case, eighteen inches high and four feet long, jointed together by means of leather hinges cut out of old boots and fixed with tin tacks, suffice.

seems to be getting chilly, it is best to put on a light extra garment, when he may be allowed to kick for another five or ten minutes. A delicate baby would need more clothing from the beginning, except on a very warm day; but it is wonderful how soon such infants gather strength and resistiveness if properly treated, and how soon they cease to be chilly on moderate exposure. In good weather very strong babies may kick out of doors for ten minutes or more without stockings. On cold winter days such babies take no harm if allowed to kick in the open air with warm clothing and stockings on, and screened from wind or draught. As baby gets older, he learns to take more and more exercise; first, rolling and tumbling about, then crawling, and finally standing and walking.

The pen is best stood out of doors on a piece of cork-carpet placed on the floor of a verandah, or on a lawn, or in any other suitable position. Cork-carpet is preferable to ordinary carpet because the latter is so liable to be dirty, dusty, fluffy, and infested with microbes. All porous fabrics for floors are specially objectionable in the case of babies on account of their becoming wetted and fouled. The baby puts his mouth to everything, and being at the floor level, he also breathes in every impurity. In warm, dry weather the pen may stand direct on the grass, whereas when the weather is bleak, blustering and rainy, it may have to be brought indoors. Whatever the situation, the pen saves the baby from cold draughts coursing along the floor or at the ground level. It can be folded when not in use.

BATHING BABY

Before starting to undress baby every precaution should be taken to prevent loss of heat before, during, and after the bath.

Bath Time

The best time for bathing baby is usually just before the 10 a.m. feeding, although some mothers prefer to bath the baby in the evening. Provided one hour has elapsed since the last feeding, the time chosen for bathing

baby is unimportant, **but it should be the same time every day.**

The room should be warm and free from draughts. A screen should be provided if necessary. In cold weather a heater or an open fire is desirable.

Bathing Requirements

(1) Suitable bath; hot and cold water, bath thermometer, pure, castile soap.

(2) Dry, warmed towels, a set of baby clothing, arranged in the order in which they will be required.

(3) Bathing apron, bathing mat and a receptacle for soiled clothing.

Bathing Procedure

The bath should be prepared at 105 deg. F. so that by the time baby is undressed it will be 100 deg. F. Pour the cold water into the bath first; then add the hot water till the required temperature is reached. If no bath thermometer is available, test the temperature by dipping the elbow in the bath.

When everything is in readiness undress baby quickly, and wrap him in a warmed bath towel. Commence bathing by first washing the eyes, then the face, using no soap. Now, using a little soap, wash the scalp, being careful to rinse well, as any trace of soap left is liable to cause cradle cap or dandruff. Dry the head, paying particular attention to the ears and other creases. Cleanse the nostrils with small spindles of old linen, dipped in warm olive oil. The mouth of the healthy baby requires no special attention and on no account should it be wiped out. Now soap baby's body thoroughly and lift him carefully into the bath, as shown on page 72. When baby is taken out of the bath, he should not remain exposed but should be wrapped at once in a warm towel and dried rapidly by gentle dabbing movements, rather than by rubbing.

Great care should be taken in drying all folds and creases of the skin. Dusting powder is not necessary and if used at all should not be regarded as a means of drying the skin. If there is any redness of the skin a little simple ointment may be applied. After bathing, baby should be dressed quickly. There should be no delay or dawdling.

First the cotton, cellular shirt, then the woollen singlet and napkin, followed by the petticoat, dress and bib. A flannel coat, boots and gloves will be necessary in cold weather. Baby should be handled as little as possible, and all garments should be put on from the back of the head.

Attention to hair and nails is necessary to complete baby's toilet.

Fig. 25 Method of Lowering Baby into the Bath

Evening Toilet

This will consist in sponging the face, hands and buttocks, and a complete change of clothing.

Baby should have separate day and night clothing. The clothing can be worn more than once provided it is clean

and dry and that it has been pressed and aired each time it is used.

Night clothing should consist of cellular shirt and singlet, napkin, and nightgown.

Cool Sponging

After six months, baby can be educated to take a cool sponge after the bath. This is stimulating and invigorating, and teaches the child to take a cold shower later on in life. Begin with water a few degrees cooler than the bath, and gradually lower the temperature, until the water used for sponging is 60 deg. F.—say at the end of the first year. If baby becomes blue or cold discontinue the cool sponging for a time.

Cold Bathing

This should be begun as soon as the child is sufficiently strong to take really active exercise. Most children of two years, and some even younger, would be benefited if given a cold bath every morning, the following precautions being carefully attended to:—

(1) Gradually reduce the temperature of the water day by day. In ten days or a fortnight the bath can be taken quite cold. With a very young child, it is well to start in summer, and in any case to pave the way by standing the child with its feet in warm water while sponging with cool water, reducing the temperature of the latter each day until cold is reached.

(2) The child should be taken straight from its bed, popped into the bath for a few seconds, rubbed and dried well with a good linen Turkish towel, dressed very quickly, and taken for an active walk, run, or game (in the open air if possible) for not less than a quarter of an hour. The exercise must never be omitted, and should be made as active and pleasurable to the child as possible. Never allow a child to dawdle about either before or after the bath. **Cold bathing, followed by really active exercise, is a most invigorating and health-giving habit, and should be continued for life.**

Oil Bathing

For premature or very delicate young babies it is well to rub or bathe with oil, and not to use water until sufficient vitality and resistiveness have been acquired. Many delicate infants, who now die, would be saved if women understood how necessary it is to guard against any avoidable loss of heat in weaklings at the dawn of life.

Some authorities go further, and say that it should be a routine practice with all babies to use only the oil bath for the first week of life. We do not agree with this, being satisfied that bathing with warm water, rapidly carried out, acts as a pleasant, invigorating stimulus in the case of a normal healthy baby. But this is not so with chilly, delicate infants—they are depressed, not stimulated, by the ordinary bath, and oil should take the place of water until a normal blood temperature has been established and improved nutrition and vitality have been built up. Then warm water bathing may be started, beginning with partial sponging followed by rubbing with warm oil—thus the mother may work up to the daily warm bath in a few weeks.

The mother is strongly advised to re-read section "Warmth," page 66 at this stage.

Care of the Cord

Modern medical opinion does not favour complete immersion of the baby at the daily bath until the navel string or cord has fallen off. A shallow bath is used at first. In private houses the simplest and safest way of dealing with the cord is as follows:—Have in readiness a supply of soft old linen or cotton cloth which has been perfectly cleansed, boiled, dried and kept covered. Divide some of the linen into pieces about 6 ins. by 3 ins., cut a hole out of the middle of each piece, such as would admit the tip of the finger, and cut a line to this from one corner.

After thorough cleansing of the tied stump of the cord and adjacent skin with methylated spirit, paint the area round the cord with tincture of iodine. Then take two of the pieces of linen and place them with the central holes

at the navel and the cord protruding through. Wrap the upper piece of linen neatly round the cord. Turn the dressed cord upward on the abdomen where it will lie snugly on the under piece of linen and will be covered and kept in place by the putting on of the binder.

This careful cleaning and dressing should be repeated daily, until the stump comes off; the raw scar should then receive similar treatment until quite healed.

Care of the Mouth

Should the baby's mouth be wiped out daily as a routine measure before the teeth are cut?

Certainly not! This is a point about which there need be no doubt whatever in spite of the contrary advice often given. There is no more need for meddlesome interference with the mouth of a nursling than there is for meddlesome interference with the lower bowel. One might imagine that the bowel might be better for a daily purifying by means of an enema, but it is strange that it should have occurred to any one that the pure mouth of a healthy baby needs cleansing from without, seeing that it is naturally irrigated many times a day by the best mouth wash—viz. the saliva. Swabbing out the mouths of young babies is a common cause of ulceration and "Thrush."

Care of the Eyes

New-born babies are liable to grave inflammation of the eyes which may cause blindness. This is due to infection with discharges from the mother's passages. Therefore cleanse the eyelids and surroundings with special care immediately on birth.

Don't attempt to separate the lids, for fear of abrading the eyeballs and carrying in impurities. With the aid of a piece of "surgical gauze," or cotton-wool, or perfectly clean boiled rag, and plenty of warm boiled water, cleanse the lids thoroughly.

If preferred, "boric lotion" may be used, or a doctor may prefer a stronger antiseptic—but perfect cleansing is the first essential.

On the slightest sign of redness or swelling about the eyelids—especially in the first week—or on any sign what-

ever of mattery discharge, call in a doctor at once, as immediate active treatment would be needed.

The discharge from an inflamed eye can infect other eyes, so the utmost care must be taken not to risk carrying, by fingers, towels, etc., any impurity from the bad eye to the sound eye of the baby—or, indeed, to any one else's eye.

During the first week baby bears light very badly. He soon likes fairly strong diffused light, but must be protected from glare (see Pram-hoods, etc., page 55).

MOTHERING AND MANAGEMENT

Natural Mothering and Moderate Handling Beneficial

Babies who are allowed to lie passively in their cots and who do not get sufficient "mothering," tend to be pale, torpid, flabby and inert. An infant should never remain in its cot continuously in one position. Not only should the position in the cot be changed from time to time, but the baby should be picked up at regular intervals and carried about. The stimulation afforded by natural handling is beneficial and necessary, but much harm is done by excessive and meddlesome interference and undue stimulation.

HANDLING THE BABY

Injudicious or Excessive Handling or Stimulation Highly Injurious

Where there are many callers, a first baby is apt to lead the life of an infant prodigy in a side show, decked out for exhibition half its time, and always at hand for special performances before special visitors.

The putting-up of food or "**regurgitation**" by babies soon after feeding is generally attributed to the nature or quantity of the milk or the manner of feeding, but in reality there may be little or nothing wrong with the food or with the times or system of feeding. Mother and nurse often bring on regurgitation by handling a newly-fed baby carelessly (fondling, rocking, jogging, or jolting him), instead of gently putting him into his cradle. It is true that if an infant is subject to colic, he may benefit

by being carefully sat up for a few minutes just after feeding (or even in the middle of the meal) to enable the wind to come away, but he should not be jogged or patted after a meal. Indeed, habitual patting on the back, done at any time of day, is highly injurious. Many women thoughtlessly and almost mechanically pat a baby to soothe him whenever he is uncomfortable or fretful, and in this way they may insidiously bring on serious indigestion accompanied by inability to keep down a sufficiency of food.

Considering how readily sea-sickness, train-sickness, or swing-sickness is induced in adults by infinitely less disturbing movements, one cannot wonder that infants often become profoundly upset by injudicious handling. If a woman's whole aim were to induce vomiting, she could not set about it more scientifically than when, picking up her baby and deftly balancing it face downwards with the belly and chest supported on her open palm, she proceeds rapidly to pat the back with the other hand, thus subjecting the stomach to a series of direct concussions and squeezings while the head dangles over her wrist.

Apart altogether from the manifest absurdity of this particular practice, every woman should realize that any form of jolting, swinging, rocking, or concussion may induce giddiness in babies just as it would in adults, and thus indirectly upset the stomach through the nervous system. Babies have been sent to our Baby Hospital suffering from emaciation, vomiting, and grave nervous debility, due almost solely to this one factor. The same mother has been known to encounter similar difficulty in rearing child after child, and has arrived at the conclusion that her progeny had some grave inborn tendency to vomit, until the contrary was proved by removing the latest arrival to the charge of a quiet, sensible, trained baby nurse.

Treating Babies as Playthings

The following quotations from leading authorities may be of some avail in preventing young mothers from treating their babies as mere interesting playthings, or allowing others to do so. This does not mean that babies

are not to be allowed to play or to be judiciously played with. Play is the natural, joyous, overflowing expression of child life and activity, and as such should be encouraged; but the baby's earliest play should be mainly with **his first playmate — himself — his own feet** (see "Milestones on Baby's Road," page 174, 5th to 7th month).

N.B.—Never play with and excite a baby before bedtime.

> "What are the principal causes of excessive nervousness in infants and young children, and what can be done to prevent this? The most important cause is the delicate structure of the brain at this time, and its rapid growth. It grows as much during the first year as during all the rest of life. This requires quiet and peaceful surroundings. Infants who are naturally nervous should be left much alone, should see but few people, should be played with judiciously, and should never be quieted with soothing syrups or 'the comforter.' The latter, of course, applies to all children.
>
> "What harm is done by playing with very young babies? They are made nervous and irritable, sleep badly, and suffer from indigestion and in many other respects." (Professor Holt, Columbia University).
>
> "Rocking of infants should be discouraged. This subject should not be dismissed without reference to a practice that is as pernicious as it is common—viz., the custom of regarding the baby as a plaything, an animated toy for the entertainment of the family, as well as a large circle of admiring friends. Children are fond of babies and never tire of stimulating their funny performances. The same is unfortunately true of parents and friends. From a purely economic point of view such amusement is exceedingly expensive, and the mortality is constantly increased for the amusement of the elders. Nervous and mental wrecks too frequently owe the origin of their disorders to want of repose in early infancy, due to injudicious stimulation. In this connection let it be understood that all evidences of mental precocity, called 'smartness' should be regarded as danger signals, and call for repression rather than encouragement." (Dr. Cotton, University of Chicago.)

Parents should never lose sight of the fact that infinite harm is done by ignoring the delicate and highly sensitive nervous organization of infancy; that theirs is the most sacred trust and privilege in the world—to mould the body and shape the destiny of a new human being, intended for a century of health and happiness here, and eternity hereafter. Half the irritability and lack of moral

Fig. 26. Nurse Imitating a Fond Relation

How a fond relation may make a baby habitually smile and "perform" until his nervous system becomes so irritable and hypersensitive, that he can neither rest, sleep, nor digest his food.

control which spoil adult life originate in the first year of existence. The seeds of feebleness and instability sown in infancy bear bitter fruit afterwards. "For the ordinary family ill-health and instability mean unemployableness; unemployableness means morbid thought and feeling; and morbid thought and feeling mean loafing, vice and crime."

Lifting and Carrying Babies

These seem to be very simple matters, but many serious injuries in the way of dislocations, fractures, and deformi-

Fig. 27 Carrying the Baby

A. Correct and comfortable way. *B*. Wrong and uncomfortable way.

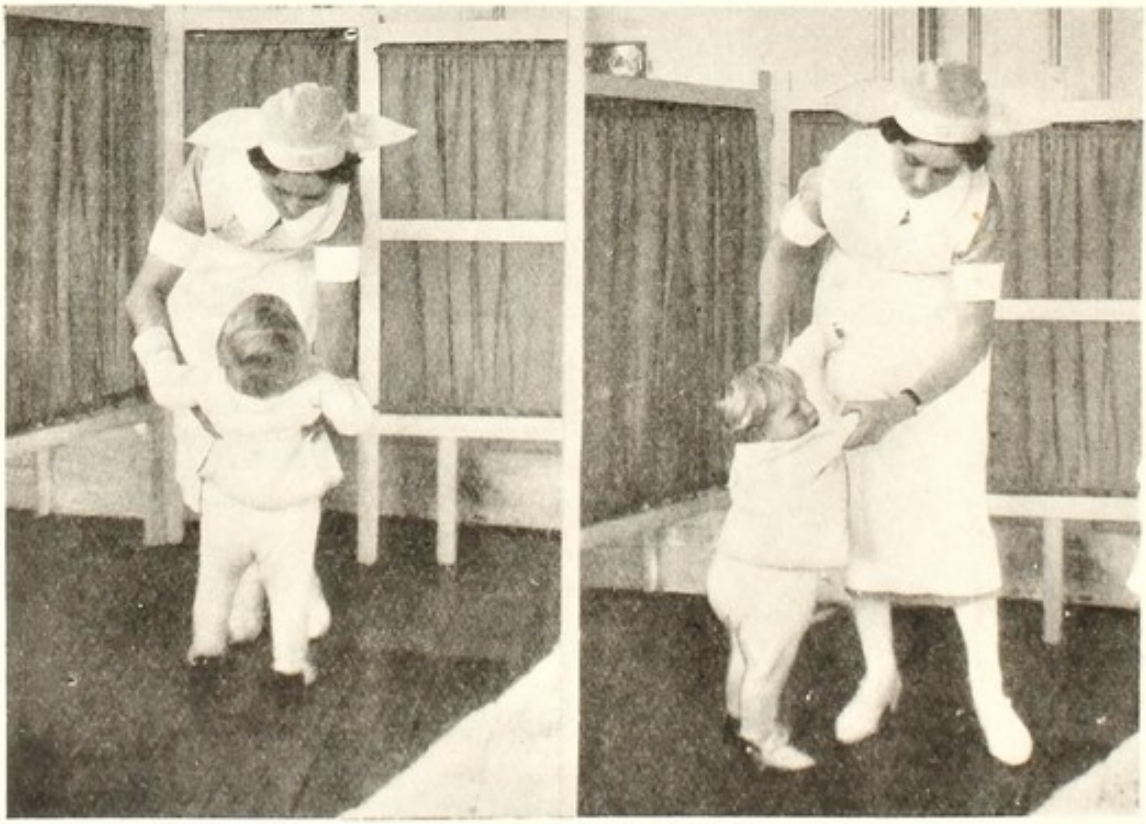


Fig. 28 Lifting Children

Right way Wrong way

ties are due to women not learning how best to lift or carry children. The so-called "bones" of little children are very fragile and easily distorted or broken, being largely made up of cartilage; hence the need for special care. One often sees a woman forcibly swing or drag a child by one arm. Fig. 28 very feebly illustrates the action, because the nurse could not be induced even to simulate the common practice.

SLEEP AND REST

A baby needs abundance of sleep. A newly-born baby normally sleeps nine-tenths of its time. At six months it should sleep two-thirds of the time. If it is sleepless, it is uncomfortable, owing most probably to its being dyspeptic, irregularly or too often fed, overfed or hungry, wet and cold, or oppressed by excess of bedclothing and overheating; or the nursery may be insufficiently ventilated; or baby may be suffering from thirst or irritation of the skin.

Children should be put to bed regularly at a reasonable hour.

It is well to continue the morning sleep or rest until the child is five or six years old, especially during the summer, when children wake early. This can easily be accomplished if there is a little firmness on the mother's part. A short sleep or rest restores a child wonderfully, and the result is that there is no crossness or fatigue at the end of the day.

Artificial Feeding

> It is wiser to put up a fence at the top of a precipice than to maintain an ambulance at the bottom.

Before describing artificial feeding, it is desirable to state emphatically that no system of bottle-feeding can ever give to either mother or child the advantages which both derive from suckling. Human milk cannot be made outside the human body. We can approach it in composition by carefully modifying the milk of some other mammal, but the imitation cannot be made identical with

the original, and must always be inferior to it. Nothing can rival milk drawn direct from the breast into the baby's stomach—pure, fresh, living, blood-warm, and uncontaminated by germs. Modified milk is superior to any other form of artificial food, but it is not human milk; and the best glass and india-rubber feeding-bottle is a troublesome, unclean, clumsy contrivance compared with the living breast.

Every infant who cannot be suckled in the natural way is entitled to receive properly modified milk.

In ordinary times, fresh cow's milk can easily be adapted for infant feeding by dilution with water to reduce the indigestible curd to less than a half, and then by the addition of sugar and fat to raise these components to the standard of human milk. Sugar of milk or Karilac are suitable forms of sugar, and Kariol, cod liver oil or cream may be used to supply the fat, though when the cream of cow's milk is used for this purpose, some cod liver oil is also required in order to supply the necessary "fat soluble" vitamins. Milk modified in this way, so as to make it approach in composition as closely as possible to mother's milk, is known as "humanised milk," and the same term is applicable to any preparation in which a reasonably close approximation is made to human milk. Cow's milk is right for the calf but not for the baby, unless the milk is specially modified so as to fit it for the young human being. The same applies to condensed and dried milks. If used for feeding a baby in the first year, they should be specially modified for the purpose. Various formulae for humanised milk are given (pages 102-112). All are of practically the same strength. Any one of the formulae can be used, and they can be interchanged to meet varying circumstances. Not only does the "Table for Feeding" (page 100), apply equally well to all formulae but also the remarks under the headings of "Practical Hints" (page 94), and "Feeding Details" (page 123). Before beginning to make any of the preparations the whole of pages 97-8 should be read over carefully, because the general principles and precautions, and the instructions as to heating and rapidly cooling milk and keeping it protected, clean and cool, etc. apply throughout.

The chart given on page 84 is one of the greatest incentives to breast-feeding, showing how Nature prepares the only perfect food for the baby, and how essentially different are the milks designed for other mammals.

The four colours show the elementary components of all foods—namely, fat, yellow; protein, red; sugar, blue; water, shaded.

The chart shows the remarkably different proportions in which the four essential elements are present in a hundred parts—(say, 100 ounces, or five pints)—of the milk of the whale, the human being, the cow and the rabbit.

MAIN PURPOSES SERVED BY FAT, SUGAR AND PROTEIN

Fat

Fat or oil is needed in food for the same reason as it is needed in a stove. Though the body is "wet through," fat is being burned in our bodies all the time, mainly in order to keep up "animal heat"—just as oil may be burned to heat a room or for cooking purposes. Without this constant supply of heat, our bodies would cool down to the temperature of the air, instead of keeping constantly at about 100 degrees Fahrenheit.

For young animals living in the air, such as the human baby, the calf and the baby rabbit, from three to four ounces of fat in 100 ounces of milk suffice—summer or winter; but for a baby whale, living in cold water, which robs the body of its heat twelve times as rapidly as air, Nature puts twelve times as much fat into the food—viz., 45% instead of 4%. Almost half of whale's milk is an oily fat.

There is a common idea that milk is **just milk**—that the milk of one creature is very much the same as that of another, and can be used in its stead. There can be no more fatal mistake. No mother knowing the nature and composition of whale's milk would dream of feeding her baby on what Providence has designed for so different a purpose!

Sugar

Sugar or starch serves mainly to supply us with the power or energy needed to "live our lives" or to do work—such as mastication, digestion, secretion, excretion, breathing, the pumping of the heart, walking, talking, fighting, feeling, thinking, loving and hating.

The baby is more energetic, and has a wider field of action than a calf, and Nature provides for this by allowing 2% more sugar-of-milk in human milk than in cows' milk. Yet one of the worst things you can do for a child is to give too much starch or sugar, or to allow sweeties or "pieces" between meals.

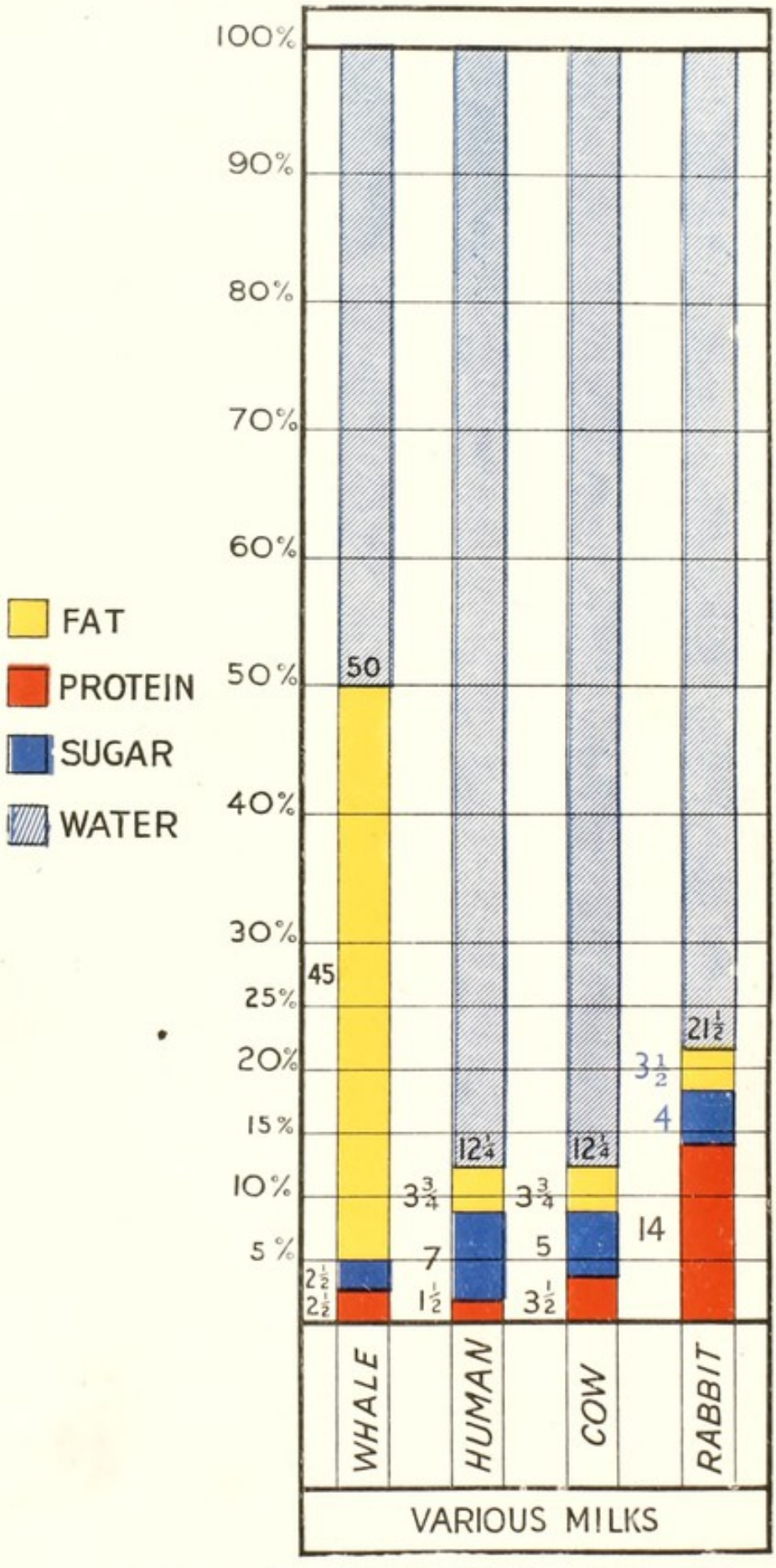


Fig. 29 Comparison of Milk of Different Mammals

Protein

The essential purpose of the "**protein**" or "**flesh-forming element**" in food is to supply the material out of which all parts of our bodies are built and repaired. Protein is the universal "building material" of the body, and whatever animal structure has to be made, it must be made out of protein. Even the bones and teeth, which seem to be merely mineral, are in reality fashioned out of a kind of tough protein gristle, infiltrated and hardened with lime salts.

Why does Nature put only 1½% of protein into mother's milk, 3½% into cow's milk, and 14% into rabbit's milk? Why does she allow the baby rabbit so much and the human baby so little?

The baby rabbit is intended to double its weight in a week; the human baby takes six months to double his weight; while the calf takes about two months. Human milk would be as unsuitable and damaging to a baby rabbit as rabbit's milk would be to a human baby—but unmodified cows' milk is only a stage less injurious to either.

Cow's milk is made expressly for a calf. Human milk is made expressly for a baby. The calf has a huge stomach, consisting of four compartments, which enable it to digest coarse curd. This substance is almost absent from human milk. The baby has one tiny delicate stomach. Not only does Nature put from two to three times the quantity of protein into cows' milk, but the protein is present in the form of a crude, tough curd, which the calf can readily digest, but which overtaxes the baby.

Water

Water is the great circulating medium, and is the main constituent of every living cell and tissue. Babies will wilt and die, just as plants do, if not kept properly supplied with water.

The explanation given here as to the rôles played by fat, sugar and protein respectively, is not intended to be exhaustive. All three yield heat when oxidised. The outstanding features are given without any attempt to indicate how far one food element may be able to take the place of another. Further nothing is said with regard to salts, enzymes, etc.

VITAMINS

It is not the purpose of this book to do more than give a little concise information as to what vitamins are, and their significance, in so far as they are of special importance for the health of mother and baby. Only those vitamins which are at all likely to be deficient in the diet, or are likely to be destroyed or impaired in the preparation of food, are mentioned here.

It has long been recognised by students of dietetics that the artificial preparation of food in some way impairs

its nutritional value. Within recent years research has shown that certain foods, in addition to containing protein, fats and carbohydrate, mineral salts and water, contain also certain "vital elements" of more or less unknown composition, which are known as "accessory food factors" or vitamins. It has been shown that the presence in the diet of adequate supplies of the various vitamins is necessary for perfect health, and that the absence of certain of these vitamins gives rise to disorders of nutrition which are called "deficiency diseases."

Among such diseases which may affect infants and which are concerned with vitamin deficiency are two of special interest to parents namely, rickets and scurvy.

Vitamins and the Expectant and Nursing Mother

Unless the food of the mother contains a correct proportion of vitamin containing foods, her own health and that of her child is likely to suffer. However, it can be said at once that if an expectant or nursing mother follows the ordinary simple rules of proper hygiene and takes plenty of healthy exercise in the open air, and eats plenty of plain wholesome food, containing milk, butter, eggs, fruit and vegetables, **there is no chance that she or her baby will lack any of the necessary vitamins.**

Nowadays various extracts and concentrated preparations of vitamins have been placed on the market and it cannot be too strongly emphasised that the **indiscriminate** taking of these vitamin preparations is unnecessary and not without possible danger, and they should only be taken at the express instruction of a doctor.

Proper diet and hygiene on the part of the nursing mother will ensure that her milk will contain all the necessary vitamins for her baby, and the giving of such extras as cod liver oil and orange juice, as a routine, to a normal baby, suckled by a normal healthy mother, is not only quite unnecessary but often leads to upsets in digestion. (See "Diet of Nursing Mother," page 8.)

Vitamins in Artificial Feeding

Here the question of sufficient vitamins is of great importance. The absence of vitamin C in the diet causes

scurvy. Vitamin C is affected by heat, and nowadays when practically all milk used in artificial feeding, whether fresh, condensed or dried, is subjected to heat, the vitamin C content is either destroyed or impaired to a greater or less degree. Therefore it is necessary to replace this by giving vitamin C in the form of fresh fruit or vegetable juice.

Fruit and Vegetable Juice

In all cases of artificial feeding give a little fresh fruit juice daily to infants from six weeks onwards, to compensate for the something that may be wanting in any prepared food. Orange juice is best, but the juice of apples, tomatoes, carrots, etc., may be used. Make sure that no part of the fruit is doubtful or unsound. Prepare the juice immediately before use, and strain carefully so that no solid particles may be included. Fruit juice is best given about midway between meals, when baby is awake, and should be diluted with twice its volume of water which has been boiled and allowed to cool.

The fruit juice may be begun at any time after six weeks, starting with five drops daily, increasing at first by a drop or two a day, and later by half a teaspoonful to a teaspoonful or more a month. At a year old a child may have an ounce or more twice a day.

It would not be wise to use the juice of very sour fruit, such as lemon, in large quantities or continuously. Where the daily use of fruit juice is not practicable, it may be given in rather larger quantities once or twice a week with advantage; but great care must then be exercised not to upset the digestion or cause diarrhœa. Where fruit is not obtainable, the juice of raw carrot, potato, beet or swede turnip may be used. They should not be peeled but should be properly cleansed and dipped in boiling water for a few seconds before expressing the juice, so as to prevent giving the baby any living germs from the soil. They should be grated and squeezed through fine muslin. The juice should be diluted as in the case of fruit juice.

Other vitamins likely to be lacking in the artificial food for baby are vitamins A and D, which are contained in

certain fats and oils, such as the cream of all fresh milk—animal or human—certain fish oils, egg yolk and many vegetables.

Vitamin A is said to be essential for perfect growth and nutrition, and is believed to increase the resistance of the body to infection. It is present in cod liver oil in large quantities and also in whole milk and certain vegetables, such as spinach, cabbage, tomatoes and carrots. A deficiency of vitamin A may lead to imperfect growth.

Vitamin D is usually found in association with vitamin A. It controls the use of calcium and phosphorus in the body and though there may be ample calcium and phosphorus in the food they cannot be properly utilised without sufficient vitamin D. Deficiency of vitamin D is one of the causes of rickets and dental caries.

Vitamin D is supplied in two ways:—

(*a*) By being present in the food.

(*b*) By being manufactured inside the body by the action of direct sunlight on a substance in the fat under the skin.

Vitamin D is present in large amounts in halibut oil, cod liver oil and also in many other fish oils, and also to a lesser extent in milk, cream and egg yolk.

Chiefly owing to the dilution of cow's milk in preparing it for baby feeding the amount of vitamins A and D falls below the necessary level for the baby's needs.

The artificially-fed baby receives **ample** supplies of vitamins A and D from the cod liver oil and butter fat contained in "Kariol" (New Zealand Cream). Cow's cream as a source of vitamins A and D is unreliable, and every baby who is artificially fed should receive at least a teaspoonful a day of pure standardised cod liver oil, or its equivalent in the form of an emulsion such as "Kariol."

N.B.—Remember also that sun bathing is one of the very best means of providing baby with extra vitamin D and that direct sunlight on the skin is an absolute necessity for **all babies,** whether naturally or artificially fed.

INGREDIENTS USED IN THE PREPARATION OF ARTIFICIAL FOOD FOR INFANTS

Milk

Milk should be fresh and obtained as soon after milking as possible. Milk secured from a mixed herd of healthy cows is more reliable as regards equality of composition than the milk of a single cow. The cows should be tuberculin tested.

The milk of various breeds of cows differs in its suitability for modification for infant feeding. In general it may be said that the milk from a Friesian, Ayrshire, or Shorthorn herd is more suitable than that from a Jersey herd as the milk from the latter breed has an unduly high fat content and forms a somewhat harder curd.

Absolute cleanliness should be observed in all stages of handling of the milk, from the cow's udder to the baby's bottle.

Milk should be cooled immediately after milking and kept clean, cold and covered until delivery. If possible it should be delivered in sealed bottles. Any milk that has been left standing without having been rapidly cooled down, covered to keep out falling particles, and kept below 60 deg. F. is quite unfit for infant feeding.

Karilac

This is a set of graduated sugar mixtures (numbered from 1 to 3) consisting of sugar-of-milk and refined dextrine and dextrose specially prepared for systematically grading the sugar-element in the baby's food up to the full standard for artificial feeding. Karilac also renders the crude casein of cow's milk more effective and digestible, and thus does away with any need for using lime water. This is brought about mainly by including in the Karilac about five per cent. of pure, granulated, edible gelatine.

Composition of Karilac

Karilac No. 1—

Sugar-of-milk, 60 per cent.
Dextri-dextrose, 35 per cent.
Fine granulated gelatine, 5 per cent.

Karilac No. 2—

Sugar-of-milk, 70 per cent.
Dextri-dextrose, 25 per cent.
Fine granulated gelatine, 5 per cent.

Karilac No. 3—

Sugar-of-milk, 80 per cent.
Dextri-dextrose, 15 per cent.
Fine granulated gelatine, 5 per cent.

The 5 per cent. of gelatine given in all grades of Karilac not only makes the curd softer and more floeculent, but tends to promote nutrition and growth by lessening waste of protein and allowing its fuller use for tissue building. This has been fully realized in the last few years, but the advantage is manifest.

Dextrose is not only the most easily and quickly absorbed form of sugar: it is the type into which all other sugars (including even sugar-of-milk) have to be converted before they can be made use of in the human body. Dextrose is the only sugar used by surgeons for injecting into the blood vessels in order to supply immediate nutriment in emergencies, to prevent collapse and sustain life.

It has been proved that delicate, emaciated babies will readily absorb and make full use of one and a half times as much sugar, if some of the carbohydrate is given in the form of pure dextrose than if restricted to sugar-of-milk. Hence the advantage of starting artificial feeding with some dextri-dextrose and only gradually bringing up the sugar-of-milk to Nature's standard.

Speaking generally, the packet of Karilac lasts nearly a fortnight, and the simplest routine advice to give is to use in succession a packet of Nos. 1 and 2; and then, if all goes well, to give No. 3, say, to the end of the first year.

It is found that some babies, especially prematures, cannot tolerate more than two per cent. of fat for several months after birth. This being so, and the calorie value of fat being more than twice that of sugar, it is desirable to compensate for shortage of 1½% of fat by at least 3% of sugar—thus making the sugar up to 7 + 3 = 10 per cent.

This proportion would never be safe in the form of lactose, which should be kept at or below the normal 7%. An addition of 3% of carbohydrate in the form of dextri-dextrose may be relied on, as not only safe but conducive to satisfactory increase in nutrition and growth in difficult cases.

In order to enable the physician to prescribe the desired percentage of dextri-dextrose, to compensate for shortage of fat, and at the same time not to raise the lactose above 6 or 7%, the Karitane Products Society issues to chemists (not for use by the public) **Karilac "A,"** composed as follows:—

Dextrose, 40%.
High solubility white dextrine, 30%.
Sugar-of-milk, 25%.
Gelatine, 5%.

Milk Sugar

This is the natural sugar extracted from milk in the form of a white powder. It is easily digested, resists injurious fermentation, and tends to check putrefaction in the contents of the intestine. Where cane sugar is substituted the risks of fermentation, indigestion, and diarrhœa are greater, especially if it is used for long and in undue proportions—as in the case of sweetened condensed milk. When a baby is ill the use of some malt sugar is sometimes a temporary advantage, but this is a medical question.

Kariol

The author has devised an artificial cream for use in the preparation of humanised milk. Kariol, formerly known as Plunket Emulsion or New Zealand Cream, affords the best, simplest, and safest means of gradually bringing the fat element up to the full standard in humanised milk. It consists of very finely homogenised fats and oils, emulsified along with dextri-dextrose and lactose; the object being to arrive at a standard emulsion, most closely resembling the fat of human mother's milk.

Kariol, which is shipped to many parts of the world, has now been perfected and standardised, and it keeps indefinitely with its good qualities unimpaired. It is

emulsified in an atmosphere of nitrogen gas to prevent oxidation of vitamins.

There is generally great difficulty in getting young babies to tolerate and digest a normal quantity of fat, when given only in the form of the fat of cow's milk, though they can readily be trained to take their proper fat allowance if a fair proportion is given in the form of the most suitable complementary fats and oils, in a very fine state of subdivision—including nearly 30 per cent. of cod liver oil. The preparation named Kariol, which is the one recommended for universal use, contains about—

50 per cent. **fats and oils**—mainly cod liver oil and butter-fat.

40 per cent. **sugars**—mainly dextrose.

10 per cent. of **water**—therefore the preparation being as dry as flour or oatmeal, neither needs nor contains any preservative. It will keep indefinitely.

COMPARISON OF N.Z. EMULSION WITH BOUGHT CREAM AND WITH TOP MILK, FOR USE IN PREPARING HUMANISED MILK.

	N.Z. Emulsion ("Kariol")	Bought Cream	Top Milk
Convenience	Food can be prepared directly milk arrives. Ready for use. Keeps well.	Must be got fresh every day. Generally more or less delay in procuring.	Takes 5 to 7 hrs. to rise. Must be prepared every day. Long delay.
Composition	Uniform, definite, reliable.	Tends to vary greatly; unreliable.	Varies more or less.
Contamination with Germs	Safe from bacteria. Contains no drugs.	Commonly laden with preservatives or bacteria.	Bacteria increase during setting.
Suitability for Supplementing Fat in Diluted Cows' Milk	Specially suitable because infinitely fine subdivision of homogenised fats facilitates digestion. Rich in vitamins A and D.	Fairly suitable if fresh and good, but young babies have difficulty in digesting their normal allowance of fat in the form of cream.	Difficult to establish toleration of full fat allowance.

The Karitane Products (Karilac, Kariol and Karil—are obtainable at the following places:—

New Zealand—All branches of The Royal N.Z. Society for the Health of Women and Children (Plunket Society).

London—Mothercraft Training Society (Babies of the Empire), Cromwell House, Highgate, N.6, and Branch Centres.

Sydney—Australian Mothercraft Society (Truby King System), 283 Elizabeth Street, and "Karitane," Nelson Street, Woollahra.

Melbourne—Tweedle Hospital (Truby King System), Footscray. The Infant Welfare Centre, Coburg, etc.

Tasmania—Baby Clinics, Hobart and Launceston. Mothercraft Home, Hobart.

South Africa—Child Life Protection Society, 127 Bree Street, Cape Town. Lady Buxton Home, Claremont, C.P. Child Welfare Society, Arcade, Port Elizabeth.

Canada—Canadian Mothercraft Society, Toronto.

The origin of the names Kariol and Karilac was the fact that the word "Karitane" (a Maori name) was applied to all the Plunket Society's Baby Hospitals in New Zealand and to similar hospitals established elsewhere. Our primary clinical experience and knowledge in connection with the use of our preparations was naturally gained in these institutions. The composition of the preparations was always freely given, and there never was, and is not now, anything to prevent their being dispensed by any chemist.

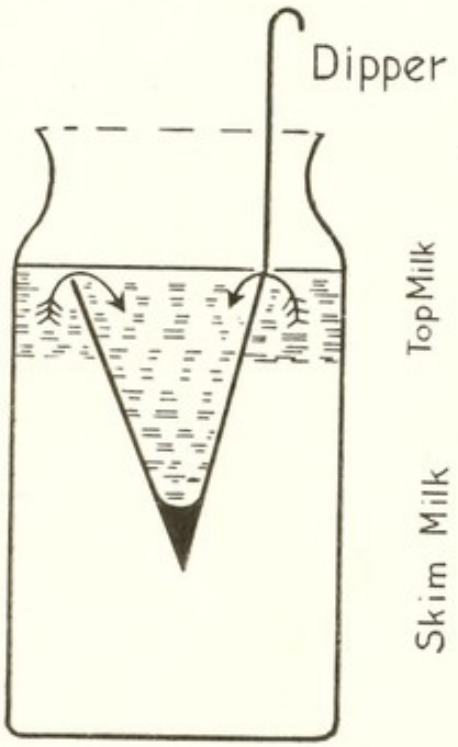
"Registration" of the names Kariol and Karilac, as standard preparations guaranteed by the Plunket Society, was considered advisable years ago; because it ensured and facilitated uniformity, and greatly simplified matters all round for Child Welfare Nurses ("Plunket Nurses"), and for the mothers whom it was their mission to visit and help.

Top Milk—(for use when Kariol or cod liver oil is not available)

"Top Milk" is not cream. The strongest recommended herein is only about three times as rich in fat as unset cow's milk. It is got by removing the upper fourth or upper third (according to the particular recipe used) from a tall, narrow jug or jar of milk, which has been left standing in a cool safe for five hours. However small the quantity of milk set, the column of fluid should be at least five or six inches high. Don't use a basin or cup. The last few ounces dipped off are practically skim milk, but the blend gives the right strength.

On very warm days, if there is no means of keeping the milk below 60 deg., the safest plan is to restrict the

setting for "Top Milk" to four hours or even less. The proportion of fat in the "Top Milk" is diminished, but this is safer for the baby when the weather is unusually warm.



How to remove "Top Milk"

This can be done by combining skimming with a spoon and pouring, but a $2\frac{1}{2}$ oz. conical dipper is much better.

Method of using Dipper

Gently lower the dipper until the "Top Milk" flows over the edge as shown in the diagram. Keep the dipper fairly level and move it deftly round towards the sides of the jar so as to get the "Top Milk" to come equally from all directions. To prevent cream from being pushed down into the skim milk it is advisable to wet and warm the dipper by plunging it into boiling water before lowering it into the jar for the first dipperful.

For the first week do not set the milk for top milk; for the second week set for half to one hour only; for the third week set for one to two hours and so gradually increase time of setting to three to five hours. If the milk is very rich, say Jersey milk,* the shorter time of setting should be used.

* Some Jersey milk is so rich that it will not require setting at all.

PRACTICAL HINTS REGARDING THE PREPARATION AND USE OF HUMANISED MILK

Cleanliness

All utensils for milk and milk preparations must be kept scrupulously clean. This can be effected by washing immediately after use with cold water and then with boiling water and soda, scouring with a brush kept

specially for the purpose. Hot water should never be used first, because it coagulates the albumin of milk and prevents proper cleansing. Milk bottles, jugs, and cans should be turned upside down to drain, and may be left thus or covered to prevent the accumulation of dust or particles floating in the air. Rinse again with boiled water immediately before use, and on no account follow this rinsing by wiping out with any form of cloth or towel, since, however clean this might be, it would probably contaminate the vessel with microbes.

Appliances

1 half-pint measure, marked in ounces
1 jug
1 tablespoon, 1 teaspoon, 1 knife } on a clean plate
1 fine strainer
1 saucepan

Measurements

Teaspoons and tablespoons used for measuring must be of standard size and the contents *always scraped off level.* (See Fig. 30, page 96.)

Emulsion (Kariol)—1 oz. equals 1 tablespoon and 2 teaspoons (level).

Karilac or sugar-of-milk—1 oz. equals 2 tablespoons pressed down and scraped off level.

Fluids (milk or water)—1 oz. equals 1½ tablespoonfuls.

Fruit or Vegetable Juice

Every bottle-fed baby must have some uncooked fruit or vegetable juice daily. In the second month begin giving a few drops of strained orange juice daily, diluting it with two parts of cooled boiled water. Give it well between the ordinary feedings. As the child increases in age, increase the quantity of orange juice. The juice of raw swede or carrot may be used instead of orange juice, but if carrot be used it is necessary to give twice the quantity. (See page 87.)

How to Give Kariol (or Cod Liver Oil)

The total amount of Kariol ordered for the day must be measured into a small cup or jar when the milk mixture is made, and this quantity must be divided between the day's feedings, giving an equal portion at each feed. It must be finished by the time the next day's food is made, when a fresh allowance must be put out.

The Kariol is best given by spoon during the feeding. It is never advisable to mix the whole day's supply in with the milk mixture, and rarely advisable to mix it into each bottle.

When giving Kariol for the first time, begin with half a level teaspoonful and work up gradually to the amount required for any particular recipe.

Fig. 30 Preparing Humanised Milk

Nurse teaching a mother how to prepare humanised milk.
Note method of measuring Karilac.

COMMENCING ARTIFICIAL FEEDING

Never start using any prepared milk at the full strength, but work up cautiously in the course of a week or ten days. Indeed, several weeks or even a month or more may be needed in the case of a young or delicate baby.

The time needed to reach the full fat allowance will vary with the infant's power to deal with fats and oils. Some babies become upset if given any form of cream or fat (other than that of human milk) unless the additions are made very cautiously and slowly, so as to habituate the baby to tolerate each advance. The normal healthy baby can generally take the full allowance in three weeks or a month; but others may need six weeks or even longer.

HOW TO KEEP MILK

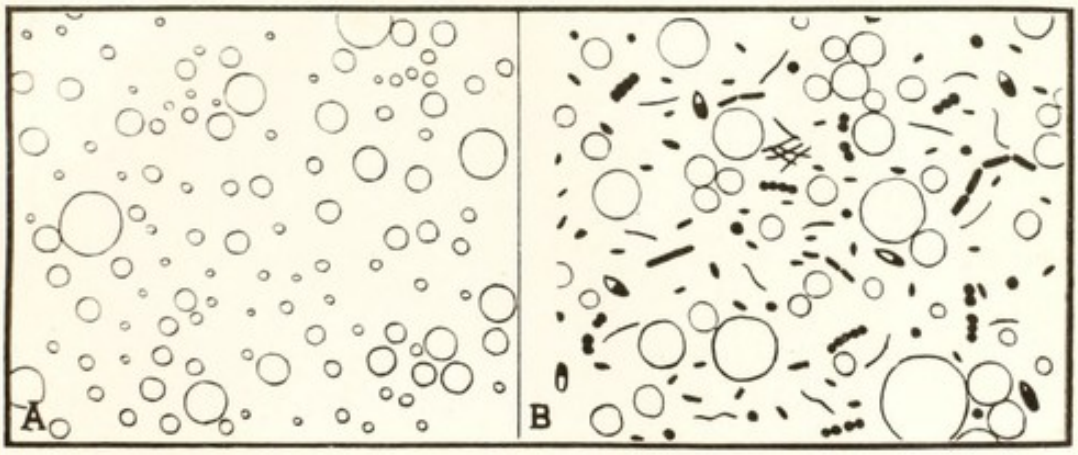


Fig. 31. Milk Under the Microscope

(*A*) **Pure milk.** No microbes. The circles are fat globules.

(*B*) **Milk left standing uncovered and uncooled.** Swarming with microbes.

If the milk is allowed to cool slowly, by merely placing it in a safe, ten times more microbes may develop in the course of a few hours than would be present if it were chilled quickly by placing the cans for half an hour or so in running water immediately after milking. Germs multiply with extreme rapidity in unchilled milk. Several

millions per teaspoonful may accumulate before the souring stage is reached, and this is why babies are liable to get diarrhœa, especially in the summer. All milk should be brought below 60 deg. F. by means of cold water or ice, before being delivered or stored in the safe at home.

How to Keep Cooled Milk Cool

If the milk is delivered in bottles, wash the outside of the bottles, then remove the caps and thus let in air, but don't allow any dust or falling particles to gain access. To prevent this, cover with a tilted saucer. (If the air is excluded by corking, milk is liable to go bad in quite a different way from natural souring, and may then be highly poisonous—just as tinned meat is liable to go bad and cause fatal poisoning.) Then place the bottles in an ordinary, wooden candle-box and surround them with clean chaff or sawdust. Keep the box in an outside safe or other cool, airy place.

By this means milk delivered cool at the house can be kept cool and safe for a whole day in the hottest weather.

People often make the great mistake of placing the bottles of milk received cool from a dairy in ordinary tap water, without pausing to reflect that this may be actually warmer, instead of cooler, than the milk. In this way they warm up what has been cooled and kept cool by ice water, whereas if they used chaff or sawdust, as directed, milk received cool would keep practically as well in warm weather as it does in winter.

The above applies to milk for household use.

The humanised milk made at home for baby's use should be prepared as soon as possible after the fresh milk is delivered. It should be cooled quickly by placing the jug in **running** water or in frequently changed cold water. Cover the jug with two thicknesses of clean, open muslin or cheese-cloth, which must dip into the water all round (see illustration, page 99).

In the country, the mother may be able to stand the milk in a cool stream under trees, or there may be cool

artesian or pump water; on the other hand she may have nothing but tank water to depend on. In the latter case, when the weather is warm, the best plan is to keep a pailful of water in the open, night air shaded from the rising sun. In this she can cool the milk which has been prepared for the baby.

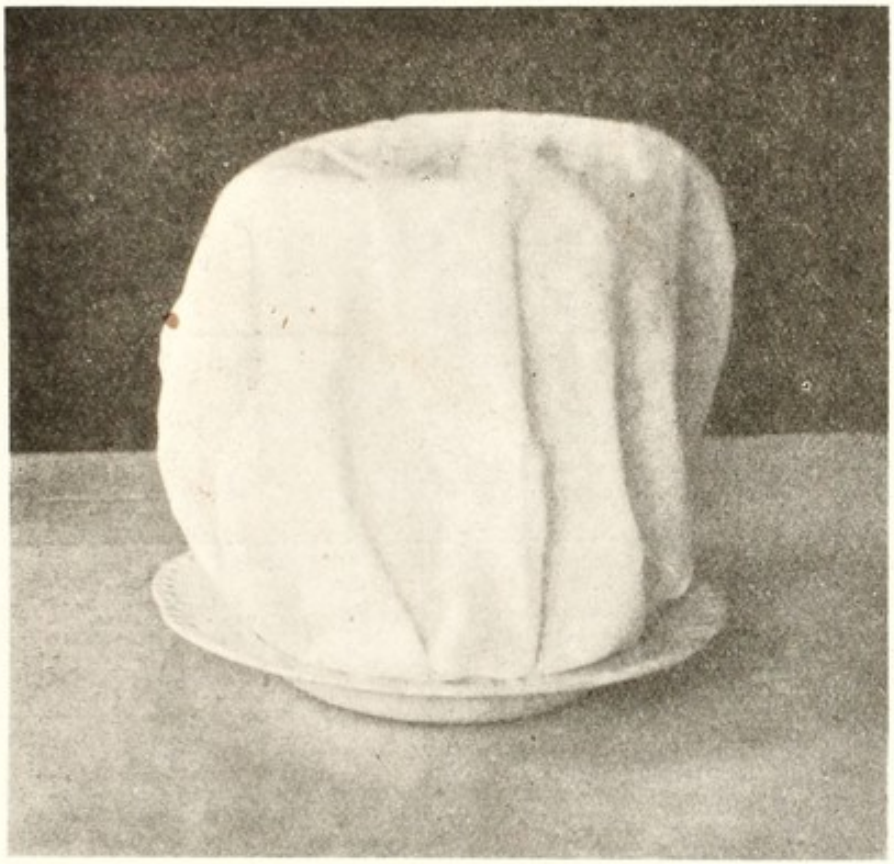


Fig. 32. A Method of Cooling Milk

The illustration shows how to cool milk by means of the evaporation from wet muslin.

Only one thickness of butter muslin has been used in the picture, but in practice it is better to use two, as one is apt to dry. Further, a shallow pie-dish is preferable to a soup-plate, as the water evaporates rapidly in warm weather.

The dish should not be stood in the house or in a closed cupboard, but in a safe standing in a draughty place in the open air on the shady side of the house, free from dust, and as remote as possible from drain openings, rubbish heaps, or garbage of any kind.

Table A—FOR ARTIFICIAL FEEDING

Average Weight of Baby	Age of Baby	No. of Feedings	Ounces at Each Feeding	Composition of Food: Total Ounces in 24 Hours	Composition of Food: Ounces Humanised Milk	Composition of Food: *Oz. Karilac Solution 10 per cent.	Ounces Kariol	Intervals in Hours	Hours of Feeding
7 lb.	Third day	6	1	6	2	4	—	3	6, 9, 12 noon; 3, 6, 10 p.m.
	Fourth day	6	1½	9	3½	5½	—	3	,,
	Fifth day	6	2	12	5	7	—	3	,,
7¼ lb.	Seventh day	6	2½	15	7½	7½	1/12	3	,,
	Tenth day	6	3	18	12	6	1/6	3	,,
	Beginning of—								
7½ lb.	Third week	6	3½	21	15	6	1/3	3	,,
	Fourth week	5	4½	22½	18	4½	½	4	6, 10 a.m.; 2, 6, 10 p.m.
8½ lb.	Second month	5	5	25	25	–	7/12	4	,,
	Third month	5	5¼	26¼	26¼	–	5/6	4	,,
	Middle of 3rd month	5	5½	27½	27½	–	5/6	4	,,
12½ lb.	At Three months	5	6	30	30	–	1	4	,,
	At Four months	5	6½	32½	32½	–	1 1/12	4	,,
	At Five months	5	7	35	35	–	1 1/6	4	,,
15½ lb.	At Six months	5	7½	37½	37½	–	1¼	4	,,
	At Seven months	5	8	40	40	–	1⅓	4	,,
	At Eight months	5	8	40	39	WHOLE MILK 1 oz.	1⅓	4	,,
18 lb.	At Nine months	5	8	40	35	5 oz.	1 1/6	4	,,

Average weight of baby at birth is 7½ lb., but it usually loses about ½ lb. during the first three days.

(For explanation of Table A, see below, page 101

N.B.: Four-hourly feeding suits most babies from the start. A few do better with three-hourly feeding for the first few weeks. This applies particularly to babies who are delicate, or to those who are completely artificially fed from birth.

No Feeding Table can be an absolute guide as to the quantity and strength of food best suited for a given baby. For a time (especially in the early months) infants with a tendency to weak digestion generally thrive better if the food specified in the Table is lessened by one or more teaspoonfuls per feeding, boiled water being added to dilute and make up the quantity. Occasionally a young or delicate baby cannot take or retain enough diluted humanised milk, yet will do well if a smaller allowance be given of full strength. In such cases a little boiled water may be given between feedings to make up the necessary fluid.

Prematures should begin with food more diluted than for those at full term, and the advance must be cautious.

All recipes for humanised milk have been purposely made from a fifteenth to a twelfth below the strength of average mother's milk: therefore, if the baby is allowed 40 oz. (as shown in the Table for use at 9 months), this is equivalent to about 37 oz. of human milk—or more correctly only about 35 or 36 oz., because at least an ounce or two may be deducted for loss in the feeding-bottle, etc., and for the fact that mother's milk is more perfectly and completely absorbed and used up in the body than any artificial preparation.

A breast-fed baby rarely needs more than 35 oz. of his mother's milk at nine months, and he may thrive best with several ounces less.

Six teaspoons Kariol equal one ounce.

Table B—SIMPLIFIED TABLE FOR ARTIFICIAL FEEDING IN THE FIRST MONTH OF LIFE

Age	Milk	Water	Karilac	Kariol	Total Ounces in 24 Hours	Ounces at Each Feeding	Intervals in Hours	Hours of Feeding
	Ounces	Ounces	Teaspoons	Teaspoons				
Third Day	¾	5¼	4		6	1	3	6, 9, 12 noon; 3, 6, 10 p.m.
Fourth Day	1½	7½	6		9	1½	3	..
Fifth Day	2½	8	6		10½	1¾	3	..
Sixth Day	3½	8½	7		12	2	3	..
Seventh Day	4½	10½	8	½	15	2½	3	..
Eighth Day	4½	10½	8	½	15	2½	3	..
Ninth Day	5¼	11¼	8	1	16½	2¾	3	..
Tenth Day	5½	12½	9	1	18	3	3	..
Eleventh Day	5½	12½	9	1½	18	3	3	..
Twelfth Day	5½	12½	9	1½	18	3	3	..
Thirteenth Day	6	13½	9½	2	19½	3¼	3	..
Fourteenth Day	6½	14½	10	2½	21	3½	3	..
End of Third Week	7½	16½	11	3	24	4	3	..
End of Fourth Week	11	14	10	3½	25	5	4	6, 10 a.m.; 2, 6, 10 p.m.

HUMANISED MILK NO. I (Table C)

Humanised Milk No. I made with Karilac and Kariol is the best mixture for the very young, delicate or premature baby. It is easy to digest as part of the insoluble casein curd has been removed. It is more complicated to make than the No. III mixture, but the whole of the preparation does not take more than 20 minutes, and the mother can attend to other household matters while the milk is being heated. Humanised Milk No. I can also be made with top milk instead of Kariol, but it is simpler and quicker to supply the fat in the form of Kariol.

INGREDIENTS—

Milk, Whey, Kariol, Karilac and Boiling Water.

Directions for Making—

(1) First of all scald all utensils; then make the whey as follows:—Stir milk and measure out about one and a half times as much milk as the amount of whey required; thus if 5 oz. of whey are needed take 7½ oz. of milk. Place this in a clean saucepan, keep a dairy thermometer standing in the milk and heat to 100 deg. F. Stir in thoroughly the rennet extract (according to directions on the bottle); allow to stand aside for three minutes, when a firm curd should have formed. Break this up thoroughly with a clean fork, bring the whey quickly to the boil, and let it stand two or three minutes. Now pour off the whey from the curd (which should have sunk in a lump to the bottom of the jug), straining it through a scrupulously clean boiled strainer lined with butter muslin.

(2) Put the correct amount of Karilac into the boiling water and stir till completely dissolved.

(3) Stir the new milk, measure out the correct quantity, and add to the Karilac and water. Stir well.

(4) Bring the mixture just to the boil in a clean saucepan kept for the purpose, and let it stand two or three minutes at just about boiling point, stirring all the time. (Or pasteurize by keeping mixture at a temperature of 155° F. for 10 minutes. Use a dairy thermometer.

(5) Measure out the required quantity of whey (which has previously boiled), and add it to the other ingredients.

(6) Cool rapidly by standing jug in running, or frequently changed, cold water; then strain through a piece of scalded muslin, kept for the purpose, into a scalded jug. Stir while cooling.

(7) Keep in a cool, airy, outside safe, with jug standing in a dish of cold water, covered with double, damp butter muslin large enough to allow the four corners to dip into the water. The milk in the jug is thus kept cool by evaporation. (See page 98.)

N.B.—Always pasteurize or boil the whey in order to destroy the action of the rennet, before mixing it with the other ingredients. If this is not done the humanised milk will curdle.

If sugar-of-milk is used, when Karilac cannot be obtained, use lime water in addition, in the proportion of one ounce to every pint of humanised milk.

HUMANISED MILK NO. II (Table D)

Humanised Milk No. II can be made either with top milk or with separated cream. In either case some cod liver oil must be used in addition; otherwise this mixture is not a reliable source of vitamin D. Humanised Milk No. II is advised only where Kariol is unprocurable, and provided there is a good supply of pure milk. The fat in the form of top milk or cream is difficult to digest, and if top milk is used there is the risk of germ multiplication during the necessary hours of setting.

INGREDIENTS

Top Milk	Karilac
(See page 93.)	Boiling Water

Directions for Making—

(1) Measure out the Karilac and dissolve it in the specified amount of boiling water.

(2) Dip off top milk and add to the Karilac solution.

(3) Bring the mixture to the boil and keep about boiling point for two or three minutes. Cool and store as described above.

Table C—HUMANISED MILK NO. 1

To Make	5 Ozs.	10 Ozs.	15 Ounces	20 Ounces	25 Ounces	30 Ounces	35 Ounces	40 Ozs.
Fresh Milk ..	1½ oz.	3 oz.	4½ oz.	6 oz.	7½ oz.	9 oz.	10½ oz.	12 oz.
Whey (New Milk)	1½ oz.	3½ oz.	5 oz.	7 oz.	8¼ oz.	10 oz.	11¾ oz.	13½ oz.
Boiled Water ..	2 oz.	3½ oz.	5½ oz.	7 oz.	9¼ oz.	11 oz.	12¾ oz.	14½ oz.
Karilac	1 teaspn.	2 teaspns.	3 teaspns.	4 teaspoons	1 tablespn. and 1 teaspoon	1 tablespn. and 2 teaspoons	1½ tablespns. and 1 teaspoon	2 table-spoons
Kariol	1 teaspn.	2 teaspns.	3 teaspns.	1 tablespn.	1 tablespoon and 1 teaspoon	1½ tablespns.	1½ tablespns. and 1 teaspoon	2 table-spoons

If sugar-of-milk is used instead of Karilac, where the latter cannot be obtained, use lime water in addition in the proportion of 1 ounce in every pint of humanised milk.

Read "Practical Hints," page 94.

ALTERNATIVE PREPARATION OF HUMANISED MILK NO. II (Table E)

INGREDIENTS

New Milk	Karilac
Separator Cream (35–40%)	Boiling Water

Directions for Making—

Make as above using cream instead of top milk. **No setting is required.**

Read directions *re* the giving of fruit juice, pages 87 and 95.

HUMANISED MILK NO. III (Table F)

Humanised Milk No. III is the simplest and best mixture for all normal babies. It is quickly and easily made. In the preparation of Humanised Milk No. III and Humanised Milk No. I made with unset milk, the extra fat is provided in the form of Kariol. It is easily digested and provides a sufficiency of the anti-rickets factor, vitamin D.

INGREDIENTS

New Milk	Kariol
Karilac	Boiling Water

Directions for Making—

(1) Measure out the Karilac and dissolve in the specified amount of boiling water, stirring until the Karilac is completely dissolved.

(2) Stir the new milk, measure out the quantity required and add to the Karilac and water. Stir well.

(3) Bring the mixture just to the boil in a clean saucepan kept for the purpose, and let it stand two or three minutes at just about boiling point, stirring all the time. (Or pasteurize by keeping the mixture at a temperature of 155 deg. F. for 10 minutes. A dairy thermometer is necessary for this.)

Cool and keep cool as described for Humanised Milk No. I.

Read carefully the instructions given regarding the measuring and giving of Kariol and fruit juice, pages 95 and 96.

Table D—HUMANISED MILK NO. II

To Make ..	5 oz.	10 oz.	15 oz.	20 oz.	25 oz.	30 oz.	35 oz.	40 oz.
Set	7 oz.	13 oz.	20 oz.	27 oz.	33 oz.	40 oz.	47 oz.	54 oz.
Top Milk ..	2 oz.	4 oz.	6 oz.	8 oz.	10 oz.	12 oz.	14 oz.	16 oz.
Boiled Water	3 oz.	6 oz.	9 oz.	12 oz.	15 oz.	18 oz.	21 oz.	24 oz.
Karilac ..	2 teaspns.	4 teaspns.	1½ tablespns.	2 tablespns.	2½ tablespns.	3 tablespns.	3½ tablespns.	4 tablespn.

Table E—HUMANISED MILK NO. II MADE WITH FORTY PER CENT. CREAM INSTEAD OF TOP MILK

To Make ..	5 oz.	10 oz.	15 oz.	20 oz.	25 oz.	30 oz.	35 oz.	40 oz.
Milk	2 oz.	3¾ oz.	5¼ oz.	7½ oz.	9½ oz.	11¼ oz.	13 oz.	15 oz.
40% Cream ..	¼ oz.	½ oz.	¾ oz.	1 oz.	1¼ oz.	1½ oz.	1¾ oz.	2 oz.
Boiled Water	3 oz.	6¼ oz.	9¾ oz.	12½ oz.	15½ oz.	18¾ oz.	22 oz.	25 oz.
Karilac ..	2 teaspns.	1 tablespn.	1½ tablespns.	2 tablespns.	2½ tablespns.	3 tablespns.	3½ tablespns.	4 tablespn.

ALTERNATIVE PREPARATION OF HUMANISED MILK NO. III (Table G)

For Use Only When Karilac and Kariol are Unobtainable

Here sugar-of-milk or cane sugar is used instead of Karilac, and cod liver oil instead of Kariol.

Note that lime water is used in the absence of gelatine (contained in Karilac).

INGREDIENTS

New Milk	Lime Water
Sugar-of-Milk or Cane Sugar	Cod Liver Oil *

Make, cool and store as described above.

* Read directions for giving of cod liver oil, page 96.

HUMANISED MILK NO. IV (Table H)

In this mixture unsweetened condensed milk is used instead of fresh milk. This preparation is indicated sometimes in certain cases of acute diarrhœa or indigestion where a sterile easily digested food is required.

When this mixture is used a fresh tin of unsweetened condensed milk must be opened each day, and it must be remembered that when once opened the milk does not keep any better than fresh milk.

INGREDIENTS

Unsweetened Condensed Milk	Kariol
Karilac	Boiling Water

Directions for Making—

Dissolve the Karilac in the required amount of boiling water, add the unsweetened condensed milk, stir well, strain, cool, and keep cool as described for fresh milk mixtures.

Read directions for measuring and giving Kariol and fruit juice, pages 95 and 96.

Table F—HUMANISED MILK NO. III

To Make ..	5 oz.	10 oz.	15 oz.	20 oz.	25 oz.	30 oz.	35 oz.	40 oz.
Fresh Milk ..	2 oz.	4¼ oz.	6½ oz.	8¾ oz.	11 oz.	13 oz.	15 oz.	17½ oz.
Boiled Water	3 oz.	5¾ oz.	8½ oz.	11¼ oz.	14 oz.	17 oz.	20 oz.	22½ oz.
Karilac ..	1½ teaspns.	3 teaspns.	1 tablespoon and ½ teaspoon	1 tablespn. and 2 teaspoons	1 tablespoon and 3½ teaspoons	2 tablespns. and 1 teaspoon	2 tablespoons and 2½ teaspoons	3 table-spoons
Kariol ..	1 teaspoon	2 teaspns.	3 teaspoons	1 tablespoon	1 tablespoon and 1 teaspoon	1½ tablespns.	1 tablespoon and 3 teaspoons	2 table-spoons

Table G—HUMANISED MILK NO. III USING SUGAR-OF-MILK OR CANE SUGAR INSTEAD OF KARILAC, AND COD LIVER OIL INSTEAD OF KARIOL

To Make ..	5 oz.	10 oz.	15 oz.	20 oz.	25 oz.	30 oz.	35 oz.	40 oz.
Fresh Milk ..	2 oz.	4¼ oz.	6½ oz.	8¾ oz.	11 oz.	13 oz.	15 oz.	17½ oz.
Boiled Water	2¾ oz.	5¼ oz.	8¾ oz.	10¼ oz.	12¾ oz.	15½ oz.	18¼ oz.	20½ oz.
Sugar-of-milk	2 teaspns.	1 tablespn.	1 tablespoon and 1½ teaspoons	1 tablespn. and 3½ teaspns.	2 tablespns. and 2 teaspoons	2 tablespns. and 3½ teaspns.	3 tablespns. and 2 teaspoons	3 tablesp. and 3½ teasps.
or								
Cane Sugar ..	1½ teaspns.	3 teaspns.	1 tablespoon	1 tablespn. and 2 teaspoons	1 tablespoon and 3 teaspoons	2 tablespns. and 1 teaspoon	2 tablespns. and 2 teaspoons	2 tablesps. and 3 teaspns.
Lime Water..	¼ oz.	½ oz.	¾ oz.	1 oz.	1¼ oz.	1½ oz.	1¾ oz.	2 oz.
Cod Liver Oil	½ teaspoon	1 teaspoon	1½ teaspoons	2 teaspoons	2½ teaspoons	3 teaspoons	3½ teaspoons	4 teaspns.

HUMANISED MILK NO. V (Table J)

Where fresh cows' milk is not procurable or where ordinary cleanliness is impossible, or when travelling, dried milk can be used in the preparation of humanised milk. The main advantages of dried milk are its keeping qualities and its small bulk. Care should be taken to procure a good reliable brand. (See "Motherhood in Hot Climates." page 169.)

INGREDIENTS

Dried milk	Kariol
Karilac	Boiling water

Directions for Making—

Measure out the required quantity of dried milk. Add the Karilac and dissolve the lot in the requisite amount of boiling water. Stir well, strain, cool and keep cool as described for fresh milk mixtures. Read directions for measuring and giving Kariol and fruit juice, pages 87 and 95-6.

ALTERNATIVE PREPARATION OF HUMANISED MILK NO. V (Table K)

For Use When Karilac and Kariol are Unprocurable

INGREDIENTS

Dried milk	Cod liver oil
Cane sugar	Boiling water

Directions for Making—

Measure out the required quantity of dried milk. Add the cane sugar, and dissolve the lot in the requisite amount of boiling water—stir well, strain, cool and keep cool.

Read directions regarding the giving of cod liver oil and fruit juice, page 96.

N.B.—When using humanised milk made from dried or condensed milk give twice the quantity of fruit juice indicated for fresh milk mixtures.

Table H—HUMANISED MILK No. IV USING UNSWEETENED CONDENSED MILK INSTEAD OF FRESH MILK

To Make ..	5 oz.	10 oz.	15 oz.	20 oz.	25 oz.	30 oz.	35 oz.	40 oz.
Unsweetened Condensed Milk	1 tablespn. and 1 teaspoon	2 tablespns. and 2 teaspns.	3 tablespns. and 3 teaspoons	5 tablespns.	6 tablespoons and 1 teaspoon	7 tablespns. and 2 teaspoons	8 tablespns. and 3 teaspoons	10 tablespoons
Karilac ..	1¼ teaspns.	2½ teaspns.	1 tablespoon	1 tablespoon and 1 teaspoon	1 tablespoon and 2½ teaspoons	2 tablespns.	2 tablespns. and 1 teaspoon	2 tablesp. and 2 teaspns.
Kariol ..	1 teaspoon	2 teaspns.	3 teaspoons	4 teaspoons	5 teaspoons	6 teaspoons	7 teaspoons	8 teaspns.
Boiled Water to Make up to a Total of ..	5 oz.	10 oz.	15 oz.	20 oz.	25 oz.	30 oz.	35 oz.	40 oz.

Table I—HUMANISED MILK NO. V USING FULL CREAM DRIED MILK INSTEAD OF FRESH MILK

To Make ..	5 oz.	10 oz.	15 oz.	20 oz.	25 oz.	30 oz.	35 oz.	40 oz.
Dried Milk ..	1 tablesp. and 1 teaspoon	2 tablespn. and 2 teaspns.	3 tablespoons and 3 teaspoons	5 tablespns.	6 tablespns. and 2 teaspoons	8 tablespns.	9 tablespns.	10 tablesp.
Karilac ..	1¼ teaspns.	2½ teaspns.	1 tabiespoon	1 tablespoon and 1½ teaspns.	1 tablespoon and 2 teaspoons	2 tablespns.	2 tablespns. and 2 teaspoons	2 tablesp. and 3 teaspns.
Kariol ..	1 teaspoon	2 teaspns.	3 teaspoons	4 teaspoons	5 teaspoons	6 teaspoons	7 teaspoons	8 teaspns.
Boiled Water to Make up to a Total of ..	5 oz.	10 oz.	15 oz.	20 oz.	25 oz.	30 oz.	35 oz.	40 oz.

Table J—HUMANISED MILK NO. VI USING FULL CREAM, DRIED MILK AND CANE SUGAR, OR SUGAR-OF-MILK AND COD LIVER OIL INSTEAD OF KARILAC AND KARIOL WHEN THESE PRODUCTS ARE UNPROCURABLE

To Make ..	5 oz.	10 oz.	15 oz.	20 oz.	25 oz.	30 oz.	35 oz.	40 oz.
Dried Milk ..	1 tablespn. and 1 teaspoon	2 tablespn. and 2 teaspns.	3 tablespns. and 3 teaspoons	5 tablespns.	6 tablespoons and .. 2 teaspoons	8 tablespns.	9 tablespns.	10 tablesp.
Cane Sugar ..	1¼ teaspns.	2½ teaspns.	1 tablespoon	1 tablespoon and 1 teaspoon	1 tablespoon and 2 teaspoons	1 tablespn. and 3 teaspoons	2 tablespns. and 1 teaspoon	2 tablesp. and 2 teaspns.
or								
Sugar of Milk	1¾ teaspns.	3½ teaspns.	1 tablespoon and 1 teaspoon	1 tablespn. and 3 teaspoons	2 tablespns. and ½ teaspoon	2 tablespns. and 2 teaspoons	3 tablespoons	3 tablesp. and 1½ teaspn.
Cod Liver Oil	½ teaspoon	1 teaspoon	1½ teaspoons	2 teaspoons	2½ teaspoons	3 teaspoons	3½ teaspoons	4 teaspns.
Boiled Water to Make up to a Total of ..	5 oz.	10 oz.	15 oz.	20 oz.	25 oz.	30 oz.	35 oz.	40 oz.

FUEL VALUES

Table Showing the Percentage Composition and Caloric Value of Various Food Substances

	Sugar (per cent.)	Fat (per cent.)	Protein (per cent.)	"Caloric" or Fuel Value per Oz.
Human Milk	7	3·5	1·5	20
Cows' Milk	5	3·5	3·5	20
New Milk Whey ..	5	1·2	1·1	11
Skim Milk Whey ..	5	—	1	7
Jersey Milk	5	5-6	4	25
Goats' Milk	4·5	3·5	4	19·5
Unsweetened Condensed Milk	15	10	10	58
Unsweetened Condensed Milk (English Brands)	13	9	9	50
Dried Milk	40	25	25	142
Butter Milk	4	·5	3·3	9
Karilac	95	—	—	110
Sugar-of-milk	98	—	—	116
Cane Sugar	98	—	—	116
Kariol	40	50	—	180
Cod Liver Oil	—	100	—	226
Separator Cream (35-45 per cent. Fat)	3	40	2	112

PERCENTAGE FEEDING

In connection with the artificial feeding of infants, Dr. E. H. Williams, M.B., Ch.B., M.R.C.S., Lecturer on Diseases of Children, University of Otago, and Senior Honorary Physician Truby King Harris Hospital, Dunedin, writes:—

> "While the chief aim of the Plunket Society has been from its inception and is to-day the encouragement and successful

conduct of breast-feeding, there will always, of necessity, be numerous cases where this is possible only in part or not at all; so that it is essential that there should be an intelligent idea of the requirements of the infant where it is denied the natural food supply.

When the Plunket Society was formed, now thirty years ago, it was as the result of the recognition by Sir Truby King of the urgent necessity for vigorous measures to combat the waste of infant life.

The methods then in use in the artificial feeding of infants were crude and inexact. Patent foods of faulty composition and proportion were easy of access and widely used. Cases of gross malnutrition from ignorance and sometimes from intention were frequent, and the death-rate in the first year of life was nearly three times what it is to-day.

He therefore conceived and put into practice the system of artificial feeding as we now know it. It is true that this method of modifying cow's milk for the use of the infant had already been in use in America and on the Continent for some years. Sir Truby King adapted it and elaborated it so that it might be readily applied by trained nurses. This system is erroneously termed 'percentage feeding,' whereas it is more correct to describe it as a percentage method of calculation in order that accuracy may be assured. The principle involved is the desirability of so modifying cow's milk that the composition of the mixture may resemble that of human milk as nearly as possible. At the outset the results of the application of a system of infant feeding and management, where previously none had existed, were striking and gratifying, and the advantages of the Plunket Society's methods, of which the artificial feeding of infants is only a part, are acknowledged throughout New Zealand and beyond this country also.

The success of any reasonable method of artificial feeding is dependent upon its intelligent application. In an infant clinic or a Karitane Hospital or where there is frequent home visiting, this can be attained; but where visits are possible only at varying and irregular intervals, the maternal factor of error or indifference to instructions has to be considered, and the best system may fail to give satisfaction. A review of thirty years' experience of the use of modified cow's milk as originally proposed by Sir Truby King cannot fail to convince an observer of the soundness of the methods employed; but it must not be thought that an unalterable formula is applicable to every baby. For the average normal infant, however, normal physical progress and good health is the experience of doctors and nurses when their instructions are faithfully carried out.

As the result of a recent examination of some 500 children up to the age of six years, the majority of whom had been reared strictly according to the methods advocated by the Society,

there is convincing evidence of the value of the system in the normal physical growth, soundness of health and freedom from defects in those examined.''

CHANGING TO HUMANISED MILK

Humanised milk is of the same strength as human milk, and should not be diluted or altered unless for some special reason. Some boiled water or Karilac solution should be added throughout the first month of life, and the same principle applies when any baby is to be fed with humanised milk for the first time.

If baby is over a month old and quite strong he may start with equal parts humanised milk and boiled water. Gradually increase the proportion of humanised milk and correspondingly reduce the boiled water day by day. At the end of a week or ten days, humanised milk may be given undiluted.

If baby is delicate, begin with one part humanised milk to two of boiled water.

Say baby is three months old and would need for full sustenance (if of normal weight and development) about 30 ounces (1½ pints) of mother's milk or of humanised milk, we might begin with 10 ounces humanised milk and 20 ounces boiled water, allowing of this mixture six feedings of five ounces each in 24 hours. This gives only a third of the proper allowance of food for sustaining normal growth. However, the main point at first is to get the digestive organs into working order. Consult the table on page 116.

DON'T MAKE SUDDEN CHANGES

There should be no sudden thoughtless changes to new forms of food. The growing digestive organs should be carefully trained and gradually habituated to perform each new function. The natural development of the organs is a delicately adjusted process of orderly growth.

DON'T ADD SOLIDS

Where babies have to be fed artificially, humanised milk should be the only food needed for nine months, but baby may do better if towards the middle of the period a few ounces of whole milk are gradually added

ounce by ounce to the day's allowance. This is always worth trying when the baby has attained sufficient digestive capacity. No "solids" are needed until after nine months. Don't resort to patent foods, or indeed to anything in the way of food beyond what is mentioned above, unless specially ordered by a doctor. Fruit juice is an important adjunct, but can scarcely be regarded as a food.

GIVE BABY A BONE

At six months of age a chicken-bone or chop-bone (from which all but a trace of meat has been removed) may be given to the baby at meal-times, as the munching of this tends to promote a free flow of blood to the developing teeth, which should be rapidly growing and pushing their way up under the gums.

Table showing how (beginning with one part of humanised milk and two parts boiled water) full strength humanised milk may be arrived at in one, two, or three weeks respectively.

Time of Modified Feeding	I—Full Strength in a Week		II—Full Strength in a Fortnight		III—Full Strength in Three Weeks	
	Humanised Milk (Ounces)	Boiled Water (Oz.)	Humanised Milk (Ounces)	Boiled Water (Oz.)	Humanised Milk (Ounces)	Boiled Water (Oz.)
1st day	10	20	10	20	10	20
2nd ,,	13	17	13	17	12	18
3rd ,,	16	14	**15**	**15**	**14**	**16**
4th ,,	19	11	**15**	**15**	**14**	**16**
5th ,,	22	8	17	13	**14**	**16**
6th ,,	25	5	19	11	16	14
7th ,,	28	2	**20**	**10**	18	12.
8th ,,	30	0	**20**	**10**	**20**	**10**
9th ,,	..	..	22	8	**20**	**10**
10th ,,	..	..	24	6	**20**	**10**
11th ,,	..	..	26	4	**20**	**10**
12th ,,	..	..	**28**	**2**	22	8
13th ,,	..	..	**28**	**2**	23	7
14th ,,	..	..	30	0	24	6
15th ,,	..	..	..	..	**25**	**5**
16th ,,	..	..	..	..	**25**	**5**
17th ,,	..	..	..	..	26	4
19th ,,	..	..	..	..	28	2
21st ,,	..	..	..	..	30	0

Schemes II and III show fairly quick advances at first, then for a few days no advance (see thick black figures). Why is this?

(1) To avoid keeping baby long on very weak food (below half strength).

(2) The pause lets one see the effect of the food, thus lessening risk of overstepping digestive power—judging by look and number of motions, discomfort, sleep, etc.

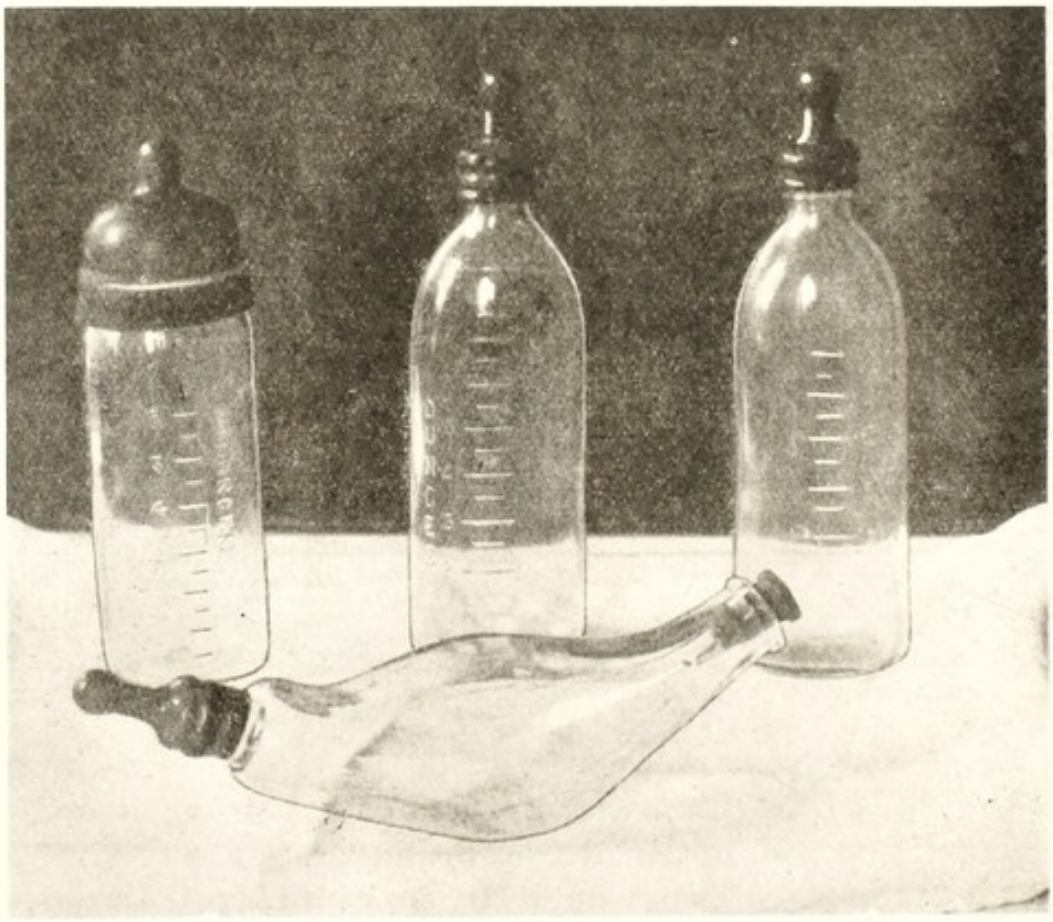
Feeding Bottles

The feeding bottle needs as serious consideration and attention as the milk itself. The use of improper forms of "feeders," and carelessness as to perfect cleansing (see page 123) are main sources of poisoning by microbes. This is a large factor in the high death-rate of children under one year of age, and is a leading cause of indigestion and summer diarrhœa. Every part of the feeding bottle must be capable of easy sterilization. It must have no corners or angles, and must have no letters stamped on it causing projections inside. The simpler the form of bottle the better. The neck must be sufficiently wide to permit of easy scouring, preferably without the use of a brush. There must be no tube or screw to harbour dirt and germs.

The Hygeia Feeder *A* (Fig. 33), affords the nearest approach to Nature, the human breast being closely imitated. Instead of a bottle an open glass jar is used, the jar being covered by an india-rubber cap, shaped like the human breast. There is no trouble whatever in keeping the vessel perfectly clean without the use of a brush. Further, the process of sucking from this feeder closely resembles natural suckling. The baby will be found to nuzzle into the artificial breast, thus helping to press out the milk. He also takes portions of this "breast" between his lips, just as he would do with the mother's breast. He does not confine himself to the nipple, as is necessarily the case with ordinary teats, and the wide action of mouth and jaws provides a better form of exercise, resulting in improved blood supply to all adjacent parts. Thus it is that natural suckling, or the nearest approach to it, tends

to ensure better development of the teeth and jaws (and muscles acting on them), better tongue, palate, nose, etc., and immunity from sore throat and adenoids—these affections being mainly expressions of inactivity and impaired nutrition of the parts.

B and *D* (Fig. 33, are good forms of bottles. The sole advantage of the "boat-shape" bottle is the power to run



A *B* *C* *D*

Fig. 33. Feeding Bottles

A **Hygeia Feeder.** Note open-mouthed jar in place of bottle, and artificial breast instead of mere nipple. For details see text.

B and *D* **Good Simple Feeders.** Note that every part is rounded and easily cleansed.

C **Boat-shaped Feeder.** Note inconvenience of lying down position if a particular feeding needs boiling. The nipple is also inferior to nipple *B* because the slightly bulbous tip of the latter gives the baby a better "grip," more like the result of burying the lips in mother's nipple. (See full criticism in text.)

water through it, but a brush is needed for perfect scouring, and with a brush *B* is quite easily cleansed. The disadvantages of the "boat-shape" are fourfold, *viz.*:—

1. Extra expense. Better buy two or three bottles of type *B* than only one of type *C*.
2. The presence of india-rubber at both ends involves extra risk of germs, and more work.
3. The "air-valve" is liable to get blocked, and is not needed in any case, because air finds its way in fast enough between the teat and the neck of the ordinary bottle. In the case of the latter, the bubbles which so alarm mothers are **entering**, not **leaving**, the bottle, and it is rather easier for a baby to "swallow air" with the boat-shaped feeder than with the simple type. The way to prevent this is to hold the bottle all the time, which should be done whatever type of feeder is used.
4. The sterilizing of an occasional feeding, or the heating to 155 deg. F., when necessary is readily effected in the case of a bottle which stands upright, but is inconvenient with a bottle lying down.

The simple upright feeder *B* is the one in common use. It is cheap, conveniently shaped, and every part is rounded and easily cleansed.

D is the same type of feeder as *B*, the teat being slightly different.

TEATS

The teats should be made of good rubber, and should be fairly firm, so as not to collapse readily. Several should be kept in stock, because a teat needs replacing directly the hole becomes too large, or when the rubber shows distinct signs of perishing or becoming too soft. The size of the hole is very important. In general it may be laid down that the best aperture is the smallest through which the particular baby can suck his feeding in about fifteen minutes. Unfortunately, frequent or prolonged scalding, soaking in water or in solutions of boracic acid or soda, too much exposure to air, light, etc., may bring about such rapid changes in the india-rubber, that a nipple from which no milk drops when first used may allow it to spurt in the course of a month. This is why several teats ought always to be kept in stock, and it also shows how important it is

to adopt the best system for their preservation. If a teat is not perforated, a hole can be made by puncturing with a very fine red-hot needle; but this tends to damage the india-rubber.

WHY TEATS PERISH

The leading causes of deterioration are:—

1. Scalding or boiling, especially if frequent or prolonged. This makes teats very soft and collapsible.

2. Continuous soaking in water, or worse still in solutions of boracic acid, soda, etc. This common practice quickly "rots" teats—they swell up, become thick, coarse, granular, porous, and inelastic, and tear readily.

3. Keeping exposed in damp air; also, too free exposure in any atmosphere, especially in air-currents. Still, dry, more or less confined air of equable moderate temperature is much better, but rubber keeps best if hermetically sealed.

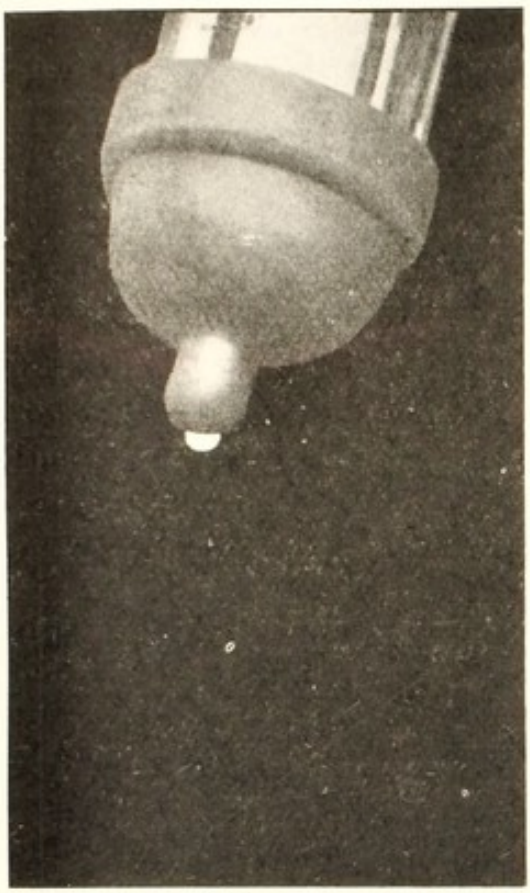
4. Keeping exposed to strong light. Darkness is the ideal condition.

Evidences of Deterioration

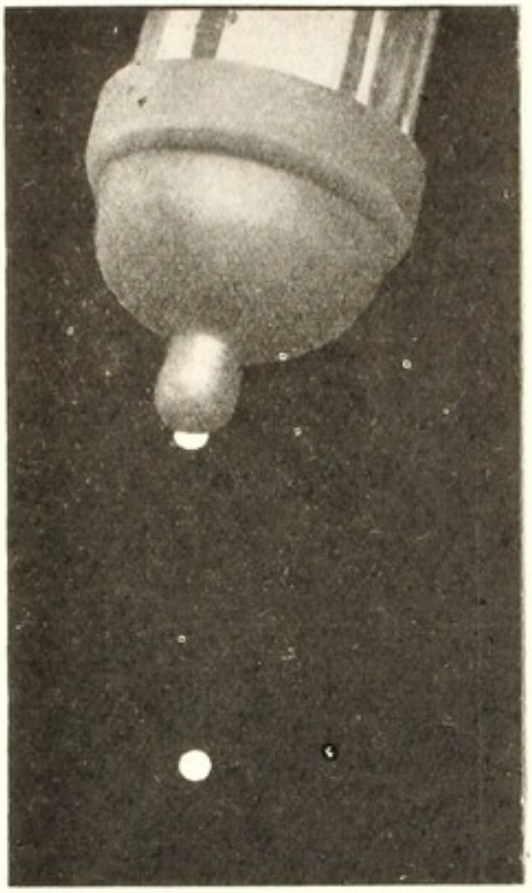
The rapid spoiling of teats, as ordinarily kept, is easily proved. One simple test of fitness for use is the rate of flow when a feeder, say half filled with milk, is turned upside down. (See Fig. 34.) With a new teat the milk should drop extremely slowly or not at all—indeed, none may appear even at the aperture. Assume the last condition: on trial, say, it is found that the baby takes its feeding in a quarter of an hour. We regard this as the ideal teat. It is scalded six times daily and kept in boracic solution: tested a few days later, the milk drops every minute, at the end of a week it drops every few seconds; in a fortnight it drops several times a second; in three weeks the drops touch one another; and at the end of a month the milk spurts out.

The baby meantime has taken a quarter of an hour over his bottle at every feeding. Naturally the nipple has been regarded as satisfactory; but in reality the child has insidiously come to do **less and less work at each meal,**

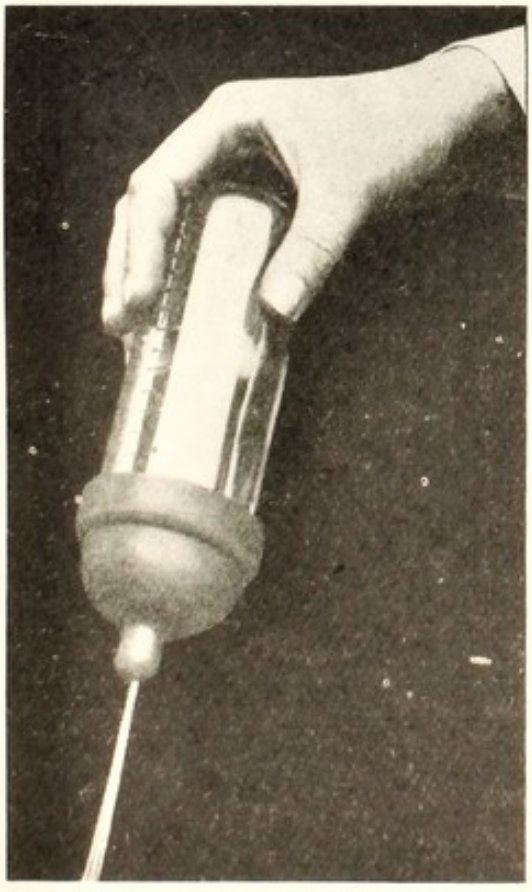
Merely turn the half-filled bottle upside-down. Don't *shake* out the drops. If the feeder were full the rate of flow would be increased; if almost empty the flow might cease.



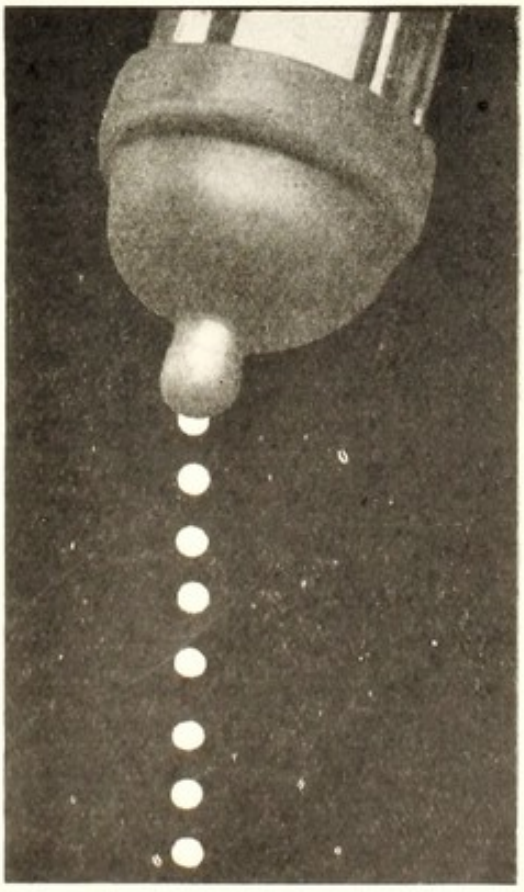
Hole right for average baby



Hole right for rather poor sucker [*Fig.* 34



Hole much too large, milk spurting out



Hole too large, except for extremely feeble baby [*Fig.* 34

and in the end is doing almost none. Anxiety about microbes has made us too forgetful of an equally important matter, viz., the ensuring of a sufficiency of daily work for the muscles of tongue, mouth, and jaws; involving secondarily an adequate supply of blood to the adjacent teeth, nose, and pharynx; and, ultimately, freedom from **adenoids** and other conditions associated with imperfect development of the upper food and air passages.

A teat often perishes far more quickly than is indicated above, and is really not fit for use at the end of a few days.

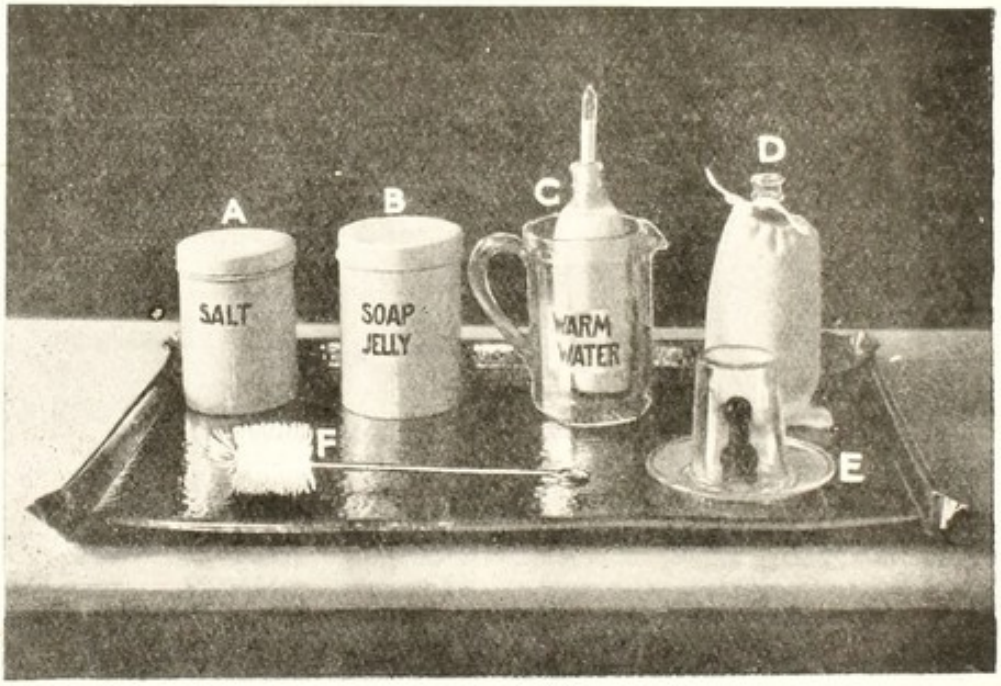


Fig. 35. Important Requisites in Connection with Feeders

A. Salt provides a ready means of removing slime from teats.

B. Soap jelly for cleansing bottles. This can be made as described on page 64.

C. Feeder of milk heating in jug of warm water. The thermometer is the best means of ensuring the right heat, viz., 100 deg. F.

D. The feeder prepared as shown in *C* is now ready for use. Note the enveloping flannel bag which lessens escape of heat during feeding. It is better for the flannel not to reach so near the teat as shown in the picture. In any case the bag must be frequently washed.

E. Teat and saucer under wine glass. In practice don't use a glass cover because light causes rubber to perish.

F. This is stronger than the type of brush ordinarily used and is more effective. If the bottle cannot be kept perfectly transparent without a brush, use one, but it must be kept scrupulously clean.

The following is a simple means of checking growth of microbes, and at the same time preserving the teats in the most effective way:—

How to Cleanse and Store Teats

1. Immediately after each feeding rinse the teat inside and out with cold water. Rub thoroughly all over with common salt. This removes the "milk-slime" which always gathers on the inside surface of teats.
2. Rinse.
3. Rinse with clean boiled water (not hotter than the hand can bear).
4. Scald teat once a day by pouring boiling water over it.
5. Place teat on a saucer, dry quickly on a warm rack, and store in a covered jar or cup.

The whole process of cleansing and putting away the teat should occupy only a few minutes—minutes well spent for the sake of the baby.

No brush is needed for cleansing teats. Rubbing with the fingers and a pinch of salt is preferable.

Cleansing of Feeding Bottles

After feeding bottles have been rinsed with cold water, boiling water and soap or soda afford the most effective and practical means of cleansing. A brush may be needed. Finally rinse thoroughly with boiling water and boil or place in the oven to bake and dry. This is a much better plan than keeping in boracic solution. If the bottle discolours on being baked, the cleansing must have been imperfect.

Feeding Details

Quantities, Intervals, etc.

The table on page 100, shows the quantities needed at each feeding by the average baby. Some thrive better with rather less food; while others may be benefited by a little more. A woman should soon recognise the natural cry of mere hunger, but she should always bear in mind that the tendency of mothers and nurses is to give babies too much

rather than too little. Overfeeding upsets digestion, retards growth, and is more injurious than slight underfeeding. A baby may be fractious and cry for the bottle merely because it is suffering from the discomfort of indigestion caused by overfeeding, or it may be merely thirsty. If in doubt as to why baby is crying, the mother should turn to page 177, "Cries of the Baby." For thirst the best thing is a drink of pure boiled water.

Regular Hours and Intervals

As already described in the chapter on "Natural Feeding," page 15, it is most essential that baby be fed perfectly regularly every three or four hours during the day, with no night feeding.

At Feeding Time

With a scalded spoon stir the prepared milk mixture, and pour into the bottle the amount required for one feeding. Place the bottle in a jug of warm water and heat the milk to blood heat. If you have a dairy thermometer the correct temperature of the baby's food is 100 deg. F. Having washed the hands, place the teat on the bottle.

To prevent undue cooling during feeding, slip over the feeding bottle a small flannel bag provided with a drawstring. In addition the food may require re-heating during the feeding.

It is a good idea to keep a small tray specially for baby's requirements at feeding time. A dinner plate will do quite well for this purpose. On this keep:—

(1) Small bowl for teats.
(2) Small jar for Kariol.
(3) Teaspoon.
(4) Jug or basin for heating bottle before and during the feed.

Cover the tray with a clean cloth.

Never keep baby's bottle warm from one feeding till the next. Though often done, especially when travelling, this is a most dangerous practice. Microbes flourish exceedingly when the temperature is between 70 deg. and

100 deg. F. Therefore keep the milk as cool as possible, and heat only the quantity required for a feeding. The means for heating can readily be obtained almost anywhere nowadays.

The ideal system is to have a wire holder provided with as many bottles as the number of feedings needed for the day. After cooling, the food for 24 hours can be

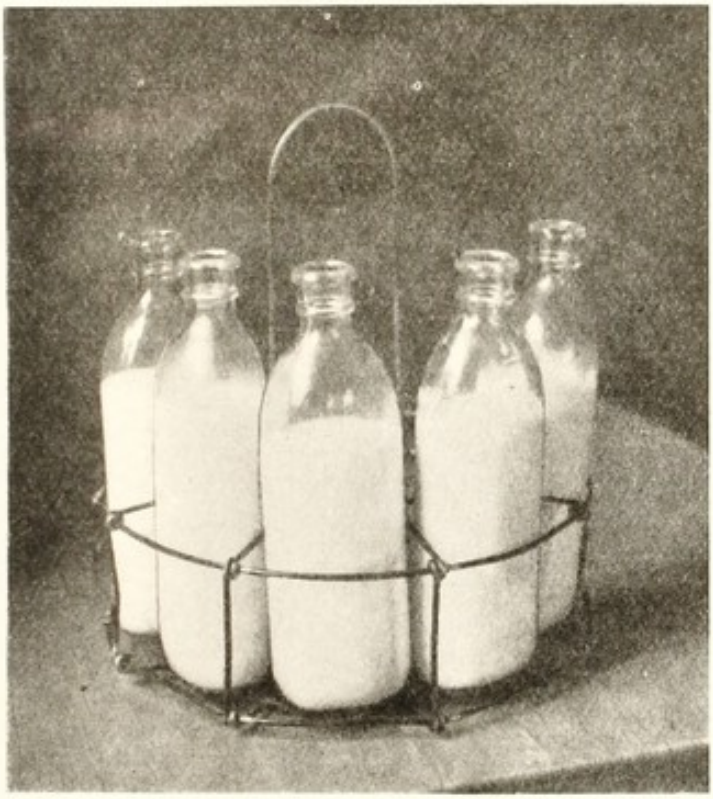


Fig. 36. Wire Bottle-holder containing the number of feeding bottles for the day.

stirred and poured at once into the feeders, which are then placed in the holder in a dish of cold water. Cover with damp butter muslin which must dip into the water all round. This plan obviates risk of contamination of food by pouring on many occasions out of the same jug, and when feeding time comes round all that is required is to take the bottle from the holder, shake it to mix the milk well and heat as described below.

Position During Feeding

Before feeding baby see that he is quite dry and that his nostrils are quite clear so that he can breathe freely while suckling.

During feeding the bottle-fed baby should be nursed in the arms of his mother in the same position in which the breast-fed baby is held. It is essential that the bottle should be held throughout the feeding and a certain pull on it should be maintained, so that the teat is kept towards the front of the mouth. By this means and by moving the teat in the mouth, the baby is brought to suck

Fig. 37. Correct position for feeding and right way to hold bottle.

much more actively, and the whole of the body is stimulated and thrown into action. Observe what takes place if you pull and move about the feeding bottle of a baby who has gone to sleep with the bottle propped up on a pillow. In a moment there tends to be vigorous and widespread action even though the baby should not wake up. If the mother cannot hold the bottle all the time, she should do so for the first five or ten minutes of each feeding. By this means

a good start is ensured, and the whole body is brought into action. The period of main vigour of sucking and associated general exercise is the first five minutes or so of each feeding. Therefore we should secure this at least at its best. It is, however, much better to continue holding the bottle until the end of the feeding.

After Feeding

After feeding handle baby as little as possible; jogging or jolting at this time frequently gives rise to the putting up of food. Hold baby upright against the shoulder to enable him to get rid of wind swallowed during feeding; then put him down to sleep. See Fig. 4, page 18.

FEEDING AFTER NINE MONTHS

After nine months introduce so-called solid food into the baby's dietary as part of his meal—not between meals. Such foods as barley jelly, oat jelly, tough crusts, crisp toast and vegetable milk broth may be introduced in succession.

The munching of such materials as the above is specially beneficial on account of the work and stimulation for muscles, jaws, teeth, and salivary glands; indeed, it is much better to get the baby into the habit of taking such dry food as its first introduction to the use of "solids," rather than to start it with the customary bread and milk or other forms of mush. At nine months a baby will eagerly nibble dry food, especially if he has been habituated for some months previously to munching bones as recommended on page 116. Week by week he can be induced to take more food in this way.

During the tenth and eleventh months, baby should be **learning to eat** rather than **eating** dry solid food. One cannot too strongly enforce this point, because mothers begin stuffing their babies with mush at ten months, instead of patiently training them to eat more solid food.

Once habituate a baby to "pap feeding" and he will become too lazy to make his jaws work for a living; at least it will be very difficult to break him of the vice. As far as possible healthy life habits should be built into the organism and firmly established in early infancy.

Rusks and biscuits are not to be recommended for babies. There is some uncertainty as to their ingredients; they possess no advantages over bread, they are more expensive, and they give little work for the jaws. For these reasons the use of bread in the form of toast, crust, etc. is advocated in preference. Rusks are almost without exception sweet, and usually made with more or less fat.

Of course the baby should never be left to take its food alone on account of the risk of choking. Special care should be taken with crusts lest too large a piece should become detached.

GENERAL RULES FOR FEEDING AFTER NINE MONTHS

Learning to eat proper things in a proper way forms a large part of a child's early education. If careful training in these matters is begun at the outset and continued, the results will well repay the time and effort required. A child who has been trained to eat properly can usually be trained to do anything else that is important.

1. Teach Baby to Drink out of a Cup at any time between 9 and 12 months (if this has not already been done, and provided he has cut two teeth), and discontinue bottle feeding. Give the drinks from a cup, first at one feed (say the 10 a.m.), then at two feeds in the day, and so on—thus discontinuing bottle feeding gradually.

2. Keep Absolutely to Regular Meal Times. Give nothing whatever but water and fruit juice between meals.

3. As Baby Takes More Solid and Varied Food he needs less milk mixture, but do not let him go without a drink at each meal. About two pints of milk mixture are necessary at 9 months, 1½ pints at a year, and rather over a pint at 18 months, including what is used in cooking and with porridge, etc.

4. It is Not Wise to Give Milk Unscalded or Undiluted to any Child. Stir, scald quickly and cool quickly before using. When scalding milk always keep stirring from the time it reaches 160 deg. F. until it boils, and continue stirring until it has cooled down to 160 deg. F., to prevent a skin forming. Cool quickly by standing the jug or saucepan in cold running water.

5. Introduce all New Foods One at a Time and a Little at a Time. Never make sudden changes. It is better to go too slowly than too quickly.

6. Teach Baby to Eat each New Food that is Good for Him. Do not let him start the bad habit of refusing food because he does not like it. If persevered with, babies like almost anything that is good for them. They will not want the things that are bad for them

if they have never tasted them. *Do not let them get the taste for cake or sweets.*

7. Active Exercise for Teeth, Jaws, and Salivary Glands is Absolutely Necessary. Baby must be taught to chew, not to bolt his food, and, as time goes on, to take more and more of his food in a dry crisp form. Remember that toast or crusts, with butter or good beef dripping, and a drink of milk, are just as nourishing, and better for teeth and digestion, than a basin of bread and milk. Always give crusts under supervision.

8. Add No Extra Sugar to Baby's Food, as that used in the preparation of the food is sufficient. It is bad for the teeth and the digestion, and baby gets ample starchy or sugary material in better forms in his cereal and other foods.

9. Cook All Foods Thoroughly and Serve Appetisingly. Add a little salt in cooking.

10. Children Should Not be Continually Urged to Eat if they are disinclined to do so. *Under no ordinary circumstances should a child be forced or coaxed to eat to satiety.*

11. If There is any Important Article of a simple diet, such as milk, meat, cereals, or vegetables, which a child habitually refuses, this should always be given first at the meal, and other food withheld until this is eaten.

12. ALWAYS give the most substantial meal in the middle of the day. NEVER give a young child a meal of meat and vegetables before he goes to bed at night.

13. Give Some Raw Fruit or Vegetable Juice Daily, at least until the child is old enough to take a fair amount of whole raw fruit daily.

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

BETWEEN 9 AND 12 MONTHS

Feed Five Times Daily

Teach baby to chew his food; give dry crusts, or oven-dried bread, about ten minutes before meals, not between feedings; give water and fruit juice only between meals.

9 to 10 Months

Milk Mixture for 24 Hours—Humanised milk 35 oz., decreasing to 30 oz.; whole cow's milk 5 oz., increasing to 10 oz.

N.B.—*Scald or pasteurize whole cow's milk as well as humanised milk.*

If the baby is having humanised milk made with Karilac and Kariol, the recipe for the foregoing mixture is as follows:—

Milk 20 oz., increasing to 23 oz.
Water 20 oz., decreasing to 17 oz.
Karilac 2 tablespoons, 1 teaspoon, decreasing to 2 tablespoons.
Kariol 7 teaspoons, decreasing to 6 teaspoons.

N.B.—*In measuring Kariol and Karilac all spoons should be cut off level with a knife. Never use heaped spoons.*

10 A.M. FEED—Give jelly of barley, oatmeal, or wheatmeal. Begin with one tablespoonful and increase slowly to four, with two to six teaspoons of top milk on it (not mixed into it). Teach baby the "feel" of solid food. Add no sugar, but just a pinch of salt in cooking. Follow this spoon-feed by the usual 8 oz. drink of milk mixture. Later when more cereal is taken, give only 6 oz. or 7 oz. to drink.

10 to 11 Months

MILK MIXTURE—Humanised milk 30 oz., decreasing to 20 oz.; whole cow's milk 10 oz., increasing to 15 oz. at 11 months of age.

Recipe for above mixture:—

Milk 23 oz.
Water 17 oz., decreasing to 12 oz.
Karilac 2 tablespoons, decreasing to 1½ tablespoons.
Kariol 6 teaspoons, decreasing to 5 teaspoons.

CONTINUE CEREAL JELLY and give at two meals, say 10 a.m. and 6 p.m., up to a total of about 10 to 11 tablespoons daily at 11 months.

GIVE CRUST OR OVEN-DRIED BREAD at 2 p.m., followed by usual 8 oz. of milk mixture.

In certain cases the introduction of vegetable milk broth may be indicated in this period.

11 to 12 Months

MILK MIXTURE—Humanised milk 20 oz., decreasing to 15 oz.; whole cow's milk 15 oz.

Recipe for above mixture:—

Milk 23 oz., decreasing to 22 oz.
Water 12 oz., decreasing to 8 oz.
Karilac 1½ tablespoons, decreasing to 1 tablespoon.
Kariol 5 teaspoons, decreasing to 3 teaspoons.

CONTINUE CEREAL JELLY, increasing amount up to about 15 tablespoons daily. Give more dry crusts and toasted bread, commencing the use of butter (from one to two teaspoons). Increase fruit juice.

Feeding in Second Year

During the first year the mother usually follows a definite method or system in the feeding of baby, but during the second year, on the other hand, she frequently abandons all pretence of care and system and delivers her offspring over to the special torture known as "taking what's going."

Most babies do come through this ordeal alive, but not one escapes unharmed. The internal organs have not reached a stage enabling them to cope properly with many articles of food which may be suitable enough for men and women; much less can the baby be expected to withstand the injurious effects of the indigestible dishes commonly favoured by adults for the stimulation of their own jaded appetites. To any one who realizes the harm done by "giving the baby what's going," there is something peculiarly aggravating in witnessing the positive pride with which parents regard the fact that the baby has reached a stage at which it can stow away almost anything that they take themselves.

MASTICATION

The special feature of the second year of normal life, as contrasted with the first year, is the progressive development of the power of mastication. This is a matter of the utmost importance, because upon it depends the future digestive power, health and strength of the individual. Fortunate indeed is the baby who during the first year of existence obtains his food by energetic suction (from the breast, if possible, and failing this, by means of a properly held bottle with a small-holed nipple), and who, towards the close of the first year and throughout the second year, is made to do a proper amount of work on his food by active, vigorous munching and chewing. These are the simple means by which we can aid the intention of Nature to provide the growing child with a masticatory apparatus which shall not prematurely atrophy and decay, but shall last sound and good to the end of life. The amount of blood supplied to the jaws and adjacent parts depends on the daily amount of work they are called on

to do. Embedded deep under the gums at the time of birth are the two embryo sets of teeth (the temporary and the permanent), and their structure, growth, proper setting and eruption depend on the supply of an abundant stream of rich, healthy blood throughout the period of most active growth. One might say: "Take care of the first two years, and the rest will take care of themselves." This is true not only of structure, but of function also. Proper feeding habits practised throughout the first two years will tend to last for life.

Every child ought to be taught to masticate well. Certainly modern children tend to chew imperfectly and to bolt their food, but this is because we suppress the natural tendency of babies to eat hard, dry, or tough solids—we give them "mush" instead. If one thwarts an instinct or refuses to gratify it at the time when it first manifests itself, the tendency of such instinct is to die out, and all effort to resuscitate it later on may be of little avail. Thus it is with **mastication.** We let the golden opportunity slip by when the baby wants something hard to bite, and we try in vain afterwards to make him take time and masticate his food properly. Children can be taught to masticate at a very early age by giving them materials which need to be chewed, as their first solid food; this habit once ingrained will continue and increase in strength if tactfully fostered by the precept and example of parents. The training of the senses and the creation and building up of healthful habits at the dawn of life, until they become as dominant and compulsive as the **instincts** of the lower animals, are among the most important and interesting duties of the rearing of children. Thus a very young child who has been habituated to appreciate pleasant smells and to dislike and shun foul ones, to appreciate pure, fresh air and to shun foul air, will open a window as if by instinct when placed in a close, stuffy room. Similarly a child trained to remove or reject hard, unsuitable objects from food, such as the seeds of oranges or grapes, will soon come to do so as if by instinct and will not swallow fish-bones if they enter the mouth. If instead of always taking away the seeds it is pointed out from time to time that there is a pip

in a particular spoonful of orange juice, which must be removed from the mouth, the sense of appreciation in this direction will be trained and developed through the sense of sight, and the intelligence, and the muscles involved in the act of rejection will be trained also. On the other hand, if the parents do everything themselves to safeguard the child and do not train his own senses and muscles to safeguard himself, there will be no proper automatic or reflex protective development. A child towards the end of the second year can easily be trained to masticate raw apple and to eat it slowly, just as he can be trained to gnaw a bone and to chew what he succeeds in tearing or biting off. The effects of such exercise on the jaws, teeth, muscles, etc., are obvious, but there is an equally important effect on the development of primitive intelligence, confidence, and self-dependence.

The advantages of chewing some more or less dry, hard or tough food are threefold, viz.:—

1. Salivary glands are stimulated to grow and secrete actively; indeed, this applies more or less to all the digestive organs.

2. Normal formation, growth and development of teeth, jaws and the muscles concerned in mastication are promoted.

3. The increased blood supply to adjacent areas, especially to throat, nose, and pharynx, tend to nourish and tone up these parts, and thus to prevent colds, sore throats, swollen tonsils, adenoids, bronchitis, consumption, etc.

ESSENTIALS IN THE SECOND YEAR

Milk

Milk continues to be an important component of the baby's food throughout the second year, but the daily allowance should gradually diminish as the child takes more and more solid food. The common advice is to give one and a half pints of milk up to two years of age, but it is better for the child's nutrition and growth not to let him depend so much on milk, but to train him to take in succession a sufficiency of other foods, which afford

healthy stimulation and active work for jaws, teeth, and salivary glands. If a good proportion of solid food is taken a pint of milk a day should suffice after the fifteenth month.

Fruit and Vegetables

Fruit and vegetables should be given and proper care should be exercised in their selection and preparation.

Meat is not a necessity during the second year, but by the fifteenth month a little chicken or light fish may be given, and after eighteen months underdone beef or mutton may be given occasionally, but the general tendency is to give too much too early. Ample flesh-forming food can be given in the form of milk, eggs and fish.

BETWEEN 12 AND 15 MONTHS

Feed Four Times Daily

Milk Mixture—Humanised milk 15 oz., whole cow's milk 15 oz.

Recipe for above mixture:—

Milk 22 oz.
Water 8 oz.
Karilac 1 level tablespoon.
Kariol 3 level teaspoons.

During this period decrease the milk to 1 pint (20 oz.) daily and gradually leave out the Karilac and Kariol according to instructions given by your Plunket nurse.

If a baby eats heartily and takes a good proportion of solid food he may not need any humanised milk beyond the end of the first year; but never discontinue entirely until after the first birthday. "Karil," the emulsion for older children, may be given as an adjunct to the diet in the second year if necessary.

Solid, Tough, Dry or Hard Foods—Crusts, and oven-dried or crisp toasted bread, and stale bread—all to be given with a little butter or dripping. Don't butter toast when hot.

Cereal Jellies to be continued. Gradually mix some unstrained porridge into the strained jelly; as time goes on, less and less need be strained.

Gradually introduce more variety into the diet on the following lines:—

Milk Puddings, made with well-cooked ground-rice, semolina, etc.

Broths—Vegetable milk-broth, chicken-broth, or mutton-broth. To be made with pearl barley or rice, and sliced vegetables; strain at first, later press vegetables through sieve.

Vegetables—Spinach, cauliflower, carrot, floury potato cooked in skin, etc., well cooked, rubbed through a fine sieve, and served warm with a little butter or meat-gravy without fat.

Fruits—Pulp of baked-apple or pulp of stewed prunes. Begin with only a teaspoonful, and increase gradually to one or two tablespoonfuls; a little thin top milk may be given with this. As soon as baby has four or more teeth, he should be taught to chew, and raw ripe apple should be given, under careful supervision. He may be taught by having a little scraped on his teeth or grated fine and fed with a spoon. Continue giving the juice of some raw fruit or vegetable daily.

Egg—During this period introduce coddled egg. Half a yolk may be given two or three times a week at the midday meal—a little white being added gradually.

N.B.—*Give the baby a dry evening meal sometimes—that is, a meal without any mushy food.*

Suggested Meals for Child from 12 to 15 Months

Early morning drink—Milk mixture 6–8 ozs.

Breakfast, 8.30 to 9 a.m.

Porridge (oatmeal or wheatmeal), partly strained, 7–9 tablespoonfuls; scalded top milk with this, 2 oz. (No sugar, salt in cooking.) Twice-baked bread or crisp toast and butter, two to three fingers (or as much as hungry for). Drink of milk mixture, 5–6 oz. Piece of raw, ripe apple last.

Dinner, 12.30 to 1 p.m.

1. Vegetable milk broth, 3–4 oz. Twice-baked bread, two fingers. Baked apple, one small, top milk ½ oz. (No sugar unless apple sour.) Drink of milk mixture, 4–5 oz. Piece of raw, ripe apple last; *or*,

2. Sieved vegetables, 3–4 tablespoons. (Spinach and potato, cauliflower and carrot, tender young greens, etc., as convenient or in season); butter, ½ teaspoon, or meat-gravy, 1–2 tablespoons. Twice-baked bread, 1–2 fingers. Junket, 1–2 tablespoons, prune pulp, 1–2 tablespoons, top milk, 2 tablespoons. Milk mixture. 4–5 oz. Piece of apple last; *or*,

3. Half a coddled egg. Bread and butter or toast and butter, 3–4 fingers. Semolina pudding, 2–3 tablespoons, apple pulp, 2–3 tablespoons, top milk, 2 tablespoons. Milk mixture, 4–5 oz. Piece of apple last.

Tea, 5 p.m.

1. Oat or wheatmeal jelly, 3–4 oz., top milk, 2 oz. Twice-baked bread and butter, toast, or bread and butter, 2–3 fingers (or as much as hungry for). Milk mixture 5–6 oz. Piece of raw apple; *or*

2. Baked apple, 1–2 tablespoons, top milk, ½ oz. Toast and butter. Milk mixture, 5–6 oz. Piece of apple; *or*,

3. Twice-baked bread, toast or bread and butter, as much as hungry for. Milk mixture, 6–7 oz. Piece of apple.

Note—The early morning milk drink may be discontinued as soon as the child takes sufficient milk with the three main meals.

A drink of water or diluted orange juice may then be substituted, breakfast being made the first meal of the day.

BETWEEN 15 AND 18 MONTHS

Three meals daily, with extra milk drink in early morning if unable to take sufficient milk otherwise.

Milk Mixture—20 oz. cow's milk (scalded), diluted with 5 oz. water. In addition, enough water should be taken to ensure a total intake of considerably more than this, preferably nearly a quart of fluid in twenty-four hours. Most fluid should be given in hot weather, the precise quantity needed depending also on the amount of exercise taken, etc. Thirst is a clear indication for increasing the fluid.

Other Foods—On same lines as during previous period, but give more of the solid, dry, tough or hard foods, including wholemeal bread; milk puddings made with whole rice, sago, tapioca, etc.; always give a piece of raw ripe apple at the end of each meal. Continue training the baby to chew thoroughly, and avoid giving much soft, mushy food.

Egg—Coddled or lightly boiled, not more often than three times a week.

Light Fish, steamed or boiled.

Chicken, steamed or boiled, either well minced or (preferably) chewed off the bone. Only a teaspoonful of either chicken or fish should be allowed at first; and limit to, say, a level dessertspoonful up to two years of age.

Suggested Meals for Child from 15 to 18 Months

Arrange on same lines as for previous period, increasing quantities gradually, according to the age, activity and appetite. *Give some food requiring chewing at each meal and see that it is chewed.* If there is any difficulty, give the hard food first. Especially avoid pappy foods at tea time. Bread, mostly wholemeal (preferably dried or toasted), with milk to drink, and fruit, is sufficient for the evening meal for a healthy child who has really learnt to chew. However, beware of underfeeding if the child does not take hard foods well. Scald and cool a pint of milk, add 5 oz. of water, and put aside for baby's use. You thus ensure his getting his full supply.

As before, give a dry evening meal sometimes.

18 MONTHS TO TWO YEARS, AND ONWARDS

Further increase the use of hard and dry foods, including oven-dried wholemeal bread, oatcake, etc.

During this period porridge made from the finest ground wholemeal may be given.

Give about one pint of milk a day; also supply enough water. Increase the use of vegetables, adding to the previous list young tender green and root vegetables of all sorts, onions, young tender

corn on cob, etc. Give raw fruit, daily if possible. If fresh, sound and ripe, any of the ordinary fruits may be used. Tomatoes are risky if there is any unsoundness. Bananas should be both ripe and sound, and if used must be mashed with a fork to prevent bolting. Apples and oranges are safest and best. Most other fruits should be allowed only in strict moderation—otherwise, they are very liable to cause irritation, fermentation and diarrhœa; this applies specially to fruits with seeds (raspberries, blackberries, strawberries, etc.).

Suggested Meals for Child from 18 Months to Two Years

Early morning drink—water or diluted fruit juice, 4–5 oz.

Breakfast

1. Porridge, unstrained, 10–12 tablespoons; top milk or whole milk, 2–3 oz. Milk drink, 5–6 oz.; *or,*

2. Oatcake and butter, or dry cereal food, with fruit juice or top milk. Toast or twice-baked bread and butter. Milk drink, 5–6 oz. Piece of raw apple.

Dinner

1. Steamed fish, 1 dessertspoon; white sauce (well cooked), 1–2 tablespoons, or melted butter, 1 teaspoon. Potato, 2–3 tablespoons, or cauliflower or other vegetable. Junket, 2 tablespoons; baked or stewed apple or other fruit, 1–2 tablespoons. Twice-baked bread, 1–2 fingers. Milk drink, 4–5 oz. Piece of raw apple; *or,*

2. Vegetables, 2 or 3 kinds, say spinach, French beans (or other greens in season), marrow, etc.; potato, baked or boiled in jacket. Butter, 1 teaspoon, or meat gravy, or sauce, made with vegetable water and milk. Custard, 1–2 tablespoons; stewed fruit, 1–2 tablespoons. Twice-baked bread, 1–2 fingers. Milk drink, 4–5 oz. Piece of raw apple; *or,*

3. Mutton broth, made with vegetables, 3–4 oz. Twice-baked bread, 2–3 fingers. Baked apple, semolina or brown rice pudding, 2–3 tablespoons. Top milk, 2 oz. Milk drink, 3–4 oz. Piece of raw apple; *or,*

4. Coddled egg with spinach, or other vegetable. Baked apple and twice-baked bread. Milk drink, 3–4 oz. Piece of raw apple.

NOTE—If the child has a good appetite and takes all mixed foods well, it is not necessary to give milk to drink at dinner.

Tea

1. Wholemeal bread and butter, or toast, with tomato or lettuce, as sandwiches. Milk drink, 5–6 oz. Raw apple; *or,*

2. Oatcake and butter. Bread and butter with little marmite or honey. Milk drink, 5–6 oz. Raw apple; *or,*

3. Brown bread and butter or toast and butter, or wholemeal oat or wheat biscuits and butter. Milk drink, 5–6 oz. Raw apple.

Suggested Meals for Child from Two to Five Years

Breakfast

1. Porridge and milk, crisp toast and butter, or twice-baked bread with butter, drink of milk and water. Piece of raw apple; *or*,

2. Oatcake and drink of milk and water (milk 3 parts, water 1 part). Brown bread and butter. Piece of raw apple.

Dinner

1. Little light meat and good gravy with fresh cooked vegetables. Simple pudding. Piece of raw apple; *or*,

2. Toast and butter. Baked apple. Drink of milk and water. Piece of raw apple; *or*,

3. Vegetable milk broth and twice-baked bread. Custard and fruit. Piece of raw ripe apple; *or*,

4. Steamed fish. Baked potato and vegetable. Junket. An orange.

Tea

1. Toast and butter. Baked apple. Drink of milk and water. Piece of raw apple; *or*,

2. Brown bread and butter or dripping, or home-made twice-baked oat or wheat scones and butter. Drink of milk and water. Piece of raw apple; *or*,

3. Raw fruit. Twice-baked bread and butter. Drink of milk and water. Piece of raw apple.

Lettuce, cress, tomato, marmite, honey, dates, raisins or nuts with bread and butter or as sandwiches.

Feeding Older Children

It is difficult to give precise dietaries for children over two years of age, because individual needs are affected by so many circumstances, and available foods vary so much with locality and social position. However, if no drinking is allowed until the end of the meal; if the food given is plain, good, and not unduly sweetened; and if a large proportion is dry or tough, there is not much risk of a child over-eating, provided that no "pieces" are allowed between meals. Properly speaking, when he has had enough a child's jaws ought to be tired, his flow of saliva ought to be running short, and his appetite failing. None of these things may take place to guide the capricious, enfeebled child whose food is merely soft and mushy. He may take double as much as he needs without being

satisfied, or he may feel satisfied with what does not contain enough nutriment.

Fluids are best taken at the end of and not during meals. Good fresh fruit may be taken freely at meals. Sweets and cakes should be avoided as far as possible, and never given just before going to bed. Always brush the teeth (using a soft brush) and rinse the mouth at bedtime.

ARTICLES FORBIDDEN

The following articles of food are improper for a healthy child under four years of age in all circumstances. Nearly all of them should be prohibited in the case of children under seven years:—

Of Meats—Ham, sausage, pork in all forms, salt fish, corned beef, bacon, meat stews, fried meat, and dressings from roasted meats.

Of Vegetables—Those especially objectionable are raw cucumbers. Nearly as bad are raw onions and potatoes fried or baked with meat.

Of Bread and Cake—All new bread, or rolls, hot-buttered toast or scones, rich cakes, particularly those which are fatty, and those heavily iced.

Of Desserts—All sweets; tarts and pastry of every description.

Of Drinks—Tea, coffee, wine, beer, soda-water and cider.

Of Fruits—All stale fruits, particularly in cities and during the summer. With most fruits it is unripeness, unsoundness, excess in quantity, or the fact of being swallowed without proper chewing that makes them injurious.

GIVING SWEETS, ETC.

The sin of giving sweets to infants is one concerning which it is difficult to speak too strongly. The following clear statement, adapted from Professor Rotch, should be taken to heart:—

> The infant should never be given cake or sweets even to taste. It is necessary to state this very decidedly, because it is an erroneous view, which is held by most mothers, that it can do no harm to give occasionally to an infant in its second year or to a young child a sweet or a little cake. This may be true so far as the immediate effect these articles may have on the digestion is concerned, but it is of far more importance that the infant should not have its taste perverted from those articles of diet which are best for its nutrition. These new articles appeal more strongly to its sense of taste, and allow it to know that there is something which tastes more agreeable than the food which it is accustomed to have. When an infant has acquired

a taste for cake or sweets it will cease to enjoy the food by which its development will be best perfected. It is, in fact, kinder to the infant never to allow it to taste cake or sweets. When these articles are withheld it will continue to have a healthy appetite and taste for those articles of food which contain the vital elements absolutely essential for normal nutrition and growth. Cakes and sweets merely supply energy and contain nothing that will sustain life.

Care of Baby's Teeth

By Professor R. BEVAN DODDS, D.D.S., Dean of Dental Faculty, University of Otago.

"When the thoughtful historian gets far enough away from the nineteenth century to see it as a whole, no single feature will stand out with greater distinctness than the fulfilment of the prophecy of Descartes, that we could be freed from an infinity of maladies, both of body and mind, if we had sufficient knowledge of their causes and of all the remedies with which nature has provided us."

—*Sir William Osler.*

It may justly be claimed that in the case of dental decay we have sufficient knowledge of the causes and natural remedies to accomplish much.

The total amount of suffering in the world, directly traceable to dental disease, must be enormous, and that largely in children and in adolescents. The pity of it all is that this is so notwithstanding the fact that, owing to the many earnest workers of the past few years, this disease is understood perhaps more fully than any other of like importance; it has been amply demonstrated that prevention can be established, and the means used shall be discussed.

The whole tale of the cause of dental decay is not told yet, but enough is known for one to appreciate the fact that no single cause operates, but a combination of factors. Fortunately these factors can be isolated and dealt with separately.

The most important factor in the prevention of dental decay is to establish proper development of the teeth and jaws to begin with. Thus we must begin with the very young, if we are to establish a "dental mechanism possessing its own barriers of defence." No artificial means of attacking the problem will ever be fully successful.

Artificial means may be quite useful as an adjunct, but the main defence against disease must always be the natural resistance of the body. In the case of the mouth, there is a complete and natural system of self-protection available, if it is only given a chance. Obviously the proper development of the teeth and jaws is our first barrier of defence, and as the **crowns of the teeth develop long before baby is born,** the diet and general well-being of the expectant mother becomes of real dental importance. Ante-natal care obviously is the first line of defence.

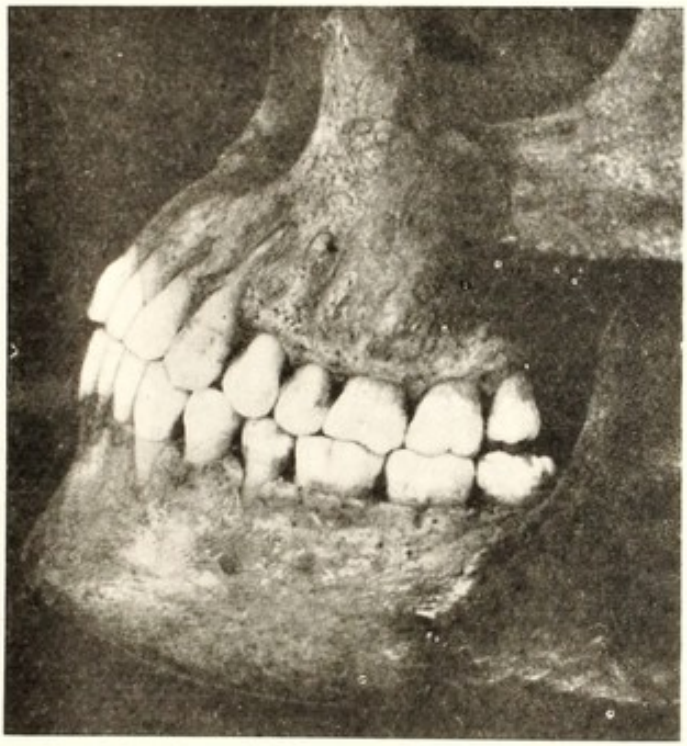


Fig. 38. Teeth and Jaws of Young Adult Maori

Note the nearly perfect arrangement of sound teeth associated with natural feeding and living conditions.

Provided that the infant is healthy, there is no reason to assume that because the parents have had a history of dental troubles, the infant will likewise be afflicted with poor teeth. There is no evidence that any hereditary influences have any bearing on the development of the teeth, and it is reasonable to assume an equal opportunity for all infants to have good, well-developed teeth and jaws, given equal ante-natal and post-natal care. Of course, the teeth being part of the body, a general disease or departure from normal affecting the whole system will be reflected in the condition of the mouth and

jaws. Illnesses occurring during the developmental period may also exert an unfavourable influence: but, other things being equal, parents can be assured that dental disease cannot be transmitted from parent to child. In the case of the history of a race of people over many generations, modifications in the shape of the jaws may occur, but well-developed modern teeth have no very marked points of dissimilarity to the teeth of man in the Stone Age. The main difference is one of development, due no doubt to generations of civilized living conditions.

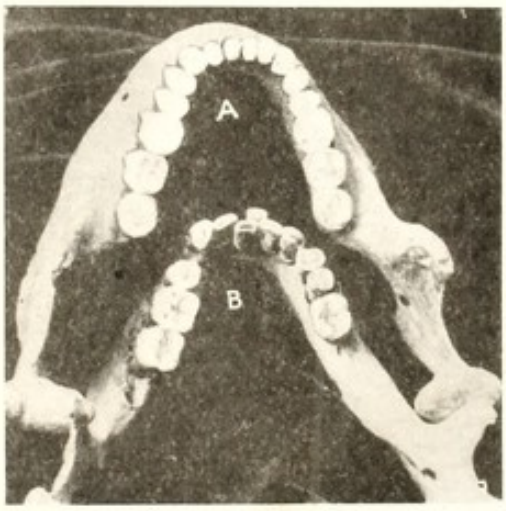


Fig. 39

A. Lower jaw of aged Maori.
B. Lower jaw of degenerate European.

Fig. 40

Upper jaw of aged Maori.

ARRIVAL OF "MILK" TEETH

The average times for arrival of the milk teeth in baby are as follows:—

Central incisor - - -	6 months.
Lateral incisor - - -	9 months.
Canine or eye tooth - -	18 months.
First double tooth - -	13 months.
Second double tooth - -	26 months.

Now these times are a useful guide as to when to expect the teeth in question, but are normally subject to very wide variations. If the child is healthy the parents should not be anxious because the teeth are earlier or later than the times noted.

TEETHING DISTURBANCES

The arrival of the deciduous teeth normally should be passive and painless, but slight disturbances, such as fretfulness of the infant, are so common as to be considered almost normal occurrences. The arrival of a tooth is heralded by a thickening of the gum, but with few other signs. Baby may worry at this and place his fingers in his mouth in a fretful manner. Here the old-fashioned teething ring serves a useful purpose, provided that it is clean. Baby feels the need of something hard to bite on, and a chicken bone, or some other form of smooth bone stripped of its meat, gives baby an excellent chance of exercising his jaws, and assisting eruption of the tooth.

Any disturbances more severe occurring during eruption call for special treatment. Baby's mouth will then show some inflammation and tension over the tooth. The gums may look white or congested—they are obviously tender—and feeding may thus be interfered with. The natural champing movement of the jaws causes baby some pain, and therefore he relinquishes the nipple usually with a cry. Ulceration is unlikely, except under habitually unhygienic conditions. Baby's mouth may be dry or there may be more saliva than usual. In the latter case the disturbance is usually very mild, there being some truth in the old saying that a "dribbling" child is all right.

The presence of "Thrush" is uncommon in this country; it arises from dirt and infection. It should be remembered that the mechanical movement of teeth during eruption, with its accompanying nervous disturbances, makes baby more liable to such things, and extreme care should be taken with regard to placing rags or fingers in baby's mouth. Kissing on the mouth by sundry people may also be a source of infection, and cannot be too strongly condemned. "Thrush" may be recognised as opaque white glistening patches, tightly adherent to the mucous membrane, and should not be confused with spots of curdled milk.

GENERAL DISTURBANCES

Loss of appetite, fretfulness, sleeplessness, sudden cries —all are associated with difficulty in eruption of the tooth.

The pain may be sudden or it may be continuous, and the child may struggle to sit upright.

A combination of the local and general symptoms outlined makes it necessary for the parent to seek professional advice, as, given a certain combination of circumstances, severe nervous or intestinal symptoms may follow. The latter of course may be primarily due to wrong feeding and warm weather, but the dental irritation may be looked upon as the immediate cause. Proper advice and treatment at this critical time may prevent the onset of serious conditions, such as gastro-enteritis or convulsions.

There are other minor accompaniments of teething troubles. A loud noisy cough may be present, which has no serious significance, and stops on removal of the local irritation in the mouth. In this connection it should be remembered that too much crying and inhalation of dirt and infection through an open mouth is, in itself, a bad thing. Finally, baby may suffer from eruptions on his body, which are inclined to be very itchy.

Local treatment of mild cases consists in giving baby some hard article to bite on, or rubbing his gums occasionally with cold water on the finger. **Lancing of the gum is never resorted to** except under professional advice, natural eruption of the tooth being regarded as the ideal.

IMPORTANCE OF THE "MILK" TEETH TO THE CHILD

There is a very prevalent idea that milk teeth are of little importance, that they will be lost in any case in the course of a few years, and that it is not worth the trouble and discipline involved in attending to them, either in the daily routine of the home, or when required by a visit to the dentist. When one realizes that such neglect means the loss of masticatory power to the child during a period when it is of vital importance, when he is developing very rapidly, and when he is establishing habits which will remain for years; and that such neglect will almost certainly give rise eventually to various deformities of the lower part of the face, with its associated harmful results to the whole organism, mental and physical, **one is justified in claiming a super-importance for the milk teeth.**

The control of dental disease at this period of life is largely or almost entirely a dietetic matter, and parents should realize that what is good for the teeth is also good for the whole body. The reverse of this is not quite true, as it is possible that a nutritive food substance may be prepared in such a way that it forms a danger to the teeth, owing to its physical character. That food substance should be prepared so that, without altering its food value, the menace to the teeth is removed.

It should be remembered that the mouth, being part of the body, will reflect the general condition of the infant in some measure. For instance, the soft tissues of the mouth may be expected to lose their healthy colour during a mild feverish illness. No special diet is recommended as a cure for dental disease. Most foods in this country are good, provided they are properly prepared and used in the meal. It is quite a common mistake to select one article of food and blame it for everything, while ignoring other more serious errors in feeding.

CAUSE OF DENTAL DECAY

In short, this is primarily due to sugary and starchy foodstuffs stagnating in the nooks, crannies and crevices about the teeth. Now stagnation is wrong and always leads to disease. The main cause of this stagnation is the failure of the self-cleansing powers of the mouth to deal with the conditions as created by dietetic errors. Starchy and sugary food materials in some form or other, are essential parts of the diet, and Nature has endowed everyone with necessary cleaning apparatus in the mouth to deal with the food debris, if only given a chance. Thus the methods of protection available are methods largely concerning the matter of diet, which will tend to stimulate the **natural self-cleansing powers** of the mouth as much as possible.

These dietetic measures are not formidable, nor do they involve any increase in the expense of raising a family. Indeed the changes advocated are really pleasant ones, and are thoroughly appreciated by the child, whose natural instincts run in the same direction, provided bad dietetic habits have not been established too firmly. The

main principles are: consumption of adequate amounts of the necessary foods, the proper natural excitation of saliva during and after a meal, and the use of food materials in such a form that they are actual cleansing agents in themselves. The latter involves suitable alteration of the starchy foods, and arrangements of meals so that the more cleansing articles of diet follow the less cleansing ones.

EXCITATION OF SALIVA

Obviously the best way to excite saliva is **for the child to be hungry.** Discipline at meals is essential. Children should take their food in the proper manner and in the proper order. It is also essential that the natural taste of the food should not be spoiled by over-preparation. At the end of the meal, when the final stimulus to the saliva is necessary for the purpose of thoroughly irrigating the mouth, and after all saliva is the perfect mouthwash, a small portion of fruit of the acid sweet type, such as apple, may be used with advantage.

CLEANSING FOODS

This is largely a matter of the preparation of the starchy foods, so that their physical consisteney will be such that they are not pappy and sticky, but rather granular and easily controlled by the tongue and swallowed. This means the selection of those starchy foods which are not over refined, but which may be prepared in the kitchen in such a way as to enable the child to eat them without coating his mouth and teeth with an injurious film of starch. Toasting and twice-baking of staple articles of food, such as bread, are strongly advocated. The use in a meal of non-starchy, self-cleansing foods is also indicated, particularly towards the end of the meal. Here again a piece of apple is excellent, for it has a fibrous network which has more effect than any toothbrush, if the apple is well "chewed."

EXAMPLES OF NON SELF-CLEANSING FOODS

White bread, sugars, and starches, and many highly refined cereal foods, except in granular form.

EXAMPLES OF SELF-CLEANSING FOODS

Fresh fruits, nuts, raw vegetables, lettuce, celery, radishes, onions, crust of wholemeal bread, crisp toast, twice-baked bread, and fish.

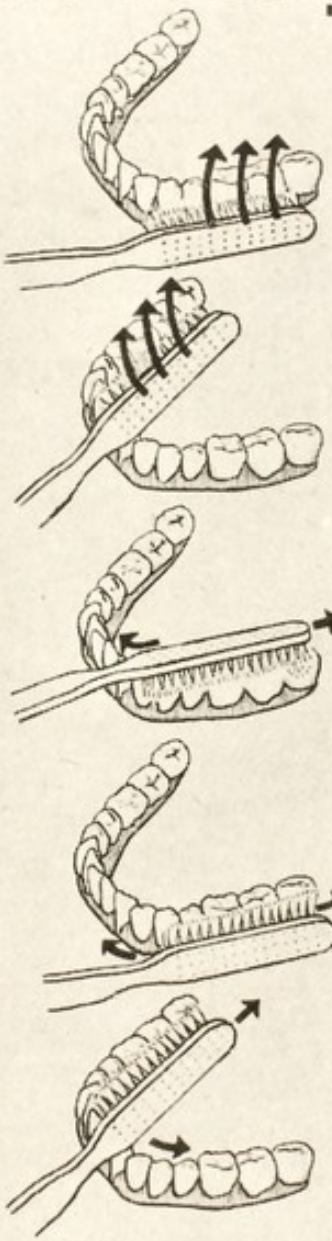
The drinking of large amounts of fluids at meal times obviously offsets the self-cleansing effect, and if the fluid is milk then it should be followed by some of the more cleansing foods.

ARTIFICIAL MEANS

One cannot expect any artificial means of cleansing to counteract the failure of the self-cleansing power of the mouth. True it is that **a clean tooth cannot decay**, but the difficulty is to make it clean, and the use of the toothbrush will not ensure that desirable condition. Up to the age when the child will have learnt a certain amount of discretion, and is able to carry out instructions, the use of the toothbrush appears more a menace than a benefit. Children cannot be expected to use the toothbrush properly, and abuse of it is probably worse than the entire neglect of it. So parents are advised to do any artificial cleansing themselves for the young child until such time as the child has learnt discretion and can be taught. Given an ordinary healthy child, and adherence to the rules as explained above, the toothbrush is seldom necessary in the very early years.

As the child gets older and less under the control of its parents in the matter of what it eats and when it eats, the toothbrush may be regarded as a useful agent. It will help to keep the child "tooth conscious," and encourage a feeling of pride in a clean mouth. The toothbrush should be small and with separated bristles, which can be kept reasonably clean. Two brushes are a great advantage, as one can be kept dry on a nail outside the bathroom window. A dentifrice for children need not be anything more elaborate than a pinch of common salt in water, although some of the proprietary pastes or powders may be used in small quantities if staining on the teeth occurs, so that the child may be induced to be particular. Strongly flavoured, hot or gritty dentifrices should be avoided.

How to clean the Teeth



Clean out the spaces between the teeth

← First outside

← Then inside

← Then brush along the tops of the teeth

← Then clean the outsides of the teeth

← Then clean the insides

Do the same to the other Jaw

THEN WASH YOUR MOUTH OUT WELL AND YOUR TEETH WILL BE CLEAN

Take care of your teeth–and your teeth will take care of you/

Issued by the DENTAL BOARD of the United Kingdom, 44 Hallam Street, London. W 1.

Fig. 41

NOTE ON SUGAR

There is no doubt that the wholesale consumption of sugar, in the form of sticky sweets, is responsible for a great deal of the dental disease in this country. However, that does not mean that sugar in itself should not be used as an article of diet; in fact it may be desirable in some cases, under medical advice, to increase sugar, but as part of the diet and not as a substance to tickle the palate continually. The correct use of sugar is bound up in the rules already stated. If sugar added to food, especially starchy foods, alters its physical consistency so that it tends more to cling to crevices in the mouth, then obviously that use of sugar is entirely wrong, and it is a flagrant case of "coals to Newcastle." Sugar, no less than starch, readily forms acid which may attack the teeth, but putting the two together not only makes the food substance impossible of removal by natural means, but supplies a ready means of forming acid. Sugar should be used and not abused, and if the meal is properly planned and sugar given in the form of fruit juice or along with fruit juice, then there is no need to apprehend any dental troubles following.

The habit of sweet-sucking not only robs the child of appetite, and makes ineffectual the cleansing powers of the mouth, but also gives rise to a chronic form of inflammation of the soft tissues, which leads to thickened and reddened gums and sticky, viscous saliva. Almost any food substance in these conditions would stagnate in the form of debris about the teeth.

It should be clearly understood that if the maximum amount of benefit is to be derived from such preventive measures as outlined above, the development of the teeth and jaws in the young child should be carefully ensured by thorough ante-natal and post-natal care on the lines dealt with elsewhere in this book. However, even with faulty development perhaps due to illnesses, the teeth may be retained in reasonable order and condition by scrupulous care and attention to detail.

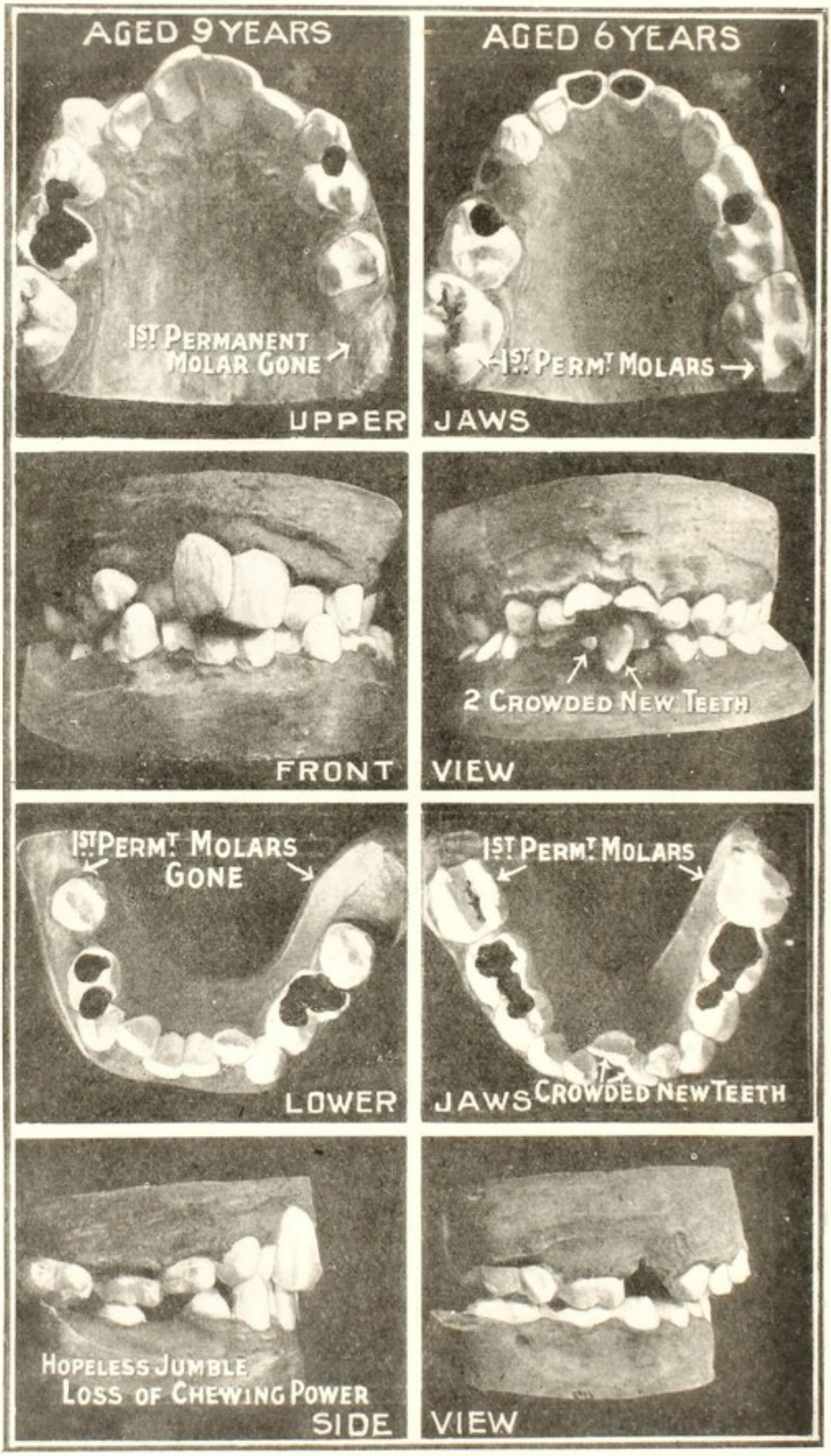


Fig. 42. Defective Jaws and Teeth

Figures 42 and 43 are taken from the first edition of "Feeding and Care of Baby."

Figure 42 shows casts of jaws of two children of the same family, showing mal-developments of jaws due to causes as discussed in the text. Prominent among these causes are lack of exercise due to continued **pap-feeding** and other bad habits.

Note narrow jaws; crowded, jumbled, irregular teeth, and decay spreading from tooth to tooth.

Note that the teeth **over-lap** one another and **interlock** when the jaws are closed, preventing all power of "grinding" or side-to-side movements essential for proper mastication. Mere up-and-down chopping movement is not enough—**food should be ground.** If in an adult we find the teeth not worn, we may be sure he has not been in the habit of masticating properly.

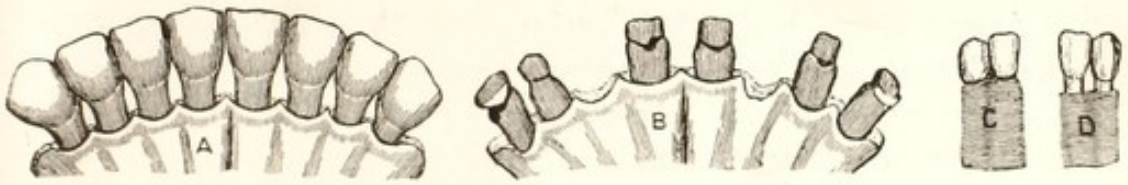


Fig. 43

EFFECTS OF SOFT FOODS ON LOWER ANIMALS

Special attention has been given of late to the effects on jaws and teeth of feeding animals with foods not demanding mastication. Whether the animal be herbivorous or carnivorous, jaws and teeth fail to develop properly, and the teeth soon decay if hard tough food is withheld.

(*A*) Teeth of a Healthy Cow.

(*B*) Teeth of a Cow fed on Slops. This shows the need of eating food that requires the use of the teeth.

(*C*) Human Teeth: Healthy sockets.

(*D*) Sockets Injured by Tartar. Germs grow in tartar and attack the teeth, so it should be kept away by eating the essential natural cleansing foods in the proper way.

DEVELOPMENT OF THE JAWS

This is bound up very intimately with the development of the lower part of the face, and thus it is particularly desirable that all efforts should be made to avoid deformities which are so prevalent to-day. Over many generations it is probable that the shape of the jaw of civilized peoples is being gradually altered and foreshortened. That is to a great extent due to factors which the individual cannot control, the main thing for any parent being to see that his child is given a chance to develop the arches of the jaws as Nature intended. In the very early years the jaws are comparatively plastic, and may be modified very readily by pressure strains. The proper strains exerted in the ordinary normal function of the jaws, and by proper breathing through the nose will ensure the best possible development of that individual's jaws and face.

BAD HABITS

Apart from lack of function and thus lack of proper muscular strain, very abnormal pressures may be brought to bear on this soft developing bone. These abnormal pressures are due, in most cases, in the infant, to bad habits. It should be carefully noted that early loss of the milk teeth will almost inevitably cause the onset of deformities of varying degree, but these occur later in the early teens.

Apart from the general tendency to dental disease, both of the soft tissues and of the teeth themselves, owing to the crowded unhygienic condition of the teeth, there are other conditions commonly associated with dental deformities, notably the presence of inflamed tonsils and adenoids. These cases have a very typical appearance. (See Fig. 48, page 214.) The eyes have an apparently stupid expression, the bridge of the nose is thickened, the nostrils are narrow and ill-formed, the upper teeth protrude and are irregular. The lower jaw is set back and the teeth are set somewhat fan-shaped. The soft tissues are inflamed, the upper lip is short and falls back exposing the teeth continually. The child has snoring respiration, especially during sleep, and the breath has a dry fœtid odour. The

condition of the whole body usually reflects the condition of the part, and the child is not given a chance.

The effect of adequate treatment of the mouth and throat is often quite dramatic, particularly the change from the apparently stupid expression of inferiority to that of the bold bright eye of self-reliance. The mental effect of any departure from normal is very marked in children. Other normal children appear to be almost barbarous in their cruelty in making such a child feel that he is not as others are. Thus it behoves all parents to give their children a fair chance, and avoid as much deformity as possible. The prevention in this case is certainly easier than the cure.

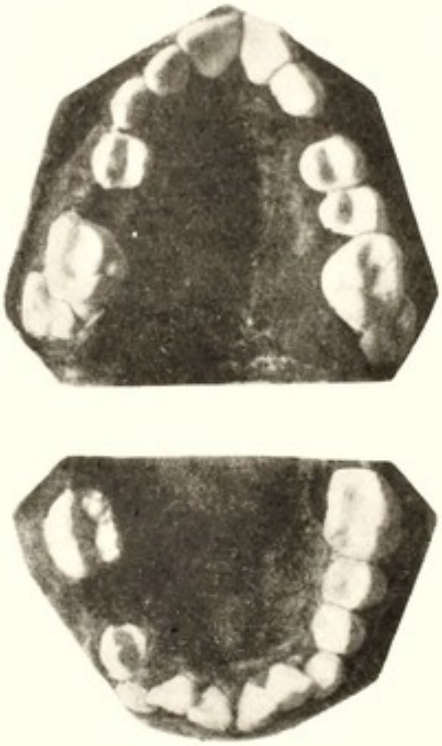
Finally, if all means of prevention fail, and the child develops tooth decay, methods of treatment are available to-day of dealing with teeth which may be lacking somewhat in development—simple methods which entail no pain and discomfort—and the parent is well advised to seek dental professional advice early in the child's life, so that the special needs of that small individual can be attended to early.

HABITS HARMFUL TO THE JAWS

It should be understood that if the shape and arch of the jaw bones be modified by habits so that a distortion of these occurs, then the lower half of the face will reflect this deformity. The final result is not only an inefficient masticatory machine, which is moreover peculiarly susceptible to disease, both of the hard and soft tissues, but a deformity of expression which may well be a rather serious handicap to the child. Associated troubles, such as nose and throat disorders, with the accompanying poor physical development, have already been mentioned. Enough has been said to demonstrate that these habits have definitely more than a local significance— they affect the whole well-being of the individual. Therefore parents must detect and check such habits in the earliest stage, for once established firmly they are most persistent and difficult to deal with.

It has already been explained that the jaw bones in the young child are plastic and are moulded by the correct

play of muscles upon them. Thus deformities occur through abnormal strain or pressure, and the bad habits can be classed as muscular habits, and can be defined as frequent movements of the tongue, lips, cheeks and floor of the mouth at variance with their normal use.



Cast of jaws of a child of six years, showing lack of development, resulting in a narrow arch and crowded irregular teeth.

This condition is common among civilized people, and is caused by wrong feeding and bad habits.

Fig. 44. Lack of Jaw Development

LIP BITING

The lower lip is placed between the upper and lower front teeth, held there and then drawn outwards, with many repetitions and variations as to timing—some will do it quickly, others slowly, while others again will simply hold the lip for a period.

The effect is very disfiguring eventually and tends to be perpetuated by the lower lip lying between the upper and lower teeth.

TONGUE BITING

This is difficult to detect sometimes. The tongue is placed between the upper and lower teeth and pressed by them. The result is that the front portions of the jaws are "open" and do not meet. Other curious habits of the tongue, with resulting deformities, occur and parents are

advised to note any habitual "tricks" with the tongue and check them. Baby may be encouraged in the habit by regarding them as "cute."

ABNORMAL CHEEK MOVEMENTS

These are not so common. They take the form of sucking the cheek in one or both sides, resulting in a pressure strain which may have results disastrous to the health of the mouth and to the appearance of the developing child.

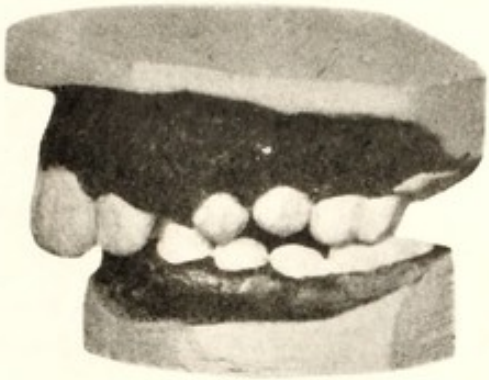


Fig. 45. Jaws of child showing lack of development.

Note the very imperfect arrangement of poorly developed teeth associated with artificial (i.e., civilized) feeding and living conditions. In this case, thumb sucking has been a contributory factor, but the case represents an abnormality becoming increasingly prevalent.

THUMB SUCKING

The bad results occur here from two heads—the pressure of the thumb itself and the sucking movement—which causes the floor of the mouth to apply undue inward pressure on the jaw. Somewhat similar results may be obtained from the feeding bottle if the teat is badly designed. In the latter case the time factor is the saviour to some extent, but in the former the habit may persist for many years and be most intractable. The usual effect of this habit, if persisted in, is the displacement of the upper teeth forward, giving a "buck tooth" effect. (See Fig. 45.)

SLEEPING POSTURES

Again an abnormal pressure during the comparatively plastic stage of the bone may be occasioned by certain sleeping postures. "Investigators in this field have shown

that where children 'pillow' in a position allowing the face to rest against the hands, arms or other semi-unyielding objects the pressure thus exerted will be productive of malformation. Unfortunately these stresses are usually brought to bear against the dental arches and jaws, and as such habits are usually acquired in early infancy the growing structures are subjected to their influence during their most vulnerable period. In some instances one side of the face is favoured to the exclusion of the other, but frequently such pressure may be alternately applied to each side. In view of the fact that during early childhood sleeping is indulged in not only through the night hours but also in the daytime, the potency of this cause can easily be appreciated." (McCoy.)

TREATMENT OF INJURIOUS HABITS

This is frequently a difficult matter when the habit has been firmly established. Early recognition and firm encouragement of the child along the right path appear the only solutions. Appliances such as mitts, tethering the hands loosely, and so on, are rather unsatisfactory in the more difficult cases, owing to the determination of the child to indulge in a pet habit; more can be done by patient effort on the part of the parent to discourage the habit and replace it by a good one.

Premature Babies

Babies born before their time and classified as "Prematures" generally weigh less than 5½ lb.: those who weigh less than 2½ lb. seldom live, though in rare cases the survival of a 2 lb. premature has been recorded.

Every premature baby needs special care and attention from the very instant of birth, even though not much under weight and not obviously weak or debilitated. On the other hand, a badly nourished or unhealthy baby born at full term may be as difficult to rear as a healthy baby born before its time. In practice, all babies who are small and debilitated at birth are classed with prematures, and need more or less similar attention. The

following remarks on prematures may therefore be regarded as applying also to congenital weaklings born at full term.

The frailty and feeble hold on life of the premature baby is due mainly to there being very little readily available fuel stored up in the body at the time of birth, and want of heat-regulating power. These deficiencies cause the body-temperature to fall rapidly and dangerously below what is needed to sustain life, unless special steps are taken **directly the premature is born** to minimize the escape of heat by completely enveloping the body in warm, insulating wrappings, and to supply warmth from the outside by warming the room and the use of hot bottles. Of course, the requirements would be greatly modified in very hot weather with the temperature ranging between 75 deg. and 100 deg. F. in the shade.

Wherever possible, everything needed for conserving and supplying heat should be in readiness before the baby is born, the main special requirements being:—

(1) Cradle or deep dress-basket, the sides ready lined with flannel, old blankets, or brown paper—except where the room-temperature registers 80 deg. F. or upwards.

(2) Three hot-water bottles (preferably rubber, but any form of bottle may be used for emergency).

(3) Warm olive oil and cotton wool.

While all the above are not needed, except for prematures and weaklings, they should be in readiness at the time of child-birth, because at least one in every six new-borns would greatly benefit by the immediate use of what is indicated, and these provisions made ahead would save many lives. Most of the babies who die in the first year fail in the first week, and many of these literally "catch their death of cold" just after they are born, or in the first few days. An attentive, specially skilled, capable nurse can ensure the success of nearly every baby—she can save practically every child who is fit to live.

FURTHER PRACTICAL DETAILS FOR PREMATURES

Make the bed as described on page 50; in addition, prevent free circulation of air round about the baby by lining the cradle and by keeping the infant in a cosy nest three inches or four inches below the level of the rim. Also gather the outside enveloping blanket round the head end so as to form a kind of cowl.

The baby should not be bathed. The body should be oiled all over with warm oil and then be wrapped in cotton wool, which may be carried up over the head; but a woollen knitted hood, lined with two thicknesses of butter-muslin, is more convenient and comfortable. The baby should be re-oiled every other day, and each time the napkin is changed the buttocks and adjacent parts should be oiled. Instead of the ordinary napkin of turkish towelling, it is much better to use a pad of teased-out wood-wool, enveloped in a few thicknesses of surgical gauze, held in place by a napkin of soft butter-muslin. After a few days, or at the end of a week or more, it is generally desirable to replace the cotton wool with ordinary clothing, as being easier to change and more comfortable, and as allowing the baby greater freedom of movement.

Extreme care must be taken not to waste heat and exhaust the child while changing and dressing. The room and the garments should be well warmed beforehand, and the changing must be done expeditiously. Dawdling at any stage robs the baby of heat, saps its strength and resistive power, and makes it very liable to catch infective colds—the bane of prematures. Further, all such checks tend to prevent gain in weight, however well the feeding may be done.

Premature babies should be handled as little as possible; but they need turning from side to side regularly, at intervals of from four to six hours, to prevent congestion of the lungs.

Temperature of the Room for Prematures

For the newly-born premature baby the temperature of the room should be between 65 deg. and 70 deg. F.; this should be gradually lowered to between 60 deg. and

65 deg. as the condition of the child permits. **The warmth of the room must not be kept up at the expense of freshness,** as is so frequently the case. Warm, moist, muggy air is, of course, very enervating; but the air should not be unduly dry—about two-thirds saturated is best. Further remarks on the temperature of the room are given at the end of this section.

Temperature of the Cradle

Three hot-water bags (in flannel covers), filled alternately one each hour, should be placed one at each side underneath the outer blanket, and the third between the chaff shakedown and the mattress towards the foot end of the cradle.

The temperature of the water in the side-bags at the time of filling should be 160 deg. F., and that of the foot-bag 180 deg. F. This should maintain a "cradle-heat" of 85 deg. to 95 deg. F., as ascertained by means of a dairy thermometer placed between the blanket and the baby's clothing and midway between the side-bags, and kept there. Gradually lower the artificial heat supply as the baby's own internal fires and powers of heat-regulation improve.

Temperature of the Baby

If the rectal temperature is taken every four hours, and later every eight hours, undue fluctuation can be prevented by regulating the cradle-heat.

Range of Body-temperature

Few prematures survive if their rectal temperature is allowed to fall appreciably below 95 deg. F. Little apparent harm is done by a rise of the baby's temperature to 105 deg. F., but there is no excuse for allowing such overheating to take place. A fairly constant temperature of 98 deg. to 99 deg. F. (with an extreme range of 97 deg. to 100 deg. F.) is the ideal, and this can be ensured by reasonable vigilance. No greater fluctuation should take place, especially no fall below 97 deg. F. The wider the range the greater the strain on the organism.

EQUABLE, TEMPERATE ROOMS versus HOT ROOMS FOR PREMATURES

Hitherto most authorities have been in the habit of recommending that the temperature of the room for prematures should be kept between 75 deg. and 80 deg. F., but the doctors and nurses who have experienced the striking contrast between the after-condition of prematures reared in "hothouse" temperatures, compared with those reared at the Truby King Hospitals in less heated air, pronounce in favour of the latter.

Prematures reared in rooms kept between 60 deg. and 65 deg. F. show comparatively little tendency to colds and bronchitis, whereas those reared in hot rooms (75 deg. to 80 deg. F.), and in incubators, can rarely be kept free from catarrh, not only in the early stages but for months afterwards. Some American authorities, while advocating hot rooms for prematures, admit that the babies so reared readily catch the slightest ailment, owing to their feeble vitality, even after they have reached three or four months of age, and that a mild bronchitis or slight attack of diarrhœa will carry them off.

A natural high room-temperature due to hot weather is generally much less prejudicial to the baby than a high temperature produced artificially, especially by a stove or hot pipes. Prematures often do well in sub-tropical countries, or even in the tropics.

No matter where or how a premature baby is reared, it must always be very carefully safeguarded against draughts, chilling, and infection, to which it is much more susceptible than any ordinary baby, especially in the early stages. But once a well-reared premature has fairly turned the corner, and got on to the open highroad of health, it ought to hold its own and go straight ahead on normal lines. By the time he is between six months and a year old a well-reared premature baby should be practically indistinguishable from a full term child.

FEEDING THE PREMATURE BABY

Mother's milk is precious for all babies, but never is it of such supreme importance as for prematures. Given proper care and attention, practically no premature baby,

capable of living and doing well, would be lost if human milk were provided; and the general experience has been that without these advantages the death-rate has been very high. This is a serious loss, because **a premature baby is not necessarily a weakling, but merely a baby born before the appointed time.**

One of the strangest and most widespread of popular errors is the foolish notion that because a mother gives birth to her baby too soon she will be unable to supply it with milk; indeed, there is a common but absurd saying that it would be "going against Nature" for her to attempt to do so! No effort should be spared to secure the mother's own milk for her baby. If a satisfactory supply cannot be established at home, she should go into residence at a Mothercraft Hospital as soon as she is able to travel.

How to Establish the Mother's Milk-flow

In reality there are very few cases in which the mother's milk-flow cannot be established, if the matter is gone about in the right way. Secretion of milk is the natural response to active, vigorous sucking; but in a large proportion of cases the premature baby is not able to suck strongly enough, or to keep up sucking long enough to establish the flow in the first instance. A vigorous premature baby weighing 5 lb. or more may be put to the breast in the ordinary way as if born at full term. The baby may suck well, secure all the milk he needs, and give no trouble from the start, provided every care is taken to keep him cosy and snug in well-warmed wraps during nursing, and to prevent any avoidable loss of heat in changing from the cradle to the breast and back again. Some temporary loss of heat is inevitable, but this can be anticipated and counteracted to a great extent by the following procedure:—

(1) When lifting the baby from his cradle put in his place the cooler of the two side-bottles (still quite warm), and replace it with another bottle containing water at 160 deg. F.

(2) Just before putting the baby back, after feeding, refill the foot-bottle (between shakedown and mattress) with water at 180 deg. F.

Even in such cases as the above it is safer not to try direct suckling for three or four days, but rather to stimulate the establishment of the mother's milk-flow by skilled hand-expression, or by getting a strong, vigorous baby to suck the mother's breasts—provided either of these means is available. This is the best way to promote the mother's secretion, and to conserve the baby's strength.*

What is to decide whether a premature baby should be given a trial at the breast in the first week, or be fed by means of a pipette or a feeding bottle for the first few weeks, or as long as may be needed?

No absolute rule can be given, but in general it is safer not to attempt direct suckling for a few weeks—certainly not if the baby weighs less than about 5 lb. However, weight is by no means the only criterion: account must also be taken of the vitality and vigour of the baby, as manifested by good crying-power, ability to suck, good colour, and good circulation and breathing. Without these indications direct suckling should not be attempted.

A strong argument against direct suckling of prematures, in the first instance, is the fact that breast-feeding, which is hard work for any baby, is a specially exhausting and arduous task for a premature. This is due partly to the immaturity of the child and partly to the fact of the mother's breasts yielding little or no milk, and that with difficulty, until strongly stimulated either by vigorous suckling (of which the premature is usually incapable at first) or by skilled manipulation and expression by hand, which if properly carried out (see pages 21-23) is quite effective.

Though a premature may suck forcibly for a short time, he may rapidly exhaust his powers, and have to desist long before he has taken enough milk. Yet the same child might do well if fed by means of a pipette or feeding bottle for a week or more, instead of lowering his vitality and frittering away his strength in vain attempts to

* Where a strong baby sucks the mother's breast, in order to promote the flow of milk, the premature baby should be pipette fed in the meantime with milk (diluted if necessary) expressed by hand from the foster-mother.

establish direct suckling too soon. A baby so treated—not taking enough nourishment day after day, and losing heat and vitality every few hours in the process of changing and feeding—becomes insensibly weaker and weaker, and insidiously declines in weight and condition. A few days or weeks, worse than lost in this way, may so reduce the baby's internal reserves and energies that the most scrupulous subsequent conserving of heat and the best of pipette feeding may then fail to sustain life, though these measures would have made rearing safe and easy if adopted in the first instance.

In all doubtful cases it is better not to move the baby out of his warm, cosy cradle more than can be avoided until he has gained strength, vigour, and resistive power.

Another reason for using bottle feeding at first is the fact that even the mother's milk may be too strong for a time unless diluted, especially without some reduction in the proportion of fat.

Pipette Feeding of Prematures with Mother's Milk or with some Form of Humanised Milk

As already stated, the majority of prematures should be fed on mother's milk for a time by means of a pipette; only the stronger and heavier minority should be tried at the breast at first, and even a 5 lb. baby may need pipette feeding for a week or two. A pipette with 1½ in. to 2 in. of soft rubber tubing may be used, or a Breck Feeder.

A nurse attempting for the first time to feed a delicate premature baby is bound to make serious mistakes, unless she has been carefully instructed and forewarned. Her first need is to realize the feeble responsiveness and the defective suckling and swallowing powers of the average baby born before its nervous and muscular apparatus is in proper working order.

The attempt to feed a weak premature baby is somewhat like trying to feed a person in a state of collapse and unconsciousness; indeed, it is more like trying to feed a comatose fever patient, so slow, feeble, ineffective, or even wanting may be the swallowing induced by stimulating the lips, tongue, and mouth. Infinite patience and watchfulness are needed on the part of the nurse.

Feeding Details

(1) On gently pushing the rubber tube into the mouth any attempt at sucking or swallowing must be carefully watched for. This may be promoted by moving the tube about and squeezing out a few drops of milk. No response may take place, or it may be long delayed. Until the child swallows on no account must any attempt be made to squeeze out more milk; otherwise the mouth will be filled, and the milk will be drawn into the windpipe when the child inspires, causing choking and grave risk of pneumonia—one of the commonest causes of death in the case of prematures.

(2) At first the nurse may not succeed in getting the baby to take more than a few drops, or at most a teaspoonful, in a quarter of an hour, and no feeding must be extended beyond half an hour at the utmost. However, the nurse must persevere, and when the baby takes an ounce at a feeding she may feel satisfied that all will go well, and three-hourly feeding can then be adopted.

The premature baby should rarely, if ever, be fed more often than two-hourly; but this frequency may be needed for a time in order to get in enough food in the twenty-four hours. Feeding more often than two-hourly tends to cause exhaustion, and the interval should be increased to two hours and a half as soon as the quantity taken is not far short of an ounce at a time.

(3) Working up carefully as indicated, the premature baby can generally be brought to take what is needed. This may be roughly set down as averaging about a fifth of his body-weight per diem—or, say, 3 oz. of fluid per pound weight of baby. He may need more, and he cannot do for long with less. The taking of enough fluid is the premature's most essential requirement; without this the whole body wilts and shrinks, the circulation begins to fail, the baby loses his natural pinkness, the face becomes grey and ashen, the lips parched, and the skin dry and shrivelled.

(4) If necessary, "**tube feeding**" must be resorted to, but this rarely needs to be continued for more than a few feeds, or it may be for a day or two. It is better

not to pass the tube more than an inch or two beyond the epiglottis, say four inches beyond the lips. The farther the tube is pushed the less stimulus is there to the act of swallowing.

The modern nurse who goes in for a special course of training in the care of babies has to be prepared to pass a soft rubber tube into the gullet and feed the child as described. Nurses trained in this way could save many lives, because no doctor can possibly spare the time to tube-feed a baby several times a day. Fortunately, it is a very easy matter to pass a small, soft, well-oiled tube, in the case of a young baby, and the proceeding does not cause the resistance, discomfort, and repugnance characteristic of adults.

Feeding a premature with a spoon is not advisable at any stage, because the milk is liable to be given with a rush and cause choking; indeed, however the baby is fed, this is what we have specially to guard against. If the nurse does not watch most carefully for manifestations of sucking before proceeding, and if she makes any attempt to force the pace, the baby is almost bound to choke. Undue haste and forcing matters is the commonest and most serious mistake at this stage.

SUMMARY OF FOOD AND FEEDING FOR PREMATURES

(1) **Mother's milk** is infinitely the best. It may need diluting at first, but may soon be given undiluted.

(2) Second best—breast-milk supplied by foster-mother.

(3) Third—human milk supplemented by a suitable preparation of cow's milk. Even two or three ounces a day of human milk is invaluable, especially in the early stages.

The most generally suitable artificial food for prematures is found to be Humanised Milk No. I, made with unset milk, boiled for ten minutes. It should be well diluted at first.

Recipe for Making Half a Pint of Humanised Milk No. I, Specially Modified for Premature Baby

New milk (boiled for 10 minutes) - - -	3 oz.
Whey (which must have been heated to 155 deg. F.)	3½ oz.
Karilac No. 1 * - - - - - - -	½ oz. (1 level tablespoon)
Boiled water - - - - - - - - -	3½ oz.

To bring up the fat gradually introduce "Kariol" (Plunket Emulsion), but it is a mistake to go beyond two per cent. of total fat in the case of seven-months prematures, until, say, six weeks or two months after birth. Very few prematures can take a standard artificial food of full strength until they have passed two months.

Dilution of Artificial Food

For the first feed or two with humanised milk (even though made with a very low fat percentage) it is best to dilute with as much as three parts of boiled water to one part of humanised milk. Day by day the dilution should be decreased, until between the seventh and tenth day the baby should be able to deal satisfactorily with half-and-half.

It is found that all feedings are more or less dependent on the general development and condition of the infant, in relation to his digestion and power to retain food. Very careful attention has to be paid to such points as wind and abdominal distension, vomiting, and the character of the motions, etc.

Begin with what is considered a minimum quantity, and gradually increase the strength and the amount of food, being guided by the growing ability of the child to deal satisfactorily with what he takes. Generally give water only or a five per cent. solution of "Karilac," until there is some indication of a first bowel movement.

Only if a baby proves totally unable to take a sufficiency by the mouth is tube feeding temporarily resorted to, giving by this means larger quantities of food at longer intervals than if feeding in the ordinary way.

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* If Sugar-of-milk is substituted for Karilac where the latter is not obtainable, use lime water, in addition, in the proportion of 1 oz. in every pint of humanised milk.

One cannot insist too strongly on the fact that if a premature baby, weighing, say, between three and four pounds, takes less than the equivalent of half a pint of mother's milk (or a modified milk mixture yielding about 200 calories), he is not getting enough food to keep up his temperature and maintain his body weight. He is being slowly starved, and must continue to go down hill until the necessary daily minimum requirement of food is taken, digested, and assimilated.

Nurses often think they are "on the safe side" when giving a baby, week after week, merely his full allowance of fluid, but much less than the necessary quantity of food. Matters should never be allowed to drift in this way. A day or two of tube feeding, resorted to before it is too late, may so fortify and strengthen the whole system that the child will begin to take and deal satisfactorily, step by step, with a steadily increasing strength and quantity of food, and gradually come up to the normal standard. There is no greater mistake than resting content with chronic underfeeding and starvation—unless it be the more common tendency to overfeed and cause indigestion.

Nothing but boiled water should be given in the first twenty-four hours, or usually until there is some indication of the first bowel movement. Then give diluted mother's milk, if available; if not, use ten per cent. solution of Karilac, gradually adding Humanised Milk No. I.

Mere guessing is never justifiable in the feeding of any babies: it is fatal in the case of prematures. A skilled nurse should never omit to calculate the caloric value of the day's food: she should "take the log" as they do on board ship, reckoning where the baby is all the time, and doing her best to prevent his drifting on to the rocks.

FEEDING TABLE FOR HEALTHY PREMATURES WEIGHING ABOUT FOUR POUNDS AT BIRTH

This table is based mainly on experience gained at the Truby King Harris Hospital, Dunedin. The standard of feeding would, of course, have to be raised or lowered for any premature appreciably above or below the weight specified, and according to the digestive and nutritive activities and powers of the particular child.

Age of Baby	Humanised Milk No. I* (made with Unset Milk instead of Top Milk	Karilac or Sugar of Milk Solution, 10%†	New Milk (boiled for 10 minutes)	Daily Total of Milk and Sugar Mixture	Plunket Emulsion	
					In Ounces	In Level Spoonfuls
	oz.	oz.	oz.	oz.		
4th day ..	1½	6	–	7½	—	
5th day ..	3	6	–	9	—	
6th day ..	4	6	–	10	—	
7th day ..	6	6	–	12	$\frac{1}{24}$	¼ teaspoon
End of—						
2nd week	9	5	–	14	$\frac{1}{12}$	½ teaspoon
3rd week	12	4	–	16	$\frac{1}{8}$	¾ teaspoon
4th week	14½	2	½	17	$\frac{1}{6}$	1 teaspoon
5th week	17	–	1	18	$\frac{5}{24}$	1¼ teaspoons
6th week	18	–	1½	19½	$\frac{1}{4}$	1½ teaspoons
7th week	19	–	1½	20½	$\frac{1}{3}$	2 teaspoons or 1 dessertspoon
8th week	20	–	2	22	$\frac{3}{24}$	2¼ teaspoons
9th week	21	–	2	23	$\frac{11}{24}$	2¾ teaspoons
10th week	22	–	2½	24½	$\frac{1}{2}$	3 teaspoons
11th week	22½	–	2½	25	$\frac{7}{12}$	3½ teaspoons
12th week	23	–	2½	25½	$\frac{2}{3}$	1 tablespoon

* Except where predigestion is to be resorted to, the milk used in preparing this special humanised milk should be boiled for ten minutes during the first few weeks; sometimes it is found desirable to peptonize or pancreatize for some weeks. The boiling in the one case and predigesting in the other should be left off gradually and cautiously.

† Dissolve 1 oz. in half a pint of boiling water.

Motherhood and Half-Motherhood in Hot Climates

There is a common idea that European mothers ought not to nurse their babies in very hot countries—indeed, that it would be exhausting to themselves and enfeebling to their offspring to attempt to do so. This is sheer nonsense. No doubt natural motherhood seems wellnigh impossible to delicate, pale, flabby, listless, self-indulgent Europeans, leading an easy, luxurious, idle life in the East, or even to the naturally strong woman who gives herself over to the stress of an irregular, nerve-racking Anglo-Oriental society existence. But women who realize the sacredness of the trust, responsibility, and privilege of motherhood may achieve the highest ideals for themselves and their offspring under almost any climatic conditions, provided they do their best to maintain a high standard of health and fitness by bathing, exercise, rest, regular habits, and sensible moderation as to food, drink, etc. Strict attention to the rules for healthy living (see the first section of this book), with a view to normal motherhood, is even more important for women whose lot is cast in hot climates than for those living in more temperate regions.

One has seen an ideal family of half a dozen robust children reared on the breast by a European in Hong Kong, who told the author what protests her fellow-women had raised against the folly of attempting to be a real, complete, and "natural" mother in the burning East. These artificial "unnatural" women could conceive only two ways of rearing "white babies"—viz. Chinese wet-nursing, or bottle-feeding.

To provide for cases where artificial feeding has to be resorted to in very hot climates or elsewhere in the absence of fresh cow's milk, the following section is given:—

HUMANISED MILK FOR THE TROPICS, ETC.

At the outset we must repeat emphatically that human milk cannot be made outside the human body. Nothing can rival milk drawn direct from the breast into the baby's stomach—pure, fresh, living, blood-warm, and

uncontaminated by germs. In hot climates, where fresh cow's milk is unobtainable, where noxious germs increase with amazing rapidity, and the risks of feeding children artificially are therefore greatly increased, it is incumbent on every prospective mother to fit herself to be a true mother and feed her child as Nature intends.

Where good, clean, reliable milk can be obtained, humanised milk may be prepared in the ordinary way in hot climates. The simplified H.M. III recipe is recommended, or the "unset" H.M. No. I, if a whey mixture is indicated.

If ice is available, the prepared milk can of course be cooled down and kept safe in an ice chest.

Where ice is not to be had, instead of cooling down the humanised milk, it should be transferred directly it has been prepared (and while still at boiling point) to a thermos flask, which has just been cleansed and heated with hot water. The milk must not be allowed to fall below 130 deg. F. If the temperature of the milk falls to 130 deg. F. it should be reheated without delay to 155 deg. F., or to boiling point, if no thermometer is available, and replaced in the cleansed and heated thermos flask as before. Germs grow and multiply with fearful rapidity in blood-warm fluids, but their vitality is checked by any wide departure from a temperature of 100 deg. F., and ceases, or falls to practical insignificance, when the temperature of a fluid is maintained below 40 deg. or 50 deg. or above 125 deg. F.

Note that a rise of 20 deg. above blood-heat checks germ-life more effectively than a fall of 50 deg. below it; hence it is that in the tropics keeping a fluid **hot** may afford a far readier and more economical means of preventing injurious changes in milk than keeping the fluid **cool.**

When feeding time comes round, shake the flask well to mix the cream thoroughly, and pour the required quantity into the feeding-bottle. Cool the milk to 100 deg. F. before giving it to the baby.

In many parts of Australia and the East, and in some places even in the British Isles, cow's milk is either not procurable, or may at times be too stale or impure for

use when delivered at the home. Naturally this is specially liable to be the case near the Equator or at midsummer. What the milkman delivers, though not sour, may be near the turning point, and may be thus quite unfit for baby.

In the tropics, and during the hottest summer weather in temperate zones, it is necessary to reduce the fat allowance. This is most easily managed by using recipes to which fat is added in the required quantity.

It sometimes happens that babies who cannot be suckled are also precluded from having the advantage of humanised milk prepared from fresh cow's milk. What is the safest course to pursue in such cases? Humanised milk made from dried milk is the simplest all-round substitute for standard humanised milk, where the latter cannot be made. See page 110-112.

Various Notes

Children are the perpetual Messiah, sent into the arms of fallen men to win them back to Paradise.—EMERSON.

NEED FOR THINKING

The extreme importance of care and system in the rearing of babies is now so universally recognised that many mothers give serious attention to the matter, and try to understand the simple requirements essential for the health of themselves and their offspring. The majority of women are prepared to take adequate trouble to understand the simplest reasons for what they are daily called upon to do, or to avoid doing, in the interests of their offspring. But the ideal baby food for some modern mothers is a powder to which only warm water need be added, and a feeding-bottle and comforter, with which the child can be left to himself. If any properly regulated system is advocated, they ask to have it expressed in half a dozen all-embracing, hard-and-fast rules, to be blindly followed without calling for thought. Unfortunately, the exercise of intelligence cannot be dispensed with. Indeed, reason becomes continually more necessary for women as they depart further and further from the simple ways of Nature, and the knowledge they need cannot be compressed

into a nutshell. However, there are certain first principles —one might almost say commandments—which every mother ought to have ingrained into her.

GOLDEN RULES

(1) Baby should be breast-fed. Failing this, give humanised milk, but never start with full strength. (See page 115.)

(2) Feed regularly, no "night-feeding." Wake the baby if asleep when meal-time comes round. Give no food between meals. May have water if thirsty.

(3) If a baby is artificially fed, the bottle used must be simple and easily cleansed. Both bottle and teat must be kept scrupulously clean. Never omit to stir the milk thoroughly before putting it into the feeder. Always hold the bottle while feeding, and keep a slight tension on it. (See page 126.)

(4) Don't use a comforter. It is utterly unnecessary, and is always prejudicial to health. A dummy deforms the jaws, teeth, and palate, and causes saliva to dribble all the time, thus interfering with digestion. Further, it is a leading cause of "adenoids."

(5) Don't use grey powders, teething powders, or soothing drugs; never give baby any drugs, save under medical advice.

(6) Don't resort to patent baby foods. If used after nine months they may be suitable for a part of baby's food, but they are not needed, because "oat jelly," toast, bread, etc., are as good or better, and infinitely cheaper.

(7) Don't listen to the advice of so-called "experienced" people merely because they have brought up a number of children, or "buried seven," and therefore think they know how babies should be fed and cared for.

(8) An infant should never remain in its cot continuously in one position. Not only should its position in the cot be changed from time to time,

but every few hours during daytime it should be taken up and carried about.

(9) A baby will not thrive properly unless it has free exercise for its limbs by kicking, waving its arms, etc., and full expansion of its lungs by occasional natural vigorous crying.

(10) Clothing should be light, porous, warm, free from irritating properties, sufficiently loose to allow perfect freedom of the limbs, and free play for the expansion of chest and abdomen, but not so loose as to ruck into folds. Beware of constricting tapes or belts; these can be felt by pushing the hand up under the clothing.

(11) Let the baby have plenty of sunlight and plenty of fresh air day and night. Never cover the mouth with anything—not even with the openest muslin. The more a baby is out in the open air the better he will thrive.

(12) The nursery should have a sunny aspect, should be cool, and should have a current of air passing through it day and night. Keep the baby out of direct draught; cool air does good if baby is protected from draught and properly clad. Premature babies may need warm air for some time.

(13) The daily bath for the first six months should be given at a temperature of 98 deg. to 100 deg. F. Always bath and dress rapidly—no dawdling. Dry thoroughly, especially about the fork, buttocks and all folds of skin. When the child is able to take active exercise, cold bathing is most beneficial. (See page 73.)

(14) Early education of bowels and bladder is most important. Baby should be "held out" at regular times every day.

(15) A baby needs abundance of sleep. (See page 81.)

Rules such as the above are good guides so far as they go, but no set of rules will save the baby if the mother fails to cultivate the use of thought and common-sense in dealing with the various matters which crop up daily.

Milestones on the Baby's Road

End of first week. Begins to like soft diffused light. Before this baby bears light badly, and opens eyes only in darkness or shadow. Squinting is common in the first month, because the mechanism for moving the two eyes together is not yet in working order. Marked squint later on is suggestive of indigestion, morbid irritation, and a tendency to convulsions. Consult doctor.

End of first month and early in second. May begin to notice differences in foods by combined smell and taste; and on this account, if offered a milk slightly different from what he has been accustomed to, may refuse to take it.

Dawnings of **attention** begin to be **expressed** by pursing up mouth, wrinkling forehead, elevating eyebrows, fixation of gaze, etc. From this time forth the baby looks out on his little world with wide-open, wondering eyes, vaguely drinking in impressions more and more day by day.

Presently **he manifests distinct interest** and more or less **pleasure,** not only in food, but also in various sensory impressions coming to him:—

(*a*) **Through touch, warmth, etc.**—Likes to be stroked, handled, patted or caressed.

(*b*) **Through sight**—Enjoys sunlight, fires, lamps, shifting lights and shadows, bright moving objects, people, animals, etc.

(*c*) **Through hearing**—Shows interest in various sounds, e.g. ticking of watch, barking of dog, musical notes, singing, etc.

Sixth to seventh week. Birth of distinct "expression" of feelings. First true, bright responsive smile, and cooing, chuckling or babbling with pleasure.

Eighth week. Begins to show distinct concentrated attention to follow slowly-moving objects with his eyes, to notice faces, etc.—"knows his mother."

Fourth month. Head ceasing to be "wobbly"—can with effort "hold up his head." (This is regarded as the first manifestation of the exercise of **will-power,** and as such marks an important stage in the baby's mental progress.) Shows increasing interest and joy in parents

and familiar friends, but tends to be alarmed or frightened by strangers—he is "becoming shy."

Fifth month. "Crows" and laughs aloud. "When the first baby laughed for the first time its laugh broke into a thousand pieces and they all went skipping about and that was the beginning of fairies."—*Peter and Wendy*, J. M. Barrie.

Sixth month. Weight at birth doubled.

Fifth to seventh month. Reaches for toys and handles them. Delights in noisily crumpling, banging or knocking things about, repeating these actions over and over again. Carries everything to his mouth, including his own toes, which fascinate him by their constant movements. They are more than mere **playthings**—they are his chief **playmates!** A young baby has no idea that his toes belong to him; they are interesting as live-moving things always at hand. About the sixth month there comes a dawning, wondering consciousness of **self.** The baby then begins to realize that his own limbs possess for him a quality which all objects apart from himself lack: they are sensitive—from them come **feelings** of pleasure or pain—they are parts of himself, and thus quite different from his toys or companions.

> An infant that is handling, for example, a wooden brick derives from his fingers sensations of touch, of temperature, and perhaps of weight, but when he drops the piece of wood and grasps his toes, stimuli now stream up to his brain, not only from the hand that grasps, but also from the toes grasped. The infant is not able at first to appreciate this difference, and is longer still in associating this peculiar quality with those objects which alone possess it, and in marking them off in his own consciousness from those that lack it. But even before this understanding is reached, the child will prefer to play with his toes rather than with a piece of wood. He derives more sensations and therefore more pleasure from the former. Gradually there is borne in upon his mind the fact that a difference exists in the objects touched, and the earliest appreciations of this fact are associated with wonder. Thus an infant grasping hither and thither, happens by chance to seize one hand with the other. He is plainly astonished. He becomes quite still and steadily stares at his interlocked fingers. Then slowly opening the enveloping hand, he supports in its palm the fingers of the other. Again he stares mystified. He begins to feel the fingers of the passive hand, bending them open and shutting them again. This

investigation is continued, until finally the hands move apart, and the child's attention wanders to other things . . . . The sense of touch is therefore of the very greatest importance in laying the foundations of the consciousness of self.—David Forsyth, M.D., D.Sc.

Eighth to ninth month. Able to sit erect.

Ninth to tenth month. Crawls or attempts to bear his weight on the feet.

Eleventh to twelfth month. Stands with assistance.

Twelfth month. Weight at birth trebled. Six teeth cut. Says single words.

Twelfth to fifteenth month. Walks alone. "The child's principal interest is no longer restricted to the immediate neighbourhood in which he sits, but henceforth he is able to concern himself with a wider area, and, in nursery, garden or field, discovers a thousand and one novel delights that urge forward his mental development at a great speed. New experiences are of frequent occurrence, and the eager intelligence of the child absorbs them as a sponge absorbs water."

Eighteenth month. "Soft spot" in the head closes. (If closure is delayed beyond two years, consult a doctor.)

Eighteenth to twenty-fourth month. Begins to have some power of distinguishing colours—especially red and green.

Twenty-fourth month. Puts words together into sentences, and should talk well. Sixteen teeth cut.

N.B.—If the MILESTONES are reached in good time the mother may feel sure that her baby is not backward or defective. There may be delay on account of rickets or other retarding illnesses, or marked backwardness may be the first evidence of mental deficiency. On the other hand, even an able child may be late in holding up his head; late in walking, talking, etc.; and "defectives" are not invariably much behind-hand in these respects. If a baby is backward consult a doctor.

Cries of Baby

Learn to recognize the different forms of crying—then act kindly, sensibly, and if necessary firmly. Never stop crying by using a "comforter" or a "soothing-powder." Never feed a baby out of his proper time to pacify him: don't "spoil" him.

THREE MAIN VARIETIES OF CRYING IN BABYHOOD

1. Primary, painless, reflex crying, needed for expansion of lungs and exercise.

2. Crying due to bodily discomfort, or to being "out of sorts," ill, or in actual pain.

3. Crying without pain, merely to gain attention. This is the cry of the "spoiled" infant, and needs firmness, not further attention and yielding.

1. PAINLESS REFLEX CRYING

Crying at birth is reflex, natural, and necessary for proper expansion of the lungs; further, a certain amount of crying during the ensuing months is healthful, because the normal act of crying involves, besides deep breathing, considerable all-round nervous and muscular activity and exercise. This explains how it is, that when no motion has taken place on merely "holding-out" the baby, he may have a good motion directly he cries. However, a young baby should get his main exercise by vigorous suckling—there being added later, kicking, waving of arms, etc.

Is the crying normal or abnormal? Crying in moderation is natural, but baby should not cry too much, and he should not cry the wrong way.

2. CRYING DUE TO BODILY DISCOMFORT

This may be due to baby being too hot or too cold; to wet napkins; harsh, tight, over-heavy or rucked clothing, or discomfort from lying too long in one position. In the last case, crying stops if baby is turned on to the opposite side.

Any other external irritation—such as fleas, sore buttocks, or prickly-heat, eczema, etc.—will keep a baby

awake and fretful. The same applies to the internal discomfort of hunger or thirst, slight indigestion or wind, thrush, the irritation of teething, or any of the other aches of infancy.

Cry of Hunger or Thirst

This is generally fretful, but may be loud and may merge into the screaming of temper. It is usually continued, is accompanied by sucking of the fingers, and stops promptly when the baby is fed or given a drink. However, never resort to feeding as a mere means of stopping crying; never feed except at feeding times. If the baby habitually cries, before the appointed hour comes round, probably his allowance is not enough (consult "Feeding Table"); but remember that indigestion and discomfort arising from overfeeding may cause similar crying. Don't jump to conclusions. Investigate.

Crying from Overtiredness, Feebleness, or Exhaustion

An overtired or sleepy baby may cry and fight for a time against going to sleep, but will drop off when made quite cosy and comfortable.

Though an overtired baby always tends to cry, a very weak, delicate, exhausted child is incapable of loud or continued crying. If severe pain is long-sustained, even a strong baby becomes exhausted, and loud cries give place to mere feeble wailing or moaning—a much more dangerous state than the earlier stage when the child is able to cry lustily.

Cries of Acute Pain

1. Pain of Injury to Skin—*e.g.* pricking with pin, or burning with hot-bottle. The cry is usually sharp, piercing, and sustained; but there may be no loud warning in the case of a feeble infant who is being slowly burned.

2. Pain of Stomach-ache—This is the popular term for all abdominal pains. The pain generally comes in waves or spasms, leading to recurrent outbursts of crying or screaming.

Slight indigestion may cause anything from mere restless moaning to lusty crying. Severe colic causes

repeated paroxysms of screaming, turning of thumbs inside the closed fingers, thrusting of fists into mouth, and agonised puckering of forehead; also board-like hardness of belly, and kicking or drawing up of thighs against abdomen. Such attacks if neglected are very liable to lead to convulsions. (See "Colic" and "Convulsions.") Consult a doctor.

Babies are specially liable to suffer from intensely painful abdominal disturbances, due in the great majority of cases to fermentation and irritation occurring in the bowels, rather than in the stomach itself, though the term "stomach-ache" is commonly applied in all cases. Most baby-pains are bowel-pains.

3. Pain of Earache—This is often mistaken for colic—sometimes with fatal results. The tormenting pain of earache causes more or less continuous, prolonged attacks of crying or screaming, accompanied by rolling the head about, or boring one side of the head into the pillow, or pressing it against the mother, or tugging the ear, or placing the hand against it. Some relief may be afforded by dropping warm oil into the ear, and by the external application of a heated bag of salt or bran; but earache may lead to such grave results that a doctor should be called in at once. Pain and tenderness of the bony prominence behind the ear, when tapped with the finger, is a specially dangerous sign.

Nearly all cases of serious earache are accompanied by fever, which is often severe, the temperature rising as high as 104 deg., or 105 deg. But though both fever and pain should happen to be absent, the mother should never fail to call in a doctor if baby forms the habit of rolling his head from side to side on the pillow, because the habit is usually due to irritation of the internal ear which may lead to grave results, if not promptly attended to. Frequent banging or beating of the head may be due to the same cause or to the irritation of teething, etc. All such troubles are specially liable to arise when a child has been "out of sorts," or after fever or sore throat, and they often occur in rickets. Never disregard or neglect the formation of any "curious habit" by a baby: if in any doubt get a doctor without delay.

Special Warning—Beware of the dangers to the brain and to hearing, arising from failure to do the right thing promptly in any case of ear trouble. There should never be any doubt or delay as to securing the best advice where there is pain or discharge from the ear. If this rule were always observed, the lives of many children would be saved every year and deafness would be much less common. Tendencies to inflammation and abscess of the brain following on ear trouble may be arrested, provided only the surgeon is summoned in due time. Unfortunately he often arrives too late, the parents having put off for days where they ought not to have wasted an hour.

Syringing Ears—Much harm is done by syringing. Don't attempt it unless you have been ordered to do so and shown how.

4. Eye-pains, Headache, etc.—The above observations apply also to "eye-pains," headache, etc. Don't delay. Get a doctor at once, whether the trouble be crying and shrinking from the light, persistent rubbing of the eyes, redness, discharge, or swelling of the eyelids (specially dangerous in first week, see page 75).

5. Mouth and Jaw Pains—Ulceration of the mouth (due to thrush, etc.) and "teething" are common causes of pain in infancy. Dribbling, fingering the mouth, crying on taking food, etc., attract attention.

6. Pain and Tenderness of Bones and Joints—This is the main cause of crying in "scurvy." Consult a doctor at once.

7. Pain on Passing Urine—Should a child cry during or after passing water and appear in obvious pain, a doctor should be consulted as the pain may be due to some such cause as tightness of the foreskin or to some abnormality of the urine.

Any illness may lead to crying. Make sure baby is not "ill" before deciding that he is merely "trying it on."

3. CRYING BECAUSE SPOILED

A normal baby whose habits have been properly regulated day and night, given his twelve primary simple rights (see page 1), should be happy, good-tempered, and

a joy in the home—not a source of anxiety and worry. But any baby can easily be spoiled and make a cross, fretful, exacting little tyrant. The following is full of ripe wisdom:—

> "Baby very soon finds out that he likes attention. When he is laid down alone, or if the mother or nurse goes out of his sight, he sets up a cry for renewed attention; he wants to be cuddled or rocked. If he does not get just what he wants, he will cry! His cry will immediately stop when he is taken up, held or rocked. When he sees his mother coming to him his cries cease; in other words, he is rapidly becoming a 'spoiled baby.'
>
> "One cannot begin 'too young' to train a baby. We often hear the remark made by some dear old grandma or loving mother, 'Oh! he will grow out of it,' or 'Wait until he grows a little older and understands what you say to him.' If you do wait you are lost! Begin when a baby is born to make him understand that you mean what you say; you are the one to be obeyed: it is for your child's good.
>
> "We now come to the **treatment,** as it were, for a baby who cries simply because he wants attention, which is: 'Baby must cry it out'."—"Cries of the Baby," by Dr. Theron Kilmer.

Read "Formation of Character," page 221.

WHAT SHOULD BE DONE IF BABY CRIES AT NIGHT

If a baby cries during the night the mother should try to find out the cause of the crying and adjust matters accordingly. Seeing that baby is warm, dry and comfortable and merely changing his position in the cot is usually all that is required. "Night feeding" is one of the common causes of "night crying," but if baby's food allowance is adequate during the day, he should sleep right through the night, uninterruptedly.

Popular Errors

"Seriously, is it not an astonishing fact that, though on the treatment of offspring depend their lives or deaths, yet not one word of instruction on the treatment of offspring is ever given to those who will by and by be parents? Is it not monstrous that the fate of a new generation should be left to the chances of unreasoning custom, impulse, fancy—joined with the suggestions of

ignorant nurses and the prejudiced counsel of grandmothers?

"To tens of thousands that are killed, add hundreds of thousands that survive with feeble constitutions, and millions that grow up with constitutions not so strong as they should be; and you will have some idea of the curse inflicted on their offspring by parents ignorant of the laws of life."—Extract from Herbert Spencer on *Education*, given under the headings, "What Knowledge is of Most Worth?" and "Preparation for Parenthood."

Error I—That human pregnancy is naturally a time for idleness, depression, and semi-invalidism.

Nothing of the kind. The pregnant woman should be radiantly healthy, happy, and uplifted. If she will only take plenty of outdoor exercise, and lead a bright, healthy, active life (see page 4), she need have no fear for herself or the baby.

Error II—That various birthmarks and blemishes are liable to arise in offspring owing to "maternal impressions" during pregnancy.

Mothers should rid their minds of all such fantastic ideas and silly worries.

Error III—That the expectant mother should "eat for two."

Absurd. The carrying of a full-term baby means an increase of only half a stone in the mother's weight: and most of us overeat. The real essentials for health are the same for all, namely:—pure air, daily outdoor exercise, care and moderation in regard to eating and drinking, regularity of bowels, etc. Overeating and indolence upset everything.

Error IV—That stout should be taken by expectant and nursing mothers.

This is quite wrong. Alcohol in any form, taken by the mother, flows as a poison in her blood. The tender growing cells of the baby, directly nourished by this poisoned stream, or fed with milk derived from it, tend to become stunted and degenerate.

Error V—That the nursing mother needs frequent feeding.

Most nursing mothers overfeed and feed too frequently, under the mistaken notion that this induces an increased flow of milk. In reality, stuffing and taking scraps or sips at all times tend to ruin digestion and spoil the milk. By taking food only three times a day, nutrition and milk secretion are better promoted and sustained than if the digestive organs are irritated and overtaxed by more frequent feeding. A glass of water morning and evening and

between meals is good for the nursing mother, but she is better without gruel or milk, except at or just after meals.

The least objectionable of ordinary dietetic indulgences to the nursing mother between meals would be represented by a cup of non-fatty cocoa, barley water, or very weak tea, none of which should contain more than a quarter of a pint of milk. Cakes or solids of any kind should not be taken either between meals or near bedtime. Of the above drinks tea is the most objectionable, and should certainly be avoided at night.

Error VI—That the baby should not be put to the breast until the third day.

This widespread fallacy is responsible for much bottle-feeding. Milk is secreted mainly in response to the stimulus of active sucking, and if the breasts are not thus stimulated during the first day after childbirth, indeed within the first twelve hours, Nature may keep the blood in the pelvic organs and refuse to send it where she intended. The ancients 2,000 years ago realized this (see page 225), though at that time nothing was known as to the circulation of the blood! Yet ignorant women of to-day say: "We advise delay because if the baby sucks it causes 'after-pains.'" Quite so; "after-pains" are due to the contractions of the womb engaged in diverting the blood stream to the breasts and in expelling from its interior, clots which tend, if retained, to become infested with microbes, and may thus give rise to poisoning of the whole organism. To escape the possibility of a little extra pain for a few hours the mother is induced to sacrifice her own health and that of the baby.

Error VII—That the newborn babe needs some food for the first day if he gets nothing from the breasts.

The baby takes no harm if given water only (no food) for a day or two. If he fails to draw anything from the breast, proceed as indicated under heading "Establishment of Lactation," page 14.

Error VIII—That if the milk does not come by the third or fourth day it will not come at all.

Quite wrong. A week or more should elapse before giving up putting the baby to the breast every three or four hours in daytime. Further, the breasts should be stimulated by sponging and massage, and everything should be done to free the mother from worrying about herself and the baby. The best frame of mind for promoting the secretion of milk is one of trustful faith that Nature is going to do her part and provide what is needed. If the mother is perpetually thinking about her breasts, and worrying on account of the flow of milk not coming, she is liable to interfere with the course of Nature—just as over-anxious attention directed to the stomach will interfere with digestion, or the keen desire for sleep will keep us awake.

Error IX—That nursing should be abandoned directly if there is a return of menstruation.

Quite wrong. Menstruation comes on during nursing in a large proportion of cases, and is a natural process which should not interfere with suckling, except where the milk manifestly disagrees with the baby. Even then, all that is needed in the majority of cases is to keep the baby from the breast for a few days at the "period," the milk being drawn off by manipulation or breast pump for the time being so as to keep up the flow. Never wean simply on account of menstruation unless under a doctor's order. The mother should wean if she becomes pregnant.

Error X—That plain cows' milk—or cows' milk, cane-sugar, and water or barley-water—are suitable substitutes for mother's milk.

An infant may live and grow fat and heavy in spite of wrong feeding, but why overtax and damage him—why give him food not adapted for ensuring proper bone, muscle, and stamina? The mother may be sure that her baby will thrive better if she prepares the best substitute, viz. humanised milk.

Error XI—That a baby should not be roused if he happens to be asleep when feeding time comes round.

This is a serious and widespread fallacy. A feeding "time-table" should be made out and strictly adhered to. In the course of a few days, if this be done, the leading organic events of the baby's life (sleeping, waking, feeding, movement of the bowels, etc.) will ordinarily take place with clock-like regularity. Nothing is more saving of stress and wear and tear to mother and child than the early establishment of perfectly regular habits, day and night.

Error XII—That when a baby cries the natural and proper course is to give him the breast or a bottle or a "comforter" to "comfort" or pacify him.

There is no surer way of ruining a baby's digestion and converting him into a fretful, exacting little tyrant, who knows he can get his way by merely crying. Feed by the clock at duly appointed meal-times only. "Comforters" spoil digestion and give rise to defective teeth, deformed jaws, and "adenoids."

Error XIII—That babies need some "solid food."

In general, anything beyond human or humanised milk should be regarded as harmful, not beneficial, for the first nine months of life. During this period nothing but milk should be given, unless prescribed for some special reason.

Error XIV—That taking "what's going" does the baby no harm in the second year.

Utterly wrong. The utmost care and attention should be given to feeding baby properly throughout the second year (see page 131).

Error XV—That the giving of "pieces" between meals does no harm.

In reality this habit is very injurious. The natural processes of digestion need certain times for their completion; and nothing tends to upset the child's digestive system more than the allowing of pieces of bread, cake, biscuits, sweets, etc., or even drinks of milk, apart from the regular meal hours.

Error XVI—That a baby's mouth should be "swabbed" out with water two or more times a day to prevent risk of thrush.

This injurious routine often leads to ulceration of the mouth and thrush. If a baby gets thrush it should be properly treated. (See page 204.) No baby in normal condition should have his mouth washed out until he has cut several teeth.

Error XVII—That a baby needs a binder to give support to abdomen and back, and to prevent risk of rupture.

Preposterous. Babies are no more in need of binders than are little pigs! A binder weakens both the back and the belly, and increases the risk of rupture. The only excuse for using a binder at all is to keep the dressing on while the stump of the cord is healing. Even for this purpose the binder if used should be light and elastic (say stockinette), and it should be left off immediately the cord is healed. Even if there is an actual rupture a binder should not be used. Consult a doctor, and he will treat it on modern lines without interfering with breathing and the growth of the muscular walls of the belly.

Error XVIII—That the modern baby needs no "mothering."

This is the view of the lazy women who hold that an infant should merely rest, passively imbibe milk, sleep and grow fat. In reality, every baby should have the active exercise and stimulation afforded by suckling, or the best available substitute. But he is entitled to, and needs, much more than this. Dr. Fordyce says: "SUCKLING is a prerogative of the mother; the capability of MOTHERING is common to all normal adult females, and under skilled guidance and direction is the most valuable aid in the treatment of infants whether sick or healthy." (For details see "Handling the Baby," page 76.)

Error XIX—That "night air"—especially pure, cold, night air—is dangerous for babies.

The reverse is the case. Nothing makes babies so strong and free from "colds" as living in pure cold air. At the Truby King Harris Hospital the sick babies sleep (after a short preliminary hardening) in rooms where there is a constant broad stream of "night air," which often keeps the temperature near freezing-point in winter from dusk till dawn. It is hard to get mothers to realize that this is safe and beneficial for babies only a few weeks old, if they are provided with suitable bed-clothing and the bed is properly made. (See pages 1 and 45.)

Error XX—That the baby's face should be covered with a handkerchief or piece of muslin when sleeping in his pram, etc.

The mouth and nose should on no account be covered, even by the most open muslin, because any covering imprisons the breath and causes the baby to breathe its own exhalations over and over again. This is highly injurious and enfeebling. It is also a great mistake to gather the bed-clothes close round the baby's face, because this also causes the re-breathing of poisoned expired air. For the same reason no pains should be spared to prevent the baby from forming the bad habit of burying his face in the pillow or the bed-clothes.

Error XXI—That the nursery be warmed to 65 to 70 deg. F.

The only time when a baby needs to be in a warmed room is when his clothes are off—for instance, at bathing time. Even then the temperature need not be above 60 deg. F., if he is protected from draught by means of a low screen. For twenty-three out of the twenty-four hours the air need not be kept much above freezing-point (32 deg. F.) even for babies only a few weeks old, so long as they are properly clad, kept out of direct draught, and provided if necessary with a hot bottle (see page 67).

Error XXII—That there is a special risk in allowing a male baby to cry, as the strain tends to cause rupture.

This fallacy often makes mother and nurse nervously anxious to prevent crying. Hence they give the baby his own way day and night, and he soon becomes a spoiled, exacting, fretful little tyrant. If he cries he is given what he wants, whether it be food between meal times, or cuddling in his mother's bed when he ought to be asleep in his own cot. Both the digestion and the nervous system may be more or less ruined in this way.

Error XXIII—That in the case of female babies the nurse should massage or "break down" the breasts so as to soften them and promote future development.

Much harm and no good results from this extraordinary proceeding. It sometimes causes abscess, and, without doing this, may so injure the parts as to prevent proper growth of the breast, and predispose to flat nipples and inability to suckle. The idea that the breasts want "breaking down," or that "the nipple strings need to be broken," is parallel to the opinion widely prevalent among mothers and nurses, that many babies are born "tongue-tied" and need "snipping," or that circumcision is a frequent necessity. People tend to get too much ahead of Nature!

Error XXIV—That if mixed feeding is resorted to (the baby being fed partly by the mother and partly from a bottle), it is best for the mother to suckle only at night.

This is absurd. There should be no night feeding! By weighing the baby both before and after suckling, the mother should ascertain precisely how much he is getting at each nursing. Knowing this, she should supplement each breast-feeding with the requisite quantity of properly graded humanised milk—thus preventing her milk being too long dammed up in the breasts. Prolonged retention of milk materially alters its quality and composition. Further, the stimulus of suckling at regular intervals is needed to keep up the supply. The "eight-hours' rest" at night causes no undue accumulation of milk, as secretion slows down during sleep. Indeed the breasts—especially the nerves and the nipples—need rest, and Nature will give it if we don't thwart her.

Ailments and Precautions

Eminent physicians say to a patient who comes to them with bad eyes: "We cannot cure the eyes by themselves; if the eyes are to be cured, the head must be treated"; then again they say that to think of curing the head alone, and not the rest of the body also, is the height of folly. Arguing in this way, they apply their methods to the whole body, and try to treat and heal the whole and the part together.—*PLATO*, 2,300 years ago.

NURSING AND TREATING

Every woman must at some time or other become a NURSE—that is, have charge of somebody's health . . . therefore every woman should know how to nurse.—*FLORENCE NIGHTINGALE.*

Every woman—indeed every grown girl—should understand the simple measures needed for keeping a baby in health; she should know how to **nurse** it, and give it the best chance of speedy recovery from illness. On the other hand, there is no greater mistake than trying specifically to **treat** disease without competent advice. Without special training and experience no one is capable of finding out the exact nature of disease. Even if a mother should succeed in determining that a baby is suffering from eczema, that fact alone would not enable her to decide on appropriate treatment, because the nature of the disease and the specific means to be adopted for curing it are not

indicated by the mere name of the malady. They vary with the particular variety of eczema, with the stage arrived at, and the condition of the patient. The same applies to summer diarrhœa and other common infantile diseases.

BURNS OR SCALDS

Large burns are very dangerous, and may prove rapidly fatal from pain and shock. To allay this, **pending the arrival of a doctor,** cover the burnt area with perfectly clean soft linen or cotton cloths, or cotton-wool, soaked in carron oil (equal parts of lime water and raw linseed oil) or simple olive oil. Either of these may be improved and made antiseptic by the addition of an ounce (1½ tablespoonfuls) of oil of eucalyptus to the breakfastcupful. Other soothing applications are vaseline or pure clean lard.

If the above are not handy, add a level tablespoonful of baking-soda to a pint of warm water and apply soft clean cloths soaked in this solution. In any case, this is very soothing before any oily dressing is used.

Immediate dredging with flour is permissible if the skin is unbroken; otherwise flour is messy and troublesome to remove. Don't use flour beyond the first day.

N.B.—Never leave a young child in a room where there is a fire without a good FIXED fireguard. Don't use flannelette!

CHOKING

If possible, hook out obstructing material with forefinger thrust far back over tongue; anything arresting breathing is practically sure to be within reach of the finger. Other measures are to place the child face-down across the knees, and slap and squeeze him on the back; or he may be held suspended by the feet, head downwards, and slapped or squeezed. The last is best if a coin, fruit-stone, bit of bone, or other such foreign body has lodged or gone the wrong way.

To restore breathing, if the child is blue and senseless after dislodging the obstruction, lay him flat on his back, with a small thin pillow, or folded towel or coat, under the shoulder-blades, and practise artificial respiration. If no one at hand knows how to do this, it will suffice to

squeeze the front and sides of the chest firmly with the open hands about fifteen times a minute—alternately squeezing and relaxing until the child begins to breathe. There should be distinct intervals between the squeezings, so as to afford time for expansion and the inrush of air. If a second person is at hand, the lower jaw and tongue should be drawn forward at the same time, while the head hangs back over the low pillow or folded towel. If "artificial respiration" does not restore breathing in a few minutes, put the child into a very warm bath (say 110 deg. F.; or as hot as can be just borne by the elbow) for half a minute, and dash some cold water on the head and chest. Then roll him over and over in a dry towel and quickly resume artificial respiration.

COLIC

Flatulence is generally due to indigestion and chilling arising from several easily removable factors acting together. By putting everything on the best basis for health, the nursing mother will not merely cure colic, but will also tend to establish a hardy, vigorous, condition of body for herself (see pages 10-12) and her baby.

Severe colic, or "windy spasm," is intensely painful. The baby is restless, begins grunting, writhing, and kicking; he puckers his forehead, and has an agonised expression; screams violently, and draws his thighs tight up against his belly, which is hard and swollen. If wind passes there is some relief. Don't try to obtain relief by giving food either from breast or bottle, because feeding makes matters worse, even where it temporarily eases pain.

The main causes of colic are:—

1. **Faulty composition of milk,** due to mother's habits, or to giving unsuitable artificial food.

In the case of a breast-fed baby the tendency to colic may sometimes be temporarily prevented by giving a few teaspoonfuls of warm boiled water before suckling—thus diluting an over-rich milk. But the true remedy is for the mother to reform her own habits—regulating her diet, taking proper daily exercise, etc., so as to render the milk normal.

2. **Overfeeding**—Study motions: if curdy, etc., food probably needs diluting or modifying (consult pages 29 and 43).

3. **Irregular, or too frequent, feeding of baby**—An extra half-hour or hour between feedings will often stop a tendency to colic.

4. **Too rapid, or too slow, feeding**—If baby sucks too greedily or too rapidly, the mother should prolong each suckling by withdrawing nipple; "bottle-feds" may also bolt their food owing to too large a hole in teat; or the colic may be due to too slow feeding and chilling of milk—caused usually by not having a flannel bag to cover feeding-bottle (see Fig. 35, page 122), or by leaving the baby alone with his bottle.

5. **Constipation of mother or child, diarrhœa, etc.**

6. **Chilling surface of baby's body,** due to dawdling at bath, not making bed properly (see page 50), wet napkins, cold feet and legs, or exposure of coddled babies to chills or draughts which would do no harm to "cold-fresh-air" baby.

7. **Anything which restricts exercise and perfectly free movements of limbs and body.**

8. **Any irritation of skin**—Clothe next skin with silk and wool.

TREATMENT OF ATTACK

An actual attack of colic may be relieved by applying warmth to the feet and abdomen; massaging the belly with fingers dipped in warm oil; handling baby as shown in Fig. 4; giving one or two drops of sal volatile or a piece of baking-soda about the size of a pea in a teaspoonful of warm boiled water. If convulsions are threatened, treat accordingly (see page 191).

An enema given at 100 deg. F. and hot flannel wrappings applied at the same time to the abdomen afford the best means of treating a severe attack of colic. Not only is the pain relieved, but for the time being the cause is removed by the evacuation of wind and irritating material. However, enemas should not be used habitually. See "Enema," "Constipation." **Consult a doctor.** Irrigation

is still more effective, and should certainly be used in all very severe attacks of intestinal colic with threatened convulsions. If the wind is distending the stomach, it should be washed out with warm water and soda.

CONVULSIONS

Convulsions would be rare if mothers would build their babies strong and resistive to disease by paying due attention to "What Every Baby Needs" (see page 1). Convulsions are not only dangerous to life, but they tend to do permanent damage to the nervous system. Many cases of epilepsy come on in people who have had convulsions during infancy, and the seeds of many other grave nervous affections are sown in the same way. Avoid all causes of delicacy and ill-health, and you will save your baby from convulsions. Keep the bowels regular. The immediate forerunner of an attack may be indigestion, colic, teething, the onset of fever, etc. The symptoms of impending convulsions are squinting, rolling of the eyeballs, twitching of the fingers, and jerking the thumbs into the palms, stiffening the neck, throwing back the head, jerking the limbs, etc. Such symptoms should put the mother on her guard to prevent a fit.

TREATMENT BEFORE OR DURING CONVULSIONS

1. Give warm saline enema or irrigation (see pages 41-2). This, with hot fomentations applied to the belly, generally arrests the fit. Give a teaspoonful or more of castor oil as soon as baby can swallow.

2. A warm mustard bath may be given, prepared by adding a level dessertspoonful of mustard to each gallon of water. The temperature should be about blood-heat (100 deg. F.). In the absence of a thermometer, a temperature that can be borne comfortably by the elbow will do. The child may remain in the bath from two to ten minutes. Cold water may be squeezed over the head, or cold cloths may be applied.

The mother often exposes her baby unduly, and wastes time over the drying of it after the warm bath. The baby should be wrapped up at once in a warmed Turkish towel,

and dried rapidly. A warm nightdress should be slipped on, and the baby should be tucked up cosily in a warmed bed without a moment's delay.

3. If the child is known to have recently taken irritating, indigestible food, prompt emptying of the stomach affords the most rapid relief. To induce vomiting, give from a half to one teaspoonful of ipecacuanha wine in warm water every quarter of an hour until effective; but in no case give more than four doses. If ipecacuanha wine is not at hand, give a teaspoonful of mustard in warm water.

On no account omit to **get a doctor without delay** if there is any question of tendency to convulsions. The treatment varies according to the cause, and the doctor alone can determine what is best. Thus, although the measures given above would be suitable in most cases, they would not be applicable in fits due to loss of blood, heart disease, etc., and in any case a doctor has other resources available.

CROUP

Simple croup is very alarming, though not usually dangerous. As, however, it is impossible for the mother to distinguish between croup and very grave conditions such as diphtheria and other acute inflammations about the throat, **a doctor should always be consulted** where possible.

Croup is often ushered in by some hoarseness during the day and a sharp, barking, metallic cough in the evening. "After the child has been asleep for a few hours it awakes suddenly, sits upright and grasps at anything it can reach, and is scarcely able to get its breath. The cough is now loud and brassy, breathing laboured, and face bluish. Other similar attacks are very liable to occur on several succeeding nights. Croup is commonest about the third year."

TREATMENT DURING ATTACK

The treatment during an attack is on the lines given above for convulsions. In addition, the breathing of a warm, steamy atmosphere, generated by the use of a kettle,

is generally recommended and may be tried, but is usually of questionable advantage. A warmed room is desirable, and the child should be kept out of draught, but there should be a good inlet for pure outside air. The tendency is to make the room too warm and stuffy. This weakens the child, and is liable to result in recurrent attacks night after night.

PREVENTION

The prevention of croupy tendencies is best effected by paying very strict attention to the essential requirements for health (see page 1). Gradual habituation to daily cold bath, followed by active exercise (see page 73), is specially effective. An attack is often brought on by careless exposure of a coddled child in cold, damp, windy weather.

CONSTIPATION

Constipation is a condition in which the motions are hard, dry and usually less frequent than normal. It is generally due to lack of attention to ensuring at least one regular action of the bowels at the same time every day, to insufficient exercise in the open air, and to insufficient ventilation in the bedroom. Nothing tends to enfeeblement more than coddling in warm, stuffy rooms. Bear in mind that every baby needs, in addition to open air and sunlight, **plenty of exercise.**

In every case where a breast-fed baby is constipated the first necessity is perfect regulation of the mother's bowels and general health, proper diet and exercise being of prime importance. A constipated mother may mean a constipated baby. If the mother's bowels are perfectly regular, a breast-fed baby rarely suffers from constipation, provided all the simple essentials for health are attended to. Normal mother's milk, containing as it does abundance of fat from the beginning, has no constipating tendency. Constipation in a breast-fed baby may, however, be due to insufficient food, and if necessary, baby should be test weighed over a period of twenty-four hours to ascertain if he is receiving the correct amount of milk. Occasionally a breast-fed baby may pass infrequent motions, but pro-

vided these are soft and normal in colour and consistency the baby is not actually constipated. Mothers are apt to worry far too much about this infrequency. Regular holding out, and simple measures to train baby to a daily habit should be persevered with, and are usually quite successful after a time. There is no need to resort to giving of medicines or enemata, provided the motions are normal when passed, and that not more than 48 hours elapse without securing an action of the bowels.

If baby is bottle-fed, see that the food is correct in proportions and amount (see "Feeding Table," page 100). Too much curd and too little fat in the food, due to the use of more diluted cows' milk tends to cause obstinate constipation. Excess of fat sometimes has the same effect. Boiling makes the milk more binding; heating should therefore not usually be carried above 155 deg. F., except in special circumstances.

Indigestion, arising from the use of patent foods, often causes constipation, alternating with diarrhœa.

Artificially-fed babies tend to suffer more or less from constipation during the first month of life, as it is not possible to give enough fat at this period to ensure regularity of the bowels in every case, but the tendency to constipation tends to improve as the food is made stronger.

Rubbing the abdomen has a great effect in stimulating the muscles, etc., and thus tends to cause the bowels to work. Begin at the right groin, move the hand up to the ribs, then across, just above the navel, to the opposite side, then around to the left groin, using a circular motion. Stroke the abdomen very gently at first with a warmed hand, using warm oil; then employ a firmer, deeper pressure as the child becomes used to it. Do this massage just before the times when the bowels are to be moved. It may be continued for five minutes, and followed by further measures to induce a motion (see "The Bowels," page 40). Don't fail to read this.

Prune juice, one to two teaspoons, may be given after six weeks, and prune pulp or fine spinach purée after three months of age, commencing with half a teaspoonful

and working up to three teaspoonfuls in twenty-four hours (for recipes, see pages 231 and 232).

In obstinate cases of hard motions, small injections of warm olive oil at night (to be retained), followed by graduated, cool saline enemata in the morning, will generally prove satisfactory. Commence with the saline at a temperature of 98 deg. F. and reduce to 70 deg. F. in the course of a few days.

DIARRHŒA

Diarrhœa is characterised by the passage of frequent, loose, green, watery motions. Indigestion due to overfeeding or to unsuitable food or to irregular feeding is the main predisposing cause of diarrhœa in babies, but the disease may also be caused by uncleanliness, i.e., dirty nipples, bottles, teats, etc., by a nervous disturbance, or by direct bacterial infection.

Diarrhœa occurs mostly in hot weather amongst bottle-fed babies, and is rare in the breast-fed.

The main preventive measures are:—

(1) To feed baby as Nature intended. The mother must do all she can to make sure that her supply of milk is good and sufficient by taking plenty of exercise in the open air, by restricting herself to good, simple food taken at regular intervals (including wheatmeal bread, fresh fruit and vegetables and from two to three pints more fluid than she would drink if not nursing), by having a current of pure, fresh, free flowing air coursing through her bedroom all night long, and regularity of all habits. The nursing mother should take no alcohol in any form.

If baby cannot be fed in the natural way the best substitute is humanised milk, but in hot weather special precautions are necessary in the preparation and keeping of milk (see Fig. 32, page 99).

(2) See that baby has "the 12 essentials" in his daily life. If the baby who has lived in fresh air, who has been naturally fed, trained in regular habits, and has received all the other essentials for good health, chances to get ill, he makes a quick recovery. A chill is often the exciting cause of diarrhœa; therefore special attention

should be paid to having infants sufficiently clad at all times, but not unduly muffled up. They are made very susceptible to cold by being kept too much indoors, by living in stuffy, unventilated, overwarm rooms, and by wearing too heavy clothing, especially when in the house. On the other hand, undue or untimely and careless exposure will not harden an infant, but will render it delicate and prone to catch cold. Quickness in bathing and getting an infant dressed afterwards is of great importance. Many chills are due to dawdling at the bath.

(3) Extra special care must be taken with regard to cleanliness during hot weather. Billies, jugs, bottles, and teats must be washed absolutely free of all traces of stale milk. An almost invisible amount of stale milk may render a whole day's supply of fresh milk poisonous. Vessels which have contained milk should always be washed in **cold water first**, and then in hot water and soap. Hot water "sets" the milk on the utensil and makes it difficult to remove.

Beware of flies. Keep everything under cover. Avoid the use of the dummy.

Remove soiled napkins at once and cover. Wash the hands after changing baby, before again handling him or his food.

Wash the nipples thoroughly before nursing baby.

(4) Be extra careful to ensure regularity of the bowels, and see that baby has freedom of movement in the open air as much as possible. Let him be out of doors practically all day and all night too, if it can be arranged, and avoid overheating him.

In all cases of diarrhœa call in a doctor if possible.

TREATMENT OF A THREATENED ATTACK

Some greenness of one or more motions may occur from time to time without further manifestations of intestinal disturbance, but if a motion is **green when passed** the mother should be on her guard at once, and should watch carefully the next motion. If it also is

green she should proceed as follows whether the baby is breast-fed or bottle-fed:—

Give a dose of castor oil—one or two drachms according to age. The average need is an ordinary teaspoonful. Give boiled water only for the next two feedings, at least. If the baby is breast-fed the mother must draw off the milk from her breasts at the usual feeding times, by hand expression (see page 23).

If green and frequent motions still persist, and baby appears to be getting worse, continue giving boiled water and **call in a doctor.** If matters are improving after the reduction to boiled water proceed as follows:—

1. In the case of a breast-fed baby, give a few ounces of boiled water, just before nursing, and allow baby to suckle for a few minutes only. At the next feeding give rather less water and a longer period of suckling, and so on, the allowance of water being cautiously reduced at each feeding and the suckling extended. It may take a few days or longer to get back to normal.

2. In the case of a bottle-fed baby, give skim milk boiled for ten minutes and diluted with water. At the first feeding following the two or more meals of boiled water only, give one part of boiled skim milk to four parts of boiled water; at the next two feedings give two parts of boiled skim milk to three parts of boiled water; then give three parts of boiled skim milk to two parts of boiled water for two or three feedings.

If all has gone well for two or three days, there having been no further green or frequent motions, full strength boiled humanised milk may be introduced gradually, until in the course of a few days, or a week or more, the baby may be taking only boiled humanised milk.

The return of yellowness to the motions is the evidence of restoration to normal.

It must not be assumed that the occurrence of a green motion or two and some relaxation of the bowels (in other words, a mere threatening of diarrhœa), will always necessitate keeping the baby on a diluted food for a whole week or more. In some cases the mere tendency to diarrhœa may be overcome by replacing one or more meals

with boiled water, followed by the boiling and dilution of the humanised milk for a day or so.

In cases of severe diarrhœa it may be necessary to cut off fat completely from the baby's food, giving only boiled skim milk and water for a longer period (instead of introducing humanised milk), diluted in the proportion of an ounce of boiled water to four or five ounces of the milk. The time of boiling may then be reduced by a minute a day until the mixture is merely scalded.

Though quicker progress than the above may be made, it is always safer to err on the side of "going slow," rather than to advance too quickly and bring on a relapse. A competent nurse can generally advance with safety more quickly than the mother, because she knows more about the symptoms and evidences which point to mere improvement on the one hand or to practically complete recovery on the other.

Discontinue fruit-juice during an attack of diarrhœa, but if all goes well reintroduce it gradually as soon as the motions have been normal for a few days.

Older Children

During the summer months, children so frequently eat unripe or partially decayed fruit that a constant watch should be kept for signs of indigestion and diarrhœa.

Treat older children in the same way as babies—that is give a dose of castor oil and boiled water only for two or three meals. Then give boiled milk and rice water. When the attack has passed off, gradually work back to ordinary food.

MAKING AND KEEPING MILK IN HOT WEATHER

It may be best to bring the baby's milk to the boil and keep it hot for ten minutes instead of only pasteurizing it— that is, keeping it at a temperature of 155 deg. F. for ten minutes. Whether boiled or pasteurized the milk **must be cooled quickly and at once** to well below 60 deg. F. if possible. Germs multiply with extreme rapidity in warm milk. Cover the jug loosely with damp butter muslin, and stand in running or frequently changed cold water. Needless to say if ice is available the problem is

solved. In the country a running stream or artesian well may be handy, but in the towns it may be impossible to get tap water below 60 deg. F. A pail full of water left outside in the air all night away from the early morning sun will be quite cold for some hours. Select the shadiest, draughtiest, cleanest place for the milk safe, and stand the jug of cooled milk in the safe in a shallow dish of the coldest water available. Cover with muslin and make sure this dips into the water all round so that it will keep damp and so cool by evaporation. This method always ensures some cooling, especially in hot, dry weather.

When there is any doubt as to whether the milk has remained below 60 deg. F. always rescald what is left of the day's supply in the evening, and again cool quickly and place in the coldest place available for the night. Naturally if it is possible to obtain fresh milk twice daily it is best to make the humanised milk morning and evening.

DISTURBED SLEEP—SLEEPLESSNESS

The habit of sleeping peacefully is one of the clearest evidences of sound health. Habitually disturbed sleep and restlessness may arise from not giving "what every baby needs" (see page 1), especially in regard to pure air, proper feeding, exercise, outing, and strict regularity of habits.

Discomfort caused by indigestion, due to irregularities and errors in regard to food or feeding, is the main cause of imperfect sleep. Avoid night feeding, overfeeding, underfeeding, irregular feeding, and feeding with unsuitable food.

When a baby has any distinct illness sleep is usually affected.

Wet napkins, over-clothing, or under-clothing are very common causes of restlessness. Lack of fresh air, due either to want of ventilation or to the presence of obstruction in the child's throat or nose, through enlarged tonsils or adenoids, will cause broken sleep.

Disturbed sleep may become habitual in a healthy baby if he is badly trained or spoiled, for instance by petting him whenever he wakes and cries, or worse still, by giving

him food to stop crying. Any of the causes of crying may be a cause of sleeplessness. Therefore read carefully "Cries of Baby," page 177.

Never give soothing powders because a child sleeps badly. Try to ascertain wherein you have erred—what is causing broken rest. If you can't—consult a doctor.

ECZEMA

Eczema is by far the commonest skin disease in babies. It may occur at any part of the skin, but most often begins where there are folds, or on the head, especially on the cheeks, forehead, and scalp, and behind the ears. It begins with an unusual redness and roughness. The surface becomes fissured and watery, and then scabs tend to form; but the red, raw surface between the scabs continues to weep—weeping and crusting being the special characteristics of eczema. The affected area is intensely itchy, and this is made worse by scratching and rubbing, which it may be extremely difficult to prevent, especially at night; yet **friction must be stopped or the skin will not heal.**

CAUSES

Breathing and living in impure air predispose to infantile eczema, but generally the leading factor is impaired digestion, due to errors in the quantity or quality of the food given, and lack of exercise. Overfeeding is the commonest predisposing cause, and frequently there is constipation. The taking of cane-sugar, even in small quantities, brings on in some children catarrh of nose, throat, or bronchi, and eczema, nettle-rash, or "heat spots." Eczema of the head is more often seen in fat, healthy-looking, or overfed babies, whether suckled or not, than it is in those who are thin, delicate, and underfed, though it is common among the latter also. Teething predisposes to eczema, but, acting alone, will not cause it. The same may be said of hereditary tendency, and, for the most part, of irritants acting directly on the skin. Local irritants specially liable to cause an attack of eczema and to prevent the skin from healing are overclothing, too much washing or washing with hard water,

imperfect drying of the folds of skin, the use of strong, irritating soaps or irritating flannel under-clothing, soiled napkins, and excessive exposure of the face to direct sunlight or excessive exposure to wind—especially if the baby when indoors is kept in warm stuffy rooms. Scratching or chafing of the skin is specially liable to retard recovery. If the baby is suckled the mother's health is of prime importance.

TREATMENT

Eczema is a very variable condition, and few skin diseases are liable to prove more intractable when neglected or improperly treated; **therefore a doctor should be consulted if possible.**

Where parents live in remote districts, beyond the reach of medical aid, the following course may be pursued:—

1. Observe all the conditions of general hygiene. (See page 1.)

2. Immediately desist from washing the affected skin with soap and water. Cleansing can be effected with olive oil and dabbing with a soft cloth—but do not rub. When healed, to prevent relapse, use only superfatted soap.

3. Remove all known sources of local irritation. To prevent scratching, cut a hole in the end of a pillow-case; put the baby's head through the hole; then secure the arms at the sides with a row of safety-pins, pinning together the front and back of the pillow-case between the arms and trunk. A similar row on pins may be used to fix each leg.

4. Coax off any scabs or crusts after some hours' soaking with sweet oil.

5. Protect the inflamed area by applying some simple, unirritating ointment, or recently boiled or perfectly fresh unsalted lard. This should be spread on butter-cloth, which may be made into a mask with holes for nose, eyes, etc. Change the dressing once or twice a day, using olive oil freely at the time of removal if there is the slightest tendency to stick.

An excellent simple ointment, for use in this and other conditions, may be made up as follows:—1 ounce white

vaseline, 1 drachm zinc ointment, 1 drachm almond oil, and ½ drachm lanoline.

If the condition does not soon clear up, all obstacles in the way of obtaining advice must, if possible, be overcome. Where the doctor cannot see the baby, one of the parents can usually manage to make a journey to consult him. Popular "Mothers' Guides" generally contain a few pages on eczema, with specific directions for medicinal treatment, but such advice may be very misleading and often causes delay in seeking skilled aid.

Eczema is sometimes associated with specific microbic or parasitic conditions which prevent recovery, unless there is appropriate medical treatment, and this cannot be arrived at by mere guessing.

GREASY SCURF ON HEAD

Scurfy, greasy patches, allied to ordinary eczema, but causing little or no irritation, often occur on babies' heads. The general lines of treatment are similar to those given above. To get rid of the scurf, rub the patches for a few moments with the tips of the fingers dipped in olive oil or vaseline; follow at once with gentle combing with a small-tooth comb, and washing with warm water and mild "baby soap." This is very effective, but care must be taken to avoid irritation of scalp by careless combing.

PRICKLY HEAT

Prickly heat is a rash consisting of multitudes of tiny red specks about the size of pin-heads. These are liable to appear very suddenly over large areas of the body, and give rise to almost intolerable itching causing the child to become extremely restless and irritable. The commonest sites are the chest (front and back), the neck, cheeks, and forehead. The rash may last for several days, and tends to come out again and again if the cause is not dealt with.

Prickly heat is the commonest skin trouble in infancy. It occurs mainly in overclad babies during hot weather, and is due to engorgement and obstruction of the sweat glands. This takes place owing to the skin being called on to overwork and pour out too much fluid, or through

direct irritation of the skin with flannel undergarments, or, more commonly, through both these causes acting together. In addition, lack of fresh air, day and night, predisposes to prickly heat. The great thing is prevention.

TREATMENT

Overclothing during hot weather being the main cause, this must be avoided; and next the skin thin silk or thin cellular linen or cotton must be used, instead of woollen materials. In very hot weather clothing should be reduced to a minimum; but, of course, every precaution must be taken against sudden change and chill.

In addition to the above, the best curative treatment for the attack is cool bathing and sponging, say, with a tablespoonful of bicarbonate of soda to a gallon of water. In addition, any good starch and boric acid dusting-powder may be used to allay the irritation, or mere finely powdered starch or rice flour may suffice.

SORE BUTTOCKS

A little knowledge and care on the part of mother or nurse should prevent irritation and excoriation.

If there is any redness, extra care should be exercised to keep the parts thoroughly dry and free from every other source of irritation.

TREATMENT

After cleansing, dry carefully, and apply some simple ointment and a small patch of wood-wool tissue, or other soft, highly absorbent material. A trace of ointment usually suffices, and even this may be omitted where the irritation is slight.

Where care is exercised, dusting powder is seldom needed, and probably most babies are better without it.

Never use fuller's earth, as cases of lockjaw have been traced to its use.

A good, safe, simple recipe is a drachm of zinc oxide to an ounce of finely powdered starch.

Dusting is the natural resort of the mother who is careless as to drying of the skin after bathing it. The folds of the skin should be dried with a soft towel, not with powder.

SWELLING OF BABY'S BREASTS

In the case of boys, as well as girls, the breasts often become swollen and painful during the first week or so of life, and may secrete a kind of milk. This swelling causes ignorant women to rub and manipulate the breasts, and try to "break them down," as they call it. Any such meddling may cause abscesses. Swollen breasts need careful cleansing with boiled water or boracic lotion, and gentle drying—no handling or rubbing being allowed. Procure some sterile gauze or gamgee-tissue from the chemist, and immediately (after cleansing and drying the parts) apply a small pad over each breast, keeping the pads in place with muslin bandages.

TONGUE-TIED BABIES

In nine cases out of ten where the mother or nurse forms the idea that baby is "tongue-tied," and cannot suck properly on that account, there is in reality nothing whatever wrong with the tongue. Where tongue-tie does really exist the trouble is a trifling one, which can be set right in a moment by the doctor, whose opinion alone is to be considered reliable on such a question. Don't allow any one else to interfere.

THRUSH

Thrush is a condition of the lining of the mouth, characterised by small whitish patches, especially on the tongue, cheeks and palate.

The disease is commonest in debilitated bottle-fed or sickly children in the early weeks of life. Lack of perfect cleanliness of the bottles and rubber teats, and the use of the dummy are active factors in producing thrush.

It is distinctly contagious, and scrupulous cleanliness must be observed with anything that comes in contact with the baby's mouth.

The baby is usually irritable and the motions may become frequent.

TREATMENT

Cleanse the mouth carefully after every feeding or nursing with a solution made by adding half a teaspoonful of baking-soda to a quarter of a pint of boiling water.

Use a tiny swab made by firmly wrapping a thin film of perfectly clean cotton wool round a wooden tooth pick or wooden match stick. With this swab gently cleanse the folds between gums, lips and cheeks. The flexible little finger, covered with cotton wool, may be used instead of a rigid swab.

After swabbing out the mouth as above, apply a little glycerine and borax to the patches of thrush.

Successful treatment depends on correct hygiene, especially perfect care and cleanliness in every detail of food and feeding. Pay strict attention to fresh air day and night, outings, and perfect regularity of all habits. If the baby does not improve at once consult a doctor.

TEETHING

"Teething is commonly placed under the heading 'infantile ailments,' though the whole process is, properly speaking, a natural one, and should be accomplished without the manifestation of constitutional disturbance, beyond at most fretfulness on the part of the child, with slight swelling of gums and increased flow of saliva. If any reflex irritation occurs during absorption and the coming through of the teeth it is reduced to a minimum by the fact that the teeth are cut in groups with intervals of rest between, instead of appearing about the same time. This arrangement is decidedly in favour of the child." A healthy, well-cared-for infant runs practically no risk from teething, and usually suffers little or no pain, but a delicate child whose mother has ignored "What Every Baby Needs" (see page 1), and whose mouth and jaws have not been properly exercised, is specially liable to "catch cold" or contract any other illness during teething. To counteract such tendencies the mother should do her best to make up for wasted opportunities, and should be doubly careful to see that in future everything conducing to health receives the most scrupulous attention—especially when teeth are about to come through the gums.

VOMITING

Habitual putting up of food soon after feeding is usually due to baby being given too much food at each

feeding, or to being fed too often; to being allowed to suck too rapidly and greedily without interruption; to wind or colic (often caused by the foregoing); or to jolting after meals, injudicious handling, too much stimulation, etc. (see "Handling the Baby," page 76). Where the feeding is partly from the breast and partly from the bottle, too much food is almost invariably given —hence the vomiting.

The only sure preventive is weighing the baby before and after suckling, so as to make certain that he is given neither more nor less than he needs (see "Overfeeding," page 29), and "Weighing Before and After Suckling," page 25). Due attention should, of course, be paid to the habits of the mother, as affecting the quality of her milk, or to the proper preparing of artificial food.

Dangers of Infectious Diseases

Very few people go through their childhood without contracting one or more of the common infectious diseases. One often hears the complacent remark of careless parents that "the sooner children catch common infectious diseases the better."

It should be realized that, though such diseases as measles, whooping cough, etc. may be mild in themselves, they frequently give rise to complications which may seriously endanger the future health of the child. Therefore no effort should be spared to guard babies and older children from contact with any known infection.

Every illness should be regarded as at least a temporary victory for the microbes—a defeat which retards the growth and development of the whole human organism, and renders it an easier prey to most other germs in the future. Pitched battles waged with microbes are a waste of time and energy precious to the growing child, and leave his tissues weakened, not strengthened, by the fight. Yet as soon as the baby has "recovered" from any illness, the mother thinks the results of her mistakes are at an end, but this is not so—more or less of lifelong damage has been done.

A check sustained in early life always leaves a permanent impress on the organism, whether plant or animal. Farm crops which have been blighted in the seedling stage may flourish afterwards and give a good yield, but not so good as if the plants had gone straight ahead. Trees which have been transplanted or diseased in "infancy," though they may afterwards grow "remarkably well," do not attain the ultimate stature or perfection of trees whose progress has been subjected to no such temporary interruption.

The time which elapses between the exposure to infection and the first symptoms of the disease, is spoken of as the **incubation period.** Any child who has been exposed to infection should be kept apart from other children during this time.

The following list gives the usual incubation periods of the common infectious fevers:—

Disease	Incubation Period
Scarlet Fever	2 to 8 days
Diphtheria	2 „ 10 „
Measles	7 „ 21 „
German Measles	7 „ 21 „
Whooping Cough	5 „ 14 „
Mumps	14 „ 28 „
Chicken Pox	11 „ 21 „

Taking Temperature of Baby

Every nurse now uses a clinical thermometer, and doctors often advise mothers to keep one in the home. However, the use of a thermometer is not always an unmixed advantage. The mother, generally on the look-out for trouble, is specially liable to worry unduly because there happens to be a rise in baby's temperature. She does not realize that in early life a rise of several degrees may be due to a comparatively trivial cause, such as a tooth coming through, indigestion, or a slight cold. A temperature of 102 or 103 deg. F. may mean very little or it may mean a great deal, though the mother need not

be greatly alarmed even when the thermometer registers 104 deg. F. if baby appears well otherwise, but of course a doctor should be consulted.

In forming a judgment as to whether an infant is seriously ill or not, physicians are guided largely by such signs as "the baby's facial expression, its frown and look of pain, and above all, its smile, the character of its voice, the movements of its limbs, chest, and abdomen, which are as significant as the condition of its tongue, pulse (and temperature). If it can smile its life cannot be in immediate danger" (Leonard Guthrie). However, where there is any doubt, competent advice should be sought.

Best Method of Taking a Baby's Temperature

The bulb of the thermometer should be oiled or vaselined, and then gently pushed into the anus until the bulb is at least half an inch out of sight, leaving visible fully two-thirds of the length of an ordinary clinical thermometer.

Adenoids

This name is applied to an abnormal growth of tissue blocking the air-way behind the nostrils. It is the commonest and gravest disease to which children of all classes are equally liable. Precise data as to the prevalence of adenoids are not available, but the observations of many authorities go to show that a large percentage of children are victims. No place is free from adenoids and in some districts it is estimated that half the children suffer from the disease. The nature of the growth is very similar to the enlargement of tonsils so often seen in the throat. Indeed the two conditions are generally associated.

There is no common disease of children which at the same time does so much local damage and strikes so directly and gravely at the health and vitality of the whole organism as adenoids. Further, there is practically no disease to which adenoids do not predispose the individual, and no disease which is not rendered much graver by the presence of these obstructions. More than half of all cases of deafness are attributed to adenoids.

"Adenoids is an affection of great importance, and may influence in an extraordinary way the mental and bodily development of children. The establishment of 'mouth breathing' is the first symptom that attracts attention. At night the child's sleep is greatly disturbed; the respirations are loud and snorting, and there are sometimes prolonged pauses, followed by deep, noisy inspirations. The pulse may vary strangely in these attacks. Night terrors are common. The child may wake up in a paroxysm of shortness of breath. There may be paroxysmal cough.

"When mouth-breathing has existed for a long time, definite changes are brought about in face, mouth, and chest. The expression is dull, heavy, and apathetic, due in part to the fact that the mouth is habitually left open. In long-standing cases, the child is very stupid-looking, responds slowly to questions, and may be sullen and cross. The lips are thick, the nasal orifices thin and pinched-in looking, and the roof of the mouth narrowed and raised. The commonest deformity of the chest is 'pigeon breast.' Mouth-breathing is often associated with stuttering. The hearing is impaired, owing to blocking of the air-tubes to the ear.

"Taste and smell are much impaired. Headache is by no means uncommon. The sufferer may also show general listlessness, and an indisposition for physical or mental exertion. The influence upon the mental development is usually striking. Mouth-breathers are usually dull, stupid, and backward. There is more than a grain of truth in the aphorism, 'SHUT YOUR MOUTH AND SAVE YOUR LIFE,' the title of Captain Catlins' celebrated pamphlet on 'Mouth-breathing,' to which cause he attributed all the ills of civilization.

"The treatment of adenoids is of the greatest importance, and should be thoroughly carried out. Parents should be frankly told that the affection is serious—one which impairs the mental not less than the bodily development of the child."

WM. OSLER, M.D., F.R.S., Professor of Medicine,
Oxford University.

(Condensed Extract from Article on Adenoids, 1909.)

Adenoids may be induced even in early babyhood by the use of the "dummy," or any system of bottle-feeding where baby passively imbibes his food, or keeps the teat too long in the mouth. The disease is predisposed to by lack of attention to any of the "Essentials for Health" summarised on page 1. Later on in babyhood the great cause is limitation to soft food.

Every baby should be TAUGHT successively to suck at a normal rate, to chew thoroughly, and to eat slowly.

Painstaking practical training and judicious checking are needed if a child tends to take his food too rapidly and greedily, either as a nursling or after the first year; but the first point to attend to is to ensure that the feeding-apparatus, or the food-materials, are of a character which will compel the child to work for his living from the outset. All efforts at training will be in vain if the artificial teat has a large aperture, permitting an easy, passive flow of milk, or if at a later period the baby is given simply "mush" instead of dry, hard, or tough food.

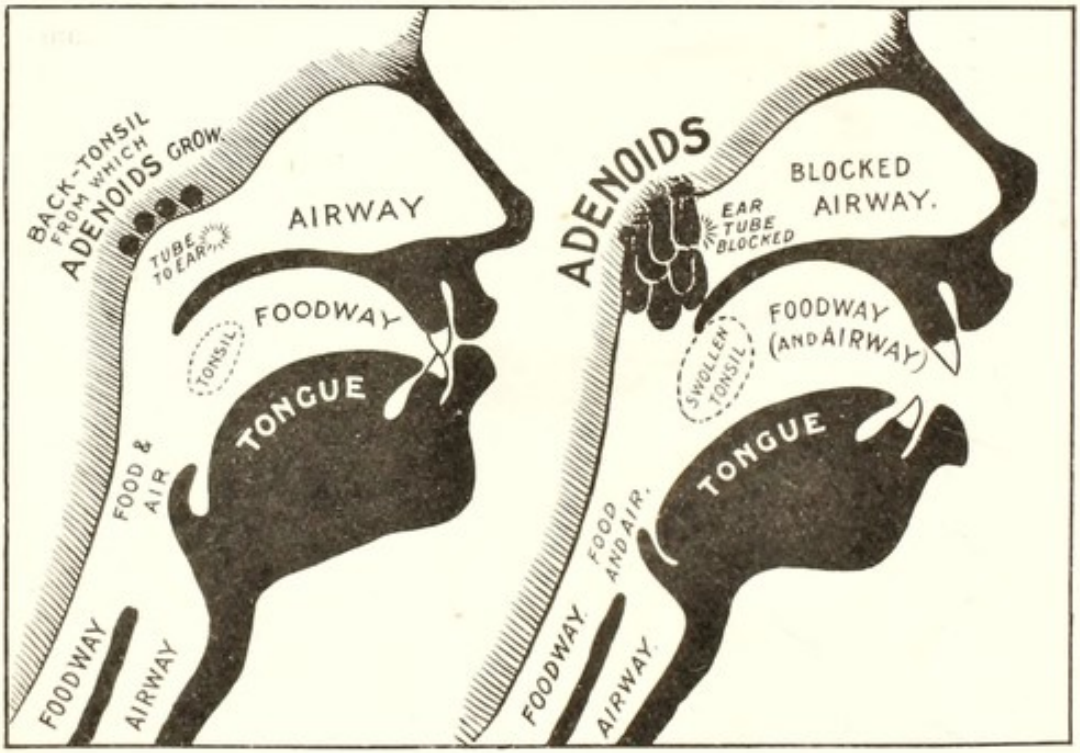

Fig. 46. Normal Nose, Mouth and Throat. **Condition due to Adenoids.**

The more a child takes of materials needing active mastication, and the less he has of soft mushy food, the better it will be for his teeth, jaws, and digestive organs, not only in childhood but throughout life.

In addition to the primary blocking of the nose and throat above, note the secondary narrowing of the air-way below the back of the tongue. The effect of these changes is in some respects similar to what the mother brings about temporarily when she puts a handkerchief over the baby's face; but adenoids deprive the child of fresh air

day and night. A double barrier in nose and throat is set up across the highway into the chest. This prevents the child from ever getting a full supply of oxygen into his lungs, however pure the air may be, and however perfect the ventilation. Chronic inflammation and degeneration of the lining membranes of nose and throat ensue with stagnation and accumulation of secretions; and the nasal chamber and adjacent parts become breeding-grounds for microbes, which spread thence to the lower food and air passages, and poison and injure the whole system.

The diagram on page 210 should enable any one to realize how grave must be the direct and indirect consequences of narrowing and shoaling the very guard-ports of the body (nose, mouth, and throat) through which all supplies for the rest of the body must enter, and through which alone the poisonous exhalations from the lungs can escape.

The immediate result is limitation of the supply of ozygen and hindrance to the escape of carbonic acid gas and other waste-products. Stunting of the chest and of the whole organism is the inevitable sequel.

LANDING-PLACES OF DISEASE

"Nose-and-throat specialists" and the leading dentists insist on the overwhelming importance of the rôle played by unhealthy conditions of the mouth, nose, and throat as the essential harbours and landing-places of disease.

In other words, the invasions of microbes associated with common colds, sore throats, decaying teeth, indigestion, diarrhœa, etc., prepare the soil for tuberculosis, typhoid, appendicitis, etc.

A hostile army cannot establish itself in Australia except by effecting a landing, say, at Melbourne or Sydney, and defeating the local forces there—it cannot dump itself down in the heart of the country—and the same applies to microbic disease in relation to ourselves. The internal organs are virtually safe if the harbours which alone give access to the interior have been strongly and capaciously constructed with a view to free access and defence, and are kept garrisoned with properly fed, sturdy, active, energetic troops (see pages 1-3).

What would be the position of Australia if its supplies had to come solely from without, as is the case with the human body? How would Australia then fare if, in addition to general neglect of the health and defensive fitness of its young men, steps were actually taken by its rulers to shoal and block its ports in such a way as to prevent entry by its own ships, while leaving them freely open to effective hostile small-craft?

Yet this is precisely what we do, in relation to our children, when we so feed and treat them as to ensure more or less contraction of mouth, jaws, nose, and throat, and overcrowding and decay of teeth—we block our own commissariat, while offering all facilities to the enemy.

IS THE MODERN CHILD DOOMED BEFORE BIRTH TO BAD TEETH AND ADENOIDS?

Many people imagine that the children of our present-day civilization inherit stunted, defective jaws and teeth, and that many babies are born either with adenoids or with a destiny that makes the disease inevitable from the start of life. Let every one dismiss such absurd ideas at once. It takes at least many generations for acquired defects of particular organs in the parents to be transmitted as such to offspring—though weak, feeble parents do tend to have all-round weakly progeny. Bad teeth and adenoids are certainly predisposed to by lack of health and strength in parents, as all weaknesses in offspring are predisposed to by this factor. But the special and alarming degeneracy of mouth, jaws, teeth, nose, and throat, which is sapping the health and strength of so large a proportion of the rising generation, is due to defective care and attention with regard to very simple matters during babyhood and childhood, and is easily preventable. The farmer has just as much reason to regard "foot-rot," which formerly ruined flocks of sheep, as inevitable (a view which he often took in the past), as we have to regard decay of teeth or "tooth-rot" as unavoidable in ourselves. The diseases are analogous, and both are easily stamped out.

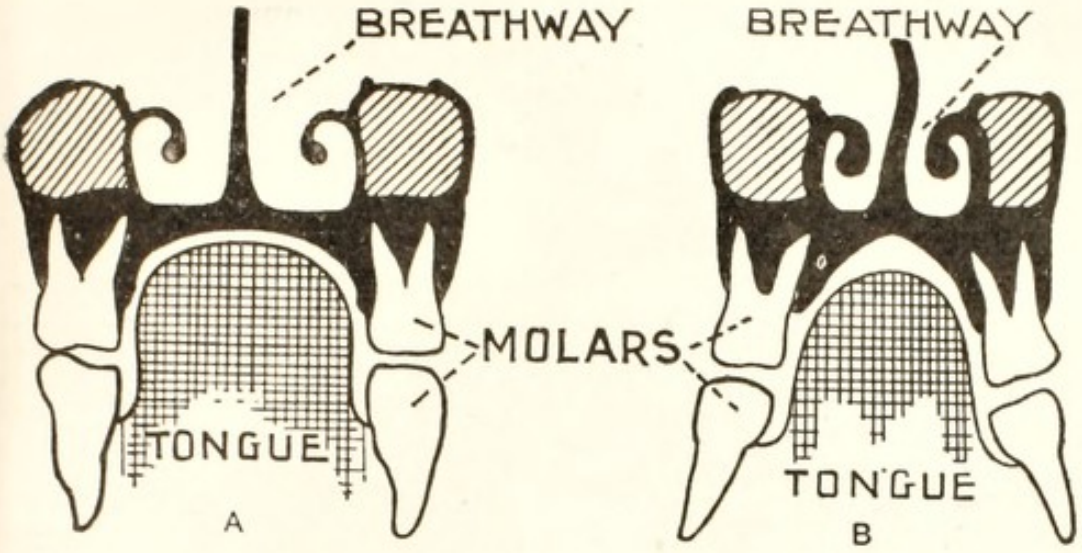

Fig. 47

Section of Mouth and Nose showing Form of Palate and Position of Teeth when—

(*A*) **Tongue, jaws, etc., have been normally worked and developed during babyhood.**

(*B*) **Mouth has been given but little work to do.**

Note how in *B* the tongue has remained small during development of palate, and has been incapable of broadly moulding roof of mouth while the parts were still plastic. This comes of allowing a lazy, passive inflow of milk through a "large-holed teat," and subsequent "pap-feeding." Pressure of "rubber teat" or "dummy" further thrusts up the narrow, ill-formed roof, buckling the mid-partition of the nose. The weakened tissues, now chronically congested, make the air way still smaller (see diagram)—a source of blocking familiar in the temporary "stuffing-up-of-the-nose" in common "colds." Then come **adenoids,** which may complete the blocking—microbes swarm, stagnating secretions gather, and further irritation and swelling ensue. Thus a vicious action and reaction, each aggravating the other, become chronic—all following on lazy, improper feeding of baby.

Adenoids and Consumption

Adenoids and the factors which give rise to them are the parents of tuberculosis and of most other diseases. Tuberculosis is not a primary condition, but due to a secondary invasion from without. Our enemies, the

tubercle bacilli, could not form large colonies, and gain a mastery over the cells of the human organism, if we reared our children properly and kept them in good physical form. If we saw to the health and fitness of girls and mothers, and trained them to give the baby proper air, food, and exercise—especially proper exercise for the growing and shaping of mouth, jaws, and teeth, instead of letting milk passively dribble down the throat, and instead of perversely moulding the growing structures in deformity—if we did these things aright, there would be no reason for anxiety as to tuberculosis, or any other such disease. Man was never meant to be the inferior of microbes either in vitality or fighting power. We are too fearful of our enemies and take too little pride in our own fitness. Microbes batten on cells "unmanned," debilitated by feeding on imperfectly aerated sluggish blood, just as "blight" swarms and thrives on a starving turnip-field, but leaves a flourishing, well-fed crop unassailed.

ENLARGED AND UNHEALTHY TONSILS

These are practically always associated with adenoids and lack of proper development of jaws and the muscles of mastication. Tonsils are far more likely to become infected in the presence of adenoids and dental caries than if the mouth is perfectly healthy and well-developed.

Fig. 48. Typical Appearance of Mouth-breather, due to Adenoids.

Tonsils become the seat of infection and inflammation in many of the infectious diseases such as scarlet fever and diphtheria, and if a "sore throat" is even suspected in an infant a doctor should immediately be called in.

In Fig. 48 note the narrow jaws, open mouth, projecting upper teeth, vacant face, arrested development, and poor nutrition.

There is no lack of such children in our midst, but it would be manifestly unfair to display them as victims of disease and defect, brought on by ignorance and faulty rearing. With growth of knowledge the truth will dawn on our children quite soon enough, and the time is not far distant when many of them will be calling their parents to account, and saying: **Why did you cause or allow us to become so cruelly disfigured and handicapped for life?**

Dummy or Comforter

The Royal New Zealand Society for the Health of Women and Children has made strong efforts to bring about the abolition of the "dummy," and has drawn the attention of the Legislature to the extent and gravity of the evils resulting from its use. Doctors and dentists are at one on this matter, and from time to time the journals of both professions refer to the evils of the "dummy habit." It must not be imagined, however, that the "dummy," and wrong feeding alone are responsible for bad teeth, adenoids, etc.; indeed the whole lesson conveyed throughout this book must have been singularly misunderstood if the reader can imagine that any one factor is to be regarded as the sole cause of human degeneracy in any direction whatever. The first page shows the broad essentials for health—the fundamental needs without which no human organism can grow up complete and perfect in all its parts—indeed, in any of its parts. Good pure blood is essential for the formation of perfect bones

and teeth, just as it is essential for the formation of a sound brain and nervous system. But there cannot be good pure blood without suitable food and proper feeding methods; abundance of fresh air and sunlight, adequate exercise, play, rest and sleep. Further, there must be no cramping of feet, limbs, or body; and there should be regularity of daily habits, proper "mothering," etc.

Summary of leading factors which tend to induce Nasal Obstruction, Mouth-Breathing, Adenoids, Defective Jaws and Teeth, and the whole train of evils to which these conditions give rise.

(1) **Failure to breast-feed the baby.** Normal suckling supplies the ideal food and the ideal form of exercise—especially for developing the mouth, nose, jaws, teeth, and all adjacent parts.

(2) **Use of the "dummy," or the habit of persistent sucking of fingers, etc.** This moulds the jaws, palate, etc. in deformity, and gives rise to defective, irregular teeth, besides upsetting the digestion by inducing constant sucking and dribbling of saliva.

(3) **Use of wrong feeders and wrong feeding methods—**

(*a*) The use of any feeder not necessitating much work on the part of the **baby.** Any teat with a large hole is harmful, because it permits of easy passive imbibition of milk instead of calling for active sucking. A hard-worked, well-grown tongue moulds the roof of the mouth, the nose, and the jaws on broad lines, and thus insures spacious highways for food and air, and plenty of room for teeth.

(*b*) **Allowing any artificial teat to remain long in the mouth.** Practically speaking, no feeding should occupy more than twenty minutes. The bottle should be held throughout each feeding.

(4) **Failure to give work to jaws and teeth—"Pap-feeding"**—*e.g.* failure to give baby a bone (say, from six months of age onwards), followed by "pap-feeding" after weaning. This is a very grave mistake. The baby's early natural instinctive tendency to exercise his jaws, followed (when he has cut some serviceable teeth), by a liking for hard, tough, or dry foods, such as crust of bread, toast, etc., should be gratified and encouraged.

(5) **Failure to supply food of the proper composition for tissue-building** (including the building of bones and teeth). Normal mother's milk is the standard type for a baby's food during the

first year, and if the infant cannot have this he is entitled to the nearest approach to it—viz. humanised milk.

(6) Defective General Hygiene—(See "What Every Baby Needs," page 1).

The woman who has once grasped the full significance of the foregoing would not say—as many a mother does when spoken to about the injury that the "dummy" is insidiously though imperceptibly doing to her bright active baby with rosy cheeks and shining eyes—"Well! the 'dummy' hasn't done him much harm so far—now, has it?"

It is amazing that so many mothers speak in this way, and act accordingly. They are quite prepared to persist in a wrong course until they can see actual definite harm. Women constantly say: "I know such and such a child who had a dummy, and his teeth are all right." They don't realize that the child's jaws, teeth, airways, digestive apparatus and whole organism and faculties would have been still better had no dummy been used, and that for one case where they can see no damage there would be a dozen cases where the evil effects would be clear even to themselves, if pointed out by some one with more knowledge as to the proper structure and shape of jaws, teeth, mouth, nose, etc.

It is not suggested that because a particular child used the "dummy" that he must therefore show obvious defects and deformities of mouth, teeth, etc.; but that the great majority of children so treated do show such defects more or less—and these will be aggravated by neglect of care and attention in regard to any of the prime factors making for health. The most deplorable cases are seen where all the adverse factors are brought to bear in the case of a particular child who has been delicate at birth; whereas a child exceptionally robust at birth, subjected to only one harmful influence—say, for instance, the use of the "dummy"—may escape, not really "scot free," but to outward appearance undamaged, and actually more normal than the average child of civilization. **However, he will not be what he might have been.**

Bad Habits

Faulty habits, if firmly established in babyhood or early childhood, are often extremely difficult to break, and even though broken, they may recur later in life. Hence the extreme importance of forming the baby's habits and character on right lines from the beginning. Regularity, robust health, good digestion, and a well-nourished active body are the best safeguards. Nervous, unstable, disobedient, spoiled weaklings are specially liable to become the victims of uncontrollable habits such as:—

(1) **Persistent Sucking of Fingers, Clothing, Etc.** Often due to use of "dummy." Years may elapse and irreparable harm may have been done to mouth and digestion before such habits can be broken.

It is often quite impossible to assign any cause for one child acquiring a habit of this kind and persisting in it, while another shows no such tendency. The difficulty of curing the habit may be very great indeed, but there is no doubt whatever that the mother should do all in her power to counteract the habit and not merely keep it from getting worse. By resourcefulness and perseverance she will win in the end, but it may take some time. Habitual thumb-sucking will bring about changes in the shape of the jaws and also interfere with the proper development of the teeth and of the air passages in the nose (see reference to the "Dummy," page 215).

The child's hands should be kept away from the mouth and there are several means by which this may be accomplished—for instance by tying them to the sides or fixing them by cutting a hole in the end of a pillow case (as described under the heading "Eczema," page 201), or by the application of corrugated cardboard splints to the elbow. These, while allowing for free movement of the arm from the shoulder will not permit the elbow to bend, and so the hand will be kept away from the mouth. Splints should not be worn all the time, but should be left off at intervals so that the child may exercise his arms.

(2) **Biting the Nails and Eating Dirt.** Both practices are liable to be very injurious, and no pains should be spared to break such habits directly they are noticed. Parents who have seen a charming child with a rare gift for violin-playing forced to abandon the instrument on account of incurable nail-biting know how dominant and overmastering such an apparently simple fault may become.

(3) **Inveterate and Persistent Bed-Wetting.** The earlier a baby can be trained to be cleanly in the daytime, and not to wet the bed at night, the better.

Much depends on mother or nurse; much on the general health and nervous stability of the child. In quite normal children wetting of the bed at night is liable to occur during the second year, and not infrequently well into the third year; but if the habit cannot be broken towards three years of age a doctor should certainly be consulted. Often the main cause is poor health; omit no detail of hygiene—see pages 1-3. Or there may be irritation in connection with urine, foreskin, worms, etc.

In cases of persistent bed-wetting it is wise to give no fluids to drink after 4 p.m., and to give the last meal of solid or semi-solid food. Take the child up regularly about 10 p.m., until you find it can sleep through the night without "accidents."

(4) **Masturbation.** This serious vice may begin as a simple, unmeaning habit, allowed to develop unchecked, indeed unnoticed, during infancy or early childhood, in the same way as persistent sucking or nail-biting.

> "Masturbation is the habit of rubbing the genital organs with the hands, with the clothing, against the bed, or rubbing the thighs together. Sometimes the child sits upon the floor, crosses its thighs tightly and rocks backward and forward. Many of these things are passed over lightly and are regarded for months as simply a 'queer trick' of the child. It may be seen at any age, even in those not more than a year old, and in both sexes. Masturbation is the most injurious of all the bad habits, and should be broken just as early as possible. Children should especially be watched at the time of going to sleep and on first waking. Punishments are of little avail, and usually make matters worse."—(*Holt.*)

Examination must be made for any local condition causing irritation or inflammation, and these causes, when present, must be treated. The habit, unless persisted in, is unlikely to cause any permanent harm to the child. **In any case medical advice should be sought.**

Circumcision—Largely on account of an impression that circumcision tends to lessen the tendency to masturbation in boys, this operation is much in vogue nowadays, and parents are greatly exercised about the question.

In the writer's opinion there are not sufficient data to warrant the conclusion that circumcision should be practised as a mere matter of routine. Indeed, there are reasons for regarding the normal foreskin rather as a protection and safeguard than as necessarily a source of danger. On the other hand, there is no question that a tight, too long, or adherent foreskin is objectionable, as being uncleanly, a source of local irritation, and an incitement to bad habits. If the foreskin can be readily drawn back in infancy there need be no anxiety, but if it cannot, a doctor should be consulted without delay.

When an infant has pain or difficulty in passing urine a probable cause is tightness of the foreskin. Consult a doctor without delay.

The Foreskin—During the first few weeks of infancy gentle daily drawing back of the foreskin should be carried out at bathing time.

At birth the foreskin usually entirely covers the "glands" (the acorn-like end of the organ), but is easily drawn back in the majority of cases.

Daily drawing back of the foreskin at bathing time and cleansing of the parts (before the dawn of definite consciousness shall have rendered the manipulations objectionable), carried out in all cases, and particularly where there is any tendency to tightness, is a most important part of the nurse's duty to male infants.

Objections to Routine Retraction of the Foreskin—Before the dawn of consciousness the daily retraction of the foreskin by the mother or nurse at bathing time is a proper procedure; but, after the first month of life, the less the organ is meddled with by the child or its elders the better.

There is an unfortunate modern tendency to advocate elaborate meddlesome attentions to various parts of the organism which would be better left alone. Wiping out the mouth and routine obtrusive handling of a baby's "privates" are cases in point.

One can only regret the well-intentioned but misguided advice that mothers are apt to have conveyed to them nowadays as to what is euphemistically called the "toilet of the genitals." The natural parental instinct to chide or slap a child for "fingering the privates" is sounder and more wholesome.

The inner surface of the normal foreskin is no more in need of washing and fingering than the baby's toothless mouth, and the natural soft, whitish, creamy, soapy secretion underlying the foreskin is no more in need of removal than is the soft, semi-fluid, protective wax lining the interior of the tube leading to the drum of the ear. Both secretions fulfil a natural and useful purpose, and the fact that occasionally either may become abnormally hard and dry, and therefore need attention, is no excuse for daily meddling with the parts. In general external washing suffices.

A moment's reflection on the frequency with which little children are "tampered with" by their elders, of either sex, should prevent developing human frailty in this direction by daily subjecting nurse-girls to the very conditions best calculated to lead both them and their charges astray.

Formation of Character

The mother should never forget that the destiny of her baby (bodily and mental), is mainly determined in the first years of life.

Nature has specially marked out the first twelve months of life as the appointed time for growing the body, and even more emphatically for growing the brain, of the human being. If the mother fritters away this one golden opportunity instead of making the most of it and doing the best possible for her baby, no after care can make up for her mistakes or neglect. "Make hay while the sun shines"—it never shines again for the baby as it shines in the first twelve months of life. Everything in after years depends on uninterrupted healthy growth during infancy.

The fostering of sound, regular, hygienic organic habits and self-reliance at the earliest possible age not only establishes such habits for life, and promotes the growth of the parts immediately concerned, as well as the health of the body generally, but will also manifest its influence on higher planes. Tendencies trained early into the very tissue and structure of the simpler and more primitive vital organs will assert themselves later on in assisting the development and functioning of the most complex and peculiarly human parts of the organism upon which character, control, and conduct to a large extent depend.

Obedience in infancy is the foundation of all later powers of self-control; yet it is the one thing the young mother nowadays is most inclined to neglect. Instead of gently, wisely, and firmly regulating her baby's habits and conduct, she tends to allow him to have his own way and to rule her and the whole household. Not so the wiser so-called "lower animals." The dog and the cat carefully train their progeny in necessary habits of regularity, cleanliness, etc., from the beginning, and as has been pointed out by Long, Seton-Thompson, and others, they chide, cuff, and punish them when necessary rather than allow the formation of bad and irregular habits which would exact far greater penalties later on. All this is

done by instinct; and the human mother, with the stronger love and the greater wisdom which should be hers, would have no difficulty in guiding her child aright by firmness and consistency alone, without resorting to punishment, if she would but start at the beginning. The establishment of perfect regularity of habits, initiated by "Feeding and Sleeping by the Clock" (see page 19), is the ultimate foundation of all-round obedience. Granted good organic foundations, truth and honour can be built into the edifice as it grows.

"Building the Teeth" and "Formation of Character" are parts of construction of the same edifice—standing in the relationship of the underground foundations of a building to the superstructure.

Our dentists tell us that nowadays when they insist on the eating of crusts and other hard food, the mothers often say "Our children simply won't!" They simply "won't" comply with laws which have a higher sanction and greater antiquity than the authority of man himself! Such children merely exemplify the ineptitude of their parents—parents too sentimental, weakly-emotional, careless, or indifferent to fulfil the primary laws of Nature. The "can't-be-so-cruel" mother, whose baby cries half the night and frets all day on account of the mother's failure to fulfil one of the first of maternal duties, should not blame Providence or heredity because her progeny has turned out a "simply-won't" in infancy, and will become a selfish "simply-can't" in later childhood and adolescence. Power to obey the "Ten Commandments," or to conform to the temporal laws and usages of society, is not to be expected of "spoiled" babies when they reach adult life. The plain meaning of the word "spoiled" is worth some reflection. Every one grasps the full significance of spoiling a dress or spoiling a dinner, but the spoiling of a child is regarded more lightly!

Unselfishness and altruism are not the natural outcome of habitual self-indulgence. Damaged health and absence of discipline and control in early life are the natural foundations of failure later on—failure through the lack of control which underlies all weakness of character, vice and criminality.

Dr. and Mrs. Fitz, in a book dedicated "**To those Parents who deem the Training of their Children their Supreme Privilege and Duty,**" say:—

> Even as the child's constitution (however weak or strong through heredity), may be markedly changed by fresh air, suitable feeding, proper clothing, and an abundance of sleep and exercise, so the child's character (whatever the inherited tendencies), may be transformed for good or for bad by training.
>
> The child at birth has a brain which is the physiological foundation of the adult brain . . . . . The child's character roughly fashioned by heredity begins to be moulded for good or ill on the day on which he is born.
>
> There are few sights more pathetic than that of the weak mother not daring to lay her child down because he will cry for the snuggling warmth of her arms, which in the few days of his apparently unintelligent existence he has learnt can be had for the crying. Critically to watch a baby "work" his mother is truly enlightening, because his physical helplessness makes it seem so incredible . . . . . And when the mother has yielded during the first few weeks to the demands of her child's cries, the chains of her slavery are curiously hard to break.

Parenthood and Race Culture

"At the bottom of Infant Mortality, high or low, is good or bad motherhood. Give us good motherhood and good prenatal conditions, and I have no despair for this or any other country."—The Rt. Hon. JOHN BURNS, M.P., as President National Conference on Infant Mortality.

The following extracts from *Parenthood and Race Culture*, by Dr. C. W. Saleeby, should be pondered over by every parent.

> "Our prime assumption from beginning to end is that 'There is no wealth but life.' . . . . We have been considering man from the point of view of what is transmitted to offspring by parents. But a word must be said as to the other factor which, with heredity, determines the character of the individual —and that factor is the environment. I wish merely to note the most important aspect of the environment of human beings, and to observe that historians hitherto have wholly ignored it; yet its influence is incalculable. I refer to MOTHERHOOD.

Heredity gives Potentialities, Environment develops these Potentialities and turns them to good or evil account.

"One might have the most perfect system of selection of the finest and highest individuals for parenthood; but the babies whose potentialities—heredity gives no more—are so splendid, are always, will be always, dependent upon motherhood. What was the state of motherhood during the decline and fall of the Roman Empire? This factor counts in history, and always will count so long as three times in every century, the only wealth of nations is reduced to dust, and is raised again from helpless infancy . . . . ."

The following is an extract from an address given by the author in 1909:—

The decadence of nations is threatening many lands. France, with its declining birthrate, has already become a second-class power. Ancient history teaches the same lesson. The decay of Greece and Rome was not primarily due to a falling-off in the prowess of the phalanx and the legion, but to increasing luxury, lessened exertion, lessened contact with the open air, a growing cost in the standard of living, and an increasing selfishness, which expressed itself in a disinclination for the ties of marriage and parenthood. Normal home life was shirked, and decadence and sterility led to the fall. Speaking of Greece, Professor Seeley remarked that there arose a general repugnance to marriage, and a reluctance to rear large families, caused by an extravagantly high standard of comfort. In Rome he showed that a similar principle of decay asserted itself. The Roman of Imperial times came to prefer celibacy to marriage, and thus was ushered in a period of sterility or barrenness in human beings—the human harvest was bad. **We hear much nowadays about national defence, but we must not put our whole trust in the "reeking tube and iron shard." The safety of nations is not a question of the gun alone, but also of the man behind the gun, and he is mainly the resultant of the grit and self-sacrifice of his mother. If we lack noble mothers we lack the first element of racial success and national greatness.**

THE DESTINY OF THE RACE IN THE HANDS OF ITS MOTHERS

To-day our historians and politicians think in terms of regiments and tariffs and battleships: the time will come when they must think in terms of babies and motherhood. We must think in such terms, too, if we wish Great Britain to be much longer great. Meanwhile some of us see the perennial slaughter of babies in this land, and the

deterioration of many for every one killed outright, the waste of mothers' travail and tears, and we recall Ruskin's words:—

> Nevertheless it is open, I repeat, to serious question, whether among national manufactures, that of Souls of good quality may not at last turn out a quite leadingly lucrative one. Nay, in some far-away and yet undreamt-of hour I can even imagine that England may cast all thoughts of possessive wealth back to the barbaric nations among whom they first arose; and that while the sands of the Indus and adamant of Golconda may yet stiffen the housings of the charger, and flash from the turban of the slave, she, as a Christian mother, may at last attain to the virtues and the treasures of a Heathen one, and be able to lead forth her Sons, saying:
>
> **"These are MY Jewels."**

Had all Roman mothers been Cornelias, would Rome have fallen? Consider the imitation mothers—no longer mammalia—to be found in certain classes to-day—mothers who should be ashamed to look any tabby-cat in the face; consider the ignorant and down-trodden mothers amongst our lower classes, and ask whether these things are not making history . . . . .

My attention has been called to the following passage, not irrelevant here. It is from the *Attic Nights* of Aulus Gellius, Book xii, chap. i, written about A.D. 150:—

A ROMAN ON MOTHERHOOD

> Once when I was with the philosopher Favorinus word was brought to him that the wife of one of his disciples had just given birth to a son.
>
> "Let us go," said he, "to inquire after the mother and to congratulate the father." The latter was a noble of senatorial rank. . . . .
>
> Favorinus having embraced and congratulated the father sat down and inquired how his wife had come through the ordeal. And when he heard that the young mother, overcome with fatigue, was now sleeping, he began to speak more freely.
>
> "Of course," said he, "SHE WILL SUCKLE THE CHILD HERSELF." And when the girl's mother said her daughter must be spared and nurses obtained in order that the heavy strain of nursing the child should not be added to what she had already gone through, "I beg of you, dear lady," said he,

"ALLOW HER TO BE A WHOLE MOTHER TO HER CHILD. Is it not against Nature, and being only half a mother, to give birth to a child, and then at once to send him away—to have nourished with her own blood and in her own body a something that she had never seen, and then to refuse it her own milk now that she sees it living, a human being, demanding a mother's care? Or are you one of those who think that Nature gave a woman breasts, not that she might feed her children, but as pretty little hillocks to give her bust a pleasing contour? Many, indeed, of our present-day ladies do try to dry up and repress that sacred fount of the body, the nourisher of the human race, even at the risk they run from turning back and corrupting their milk, lest it should take off from the charm of their beauty.

"But it makes no difference—for as they say—so long as the child is nourished and lives, with whose milk it is done.

"Does he who says this, since he is so dull in understanding Nature, think it is also of no consequence in whose womb and from whose blood the child is formed and fashioned! For is there not now in the breasts the same blood which was before in the womb? And is not the wisdom of Nature to be seen in this, that as soon as the blood has done its work of forming the body down below, and the time of birth has come, it betakes itself to the upper parts of the body, and is ready to cherish the spark of life and light by furnishing to the new-born babe his known and accustomed food?

"And so it is not an idle belief that, just as the strength and character of the seed have their influence in determining the likeness of the body and mind, so do the nature and properties of the milk do their part in effecting the same results. And this has been noticed not in man alone: in the case of timber and fruit trees, too, the qualities of the water and soil from which they draw their nourishment have more influence in stunting or augmenting their growth than those of the seed which is sown, and often you may see a vigorous and healthy tree when transplanted into another place perish owing to the poverty of the soil.

"Is it, then, a reasonable thing to corrupt the fine qualities of the new-born man, well endowed as to both body and mind so far as parentage is concerned, with the unsuitable nourishment of degenerate and foreign milk?

". . . . And besides these considerations, who can afford to ignore or belittle the fact that those who desert their offspring and send them away from themselves, and make them over to others to nurse, cut, or at least loosen and weaken, that chain and connection of mind and affection by which Nature attaches children to their parents!"

Influence and Responsibility of "Parenthood" viewed in the Light of To-day

If the foregoing enlightened and lofty reflections on the rights of the child, coming to us from the Old Roman world and based on the claims of ideal citizenship and patriotism, leave the parents of to-day unmoved, one can scarcely hope that any higher appeal will be of much avail. However, it may not be out of place to remind those mothers who now take the duties and privileges of parenthood lightly—who do not realize that they should be the virtual creators of their offspring in the highest and most responsible sense—not their mere pro-creators—it may not be out of place to say again that it lies almost entirely with the mother to make or mar not only the jaws and teeth of her offspring, but, along with the health or debility of the whole body, to determine largely the intellectual, moral, and spiritual destiny as well. "For are not your bodies the temples of the Holy Ghost?"

The Archbishop of Canterbury, speaking some years ago at a meeting of the National Health Association in London, said in effect that the time had gone by when truly religious people could narrowly ignore the claims of the body—that no one nowadays should fail to realize how the spiritual potentialities of humanity are conditioned and limited by the bodily state—that no one can expect to reach full mental, moral, or spiritual stature without due attention to the rightful claims of the body.

As for the children themselves, G. W. Steevens, the great war correspondent who died at the siege of Ladysmith, said most forcibly:—

"Children ought to be taught to be proud of being well, not of being ill; to be taught that sickness is not a source of interest but a badge of inferiority; that to be healthy (whole) is the prime condition of all things desirable in life. Such an education might be trusted to breed healthy bodies controlled and mastered by healthy minds."

Finally, we may point to words of the greatest wisdom, used by King Edward VII, in reference to consumption —words equally applicable to nearly all the ailments and disabilities of child-life:—

"IF PREVENTABLE, WHY NOT PREVENTED!"

Recipes

APPLE PULP

Bake apple until soft. Remove skin and core. Rub through sieve.

BARLEY JELLY

(*a*) Soak two tablespoons of washed pearl barley in one pint of boiled water for an hour. Bring to boil and simmer for about three hours. Strain through wire sieve.

(*b*) Make as for oat jelly, using patent barley or ground rice.

BARLEY WATER

Barley water may be made by using six times as much water as for preparing barley jelly; or by adding five parts of boiling water to one of the prepared jelly.

BORACIC LOTION

Boracic acid, one tablespoonful.
Water, one pint.

Boil for three minutes, make up to a pint with boiling water. Strain through muslin.

BROTH (Mutton)

One knuckle mutton, one tablespoon pearl barley, pinch of salt, 1½ pints cold water. Simmer down to about three-quarters of a pint, cooking slowly for two to three hours. Set aside and remove all fat next day. Strain through sieve.

Note—At first strain clear. Later cook with sliced vegetables and press through sieve.

BROTH (Vegetable Milk)

One carrot, one small potato, few leaves of spinach or silver beet, or small piece cauliflower, sprig parsley, and tablespoon pearl barley or rice. Slice vegetables, add 1½ pints water, and simmer for about two hours. Put through sieve, add an equal quantity of milk, and re-heat just before serving. At first strain the broth clear. Later press the cooked vegetables through the sieve.

CARROT OR SWEDE JUICE

Thoroughly wash the carrots or swedes and dip them in boiling water for a few seconds to prevent giving baby any living germs from the soil. Grate the vegetables on a fine kitchen grater and squeeze the juice through muslin. The vegetables should **not** be peeled.

CUSTARD (steamed)

Milk six oz., one egg, pinch of salt. Beat the egg; add the milk and salt. Stand in a saucepan of boiling water or steamer until just set. Do not allow to boil.

EGG (coddled)

Put the egg into **boiling** water. Cover and remove pan at once from the fire. Stand aside for about seven minutes. The white will be softer and more easily digested than when the egg is boiled.

FISH (steamed)

Piece of fish, tablespoon or two of milk, small dab of butter, pinch of salt. Place between two plates. Steam over saucepan of boiling water for 20 minutes or until tender. Serve with parsley sauce or melted butter.

FRUIT MIXTURE

For Constipation in Adults

Prunes one lb.; brown sugar or black treacle ½ lb.; powdered ginger ½ teaspoonful; powdered senna ½ oz. Soak the prunes overnight; boil for 20 minutes with sugar or treacle; stone and chop fine or pass through a mincer; mix the ginger and senna with the liquid, and then stir thoroughly into the mixed prunes. Store in a stoppered glass jar.

Dose—One to two teaspoonfuls morning and evening as required.

GLYCERINE AND BORACIC ACID

Boracic acid one teaspoonful, glycerine ½ oz., boiling water 5 oz.

JUNKET

Milk ½ pint. Warm milk to 100 deg. F. or blood heat. Add and stir in an amount of rennet according to the directions on the bottle. Stand in a cool place to set.

KARITANE OINTMENT

White vaseline 1 oz.
Zinc ozide 1 drachm.
Oil of almonds 1 teaspoonful.
Lanoline ½ teaspoonful.

LIME WATER

Thoroughly stir one tablespoonful of freshly-slaked lime into half a gallon of boiled water; cover to keep out falling particles. After 12 hours pour off the water and throw it away as it contains any impurities present. A thick cream of lime will remain at the bottom of the vessel. Again add half gallon of boiled water, stir for three minutes, and allow it to stand covered as before for 12 hours. The clear fluid is lime water, and should be carefully poured off and bottled in green glass-stoppered bottles.

MILK PUDDING

Made with semolina, ground rice or sago. One level dessertspoonful to 4 oz. of milk. Take a little of the milk and mix with the cereal. Add to the rest of the milk which should be boiling. Boil for a few minutes; then bake in a small bowl (standing in a dish of water), for 30 minutes. Salt to taste.

OATCAKE

Oatmeal 7 oz., butter or good dripping two teaspoons, salt ¼ teaspoon. Melt fat in two tablespoons boiling water. Mix into oatmeal. Sprinkle board with oatmeal. Roll out thin. Bake **slowly** till crisp through.

Note—For younger children, or if preferred, the above recipe may be modified by using some flour, instead of all oatmeal.

OAT JELLY

(*a*) Take well-cooked, thin, oatmeal porridge, or equal parts of well-cooked, thick porridge and hot water. Heat through in saucepan. Strain through fine sieve.

(*b*) Mix two level tablespoons of patent groats to a smooth paste with cold water, add a pinch of salt, and make up to ½ pint with boiling water. Simmer for ½ hour. Strain.

N.B.—The first method is preferable.

ORANGE JUICE

Make sure the fruit is sound. Squeeze out the juice and strain through muslin.

PORRIDGE

Stir 2 oz. of fine oatmeal into one pint of boiling water. Add half teaspoon of salt. Cook in a double saucepan for from two to three hours, stirring occasionally; or cook overnight in a home-made fireless cooker.

POTATO (baked)

Thoroughly scrub the potato. Place in hot oven until soft.

PRUNE JUICE

Wash prunes and soak in cold water overnight. Simmer for about three-quarters of hour or until the prunes are soft. Strain.

PRUNE PULP

As above. Press prunes through wire sieve with enough juice to moisten.

RICE JELLY

As for barley jelly, using whole rice.

SALINE

One level teaspoonful common salt. One pint boiled water. Bring to the boil and strain.

SOAP JELLY

(See page 64.)

SPINACH PUREE

Wash spinach thoroughly. Simmer gently with pinch of salt for 15 or 20 minutes or until quite tender. No extra water is needed if the leaves are left wet when washed, and the heat is gentle. Press through fine wire sieve.

TWICE BAKED BREAD

Take bread (preferably one day old), break into rough pieces, or cut in finger lengths. Bake in slow oven until golden brown, and dried through, but not brittle.

VEGETABLE PUREE

Use vegetables such as carrot, cauliflower, turnip. Steam or simmer gently until tender. Add pinch of salt. Mash through sieve.

Note—Cook **all** vegetables in very little water and for no longer than is required to make them tender. **Save the water they are cooked in for making broths or gravy.** (It contains valuable mineral elements out of the vegetables; children need these). **Use no soda in cooking vegetables.**

WHEATMEAL OR FINELY GROUND WHOLEMEAL JELLY

(*a*) Make as for oat jelly, using wheatmeal or wholemeal.

(*b*) Using semolina; cook well.

WHEY

Take one and a half times as much milk as the amount of whey required. Place this in a clean saucepan and heat to blood heat. Stir in the rennet extract (according to directions on bottle), and allow to stand for three minutes when a firm curd should have formed. Break this up thoroughly with a clean fork and bring the whey quickly to the boil. Let it stand aside for two or three minutes. Now pour off the whey from the curd, straining it through a clean, boiled strainer lined with butter muslin.

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